COUNTY OF UNION

DEPARTMENT OF ENGINEERING, PUBLIC WORKS & FACILITIES MANAGEMENT
Joseph J. Policay, Jr., CPWM, Director

BOARD OF COUNTY COMMISSIONERS

LOURDES M. LEON
Chairwoman

JOSEPH C. BODEK
Vice-Chairman

JAMES E. BAKER, JR.

MICHÈLE S. DELISFORT

SERGIO GRANADOS

BETTE JANE KOWALSKI

ALEXANDER MIRABELLA

KIMBERLY PALMIERI-MOUDED

REBECCA WILLIAMS

EDWARD T. OATMAN
County Manager

AMY CRISP WAGNER
Deputy County Manager

BRUCE H. BERGEN, ESQ.
County Counsel

JAMES E. PELLETTIERE
Clerk of the Board

RICARDO S. MATIAS
PE, CME, CFM
County Engineer
Director, Division of Engineering

DATE: **May 23, 2025**

FROM: **Ricardo S. Matias, PE, CME, CFM**
County Engineer

TO: **All Potential Bidders**

RE: **CLARIFICATION 1**
Clark Reservoir Improvements
Township of Clark, County of Union, New Jersey
BA # 26-2025, Union County Engineering 2020-002

Bidders of the above project are hereby notified of the enclosed clarification.

Please be sure to complete and submit the "Acknowledgement of Addendum" form included in the original specifications and submit it with the bid as Addendum #1 and Addendum #2 have been previously issued.

May 22, 2025

UNION COUNTY, NEW JERSEY
SPECIFICATIONS AND CONTRACT DOCUMENTS
FOR

CLARK RESERVOIR IMPROVEMENTS PREPARED APRIL 2025

CLARIFICATION No. 1

To All Concerned:

Bidders of the above captioned project are hereby notified of the following clarifications to the Specifications and Contract Documents:

1. Regarding the available inflow/outflow hydraulic data, Bidders are directed to the following sources:

a. FEMA's Flood Insurance Study for Union County, NJ, dated September 20, 2006. https://map1.msc.fema.gov/data/34/S/PDF/34039CV001A.pdf?LOC=76680e08d76c8f2a01ebe6833ee78ce9

   i. Bidders are specifically directed to Page 41 – Table 4 – Summary of Discharges which contains peak discharges for Robinson Branch at Middlesex Reservoir Dam and Robinson Branch Downstream of Winding Brook (point located approximately 5,000' upstream of Featherbed Lane).

b. United States Geological Survey (USGS) StreamStats. https://www.usgs.gov/streamstats

   i. According to StreamStats, the following peak flows were generated for the flows entering the Headwaters:

Statistic	Value	Unit
50-percent AEP flood	865	CFS
20-percent AEP flood	1250	CFS
10-percent AEP flood	1520	CFS
4-percent AEP flood	1870	CFS
2-percent AEP flood	2130	CFS
1-percent AEP flood	2400	CFS
0.2-percentAEPflood	3020	CFS

ii. According to StreamStats, the following peak flows were generated for the flows directly downstream of the Dam located on the East Lake:

Statistic	Value	Unit
50-percent AEP flood	821	CFS
20-percent AEP flood	1190	CFS
10-percent AEP flood	1440	CFS
4-percent AEP flood	1770	CFS
2-percent AEP flood	2010	CFS
1-percent AEP flood	2260	CFS
0.2-percentAEPflood	2830	CFS

Bidders are advised that information in this regard is readily available online, and that this Clarification is provided for reference purposes only and should not be relied upon or referenced in any submission. Each Bidder is responsible for determining these values for themselves.

COUNTY OF UNION

DEPARTMENT OF ENGINEERING, PUBLIC WORKS & FACILITIES MANAGEMENT
Joseph J. Policay, Jr., CPWM, Director

MEMORANDUM

BOARD OF COUNTY COMMISSIONERS

LOURDES M. LEON
Chairwoman

JOSEPH C. BODEK
Vice-Chairman

JAMES E. BAKER, JR.

MICHÈLE S. DELISFORT

SERGIO GRANADOS

BETTE JANE KOWALSKI

ALEXANDER MIRABELLA

KIMBERLY PALMIERI-MOUDED

REBECCA WILLIAMS

EDWARD T. OATMAN
County Manager

AMY CRISP WAGNER
Deputy County Manager

BRUCE H. BERGEN, ESQ.
County Counsel

JAMES E. PELLETTIERE
Clerk of the Board

RICARDO S. MATIAS
PE, CME, CFM
County Engineer
Director, Division of Engineering

TO: All Potential Bidders

FROM: Ricardo S. Matias, PE, CME, CFM, (RSM)
County Engineer
Director / Division of Engineering

DATE: May 19, 2025

RE: **ADDENDUM NUMBER 2**
Clark Reservoir Improvements
Township of Clark, County of Union, New Jersey
BA # 26-2025, Union County Engineering 2020-002

Attached is Addendum Number 2 for the above referenced project.

Please be sure to complete and submit the standard "Acknowledgement of Addendum" form included in the original bid specifications and submit it with the bid.

May 19, 2025

UNION COUNTY, NEW JERSEY
SPECIFICATIONS AND CONTRACT DOCUMENTS
FOR

CLARK RESERVOIR IMPROVEMENTS PREPARED APRIL 2025

ADDENDUM No. 2

To All Concerned:

The original Specifications and Contract Documents for the Clark Reservoir Improvements prepared April 2025 are amended as noted herein this Addendum No. 2.

CONCERNING THE SPECIFICATIONS, BID DOCUMENTS, AND CONTRACT DRAWINGS

CONCERNING THE SPECIFICATIONS AND BID DOCUMENTS

1. BID FORM

The Descriptions, Units, and Contract Quantities for Item #88 and Item #89 have been revised. Remove Page B-90 and replace with the attached page B-90.

Deletion Item # 3-14 has been added. Remove Page B-110 and replace with the attached page B-110.

2. SECTION 206– ALLOWANCE FOR DISPOSING OF HAZARDOUS AND REGULATED MATERIAL

Remove the fifth paragraph on Page 200-19 and replace with the following:

Payment under disposing of regulated material shall include permits, fees, and handling associated with the disposal of regulated material.

3. SECTION 502– LOAD BEARING PILES

The following items are hereby added to Section 502.04

Pay Item	*Pay Unit*
Pre-Augering for Timber Piles (If and Where Ordered)	Linear Foot
Pre-Augering for Bridge F Piles (If and Where Ordered)	Linear Foot

4. SECTION 606– SIDEWALKS, DRIVEWAYS, AND ISLANDS

Remove the third paragraph of Section 606.01 in its entirety.

Remove the third, fourth, and fifth paragraphs from Section 606.02 in their entirety.

CONCERNING THE CONTRACT DRAWINGS

5. CONSTRUCTION DETAILS (3 OF 9) (PLAN 99 OF 139)

The attached Preformed Scour Hole detail is hereby added.

6. PEDESTRIAN BRIDGE "E" SECTIONS AND DETAILS (2 OF 2) DETAILS (S-15) (PLAN 131 OF 139)

The attached "Timber Post Base Connection" detail is hereby added.

Remove "SEE BOX CULVERT DWGS FOR CONNECTION DETAIL" from the note on the Timber Bridge Approach Railing Detail.

7. PEDESTRIAN BRIDGE "F" PLAN, ELEVATION AND DETAILS (S-16) (PLAN 132 OF 139)

Revise the grade of the ASTM F1554 anchors in the Anchor Bolt Elevation from 36 to 105.

8. PEDESTRIAN BRIDGE "F" SECTIONS, DETAILS AND DESIGN-BUILD NOTES (2 OF 2) (S-18) (PLAN 134 OF 139)

Revise the last sentence of Note #11 to "Measurement and Payment for Pre-Augering shall be included in the unit price bid for "Pre-Augering for Bridge F Piles (If and Where Ordered)."

9. KAYAK STORAGE PIER – PILE CAPES, JOISTS AND DECK FRAMING PLAN (S-21) (PLAN 137 OF 139)

Revise the last sentence of Note #9 to "Measurement and Payment for Pre-Augering shall be included in the unit price bid for "Pre-Augering for Timber Piles (If and Where Ordered)."

10. CENTRAL LAKE PARK BOAT RAMP PLAN, DETAILS AND NOTES (S-22) (PLAN 138 OF 139)

Revise the "2 ½" MINUS ANGULAR DRAWING STONE W/ NO FINES" note in Detail 1, Section T, and Section U to "MINIMUM 8" THICK 2 ½" MINUS ANGULAR DRAWING STONE W/ NO FINES".

REQUESTS FOR INFORMATION

11. Please note that Note #9 on Drawing S-21 states piles may require pre-augering where necessary. Including these uncertain costs in the driven timber pile pay items could unnecessarily inflate bids. Instead, any required pre-augering should be quantified and listed as a separate bid item, as contractors cannot accurately estimate these costs in advance.

Response: An item and corresponding quantity has been provided as indicated herein.

12. Please confirm that all excavated material being generated for the proposed bridge construction will not be suitable for re-use as backfill. The note on Drawing Number S-10 and the detail for "Pay Limits of Backfill" provide contradictory information.

Response: Please refer to Pay Limit Note #3 on Drawing No. S-10.

13. Under which pay item will the contractor be compensated for the Licensed Professional Engineering and Subsurface Exploration being proposed for the Design Build of Bridge "F".

Response: Please refer to Design-Build Note #4 on Drawing Nos. S-17 and S-18.

14. Under which pay item will the contractor be compensated to install the proposed 8" Perforated HDPE Underdrains for Bridges "E" & "F".

Response: Please refer to NOTE in the abutment section views on Drawing Nos. S-14 and S-18.

15. Please confirm that Bridge "F" is the only area where concrete staining on the abutments and wing walls will be necessary.

Response: Confirmed.

16. Under section 157 – Construction Layout – paragraph 7 on page 150-6, states "When requested by the RE, make available a competent person from his construction force to assist the RE in any manner which may be necessary to check the grades and alignment as well as other features of the work. No extra payment will be made for the services of such an assistant, and payment for the assistance shall be deemed to be included in the various unit prices bid. Failure to comply with this provision shall be sufficient cause for the RE to stop work on unchecked sections." The question is how do we quantify how much time is needed? Is it one day per month, once per week, a few hours per month, please clarify or provide an allowance.

Response: A competent person shall be on site at all times during Construction to assist the RE.

17. Under Section 202.04 Measurement and payment, the following is added in paragraph 2, states "Separate measurement and payment shall not be made for the disposal of Regulated Material associated with the dredging of the ***Headwaters, West Lake, and Central Lake. Same shall be included in the unit price bid for LAKE EXCAVATION INCLUDING LAKE LOWERING, DEWATERING, TRANSPORTATION, AND DISPOSAL OF DREDGE SPOILS****." But under section 206.08 there is an Allowance item of $500,000 dollars for DISPOSING OF REGULATED MATERIAL. and the next paragraph states the same language as above. Should the payment under the lake excavation item include state -NON-REGULATED? Other wise what is the allowance for and how will that be paid, please clarify.*

Response: Please refer to Section 206, specifically Section 206.02-H.

18. With regards to all of the allowance items, it states measurement, and payment will be paid based on the actual costs as evidenced by supporting records. Please clarify that no overhead or profit, typically 5% on sub or service will not be allowed on any of these ALLOWANCE items.

Response: The only Allowance Item in which the Contractor is not entitled to any profit or overhead is the TRAFFIC DIRECTOR MUNICIPAL POLICE ALLOWANCE as indicated in the first paragraph of Section 159.04. For all other Allowance Items, please refer to section 7.3.11 of Document A201 General Conditions of the Contract for Construction in the Specifications for information pertinent to overhead and profit.

19. Section 515 Prefabricated bridges, definition calls out a Foundation engineer and geotechnical engineer and several references are made through out the section, especially in Article 12.0 Foundation, states that the foundations are designed by the Foundation Engineer with support for the geotechnical engineer. And states the Contractor shall hire these. There are also several references to design build in this section. Is it the Owners intent for the Contractor to hire a foundation engineer and geotechnical firm to review and redesign the contract foundations? And If so, if the design changes how will the Contractor be compensated for these changes considering bridges A-C are lump sum? Please clarify? Also there is the same kind of language in other items like Section 646 – Stone Vener Pillars as well. Is that the intent to hire a Geotech firm to do a boring for these types of items?

Response: The Contractor is required to retain the services of a licensed Professional Engineer currently registered in the State of New Jersey to prepare the design for the Bridge "F" substructure only, including the performance of a subsurface exploration program. Refer to the Design-Build Notes on Drawing Nos. S-17 and S-18. The Contractor is not required to hire a foundation engineer and geotechnical firm to review and redesign the foundations for Bridges "A", "B", "C", and "E".

Regarding the stone veneer pillars, the Contractor will be required to retain the services of a licensed Professional Engineer currently registered in the State of New Jersey to prepare the design of the piers and footings. Refer to the Working/Design Drawing Notes on Sheet 88 of 139 and in Specification Section 646.03.02.C.

20. Is the lake lowering permit available for review? We did not see it in the documents provided.

Response: The NJDFW Permits for Water Lowering, Scientific Collection, and Fish Stocking are contingent upon the Contractor providing "means and methods" operations of the water lowering and fish collection.

21. Drawing sheet 10 of 139, illustrates a detail "Typical Reservoir Cross Section Detail" for a four-foot bench. However, this grading element doesn't seem to appear in the provided cross sections. Please describe the plan limits of where this bench is to be implemented, and if it will be paid for under the "Excavation, Unclassified" or "Lake Excavation" item.

Response: Please refer to the Notes on the "TYPICAL RESERVOIR CROSS SECTION DETAIL" which indicate the safety ledge shall be constructed and maintained adjacent to land and properties around perimeter of Reservoir. Measurement and payment shall be included in the unit price bid for "Lake Excavation".

22. Under what item is the Contractor to include the cost of temporary seeding of stockpiles while dredged material dries, or for temporary seeding of disturbed areas prior to final site grading and permanent seeding occurs?

Response: Separate measurement and payment shall not be provided, but shall be included in the unit price bid for items requiring same.

23. In the absence of any boring information associated in the areas of the Bridge F Piers and Kayak and Boardwalk structures, please consider providing a separate pay item for augering for piles if and where needed.

Response: An item and corresponding quantity has been provided as indicated herein.

24. Who is responsible for the testing and certification of subgrade soil bearing capacity under bridge substructures?

Response: Please refer to Earthwork and Foundation Preparation Note #8 on Drawing No. S-2.

25. Drawing sheet 132 of 139 contains a reaction table that appears to have some fields blacked out. Please confirm that the blackened fields do not contain any information.

Response: The blacked-out fields in the Pedestrian Bridge "F" reaction table on Sheet 132 of 139 do not contain any information as certain load cases are not appliable to all direction types.

26. Regarding the necessary access for bridge and wall construction:

i. Please confirm that this project has been introduced to the Clark DPW, Board of Education, Parks Dept., and Little League.

Response: Multiple public hearings have been held for this Project.

ii. Has any ROW access been discussed with these agencies? Please provide any correspondence.

Response: Numerous conversations have been held with the Municipality and the Department of Public Works. Correspondence is not available. Please refer to Section 108.12 of the Specifications.

iii. Please provide the contact information for the Clark DPW, Board of Education, Parks Dept., and Little League with whom the County has been in contact with.

Response: Contact information is readily available online.

27. Section 515 – Prefabricated Pedestrian Bridges, pertaining to the fabrication of the pedestrian bridge trusses, I offer the following: Section 1.1 mentions the use of corrosion resistant high-strength low-alloy (weathering) steel construction; Section 8.1 mentions "all bridges shall be fabricated using A847 for HSS sections and A588 for structural shapes and plates"; Section 9.0 mentions "For corrosion resistant high-strength low-alloy (weathering) steel no surface finish treatment is necessary"; however, Drawing sheet 120 of 130, note 10 specifies Structural Steel AASHTO M270, Grade 50 (ASTM A 709, Grade 50), but does not mention or indicate the use of weathering steel by grade designation."

i. Please clarify whether all truss, floor beams, and stringers are to be from A847, A588, or A709 Grade 50 steel.

Response: All prefabricated pedestrian bridge trusses and stringers shall be square or rectangular HSS members fabricated using A847. Prefabricated pedestrian bridge floor beams shall be square or

rectangular HSS members fabricated using A847 or wide flange shapes if required, fabricated using A588.

ii. Please specify the grade of steel for all truss bridge bearing fabrication.

Response: Bearing type and size shall be designed by the Bridge Manufacturer based on anticipated loads and movements, per the Bridge Manufacturer's standard requirements and recommendations.

iii. Please specify if there is any requirement for coating of steel elements below the deck elevations or end treatments.

Response: Refer to Specification Section 515.9.0 for steel finish and cleaning requirements.

28. Section 654 – Metal Works is very extensive and not very descriptive as to what elements of the project it is applicable.

i. What parts of this spec section is applicable to the furnishing of the pedestrian bridge trusses?

Response: Section 654 – Metal Works does not apply to the prefabricated pedestrian bridge superstructures. Section 515 – Prefabricated Pedestrian Bridges shall govern.

ii. Can any material specifications within Section 654 conflicting with that listed within Section 515 be ignored?

Response: See above response.

iii. What elements provided for the bridge truss may be subject to the galvanizing and/or painting requirements listed within Section 654?

Response: See above response.

29. Regarding the deduct items within the bid form, please consider providing marked up drawings for the Contractor illustrating the locations and limits of the item quantities to be eliminated per deduct package, so that a determination can be made associated with mobilization, material storage, access, stockpile locations, and rigging locations for the construction of items not effected.

i. *Deletion Item 1 – illustrate the limits of the deletion of Parking Lot A, particularly whether clearing would still be permitted in this area.*
Response: The limits for Deletion Item 1 (Parking Lot A) are from Sta. 2+40 to Sta. 5+00 along the Entrance Road Baseline as referenced on Plan 46 of 139. Clearing would still be permitted in this area.

ii. *Deletion Item 2-A – illustrate the limits of the deletion of Retaining Wall, and any clearing/grading to occur in its absence.*

Response: Please refer to the heading of Deletion Item 2-A which indicates the limits from Sta. 28+68 – Sta. 30+07 on N. Central Trail.

iii. *Deletion Item 2-B – illustrate the limits of the deletion of the MSE , and any clearing/grading to occur in its absence.*

Response: There is no Deletion Item 2-B. Addition Item 2-B is to be utilized in conjunction with Deletion Item 2-A to propose a mechanically stabilized earth wall in place of the permanent sheeting wall.

iv. *Deletion Item 4 – illustrate the limits of this deletion package.*

Response: Deletion Item 4 is the entirety of the North Central Trail and all associated improvements, excluding the permanent sheeting wall from Sta. 25+15 to Sta. 28+68.

30. *For reasons associated with mobilization, material storage, access, stockpile locations, and rigging locations for the construction of items not effected, it may be necessary to consider that the unit prices may not be able to remain the same in the base bid verses the alternate deduct bid pricing. Please consider revising this pricing requirement.*

Response: Please refer to the third paragraph on Page B-107.

31. *So that a determination can be made associated with mobilization, material storage, access, stockpile locations, and rigging locations for the construction of items not effected, please clarify the following:*

i. *Can the area designated as Parking Lot 1 still be cleared and used for stockpile and storage even if eliminated from the scope under Deletion Item 1?*

Response: Yes.

ii. *Might Addition item 2-B be used though deletion item 2-A be removed?*

Response: Addition Item 2-B shall be used in conjunction with Deletion Item 2-A.

iii. *Do Deletion items 2-A and 2-B get eliminated together, and not an either/or situation?*

Response: There is no Deletion Item 2-B. Addition Item 2-B is to be utilized in conjunction with Deletion Item 2-A to propose a mechanically stabilized earth wall in place of the permanent sheeting wall.

iv. *Might Bridge F still be chosen for construction, even if the 2-A DPW wall is eliminated?*

Response: Please refer to the third paragraph on page B-107 which indicates Union County shall have the right to delete as few or as many items in numerical order (Deletion Item 1 shall be the first Deletion Item utilized and Deletion Item 5 the last Deletion Item utilized).

v. *Might Bridge F still be chosen for construction, even if the MSE walls and paths leading to it are eliminated?*

Response: Please see response *iv* above.

vi. *Should Deletion items 2-A and 2-B get eliminated together, can this location still be cleared and graded for access to the construction of Bridge F should it be left in the scope?*

Response: There is no Deletion Item 2-B. Addition Item 2-B is to be utilized in conjunction with Deletion Item 2-A to propose a mechanically stabilized earth wall in place of the permanent sheeting wall.

vii. *Please provide a sequential order of deletion for the understanding of the deletion packages.*

Response: Please refer to the third paragraph on page B-107 which indicates Union County shall have the right to delete as few or as many items in numerical order (Deletion Item 1 shall be the first Deletion Item utilized and Deletion Item 5 the last Deletion Item utilized).

32. Please provide the definition of "hard bottom" to be reached during the dredging?

Response: Hard bottom is defined as the natural channel bottom, which is the original, undisturbed bottom surface of the Reservoir.

33. Will the vertical limits of dredging be limited to the elevations shown within the cross sections drawn and labeled as "hard bottom", or to a level as determined by resistance or observation of the subsoils encountered during excavation?

Response: Pursuant to the NJDEP Permit Conditions, dredging shall not extend beyond or below the natural channel bottom.

34. Will any testing be required in determining what will be "hard bottom", and if so, please provide the procedure to be followed and at who's cost in making the determination?

Response: No testing is required.

35. Please clarify the Eastern "Limits of Dredge Improvements" as depicted on sheet 23 of 139 adjacent to the Garden State Parkway Bridge. Elevations called out on the drawings show both the existing top of sediment as well as the approximate elevation of hard bottom which is the indicated bottom of dredge limit. At the location depicted as the "Limit of Dredge Improvements" there will be a 4' elevation difference from the proposed sediment dredge grade and existing grades within the flow channel. Please clarify if the "Limit of Dredge Improvements" line is the top of the dredge slope or the toe of the dredge slope allowing for the natural angle of repose of the sediment.

Response: The Limit of Dredging Improvements line shall be the top of the dredge slope.

36. The drawings depict 3 locations for access to each separate body of water, namely Head Waters, West Lake and Central Lake. Please indicate where the allowable limits of clearing and use of stockpile areas will be permitted at each of the identified access locations.

Response: The Contractor is confined to the limit of disturbance as indicated on the Plans.

37. Please clarify any requirements for dredged material stockpile leachate/drain water collection systems and/or treatment. Will we be permitted to let the dredged material stockpile to drain back into the lake via surface runoff or percolation?

Response: Please refer to the Conditions of the NJDEP Permit and "The Standards for Soil Erosion and Sediment Control in New Jersey" for requirements pertaining to the leachate/drain water collection systems and/or treatment. Drain water collection systems

must be desilted/treated in accordance with NJDEP and SESC standards. Please also refer to the second paragraph of Section 202.03.12 which indicates that the Contractor shall submit a dewatering design prior to initiation of any dewatering activities.

38. Will all water captured via pumping for dewatering be permitted to go through sediment filter bags and then drain back into the lake?

Response: Please refer to the response above.

39. This technical specification section makes mention of an application of color contrast and a slip resistant surface on existing or proposed concrete sidewalks. Please provide a separate bid item with quantities if there is existing sidewalk that will require this treatment. Is the contractor to figure all new sidewalk will require this color contrast and slip resistant surfacing?

Response: This language has been removed from the Specifications per Addendum Item #4.

40. How is the contractor to be compensated for the proposed dense graded aggregate base course being proposed for concrete sidewalks and HMA sidewalks?

Response: Measurement and payment shall be included in the unit price bid for concrete sidewalks and HMA sidewalks.

41. Please provide the contractor with a construction detail plan sheet to show the proposed security curbing, ladder, timber piles, timber pile caps, kayak launch and drive through ADA kayak launch. The current civil plans do not show these appurtenances so they cannot be quantified and added to this lump sum bid item

Response: Please refer to Section 640 of the Specifications and Plan Sheet 105 of 139.

42. Please provide the contractor with a construction detail plan sheet to show the proposed security curbing, ladder, timber piles and timber pile caps. The current civil plans do not show these appurtenances so they cannot be quantified and added to this lump sum bid item.

Response: Please refer to Section 640 of the Specifications and Plan Sheet 105 of 139.

43. Please confirm that stone construction driveway and/or access not shown but needed, will be paid for at the unit price under item #7 "Construction Driveway".

Response: Please refer to Section 108.12 of the Specifications.

44. Please confirm that tree clearing for construction driveway and/or access not shown but needed, will be paid for at the unit price under item #231 " Selective Clearing".

Response: Please refer to Section 108.12 of the Specifications.

45. Please confirm that any restorations necessary to repair areas disturbed for construction driveway and/or access not shown but needed, will be paid for under the respective unit price items.

Response: Please refer to Section 108.12 of the Specifications.

46. Having seen the chemical analysis of the lake sediment within the specifications, we haven't seen any physical properties/soil composition of samples taken of the lake bed material to be dredged. Please provide any geotechnical reports of samples, and borings within the lake bed.

Response: Information for all available sediment sample results and borings for geotechnical evaluation are included in Appendix A of the Specifications.

47. In the absence of any geotechnical information within the dredge limits, please provide who we would need permission from in order for us to enter the lake with our own boat/skiff in to take our own grab samples of the makeup of the material to be dredged, prior to the bid date? Permissions would be for access to the Head Waters, West and Central Lake.

Response: There is an existing boat ramp off of Old Raritan Road at the Headwaters.

48. Please describe any weir controls, gate valves, or other appurtenances that exist that would enable the Contractor to be able to lower and control the water levels of the Head Waters, West, and Central Lakes.

Response: There is an existing outflow gate located at the dam on the East Lake. The Contractor is required to coordinate with the Union County Department of Public Works prior to any operations of the gate.

49. In the absence of any known weir controls, gate valves, or other appurtenances that exist that would enable the Contractor to be able to lower and control the water levels of the Head Waters, West, and Central Lakes; please provide any restriction for the use of pumps and discharge of water downstream of the East Lake Dam.

Response: Please refer to the first sentence of section 202.03.12.

50. Please confirm that there are no weir structures under the Garden State Parkway, between the Central and East lakes, and that passage is unobstructed via water access.

Response: The County is not aware of any weir structures under the Garden State Parkway.

51. Please identify the proposed thickness of the 2.5" minus angular drainage stone beneath the proposed Armorflex 55 precast concrete mattress.

Response: Please refer to Addendum Item #10 herein.

52. Please provide or direct me to the timber post base connection detail referenced under the last arrow note listed within the detail "Timber Bridge Approach Railing Detail" on sheet number 131, where it states, "see box culvert dwgs for connection detail". Detail not found.

Response: A detail for the "Timber Post Base Connection" is provided herein.

53. There is a considerable amount of information missing within the issued contract documents that will have a large impact to the approach, means and methods, and cost to building this project. In the absence of any response to the previous RFIs (listed below this email) please consider a four week postponement to the bid date.

Response: An extension for the Bid deadline cannot be granted.

NOTE: PURSUANT TO SECTION 4 "INTERPRETATIONS AND ADDENDA", THE TIMELINE FOR SUBMITTING QUESTIONS HAS PASSED.

BID FORMS:
PAGE B-90

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
84	FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE "F"	LS	LUMP SUM		
85	CONSTRUCT REINFORCED CONCRETE FOOTINGS, WALLS AND BEAMS FOR BOARDWALKS AT BOAT RAMP, INCLUDING SUPPORT OF EXCAVATION, EXCAVATION, STONE BASE, REINFORCEMENT STEEL AND BACKFILL	CY	37		
86	NO ITEM				
87	CONSTRUCT BOARDWALKS FOR BOAT RAMP	SF	440		
88	PRE-AUGERING FOR TIMBER PILES (IF AND WHERE ORDERED)	LF	550		
89	PRE-AUGERING FOR BRIDGE F PILES (IF AND WHERE ORDERED)	LF	2063		
90	CONSTRUCT KAYAK STORAGE PIER	SF	957		
91	MODULAR BLOCK RETAINING WALL	SF	429		
92	NO ITEM				
93	NO ITEM				
94	NO ITEM				
95	6" HIGH DENSITY POLYETHYLENE PIPE	LF	27		
96	8" HIGH DENSITY POLYETHYLENE PIPE	LF	49		
97	15" HIGH DENSITY POLYETHYLENE PIPE	LF	280		

BID FORMS:
PAGE B-110

ADDITION ITEM 2-B
(ADD. 2-1)(PROPOSE MECHANICALLY STABILIZED EARTH [MSE] WALL – FROM STA. 28+68 – STA. 30+07 ON N. CENTRAL TRAIL)

BASE BID ITEM	ADD. ITEM	DESCRIPTION	UNIT	ADDITION QUANTITY
-	ADD. 2-1	MSE RETAINING WALL	SF	2,570

TOTAL ADDITION ITEM 2-B (ADD. 2-1) $_____

NET TOTAL DELETION ITEM 2 $_____

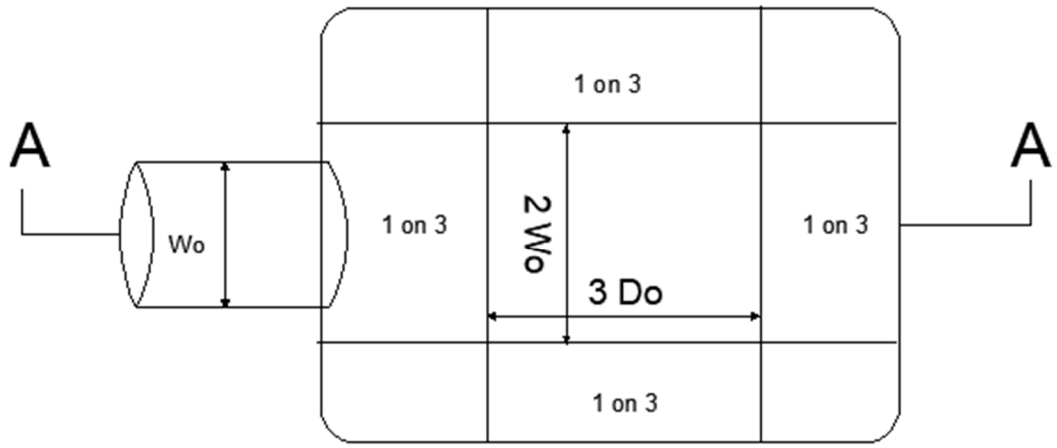
DELETION ITEM 3
(DEL 3-1 TO DEL 3-14)(BRIDGE F)

BASE BID ITEM	DEL. ITEM	DESCRIPTION	UNIT	DELETION QUANTITY
72	DEL. 3-1	EXCAVATION, UNCLASSIFIED, BRIDGE "F"	CY	2,123
73	DEL. 3-2	I-9 SOIL AGGREGATE, BRIDGE "F"	CY	935
74	DEL. 3-3	COARSE AGGREGATE, SIZE NO.57, BRIDGE "F"	CY	110
75	DEL. 3-4	TEMPORARY COFFERDAM, BRIDGE F	LS	LUMP SUM
76	DEL. 3-5	FURNISHING EQUIPMENT FOR DRIVING PILES, BRIDGE "F"	LS	LUMP SUM
77	DEL. 3-6	STEEL H-PILE, FURNISHED, HP 10 X 42, BRIDGE "F"	LF	4,125
78	DEL. 3-7	STEEL H-PILE, DRIVEN, HP 10 X 42, BRIDGE "F"	LF	4,125
79	DEL. 3-8	REINFORCEMENT STEEL, GALVANIZED, BRIDGE "F"	LB	154,000
80	DEL. 3-9	CONCRETE FOOTING, BRIDGE "F"	CY	374
81	DEL. 3-10	CONCRETE WINGWALL WITH STONE FORMLINERS, BRIDGE "F"	CY	77
82	DEL. 3-11	CONCRETE ABUTMENT WALL WITH STONE FORMLINERS, BRIDGE "F"	CY	66
83	DEL. 3-12	CONCRETE PIER WALL WITH STONE FORMLINERS, BRIDGE "F"	CY	275
84	DEL. 3-13	FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE "F"	LS	LUMP SUM
89	DEL. 3-14	PRE-AUGERING FOR BRIDGE F PILES (IF AND WHERE ORDERED)	LF	2,063

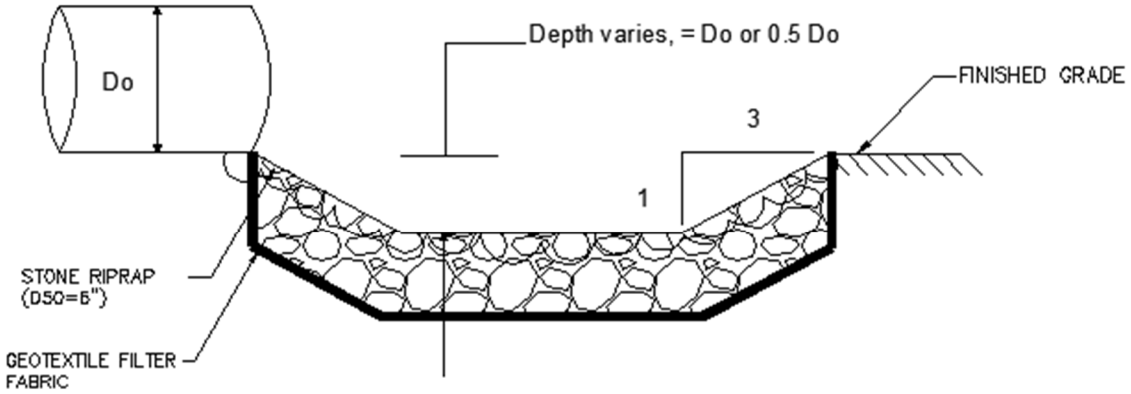
TOTAL DELETION ITEM 3 (DEL 3-1 TO DEL. 3-14) $_____

CONSTRUCTION DETAILS:
PREFORMED SCOUR HOLE DETAIL

Preformed Scour Hole



PLAN

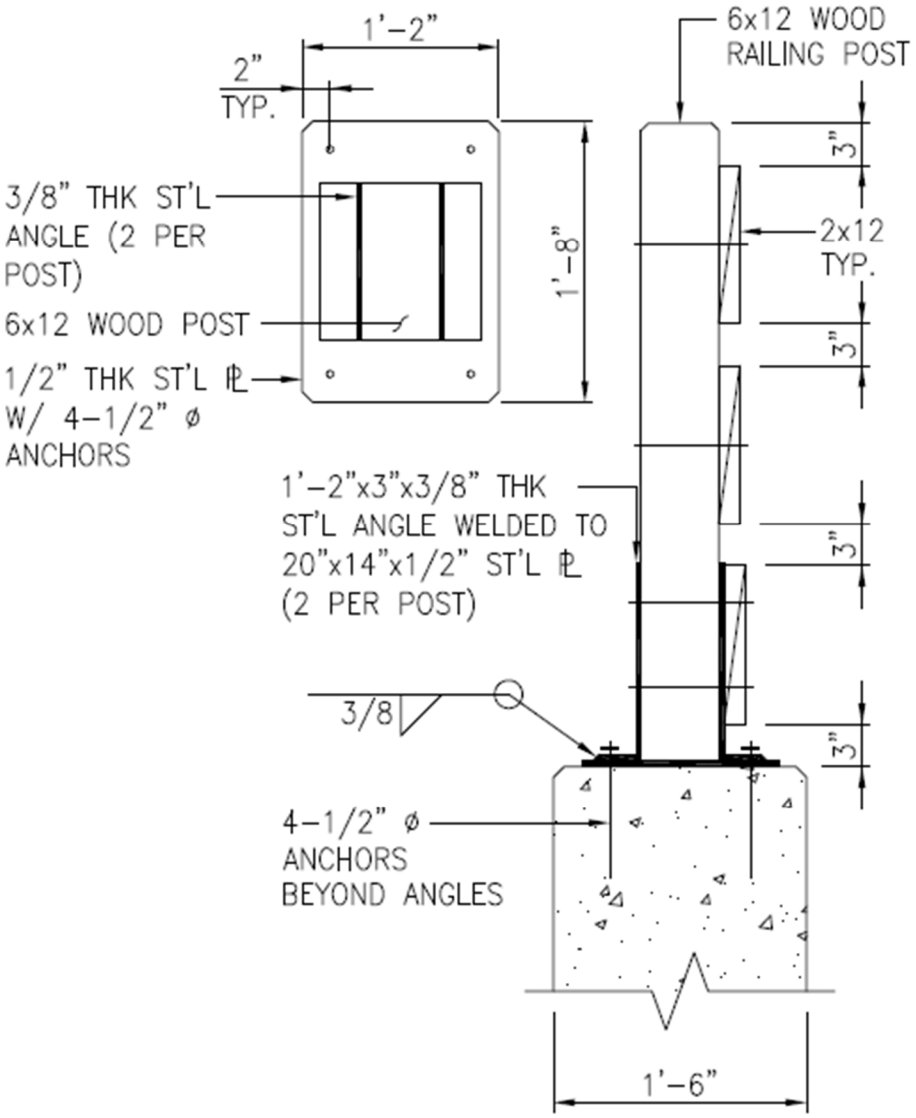


Section A - A

PREFORMED SCOUR HOLE

N.T.S.

CONSTRUCTION DETAILS:
TIMBER POST BASE CONNECTION DETAIL



TIMBER POST BASE CONNECTION

SCALE: 3/4"=1'-0"

COUNTY OF UNION

DEPARTMENT OF ENGINEERING, PUBLIC WORKS & FACILITIES MANAGEMENT
Joseph J. Policay, Jr., CPWM, Director

MEMORANDUM

BOARD OF COUNTY COMMISSIONERS

LOURDES M. LEON
Chairwoman

JOSEPH C. BODEK
Vice-Chairman

JAMES E. BAKER, JR.

MICHÈLE S. DELISFORT

SERGIO GRANADOS

BETTE JANE KOWALSKI

ALEXANDER MIRABELLA

KIMBERLY PALMIERI-MOUDED

REBECCA WILLIAMS

EDWARD T. OATMAN
County Manager

AMY CRISP WAGNER
Deputy County Manager

BRUCE H. BERGEN, ESQ.
County Counsel

JAMES E. PELLETTIERE
Clerk of the Board

RICARDO S. MATIAS
PE, CME, CFM
County Engineer
Director, Division of Engineering

TO: All Potential Bidders

FROM: Ricardo S. Matias, PE, CME, CFM, (RM)
County Engineer
Director / Division of Engineering

DATE: May 14, 2025

RE: **ADDENDUM NUMBER 1**
Clark Reservoir Improvements
Township of Clark, County of Union, New Jersey
BA # 26-2025, Union County Engineering 2020-002

Attached is Addendum Number 1 for the above referenced project.

Please be sure to complete and submit the standard "Acknowledgement of Addendum" form included in the original bid specifications and submit it with the bid.

May 14, 2025

UNION COUNTY, NEW JERSEY
SPECIFICATIONS AND CONTRACT DOCUMENTS
FOR

CLARK RESERVOIR IMPROVEMENTS PREPARED APRIL 2025

ADDENDUM No. 1

To All Concerned:

The original Specifications and Contract Documents for the Clark Reservoir Improvements prepared April 2025 are amended as noted herein this Addendum No. 1.

CONCERNING THE SPECIFICATIONS, BID DOCUMENTS, AND CONTRACT DRAWINGS

CONCERNING THE SPECIFICATIONS AND BID DOCUMENTS

1. BID FORM

Remove Page B-94 and replace with the attached page B-94.

2. SPECIAL PROVISIONS

Remove the third and fourth paragraphs of Section 12: Tree Preservation and Removal in their entirety.

3. SPECIAL PROVISIONS - PERMITS

The NJDEP Permits section is deleted and replaced with the following:

NJDEP Permits:
The contractor is herein advised that the following NJDEP permits have been obtained for the Project which are included in the Appendix of these specifications and Contract Documents:

Flood Hazard Area Verification – Method 3
Flood Hazard Area Individual Permit
Freshwater Wetlands General Permit No. 11
Freshwater Wetlands General Permit No. 17
Freshwater Wetlands General Permit No. 19
Water Quality Certificate

The Contractor is required to review the enclosed permits and adhere to and comply with all

the requirements indicated.

The Contractor is advised that the NJDEP Permit application indicates that the dredging will be performed utilizing mechanical methods. The NJDEP has indicated that alternative dredging methods are acceptable provided that all work is confined to the limit of disturbance indicated on the Plans. An amendment to the approved NJDEP Permit will be required indicating the alternative dredging method prior to the commencement of the dredging.

4. SECTION 202– EXCAVATION

Remove Section 202.03.03-A.3 in its entirety.

5. SECTION 502– LOAD BEARING PILES

Remove Section 502.02 – B and replace with following:

All classes of piles shall be treated in accordance with the reference AWPA Standard for Use Category 5B for Marine piling. Minimum preservative retention level and treatment shall be 2.5 pcf ACZA.

6. SECTION 509– BRIDGE COMBINATION RAILING, MISCELLANEOUS RAILINGS, AND FENCE

Remove subsection 509.02 WOOD - PRESERVATIVE / TREATED MATERIALS-A.b in its entirety.

7. SECTION 510– TIMBER STRUCTURES

Remove the first sentence of Section 510.02.C.b.2 and replace with the following:

Lumber above elevation 48.7 shall be treated with ACZA in accordance with the AWPA standard requirements for Use Category 4B.

8. SECTION 605 – FENCE

The following subsection is hereby added:

Section 605.03.05 Wooden Snow Fence

The Contractor shall furnish, install, and maintain wooden snow fence as indicated on the Contract Drawings and as directed by the Engineer and County. It is anticipated that Wooden Snow Fence shall be installed along the perimeter of the limit of disturbance in order to protect trees not marked to be removed for the duration of construction.

9. APPENDIX D – NJDEP PERMIT

Please find enclosed the NJDEP Permit Approval for the Project.

CONCERNING THE CONTRACT DRAWINGS

10. CONSTRUCTION AND SOIL EROSION AND SEDIMENT CONTROL PLAN – CENTRAL LAKE PARK PLAN (1 0F 5) (PLAN 45 OF 139)

Remove the note "FURNISH AND INSTALL 8" DIA. DIP CLASS 54 FIRE SERVICE" and replace with "FURNISH AND INSTALL 8" DIA. CEMENT LINED DIP CLASS 56 WATER MAIN".

11. CONSTRUCTION DETAILS (9 OF 9) (PLAN 105 OF 139)

The attached concrete pad detail for waste and recycling container is hereby added.

REQUESTS FOR INFORMATION

12. "As per our conversation, the first page of the drawings is not signed. Please let me know if the drawings will be re-issued."

Response: The Drawings have been signed by the Design Professional of Record.

13. What is the justification for implementing a PLA on this project, and how does it benefit the public interest?

Response: Union County policy through State Law is that any Project over $5 Million requires a PLA.

14. How will Union County ensure fair opportunities for non-union contractors and workers to participate in this project?

Response: All government work in the State of New Jersey in excess of $19,375 is subject to Prevailing Wage. As noted above work over $5M is subject to PLA.

15. What measures are in place to prevent discrimination against non-union workers and ensure compliance with equal employment opportunity laws?

Response: All government work in the state of New Jersey in excess of $19,375 is subject to Prevailing Wage

16. Has an economic impact analysis been conducted to assess the potential cost implications of the PLA requirement?

Response: An economic impact analysis is not available.

17. We respectfully request that Union County reconsider the PLA requirement to ensure a fair, open, and competitive bidding process that does not discriminate against non-union contractors and workers.

Response: The PLA requirements will remain as stipulated in the Specifications.

18. Sheet 98 of 139, shows the Typical Pipe Bedding Storm Sewer detail with 4" PPT Pipe to be utilized as an underdrain at each down-stream structure. Under which item will this additional pipe be paid for?

Response: Measurement and payment shall be included in the unit price bid for drainage structures requiring same.

19. Please provide the NJDFW Permits for Water Lowering, Scientific Collection and Freshwater Fish Stocking so that the contractor may be familiar with the requirements.

Response: The NJDFW Permits for Water Lowering, Scientific Collection, and Fish Stocking are contingent upon the Contractor providing “means and methods” operations of the water lowering and fish collection.

20. Have NJDEP Permits been secured for the project? If so, please provide copies for the contractors review.

Response: Yes, and same has been provided herein.

21. As per Section 123 of the Special Provisions, please identify the duration that the contractor shall provide a New Jersey certified Forester or New Jersey certified Tree Expert to be on-site. In addition, how shall the contractor be compensated for this work?

Response: This section has been revised herein and accordingly a New Jersey Certified Forester or Tree Export is not required for the Project.

22. Being that the bid items for Temporary Chain Link Fence and Temporary Chain Link Fence Gate are if and where directed, we will require a duration of time as to how long the County may require these temporary measures to be in place in order to properly identify the costs associated with these items.

Response: Refer to section 605.03.04 of the Specifications which indicates same is required for the duration of the Project.

23. How is the contractor to be compensated should rock bolting or other stabilization techniques be required if in-place stabilization will be necessary?

Response: This language has been removed from the Specifications per Addendum Item #4.

24. In an attempt to keep all bids balanced and with the contractors unable to determine how much in-situ material will be suitable for backfill, we request the County provide a bid item with an estimated quantity for Disposal of Unsuitable Material.

Response: Separate allowances have been provided for the Disposal of Hazardous Material and the Disposal of Regulated Material. Please refer to eleventh paragraph on page 200-9 of the specifications for the measurement and payment for excess and unsuitable material.

25. Please provide the contractor with the Materials Management Plan(MMP) that is legally required on a construction site when it is suspected to generate contaminated soil. As per N.J.A.C. 7:26E, a Materials Management Plan is explicitly required for projects generating >200 cubic yards of contaminated soil, including linear transportation projects like roads.

Response: A Materials Management Plan is not required for this Project.

26. Please provide the contractor with the NJDEP Dewatering Permit for dewatering contaminated groundwater during excavation.

Response: It is not anticipated that an NJDEP Dewatering Permit for dewatering contaminated groundwater during excavation will be required for this Project.

27. Upon stockpiling and testing of excavated material, should the testing result in classification of the material as non-hazardous(ID-27), will this material be suitable for re-use on site? If not, under which bid item will the contactor be compensated for the disposal of non-hazardous(ID-27) soils?

Response: Please refer to Section 202.03.03 – C for the requirements of excavated material to be reused on site. Please refer to the eleventh paragraph on page 200-9 of the Specifications regarding the disposal of excess and unsuitable excavated material. In addition, Item #24 has been provided as an allowance for the disposal of regulated material.

28. For designing the "or equal" biofilters please provide the design treatment water quality flow for each of the water quality units specified on the plans.

Response: Refer to Plan 100 of 139 which contains tables for the Design Flow for each corresponding water quality treatment structure.

29. The current Soil Boring Logs provided for contractor review are missing critical elevation data necessary for accurate project assessment and bidding. The documentation lacks both existing ground elevation measurements and groundwater elevation readings for all boring and test pit locations. Additionally, the provided location plan does not contain sufficient reference points for contractors to independently determine ground elevations. This omission of essential data creates significant challenges in calculating groundwater elevations, which is crucial for project planning. Given that groundwater management and the reuse of in-situ excavated materials are major components of the construction operations, this missing information substantially impacts contractors' ability to develop accurate bids. We request that the Soil Boring Logs be updated to include the existing ground elevation at each boring and test pit location, along with corresponding groundwater elevation measurements where encountered. These updates are essential for contractors to properly assess excavation requirements, determine material handling strategies, and develop comprehensive construction approaches. Without this critical elevation data, contractors cannot provide balanced, competitive bids, potentially leading to cost inefficiencies and suboptimal use of project resources. To ensure

responsible stewardship of taxpayer funds and enable accurate cost estimation, please provide updated documentation that includes these essential elevation measurements.

Response: The Boring Locations Plans included in the Specifications contain contours for which approximate ground elevations can be extrapolated for the corresponding borings and test pits. The depths to groundwater are contained in the soil boring logs and test pit logs contained in the Specifications.

30. Will Builders Risk Insurance be required for this project?

Response: Yes, please refer to Section 10 “Insurance Requirements.”

31. For Bridges E and F, there is a proposed wooden bridge railing atop the proposed wing walls. Under which pay item shall the contractor expect to be compensated for the proposed wooden bridge rail?

Response: Please refer to Note #1 on Plan S-15 (131 of 139).

32. Please confirm if Video Inspection of new installed storm drainage piping will be required on this project. If so, under which pay item will this work be paid?

Response: Video inspection of new installed storm drainage piping is not required.

33. Please confirm that the 8" Tee located at approximation station 2+27 on Madison Hill Road is to be supplied and installed by NJAW.

Response: Confirmed.

34. The callout for the 8" diameter DIP located near the aluminum heated enclosure on the plans is for Class 54 Fire Service. Bid Item # 190 calls for 8" dia. Cement lined class 56 water main. Please clarify the class of pipe that will be required for the 8" water main.

Response: Remove the note “FURNISH AND INSTALL 8” DIA. DIP CLASS 54 FIRE SERVICE” and replace with “FURNISH AND INSTALL 8” DIA. CEMENT LINED DIP CLASS 56 WATER MAIN”.

35. Please define the class of pipe that will be required for the 6" Cement Lined DIP.

Response: The 6” Cement Lined DIP shall be Class 56.

36. Please provide a detail for the concrete pads for the waste and recycling containers.

Response: A detail for the concrete pad is provided herein.

37. Please define the amount of inflow into the reservoir.

Response: The amount of inflow into the reservoir is not available.

38. Please confirm that in Bid Item #28, the contractor is to figure the cost for disposal of existing dredge spoils as regulated material.

Response: Please refer to Appendix C of the Specifications which contain samples of the Sediment material.

39. This technical specification section directs the contractor to "Dewater according to the approved dewatering plan." Please provide the approved dewatering plan.

Response: In accordance with the Specifications, it is the Contractor's responsibility to provide a dewatering plan for approval.

40. In consideration of the size and complexity of this project, please consider conducting a virtual prebid meeting to discuss the major elements, concerns, and sequence of the project.

Response: A pre-bid meeting will not be held.

41. It is our understanding that this this is a rebid. Please provide a copy of the NJDEP permit requirements that the Contract will need to take into consideration in preparing their bid, particularly the language associated with dredging, limits of disturbance, and fish and wildlife restrictions.

Response: A copy of the Permit has been provided herein.

42. Please provide any seasonal restrictions for tree clearing.

Response: Please refer to the attached NJDEP Permit.

43. Being that the County may seek to wait to award the bid until receipt of the necessary permit(s) by NJDEP, when is the anticipated approval and issuance expected?

Response: A copy of the Permit has been provided herein.

44. Please provide copies of NJDEP Permits:
- *a. - Flood Hazard Area Individual Permit*
- *b. - Freshwater Wetlands General Permit #11*
- *c. - Freshwater Wetlands General Permit #13*
- *d. - Freshwater Wetlands General Permit #17*
- *e. - Freshwater Wetlands General Permit #19*

Response: A copy of same has been provided herein.

45. Please provide copies of New Jersey Division of Fish and Wildlife (NJDFW) Permits:
- *a. - Water Lowering Permit*
- *b. - Scientific Collection Permit*
- *c. - Freshwater Fish Stocking Permit*

Response: The NJDFW Permits for Water Lowering, Scientific Collection, and Fish Stocking are contingent upon the Contractor providing “means and methods” operations of the water lowering and fish collection.

46. Please confirm that the County will be responsible for the submission of and securing the Soil Erosion and Sediment Control permit prior to award.

Response: The Soil Erosion and Sediment Control permit has been submitted to the Somerset-Union Soil Conservation District and is currently pending approval.

47. Please identify the location and restrictions of onsite soil stockpile areas in accordance with the approved permits.

Response: Soil stockpiles shall be located within the limit of disturbance. Soil stockpiles, where necessary, shall be in accordance with the NJDEP Permit contained herein and “The Standards for Soil Erosion and Sediment Control in New Jersey.”

48. In the absence of the actual permits, please consider the following. The specifications state that no waters should be lowered from July 1 to September 15 . In addition, all waters in New Jersey located north of Route 195 must be drawn down to their permitted extent by November 15.

a. Please confirm that waters can be lowered prior to July 1, and maintained at the lowered condition through the July 1 to September 15 period.

Response: As indicated in the Specifications, no waters should be lowered from July 1 to September 15 and all waters in New Jersey located north of Route 195 must be drawn down to their permitted extent by November 15. Pursuant to NJDFW regulations, "waterways may remain in the lowered state until project completion."

b. Please clarify whether the action of lowering must occur between September 15th and be completed by November 15th, and maintained in the lowered condition thru to July 1st and September 15th.

Response: As indicated in the Specifications, no waters should be lowered from July 1 to September 15 and all waters in New Jersey located north of Route 195 must be drawn down to their permitted extent by November 15. Pursuant to NJDFW regulations, "waterways may remain in the lowered state until project completion."

c. What is the lowest elevation permitted of lake water level?

Response: The extent of drawdown requested on the NJDFW Application for Water Lowering is 12.3 ft from the water surface elevation.

d. What are the downstream outfall flow restrictions?

Response: Please refer to the first sentence of section 202.03.12.

49. Please provide asbuilts of any upstream and downstream flow restriction structures, weirs, etc.

Response: Asbuilts are not available.

50. Please provide any hydrology reports, or analysis, in order for the Contractor to obtain a better understanding of flow through the work zones.

Response: Hydrology reports and analysis are not available.

51. Are there any known upstream or seasonal releases of water that will have an impact on the hydrology of the lakes during construction?

Response: The County is not aware of any upstream or seasonal release of water.

52. The specifications state that "NJDEP prohibits construction, excavation, filling or grading within non-trout water bodies that support general game fish north of Interstate 195 between May 1 through July 31 per N.J.A.C. 7:13-11.5." Does this exclude the condition for when the Contractor lowers the lake elevation prior to May 1st, and maintains it at the lowered elevation thru July 31st?

Response: It is our understanding that once the lake elevation is lowered, the timing restrictions are not applicable.

53. The specifications states that "The Contractor shall be responsible for the disposal of the dredge materials at an offsite facility in accordance with the conditions of the NJDEP Flood Hazard Area & Freshwater Wetlands Permits." Please provide said requirements.

Response: A copy of the Permit has been provided herein.

54. In the absence of any NJDEP and other relevant permit documents, language therein, and/or requirements, issued prior to the bid, can the Contractor assume that any relevant conditions imposed by the permit effecting the cost of building the work will be handled as a changed condition?

Response: The NJDEP Permit has been obtained and is included herein.

55. In the absence of any definable limitations, please confirm that the Contractor will have full and uninterrupted access and use of the project site for the duration of construction.

Response: The Contractor will have full and uninterrupted access to the Project Site.

56. Please confirm that the project site will be closed to public access for the duration of construction, exclusive of work in the public roadways.

Response: Confirmed.

57. Due to the schedule variables associated with contract award, permit approval times and undisclosed seasonal restrictions imposed therein, please acknowledge that in accordance with typical NJDOT requirements that achieving substantial completion will be exempt from completion of the seasonal requirements for when plantings can occur.

Response: The Contract is anticipated to be awarded in June, the NJDEP permit has been obtained and is included herein, and the NJDEP permit indicates seasonal restrictions.

58. When will the County expect to administrate the execution of the PLA with all the respective trades?

Response: After the award of the Project, but prior to the Notice to Proceed.

59. Please specify whether there is any State or Federal funding associated with the award of this project, and if said funding is in place.

Response: There is State and Federal funding associated with the Project and funding is in place.

60. Exhibit A, part 59 "Federal Terms", mentions use of contracting with small, minority, and women business enterprises, but falls short of explaining any goals or good faith effort requirements. Please confirm that no other requirements will be enforced other then what is stated therein.

Response: To the best of the County's knowledge there are no other specific requirements.

61. The specifications states that "New Jersey Sales and Use Tax Requirements: All Contractors with subcontractors, or any of their affiliates, who enter into contracts for the provision of goods or services with or for New Jersey local government entities, are required to collect and remit to the New Jersey Director of Taxation in the Department of the Treasury the use tax due on all of their sales of tangible personal property delivered into the State of New Jersey pursuant to the "Sales and Use Tax Act," (N.J.S.A. 54:32B-1 et seq.), regardless of whether the tangible personal property is intended for a contract with the contracting agency. This tax shall be remitted for the term of the Contract." Please simplify whether all permanent materials incorporated into the building of this project will be exempt from all sales tax.

Response: As provided by N.J.S.A. 54:32B-8.22, a contractor improving, altering, or repairing the real property of an exempt organization or exempt government entity is exempt from Sales and Use Tax on qualifying purchases. Qualifying purchases are purchases of construction materials, construction supplies, and a few qualifying services, if used exclusively and entirely consumed in erecting structures or building on, or otherwise improving, altering, or repairing real property belonging to an exempt entity. The exemption does not extend to equipment (e.g., bulldozers, jackhammers, or computers) purchased, leased, or rented to perform the work on the real property.

62. Please explain the requirements of, and under what pay item is the Contractor to include the cost of hiring the NJ certified forester or tree expert required in the specifications.

Response: This section has been revised herein and accordingly a New Jersey Certified Forester or Tree Export is not required for the Project.

63. What will be the allowable percentages for overhead and profit that will be included for payment under the various allowance items?

Response: Please refer to section 7.3.11 of Document A201 General Conditions of the Contract for Construction in the Specifications.

64. What is the final cut-off date for submission of questions?

Response: Pursuant to Section 4 “Interpretations and Addenda” of the Specifications, the deadline for RFI’s is May 14.

65. Will there be a pre-bid meeting and if so, please provide the date, time, and location?

Response: A pre-bid meeting will not be held.

66. When is the deadline for Request For Information?

Response: Pursuant to Section 4 “Interpretations and Addenda” of the Specifications, the deadline for RFI’s is May 14.

67. Is this project NJ Sales Tax Exempt on permanent materials?

Response: With respect to permanent materials, please see Response No. 61 above.

68. Please confirm that the Material Transfer Vehicle (MTV) is definitely required for asphalt placement due to the nonlinear, condensed, and tighter working areas for this project? This requirement seems excessive for non-highway pavement areas in this project.

Response: A Material Transfer Vehicle is not a requirement for this Project.

69. Please confirm that IRI Testing (Section 401.03.07) is definitely required on asphalt paving. The areas are nonlinear, condensed, and tight with no high speeds. This requirement seems excessive for non-highway pavement areas in this project.

Response: IRI Testing is not a requirement for this Project.

70. Please confirm that the lake can be lowered by operating an outflow gate at the dam. If so, who will be responsible for operating the gate and maintaining proper flow?

Response: The outflow gate at the dam is functional. The Contractor is required to coordinate with the Union County Department of Public Works prior to any operations of the gate.

71. Is the intent of fish collection, relocation, and restocking to allow the fish to migrate to the East Lake as the entire lake level is being lowered and the fish remain in the East Lake until the water level is brought back to operating level?

Response: Please refer to the third and fourth paragraphs of section 204.03 of the Specifications.

72. Are we required to search out carp and goldfish in the lake and remove/dispose of them? Or do you only remove/dispose if found?

Response: No. Pursuant to N.J.A.C 7:25-6.26-g, “Any carp, including koi and goldfish and potentially dangerous fish collected as a result of a permitted lowering must be destroyed.”

73. Please confirm that the allowances for Bid Items #23 Disposing of Hazardous Material and #24 Disposing of Regulated Material and as noted as “handling” on page 200-19 of the specifications includes reimbursement for loading and trucking?

Response: The allowance for Disposing of Hazardous Material (Bid Item #23) includes reimbursement for loading and trucking. The allowance for Disposing of Regulated Material (Bid Item #24) includes reimbursement for loading and trucking excluding the transportation and disposal of material associated with the dredging of the Headwaters, West Lake, and Central Lake. The transportation and disposal of regulated material associated with the dredging of the Headwater, West Lake, and Central Lake shall be included in the unit price bid for LAKE EXCAVATION INCLUDING LAKE LOWERING, DEWATERING, TRANSPORTATION, AND DISPOSAL OF DREDGE SPOILS.

74. Please confirm that Bid Item #30 Allowance for Laboratory Test/Material Testing covers the testing for all materials including but not limited to dredge spoils and all other excavated spoils within and outside the lake.

Response: Yes.

75. Can the PLA requirement be waived in the case of Bid Item #27 Fish Collection, Relocation, and Restocking which requires specialty subcontractors to complete this level of work? We have inquired and are finding that these companies do not supply Union labor.

Response: The PLA requirements cover the entire Project.

BID FORMS:
PAGE B-94

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
144	WOODEN SNOW FENCE	LF	18,740		
145	FURNISH AND INSTALL 8’ WIDE AGGREGATE WALKING TRAIL INCLUDING 2” THICK QUARRY PROCESS CRUSHED CLEAN STONE NJDOT NO. 10 SCREENINGS, 4” THICK QUARRY PROCESS COARSE CLEAN AGGREGATE NJDOT TYPE 57, SUBSURFACE GEOTEXTILE FABRIC, METAL EDGING AND ALL ASSOCIATED WORK	SY	6,169		
146	CONCRETE SIDEWALK, 4" THICK	SF	1,533		
147	HOT MIX ASPHALT SIDEWALK, 6" THICK	SY	2,158		
148	HOT MIX ASPHALT DRIVEWAY, 6" THICK, COMMERCIAL	SY	547		
149	CONCRETE DRIVEWAY, REINFORCED, 10" THICK, COMMERCIAL	SF	264		
150	NO ITEM				
151	DETECTABLE WARNING SURFACE	SY	9		
152	GRADE, COMPACT AND TOP DRESS WITH NJDOT NO. 57 TYPE STONE, UP TO 4" THICK	SY	170		
153	9"x20" CONCRETE VERTICAL CURB	LF	247		
154	GRANITE BLOCK CURB	LF	3,837		
155	SLOPED GRANITE BLOCK CURB	LF	282		
156	RESET BEAM GUIDE RAIL WITH EXISTING POSTS	LF	50		
157	TRAFFIC STRIPES, LONG-LIFE, "THERMOPLASTIC", 4" WIDE, WITH GLASS BEADS	LF	2,719		

APPENDIX D:
NJDEP PERMIT

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WATERSHED & LAND MANAGEMENT
Mail Code 501-02A, P.O. Box 420, Trenton, New Jersey 08625-0420
Telephone: (609) 777-0454 or Fax: (609) 777-3656
www.nj.gov/dep/landuse

PERMIT

In accordance with the laws and regulations of the State of New Jersey, the Department of Environmental Protection hereby grants this permit to perform the activities described below. This permit is revocable with due cause and is subject to the terms, conditions, and limitations listed below and on the attached pages. For the purpose of this document, "permit" means "approval, certification, registration, authorization, waiver, etc." Violation of any term, condition, or limitation of this permit is a violation of the implementing rules and may subject the permittee to enforcement action.

Approval Date
April 25, 2025

Expiration Date
April 24, 2030

Permit Number:
2002-24-0001.1 LUP240001

Type of Approvals:
Flood Hazard Area Verification - Method 3
Flood Hazard Area Individual Permit
Freshwater Wetlands General Permit No. 11
Freshwater Wetlands General Permit No. 17
Freshwater Wetlands General Permit No. 19
Water Quality Certificate

Governing Rules:
N.J.A.C. 7:13-1.1(b)
N.J.A.C. 7:7A-1.1(a)

Permittee:
Edward Oatman
Union County
10 Elizabethtown Plaza
Elizabeth, NJ 07202

Site Location:
Blocks & Lots: [198, 1.0101] [2, 3] [3, 1] [33, 5] [33, 7] [42, 88.02] [42, 89.01] [50, 16] [52, 11.01] [52, 11.02] [52, 13] [53, 34] [53, 35]
Municipality: Clark Township
County: Union

Description of Authorized Activities:

This document verifies the limits of floodway, flood hazard area and riparian zone associated with the Clark Reservoir, which is an onstream impoundment along Robinsons Branch and is comprised of West, Central and East Lakes, on the parcel referenced above, as shown on the approved plans. In addition, this document authorizes dredging of the West, Central and East Lakes situated within the Clark Reservoir Recreation Area and the construction of new amenities surrounding the Central Lake that includes a perimeter pedestrian path comprised of pervious material, a boat house and water access amenities including boat ramp, pier, and a dock, site access driveway and parking areas comprised of hot mix asphalt pavement, site lighting, drainage and stormwater management, ADA accessibility, bridge and culvert structures, and other site amenities.

This authorization to conduct activities in wetlands and/or waters includes the issuance of a Water Quality Certificate.

The Department has determined that the herein approved activities meet the requirements of the FHACA rules. This approval does not obviate the local Floodplain Administrator's responsibility to ensure all development occurring within their community's Special Flood Hazard Area is compliant with the local Flood Damage Prevention Ordinance, and minimum NFIP standards, regardless of any state-issued permits. FEMA requires communities to review and permit all proposed construction or other development within their SFHA in order to participate in the NFIP.

Prepared by:

Dhruv Patel

Received and/or Recorded by County Clerk:

If the permittee undertakes any regulated activity, project, or development authorized under this permit, such action shall constitute the permittee's acceptance of the permit in its entirety as well as the permittee's agreement to abide by the requirements of the permit and all conditions therein.

This permit is not valid unless authorizing signature appears on the last page.

STATEMENT OF AUTHORIZED IMPACTS:

The authorized activities allow for the permittee to undertake impacts to regulated areas as described below. Additional impacts to regulated areas without prior Department approval shall constitute a violation of the rules under which this document is issued and may subject the permittee and/or property owner to enforcement action, pursuant to N.J.A.C. 7:13-24 and N.J.A.C. 7:7A-22.

FWW GP11 Outfalls/Intake Structures	Permanent Disturbance (Acres)	Temporary Disturbance (Acres)
Freshwater wetlands	0	0
Transition areas	0	0
State open waters	0.004	0

FWW GP17 Trails/Boardwalks	Permanent Disturbance (Acres)	Temporary Disturbance (Acres)
Freshwater wetlands	0.321	0
Transition areas	0.693	0
State open waters	0.398	0

FWW GP19 Docks/Piers	Permanent Disturbance (Acres)	Temporary Disturbance (Acres)
Freshwater wetlands	0	0
Transition areas	0	0
State open waters	0.048	0

Riparian Zone Vegetation	Area of riparian zone (Acres)
Permanent Disturbed	0.587
Temporary Disturbed	0.615

PRE-CONSTRUCTION CONDITIONS:

1. **Timing**: If this permit contains a condition that must be satisfied prior to the commencement of construction, the permittee shall comply with such condition(s) within the time required by the permit or, if no time specific requirement is imposed, then the permittee shall comply with such condition(s) within six months of the effective date of the permit, or provide evidence satisfactory to the Division that such condition(s) cannot be satisfied.

2. Prior to the start of any construction onsite, the permittee/owner shall record a deed notice for all stormwater management measures authorized under this permit which shall be recorded in the Office of the County Clerk or the registrar of deeds and mortgages of the county in which the development, project, project site, or mitigation area containing the stormwater management measure is located. A form of deed notice shall be submitted to the Watershed and Land Management Program (Program) for approval prior to filing. The deed notice shall contain a description of the stormwater management measure(s) used to meet the green infrastructure, groundwater recharge, stormwater runoff quality, and stormwater runoff quantity standards at

N.J.A.C. 7:8-5.3, 5.4, 5.5, and 5.6 and shall identify the location of the stormwater management measure(s) in NAD 1983 State Plane New Jersey FIPS 2900 US Feet or Latitude and Longitude in decimal degrees. The deed notice shall also reference the maintenance plan required to be recorded upon the deed pursuant to N.J.A.C. 7:8-5.8(d). Prior to the commencement of construction, proof that the above required deed notice has been filed shall be submitted to the Program. Proof that the required information has been recorded on the deed shall be in the form of either a copy of the complete recorded document or a receipt from the clerk or other proof of recordation provided by the recording office. However, if the initial proof provided to the Program is not a copy of the complete recorded document, a copy of the complete recorded document shall be provided to the Program within 180 calendar days of the authorization granted by the Program.

3. Prior to the commencement of site clearing, grading, or construction onsite, the permittee shall install a sediment barrier at the limits of disturbance authorized herein, which is sufficient to prevent the sedimentation of the remaining regulated areas or waters on and/or adjacent to the site and shall serve as a physical barrier protecting these areas from encroachment by construction vehicles or other soil-disturbing activities. All sediment barriers and soil erosion control measures shall be kept in place and maintained throughout the duration of construction, until such time that the site is stabilized.

4. Prior to the commencement of site clearing, grading, or construction onsite, all existing trees near the project area which are not to be removed shall be marked and a protective construction fence shall be placed around each tree for the duration of construction until the site is stabilized.

5. Prior to site preparation or construction onsite, the permittee shall obtain all necessary consent from any affected offsite and/or easement property owners. No work shall occur without proper permissions.

6. Prior to project implementation, the permittee shall ensure that effects to historic and archaeological resources shall be resolved pursuant to New Jersey Register of Historic Places Act of 1970 (N.J.S.A. 13:1B-15.128 et seq.) and in compliance with N.J.A.C. 7:4, Subchapter 7 of the New Jersey Register of Historic Places Act Rules. The permittee shall ensure that an application for project authorization pursuant to the New Jersey Register of Historic Places Act that is technically and professionally complete and sufficient pursuant to N.J.A.C. 7:4-7.1(d) is submitted to the HPO for review and comment prior to project implementation.

    a. Upon completion of the New Jersey Register of Historic Places Act review, the permittee shall provide the Division of Land Resource Protection a copy of New Jersey Register of Historic Places Act resolution and/or HPO encroachment review finding together with a statement of how the comments and findings have been incorporated into the project, pursuant to N.J.A.C. 7:7A-4.3(b)(5).

SPECIAL CONDITIONS:

1. Within 90 calendar days of the date of this letter, the applicant shall submit the following information to the clerk of each county in which the site is located, and shall send proof to the Department that this information is recorded on the deed of each lot referenced in the verification:

    a. The Department file number for the verification;

    b. The approval and expiration dates of the verification;

    c. A metes and bounds description of any flood hazard area limit and/or floodway limit approved under the verification;

    d. The flood hazard area design flood elevation, or range of elevations if variable, approved under the verification;

    e. The width and location of any riparian zone approved under the verification; and

f. The following statement: "The State of New Jersey has determined that all or a portion of this lot lies in a flood hazard area. Certain activities in flood hazard areas are regulated by the New Jersey Department of Environmental Protection and some activities may be prohibited on this site or may first require a permit. Contact the Watershed and Land Management Program at (609) 777-0454 for more information prior to any construction onsite."

Failure to have this information recorded in the deed of each lot and/or to submit proof of recording to the Department constitutes a violation of the Flood Hazard Area Control Act rules and may result in suspension or termination of the verification and/or subject the applicant to enforcement action pursuant to N.J.A.C. 7:13-24.

2. Any new, reconstructed, enlarged, or elevated structure within a flood hazard area shall be secured to resist flotation, collapse, and displacement due to hydrostatic and hydrodynamic forces from floodwaters.

3. Construction equipment shall not be stored, staged or driven within any channel, freshwater wetland or transition area, unless expressly approved by this permit and/or described on the approved plans.

4. All sediment barriers and other soil erosion control measures shall be installed prior to commencing any clearing, grading or construction onsite, and shall be maintained in proper working condition throughout the entire duration of the project.

5. The applicant must adhere to the operations and maintenance plan for the stormwater management measures incorporated into the design of this major development in accordance with N.J.A.C. 7:8-5.8. Guidance set forth in the New Jersey Stormwater Best Management Practices Manual should be followed to the maximum extent practicable.

6. The Department has determined that this project meets the requirements of the Stormwater Management rules at N.J.A.C. 7:8. Any future expansion or alteration of the approved stormwater management system, which would affect water quality, increase the rate or volume of stormwater leaving the site, affect the infiltration capacity on the site, or alter the approved green infrastructure best management practices, shall be reviewed and approved by the Department by obtaining a modification or new permit as appropriate prior to construction. This includes any proposed changes to the discharge characteristics of any basin, the construction of new inlets or pipes that tie into the storm sewer network and/or the replacement of existing inlets or pipes with structures of different capacity.

7. Any future expansion or alteration of the approved site layout and/or land cover which would affect water quality, increase the rate or volume of stormwater leaving the site, or affect the infiltration capacity on the site, shall be reviewed and approved by the Department prior to construction.

8. After all in-channel activities are completed, native stream bed material must be replaced within the channel. This material must be contoured to mimic the original physical characteristics of the channel (such as its shape, width, slope, thalweg, meander, and ratio of shallow areas to deep areas,) in order to provide low-flow aquatic passage throughout the entire disturbed area.

9. The riprap proposed within the channel must be carefully imbedded into the channel substrate and contoured to mimic the original physical characteristics of the channel (such as its shape, slope, thalweg and meander) in order to provide low-flow aquatic passage throughout the entire disturbed area. Furthermore, any void spaces within the riprap must be filled with native substrate from the channel.

10. De-watering of cofferdams must include properly sized temporary sediment basins or other filtering methods to reduce turbidity. The stream area to receive return water discharged from cofferdams must be encompassed by a turbidity barrier. The turbidity barrier must be located parallel to the stream banks and anchored to the shoreline to maintain freeflow of the stream center. In order to avoid obstruction of stream flows or fish passage, turbidity barriers must not be placed across the entire stream channel.

11. Construction may only occur while the stream area is dry or in a de-watered condition. No work may be performed where the stream channel is wet.

12. The sections of watercourse to be cleaned/dredged under this permit shall be accessed only in the areas specifically shown on the approved drawing(s). The maximum limit of bank disturbance shown shall be observed and no additional disturbance to the channel is authorized.

13. The permittee shall ensure that only accumulated silt, sediment and debris are removed from the watercourse and dredging shall not extend beyond or below the natural channel.

14. The bridge/culvert approved under this permit does not have the hydraulic capacity to pass the flood hazard area design flood. Therefore, the proposed roadway may be overtopped by floodwaters and become inaccessible to emergency vehicles or other vehicular traffic during a flood.

15. All excavated and dredged material must be disposed of in a lawful manner outside of any flood hazard area, riparian zone, state open water, freshwater wetland, and freshwater wetland transition area, and in such a way as to not interfere with the positive drainage of the receiving area.

16. The authorized activities shall comply with the applicable conditions set forth under N.J.A.C. 7:7A-5.7, 7.11, 7.17, 7.19 and 20.2. Failure to comply with these conditions shall constitute a violation of the Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 et. seq.). Any additional un-permitted disturbance of freshwater wetlands, State open waters, or transition areas besides that shown on the approved plans shall be considered a violation of the Freshwater Wetlands Protection Act Rules unless the activity is exempt or a permit is obtained from the Department prior to the start of the disturbance.

17. The Department has determined that the freshwater wetlands affected by this permit authorization are of intermediate resource value and the standard transition area or buffer required adjacent to these wetlands is 50 feet. This general permit includes a transition area waiver, which allows encroachment only in that portion of the transition area, which has been determined by the Department to be necessary to accomplish the regulated activities. Any additional regulated activities conducted within the standard transition area onsite shall require a separate transition area waiver from the Division. Regulated activities within a transition area are defined at N.J.A.C. 7:7A-2.3. Please refer to the Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 et seq.) and implementing Rules (N.J.A.C. 7:7A) for additional information.

18. This authorization for a General Permit is valid for a term not to exceed five years from the date of this permit. If the permittee wishes to continue an activity covered by the permit after the expiration date of the permit, the permittee must apply for and obtain a permit extension or a new permit, prior to the permit's expiration. If the term of the authorization exceeds the expiration date of the general permit issued by rule, and the permit upon which the authorization is based is modified by rule to include more stringent standards or conditions, or is not reissued, the applicant must comply with the requirements of the new regulations by applying for a new GP authorization or an Individual permit.

19. The Department has determined that the onsite riparian zone along the Robinsons Branch/Clark Reservoir is 50 feet. To ensure full compliance with the Flood Hazard Area Control Act rules at N.J.A.C. 7:13, the permittee shall follow all requirements under permit-by-rule No. 17 at N.J.A.C. 7:13-7.17 for the proposed public floating docks and permit-by-rule No. 18 at N.J.A.C. 7:13-7.18 for the proposed public boat ramp.

20. Vegetation within the freshwater wetlands, freshwater wetlands transition areas, and riparian zone onsite shall only be disturbed in the areas specifically shown on the approved drawings and upon completion of the project, all temporarily disturbed areas shall be replanted with native, non-invasive vegetation appropriate for the hydrologic conditions of the area, where feasible.

21. The trenches into which the stormwater conveyance structures are placed shall be no wider than necessary to comply with the United States Occupational Safety and Health Administration safety standards for excavations set forth at 29 CFR Par 1926, Subpart P.

22. Any excavation within freshwater wetlands, transition areas, or State open waters shall be backfilled to preexisting elevations where feasible and with the uppermost 18 inches backfilled with original topsoil

material. The permittee shall ensure that the backfilling activities do not interfere with the natural hydraulic characteristics of the freshwater wetlands, such as flow characteristics of the groundwater onsite. The freshwater wetland and/or freshwater wetland transition area above the excavation shall be replanted/restored with an appropriate indigenous species/an indigenous seed mix, where feasible.

23. Any pipes laid through freshwater wetlands, transition areas, or State open waters which have been authorized by a Department permit shall be properly sealed to prevent leaking or infiltration and designed to not form a path for groundwater to be discharged or drained from a freshwater wetland. Pipes and backfilled materials shall be placed entirely beneath the preexisting ground elevation, where feasible.

24. The permittee shall take all measures necessary to ensure the authorized activities do not alter or interfere with the natural hydrology of the area.

25. Upon completion of the project, the permittee shall incorporate trail features designed to educate users about the importance of freshwater wetland and open water ecosystems, or other significant environmental features or phenomena.

26. In order to minimize disturbances to vegetation, the permittee shall incorporate minor deviations in the trail alignment to avoid impacts to mature trees within the work area.

27. The construction of the public footbridge(s) shall use non-polluting wood products to protect the environment from the effects of leaching; no Creosote or CCA treated lumber, or any other preservative susceptible to leaching, shall be used.

28. The Department has determined that the onsite riparian zones along the regulated waterways/Clark Reservoir/Robinsons Branch/Robinsons Branch tributaries are 50 feet, as shown on the approved plans. Therefore, vegetation within 50 feet from the respective top of banks of these watercourses shall only be disturbed in the areas specifically shown on the approved drawings. Upon completion of the project, all temporarily disturbed areas shall be restored with indigenous, non-invasive vegetation in accordance with N.J.A.C. 7:13-11.2(z).

29. In order to protect general game fish north of Interstate 195 and their spawning activity within Robinsons Branch/Clark Reservoir from sediment generating activities, any grading, excavation, or construction activities within the waterbody or the banks of the water(s) are prohibited between May 1 and July 31 of each year. In addition, any activity within the flood hazard area or riparian zone of this waterbody which does not minimize the introduction of sediment into the waterbody, or which could cause more than a minimum increase in the natural level of turbidity, is also prohibited anytime but especially during this period. The Department reserves the right to require additional soil conservation measures if it becomes evident that additional measures are required to protect State-regulated resources, or the right to suspend all regulated activities onsite should it be determined that the permittee has not taken proper precautions to ensure continuous compliance with this condition.

30. In order to protect fish habitat within the channel onsite, no boulders or logs providing fish habitat shall be removed from the channel where feasible.

31. The permittee shall prevent unset or raw concrete from encountering the waters of the channel(s) during all construction activities onsite; raw concrete is toxic to aquatic biota.

32. Prior to entrance into the project location, the permittee shall ensure that all matting material and construction equipment, including tracks and tires, shall be washed, cleaned, and certified as clean by CME's Environmental Inspector to minimize the spread and colonization of invasive plants and organisms. In addition, soil containing root fragments and above-ground vegetative material from invasive plant species shall be carefully managed during soil-disturbing activities and disposed of at a suitable offsite location rather than mulched and reused or stockpiled elsewhere onsite. For information on the specific species that are considered to be invasive, please refer to the Invasive Plant Atlas at http://www.invasiveplantatlas.org/index.html.

33. To reduce the risk of harm to Indiana Bat, Northern Long-eared Bat, Tricolored Bat (proposed federal listing), as well as nesting migratory bird species, and potential violation of the NJ Endangered and Nongame Species Conservation Act (ENSCA; N.J.S.A. 23:2a-1-13), and to reduce the risk of direct impacts to sensitive habitat, the Permittee shall adhere to a seasonal restriction on the clearing of all woody vegetation from April 1 through September 30 of each calendar year.

STANDARD CONDITIONS:

1. The issuance of a permit shall in no way expose the State of New Jersey or the Department to liability for the sufficiency or correctness of the design of any construction or structure(s). Neither the State nor the Department shall, in any way, be liable for any loss of life or property that may occur by virtue of the activity or project conducted as authorized under a permit.

2. The issuance of a permit does not convey any property rights or any exclusive privilege.

3. The permittee shall obtain all applicable Federal, State, and local approvals prior to commencement of regulated activities authorized under a permit.

4. A permittee conducting an activity involving soil disturbance, the creation of drainage structures, or changes in natural contours shall obtain any required approvals from the Soil Conservation District or designee having jurisdiction over the site.

5. The permittee shall take all reasonable steps to prevent, minimize, or correct any adverse impact on the environment resulting from activities conducted pursuant to the permit, or from noncompliance with the permit.

6. The permittee shall immediately inform the Department of any unanticipated adverse effects on the environment not described in the application or in the conditions of the permit. The Department may, upon discovery of such unanticipated adverse effects, and upon the failure of the permittee to submit a report thereon, notify the permittee of its intent to suspend the permit.

7. The permittee shall immediately inform the Department by telephone at (877) 927-6337 (WARN DEP hotline) of any noncompliance that may endanger public health, safety, and welfare, or the environment. The permittee shall inform the Watershed & Land Management by telephone at (609) 777-0454 of any other noncompliance within two working days of the time the permittee becomes aware of the noncompliance, and in writing within five working days of the time the permittee becomes aware of the noncompliance. Such notice shall not, however, serve as a defense to enforcement action if the project is found to be in violation of this chapter. The written notice shall include:

    i. A description of the noncompliance and its cause;

    ii. The period of noncompliance, including exact dates and times;

    iii. If the noncompliance has not been corrected, the anticipated length of time it is expected to continue; and

    iv. The steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

8. Any noncompliance with a permit constitutes a violation of this chapter and is grounds for enforcement action, as well as, in the appropriate case, suspension and/or termination of the permit.

9. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the authorized activity in order to maintain compliance with the conditions of the permit.

10. The permittee shall employ appropriate measures to minimize noise where necessary during construction, as specified in N.J.S.A. 13:1G-1 et seq. and N.J.A.C. 7:29.

11. The issuance of a permit does not relinquish the State's tidelands ownership or claim to any portion of the subject property or adjacent properties.

12. The issuance of a permit does not relinquish public rights to access and use tidal waterways and their shores.

13. The permittee shall allow an authorized representative of the Department, upon the presentation of credentials, to:

    i. Enter upon the permittee's premises where a regulated activity, project, or development is located or conducted, or where records must be kept under the conditions of the permit;

    ii. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit;

    iii. Inspect, at reasonable times, any facilities, equipment, practices, or operations regulated or required under the permit. Failure to allow reasonable access under this paragraph shall be considered a violation of this chapter and subject the permittee to enforcement action; and

    iv. Sample or monitor at reasonable times, for the purposes of assuring compliance or as otherwise authorized by the Federal Act, by the Freshwater Wetlands Protection Act, or by any rule or order issued pursuant thereto, any substances or parameters at any location.

14. The permittee shall not cause or allow any unreasonable interference with the free flow of a regulated water by placing or dumping any materials, equipment, debris or structures within or adjacent to the channel while the regulated activity, project, or development is being undertaken. Upon completion of the regulated activity, project, or development, the permittee shall remove and dispose of in a lawful manner all excess materials, debris, equipment, and silt fences and other temporary soil erosion and sediment control devices from all regulated areas.

15. The permittee and its contractors and subcontractors shall comply with all conditions, site plans, and supporting documents approved by the permit.

16. All conditions, site plans, and supporting documents approved by a permit shall remain in full force and effect, so long as the regulated activity, project, or development, or any portion thereof, is in existence, unless the permit is modified pursuant to the rules governing the herein approved permits.

17. The permittee shall perform any mitigation required under the permit in accordance with the rules governing the herein approved permits.

18. If any condition or permit is determined to be legally unenforceable, modifications and additional conditions may be imposed by the Department as necessary to protect public health, safety, and welfare, or the environment.

19. Any permit condition that does not establish a specific timeframe within which the condition must be satisfied (for example, prior to commencement of construction) shall be satisfied within six months of the effective date of the permit.

20. A copy of the permit and all approved site plans and supporting documents shall be maintained at the site at all times and made available to Department representatives or their designated agents immediately upon request.

21. The permittee shall provide monitoring results to the Department at the intervals specified in the permit.

22. A permit shall be transferred to another person only in accordance with the rules governing the herein approved permits.

23. A permit can be modified, suspended, or terminated by the Department for cause.

24. The submittal of a request to modify a permit by the permittee, or a notification of planned changes or anticipated noncompliance, does not stay any condition of a permit.

25. Where the permittee becomes aware that it failed to submit any relevant facts in an application, or submitted incorrect information in an application or in any report to the Department, it shall promptly submit such facts or information.

26. The permittee shall submit email notification to the Bureau of Coastal & Land Use Compliance & Enforcement at CLU_tomsriver@dep.nj.gov at least 3 days prior to commencement of site preparation and/or regulated activities, whichever comes first. The notification shall include proof of completion of all pre-construction conditions, including proof of recording of permits, approved plans and/or conservation easements, if required. The permittee shall allow an authorized Bureau representative on the site to inspect to ensure compliance with this permit.

27. The permittee shall record the permit, including all conditions listed therein, with the Office of the County Clerk (the Registrar of Deeds and Mortgages, if applicable) of each county in which the site is located. The permit shall be recorded within 30 calendar days of receipt by the permittee, unless the permit authorizes activities within two or more counties, in which case the permit shall be recorded within 90 calendar days of receipt. Upon completion of all recording, a copy of the recorded permit shall be forwarded to Watershed & Land Management through the DEP Online service. The uploaded documents will go directly into the Department's database, and staff will be notified that information has been received. The service can be found at: https://dep.nj.gov/wlm/eservices/lrp-eservices/.

APPROVED PLANS:

The drawings hereby approved consist of seventy-five (75) sheets prepared by CME Associates, dated March 2024, unless otherwise noted, last revised February 28, 2025, unless otherwise noted, entitled:

"TOWNSHIP OF CLARK, UNION COUNTY, NEW JERSEY, CLARK RESERVOIR PARK IMPROVEMENTS",

- "NJDEP FHA PERMIT PLAN DREDGING PLAN", Sheet Nos. 3, 6 to 10, 13 to 17, 22 to 38 and 40 of 74,
- "NJDEP FHA PERMIT PLAN DREDGING PLAN", Sheet Nos. 5, 12, 20 and 21 revised April 21, 2025,
- "NJDEP FHA PERMIT PLAN", Sheet No. 41 of 74, last revised April 21, 2025,
- "NJDEP FHA PERMIT PLAN PARK AND TRAIL PLAN", Sheet Nos. 46 to 49, 52 of 74, revised April 21, 2025,
- "NJDEP FHA PERMIT PLAN EARTHWORK PLAN FHA - 10 YEAR", Sheet No. 46A, 47A, 48A, 48B, 49A of 74, last revised April 21, 2025,
- "NJDEP FHA PERMIT PLAN PARK AND TRAIL PLAN", Sheet No. 50, 51, 57, 58, 59, 60, and 61 of 74,
- "NJDEP FHA PERMIT PLAN DRAINAGE PLAN - CENTRAL LAKE PARK", Sheet No. 53 of 74,
- "NJDEP FHA PERMIT PLAN DRAINAGE PLAN - 2 of 2", sheet no. 53A of 74, last revised March 12, 2025,
- "NJDEP FHA PERMIT PLAN STABILIZATION PLAN - OUTFALLS", Sheet No. 55 of 74,
- "NJDEP FHA PERMIT PLAN STABILIZATION PLAN - STREAMBANKS", Sheet No. 56 of 74,

- "NJDEP FHA PERMIT PLAN EARTHWORK PLAN FHA - 10 YEAR", Sheet No. 58A of 74, dated August 2024,
- "NJDEP FHA PERMIT PLAN EARTHWORK PLAN FHA - 10 YEAR", Sheet No. 59A of 74, last revised January 8, 2025,
- "NJDEP FHA PERMIT PLAN EARTHWORK PLAN FHA - 10 YEAR", Sheet No. 60A, 60B, 61A, 61B, and 62A of 74,
- "NJDEP FHA PERMIT PLAN PARK AND TRAIL PLAN", Sheet No. 61, 62, and 63-67 of 74,
- "NJDEP FHA PERMIT PLAN EARTHWORK PLAN FHA - 10 YEAR", Sheet No. 62A of 74,
- "NJDEP FHA PERMIT PLAN CONSTRUCTION DETAILS (1 OF 7)", Sheet No. 68 of 74, last revised on March 27, 2025,
- "NJDEP FHA PERMIT PLAN CONSTRUCTION DETAILS (3 OF 7)", Sheet No. 70 of 74,
- "NJDEP FHA PERMIT PLAN CONSTRUCTION DETAILS (6 OF 7)", Sheet No. 73 of 74,
- "NJDEP FHA PERMIT PLAN CONSTRUCTION DETAILS (7 OF 7)", Sheet No. 74 of 74,
- "NJDEP FLOOD HAZARD & RIPARIAN ZONE LOCATION PLAN (1 OF 2)", Sheet No. 1 of 2, dated March 2025, unrevised,
- "NJDEP FLOOD HAZARD & RIPARIAN ZONE LOCATION PLAN (2 OF 2)", Sheet No. 2 of 2, dated March 2025, unrevised,
- "NJDEP FLOODWAY LOCATION PLAN (1 OF 2)", Sheet No. 1 of 2, dated March 2025, unrevised,
- "NJDEP FLOODWAY LOCATION PLAN (2 OF 2)", Sheet No. 2 of 2, dated March 2025, unrevised,
- "NJDEP FWWL PERMIT PLAN PARK AND TRAIL PLAN", Sheets 46-49, 58 and 61 of 74,
- "NJDEP FWWL PERMIT PLAN PARK AND TRAIL PLAN", Sheet 52 and 67 of 74, revised April 21, 2025.

APPEAL OF DECISION:

Any person who is aggrieved by this decision may submit an adjudicatory hearing request within 30 calendar days after public notice of the decision is published in the DEP Bulletin (available at https://dep.nj.gov/bulletin/). If a person submits the hearing request after this time, the Department shall deny the request. The hearing request must include a completed copy of the Administrative Hearing Request Checklist (available at https://dep.nj.gov/wlm/forms/). A person requesting an adjudicatory hearing shall submit the original hearing request to: NJDEP Office of Administrative Hearings and Dispute Resolution, Attention: Adjudicatory Hearing Requests, Mail Code 401-07A, P.O. Box 420, 401 East State Street, 7th Floor, Trenton, NJ 08625-0420. Additionally, a copy of the hearing request shall be submitted to the Director of Watershed & Land Management at the address listed on page one of this permit. In addition to your hearing request, you may file a request with the Office of Dispute Resolution to engage in alternative dispute resolution. Please see www.nj.gov/dep/odr for more information on this process.

If you need clarification on any section of this permit or conditions, please contact Watershed & Land Management's Technical Support Call Center at (609) 777-0454.

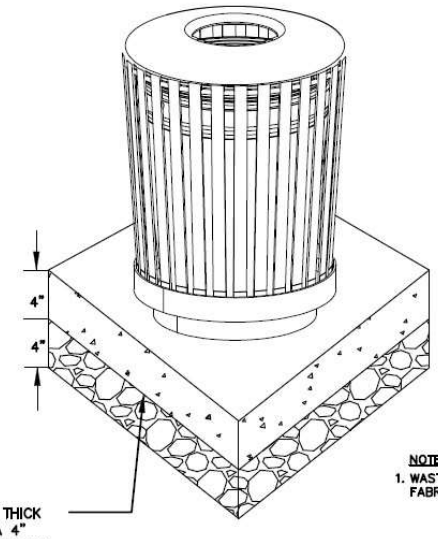
Approved By:

_____

Ryan J. Anderson, Manager
Bureau of Freshwater Wetlands & Highlands Permitting
Watershed & Land Management

e-copy: Municipal Clerk, Clark Township
Municipal Construction Official, Clark Township
Agent (original) – Austin Bazuk, CME Associates

CONSTRUCTION DETAILS:
WASTE AND RECYCLING CONRETE PAD DETAIL



2'-0" X 2'-0" X 4" THICK CONCRETE PAD ON A 4" CRUSH STONE SETTING BED (TYP.) THE CONCRETE PAD IS FOR THE TRASH RECEPTACLES NOT LOCATED ON A CONCRETE SURFACE



NOTE:
1. WASTE AND RECYCLING CONTAINERS SHALL BE MODEL CFTR-011, MANUFACTURED BY CUSTOM FABRICATION INC. OR APPROVED EQUAL.

WASTE AND RECYCLING CONTAINERS DETAIL

N.T.S.

SPECIFICATIONS

FOR

CLARK RESERVOIR IMPROVEMENTS,

Township of Clark, County of Union, New Jersey

BA # 26-2025, Union County Engineering 2020-002

April 2025

UNION COUNTY
BOARD OF COUNTY COMMISSIONERS

Lourdes M. Leon, Chairwoman
Joseph C. Bodek, Vice Chairman
James E. Baker, Jr., Commissioner
Michele S. Delisfort, Commissioner
Sergio Granados, Commissioner
Bette Jane Kowalski, Commissioner
Alexander Mirabella, Commissioner
Kimberly Palmieri- Mouded, Commissioner
Rebecca Williams, Commissioner

CLERK OF THE BOARD
James E. Pellettiere, RMC

COUNTY MANAGER
Edward T. Oatman

DEPARTMENT OF ENGINEERING, PUBLIC WORKS AND FACILITIES MANAGEMENT
Joseph J. Policay Jr., CPWM
Director, Department of Engineering, Public Works and Facilities Management

COUNTY ENGINEER
DIVISION OF ENGINEERING
Ricardo Matias, PE, CME, CFM

Prepared by:
CME Associates, Consulting and Municipal Engineers
3141 Bordentown Avenue
Parlin, New Jersey
(T) 732-727-8000
Michael McClelland, P.E.,P.P.,C.M.E

COUNTY OF UNION
NOTICE TO BIDDERS

Sealed bids will be received by Michelle Hagopian, Assistant Director of the Division of Purchasing, or their designee, on **May 29, 2025 at 10:30 a.m**., prevailing time, in the **3rd Floor Conference Room**, Union County Administration Building, 10 Elizabethtown Plaza, Elizabeth, New Jersey for:

Clark Reservoir Improvements
Township of Clark, County of Union, New Jersey
BA # 26-2025, Union County Engineering
2020-002

The Project generally consists of park, perimeter walking trail, footbridge, and dredge improvements to the Clark Reservoir Area, which includes four waterbodies, separated by Featherbed Lane, Raritan Road, and the Garden State Parkway referred to as the Headwaters, West Lake, Central Lake, and East Lake. The park improvements generally include the construction of parking lots, an access road, floating docks, and boat ramp. The perimeter walking trail and footbridge improvements generally include the construction of eight foot (8') wide asphalt and aggregate walking trails, pedestrian footbridges, drainage improvements, and retaining walls. The dredging improvements generally include the dewatering, removal, and disposal of dredge spoils from the Headwaters, West Lake, and Central Lake.

The bid documents may be obtained at no charge by registering and downloading at http://ucnj.org/bid-specs. Bid documents may also be obtained in person from the Division of Engineering at 2325 South Avenue, Scotch Plains, New Jersey 07076 between 8:30 a.m. and 4:00 p.m. weekdays upon payment of a non-refundable money order or certified check in the amount of $275.00 made payable to the County of Union (County). Cash and Personal / Company checks will not be accepted. Project Specifications will not be mailed. For further information please call the Division of Engineering at 908-789-3675.

The County reserves the right to reject all bids pursuant to N.J.S.A. 40A:11-13.2 and any bid that is non-responsive or submitted by a bidder that is not responsible and to waive all minor informalities or non-material exceptions in the bid in accordance with the New Jersey Local Public Contracts Law.

Please note the successful bidder will be required to sign a *PROJECT LABOR AGREEMENT (PLA)* for this project, which is included in the bid package for your review. Further, take note of all documents referring to the PLA and any action required on same.

Bids shall be submitted in a sealed envelope addressed to the County and clearly marked with the subject of the bid, name and address of the bidder, phone & fax number, if any, and date of the bid opening. Each bid must be delivered to reach the Division of Purchasing prior to the stated time of the opening of the bids. The County will not be responsible for late delivery by the U.S. Mail or any other carrier. If hand delivered, please note that parking and security access at the County Administration Building may cause delays and bidders should take them into consideration in order to submit a timely bid. No late bids will be accepted. No bid shall be accepted via fax or electronic submission.

Bidders are required to comply with the requirements of N.J.S.A. 10:5-31 et seq. and N.J.A.C. 17:27-1 et seq.

MICHELLE HAGOPIAN, ASSISTANT DIRECTOR OF PURCHASING

Union County Board of County Commissioners
We're Connected to You!

Clark Reservoir Improvements
Township of Clark, County of Union, New Jersey
BA # 26-2025, Union County Engineering 2020-002

TABLE OF CONTENTS

NB-1: Notice to Bidders

PROJECT SPECIFICATIONS
Definitions

Section 1: BID FORM
Section 2: WITHDRAWAL OF BID DUE TO MISTAKE
Section 3: QUALIFICATIONS OF BIDDERS AND REQUIRED SUBMISSIONS
Section 4: INTERPRETATIONS AND ADDENDA
Section 5: OBLIGATION OF BIDDER TO INSPECT SITE AND CONTRACT DOCUMENTS
Section 6: BID AND PERFORMANCE GUARANTEE
Section 7: COMMENCEMENT AND COMPLETION
Section 8: BIDDER AFFIDAVIT
Section 9: LABOR AND MATERIALS
Section 10: INSURANCE REQUIREMENTS
Section 11: INDEMNIFICATION REQUIREMENTS
Section 12: ROYALTIES AND PATENTS
Section 13: PLANS AND SPECIFICATIONS
Section 14: GUARANTEE AGAINST DEFECTIVE WORK
Section 15: TRAFFIC AND STREET MAINTENANCE
Section 16: CONTRACTOR'S EMPLOYEES
Section 17: OWNERSHIP DISCLOSURES REQUIRED
Section 18: NON-COLLUSION AFFIDAVIT
Section 19: EQUAL EMPLOYMENT OPPORTUNITY COMPLIANCES
Section 20: COMPLIANCE WITH NEW JERSEY PREVAILING WAGE ACT
Section 21: BRAND NAME OR EQUAL
Section 22: LINES AND GRADES
Section 23: NUMBER OF WORKING DAYS
Section 24: PROMPT PAYMENT OF CONSTRUCTION CONTRACTS (NJ Prompt Payment Act)
Section 25: STOPPING WORK ON ACCOUNT OF BAD WEATHER
Section 26: ACCESS FOR OTHER CONTRACTORS
Section 27: CONDEMNED MATERIALS AND WORK
Section 28: STORAGE
Section 29: FINAL CLEAN UP
Section 30: SUB-LETTING OF WORK
Section 31: SAFETY
Section 32: QUALITY, SAFETY AND PERFORMANCE STANDARDS
Section 33: MATTERS NOT MENTIONED IN CONTRACT DOCUMENTS
Section 34: PERMITS
Section 35: CONTRACTOR TO PROVIDE PROOF OF PAYMENT
Section 36: CHANGE ORDERS
Section 37: SUPPLEMENTAL WORK
Section 38: FORM OF CONTRACT
Section 39: PROGRESS PAYMENTS
Section 40: INSPECTION
Section 41: DAMAGES
Section 42: LIQUIDATED DAMAGES
Section 43: AFFIRMATIVE ACTION REQUIREMENTS
Section 44: OMITTED
Section 45: OMITTED

PROJECT SPECIFICATIONS CONTINUED

Section 46: COMPLIANCE WITH THE PUBLIC WORKS CONTRACTOR REGISTRATION ACT (N.J.S.A. 34:11-56.48 et. seq.)
Section 47: UTILITIES
Section 48: MATERIAL COMPLIANCE AND SHOP DRAWINGS Section 49: PRECONSTRUCTION
Section 50: DISPUTES UNDER THE CONTRACT
Section 51: CONTRACTOR BUSINESS REGISTRATION CERTIFICATE (New Mandatory Requirement – Effective 1/18/2010 Section 52: PROJECT LABOR AGREEMENT
Article 1 – Preamble
Article 2 – General Conditions
Article 3 – Scope of the Agreement
Article 4 – Union Recognition and Employment
Article 5 – Union Representation
Article 6 – Management's Rights
Article 7 – Work Stoppages and Lockouts
Article 8 – Local Administrative Committee (LAC)
Article 9 – Grievance & Arbitration Procedure
Article 10 – Jurisdictional Disputes
Article 11 – Wages and Benefits
Article 12 – Hours of Work, Premium Payments, Shifts and Holidays
Article 13 – Apprentices
Article 14 – Safety Protection of Person and Property
Article 15 – No Discrimination
Article 16 – General Terms
Article 17 – Savings and Separability
Article 18 – Future Changes In Schedule "A" Area Contracts

Section 53: BID PROTEST - LEGAL FEES AND COSTS
Section 54: AMERICAN GOODS AND PRODUCTS WHERE POSSIBLE
Section 55: NEW JERSEY PAY-TO-PLAY REQUIREMENTS
Section 56: STATEMENT OF EQUIPMENT TO BE USED IN CONSTRUCTION
Section 57: NEW JERSEY SALES AND USE TAX REQUIREMENTS
Section 58: RESOLUTION No. 2014-408 (Omitted)
Section 59: FEDERAL TERMS
Section 60: EXECUTIVE ORDER 166 REQUIREMENT

BIDDING DOCUMENTS

Bid Document Submission Checklist (Project Specifications)
Bid Form Consent of Surety
Bidder Signature Page
Statement of Ownership Disclosure
Subcontractor Identification Statement: List of Subcontractors and Certification
Acknowledgement of Addendum
Contractor Business Registration Certificate
Affirmative Action Requirement
Experience Statement
Certificate of Bidder Showing Ability to Perform Contract
Non-Collusion Affidavit
Contractor Registration Advisement
Americans with Disabilities Act
Statement of Bidder's Qualifications
Contractor Performance Record
Prior Negative Experience Questionnaire-Certification
Contractor's Certification of Compliance - New Jersey Prevailing Wage Act
Certificate of Insurance Statement
Collection of Use Tax on Sales to Local Governments

Time of Completion
Federal Non-Debarment Certification
Byrd Anti-Lobbying Amendment
Certification Regarding Lobbying
Disclosure of Lobbying Activities (LLL Form)
New Jersey Department of Labor & Workforce Development Payroll
Certification for Public Works Projects Form

SS - STANDARD NJDOT SPECIFICATIONS SS-1

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION AIA DOCUMENT A-201/2017
(Sample form until contract is awarded**)**

NEW JERSEY PREVAILING WAGE DETERMINATION DOCUMENTS

SPECIAL PROVISIONS

SPECIAL PROVISIONS - PERMITS

PROJECT TECHNICAL SPECIFICATIONS

DIVISION 100 GENERAL PROVISIONS
DIVISION 150 CONTRACT REQUIREMENTS
DIVISION 200 EARTHWORK
DIVISION 300 SUBBASE AND BASE COURSE
DIVISION 400 PAVEMENTS
DIVISION 500 BRIDGES AND STRUCTURES
DIVISION 600 MISCELLANEOUS CONSTRUCTION
DIVISION 650 UTILITIES
DIVISION 700 ELECTRICAL
DIVISION 800 LANDSCAPING
DIVISION 900 MATERIALS
DIVISION 1000 EQUIPMENT
DIVISION 26 ELECTRICAL

END OF SECTION

APPENDICES TO PROJECT TECHNICAL SPECIFICATIONS

APPENDIX A – SOIL BORING LOGS

APPENDIX B – TEST PIT LOGS

APPENDIX C – CLARK RESERVOIR SEDIMENT SAMPLES

UNION COUNTY BOARD OF COUNTY COMMISSIONERS
PROJECT SPECIFICATIONS (Also known As INSTRUCTIONS TO BIDDERS AND FORMS)

DEFINITIONS

Wherever reference is made to the County, Title of Project, Bidder, or Vendor/Contractor they shall be as follows:

OWNER/COUNTY:
Union County Board of County Commissioners
UC Administration Building, 6th Floor
10 Elizabethtown Plaza
Elizabeth, New Jersey 07207

ADDRESS INQUIRIES TO:
Union County Division of Purchasing
UC Administration Building, 3rd Floor
10 Elizabethtown Plaza
Elizabeth, NJ 07207
Attn: Michelle Hagopian, Assistant Director, Division of Purchasing
Telephone: 908-527-4130
Facsimile: 908-558-2548
ucbids@ucnj.org

ADDRESS BIDS AND SUBMIT TO:
Union County Division of Purchasing
UC Administration Building, 3rd Floor
10 Elizabethtown Plaza
Elizabeth, NJ 07207
Attn: Michelle Hagopian, Assistant Director, Division of Purchasing
Telephone: 908-527-4130

TITLE OF PROJECT: CLARK RESERVOIR IMPROVEMENTS
Township of Clark, County of Union, New Jersey
BA # 26-2025, Union County Engineering 2020-002

ENGINEER:
CME Associates, Consulting and Municipal Engineers
3141 Bordentown Avenue
Parlin, NJ 08859

COUNTY ENGINEER AND/OR CONSTRUCTION MANAGER (as applicable):

COUNTY ENGINEER:
Ricardo S. Matias, PE, CME, CFM
Union County
Division of Engineering

CONSTRUCTION MANAGER:
CME Associates, Consulting and Municipal Engineers
3141 Bordentown Avenue
Parlin, NJ 08859

1. BID FORM

Bids for this Work shall be enclosed in a sealed envelope addressed to the Assistant Director of the Division of Purchasing at the County of Union (County), New Jersey, Union County Administration Building, 10 Elizabethtown Plaza, Elizabeth, New Jersey 07207, with the full name of the Project clearly marked on the outside, along with the name and address of the bidder, phone & fax number, if any, and the bid Project name and the date of the bid opening. Refer to the sheet marked "Notice to Bidders" for the full name of the Project. Bidders must submit their bids on the attached Bid Form in a sealed envelope addressed to the Assistant Director of the Division of Purchasing at the County of Union.

The Assistant Director of the Division of Purchasing will receive the bids for this Work at the Union County Administration Building, 10 Elizabethtown Plaza, Elizabeth, New Jersey on the date and time noted on the sheet marked "**Notice to Bidders**".

It is the Bidder's responsibility to submit the bid to the Division of Purchasing at the time and place designated in the Notice to Bidders.

Bids will be accepted only on the Bid Form supplied. Bids on forms other than the Bid Form supplied herein will be rejected. The Bid Documents designated as mandatory with the bid are to be submitted with this Bid.

The Bidder shall state in the Bid Form the price per unit of measure for each scheduled Item of Work for which the Bidder will agree to carry out the Work, and the Total Bid Price for the construction of the Project.

The prices in the Bid Form shall be typed or written in pen and ink. Erasures or alterations must be initialed by the bidder in ink.

The Bidder is advised that the following allowances are included in the Project:

TRAFFIC DIRECTOR, MUNICIPAL POLICE ALLOWANCE - $100,000
DISPOSING OF HAZARDOUS MATERIAL ALLOWANCE - $750,000
DISPOSING OF REGULATED MATERIAL ALLOWANCE - $500,000
ALLOWANCE FOR LABORATORY TEST / MATERIAL TESTING - $500,000
TRAIL SECURITY SYSTEM ALLOWANCE - $100,000
BID CONTINGENCY ALLOWANCE - $1,000,000

The Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from the Bid Contingency Allowance. Funds will be drawn from the Bid

Contingency Allowance only by Change Order pursuant to N.J.A.C 5:30-11.3 et seq.. At closeout of Contract, funds remaining in the Bid Contingency Allowance will be credited to Owner by Change Order.

A Bid Contingency Allowance is provided for modifications or additions associated with construction of the Project including material, services, or appurtenances not specifically described in the specifications but as required to satisfactorily complete the Project. Nothing herein shall constitute a guarantee that the Contractor is entitled to payment of the full allowance. To qualify for payment, work must be ordered by the Engineer in writing pursuant to N.J.A.C. 5:30-11.3 et seq. An amount of one million dollars ($1,000,000) is established for this item and is included in the Proposal.

All Bidders are required to add these fixed amounts to their base bid and to include the additional amounts in their Bid Bond. These sum will be included in the Contract as well as the performance, labor and materials bond. Payment by the County will be made to the Contractor from these funds only upon the completion of extra Work pursuant to a written notification by the County's Engineer or their designee and the Contractor, prior to the commencement of such Work. Work commenced prior to written approval by the County shall be done at Contactor's risk. Such payment will only be in the amount agreed to by the parties, in writing in the Change Order(s). See Section 37, Change Orders, of these Project Specifications Refer to Bid Document Submission Checklist on pages B1 & B2 herein for all required documents.

In the event there is a discrepancy between the unit price given and the extended total, the unit price will govern. Any discrepancies will be mathematically adjusted.

The determination of the low bid shall be made based on the total base bid. Where necessary to reduce the Contract price to be within the Project budget, the low bid shall be determined based on the total base bid and the least amount of Deletion Items in numerical order (Deletion Item 1 shall be the first Deletion Item utilized and Deletion item 5 the last Deletion item utilized) to stay within the Project budget as indicated in the Deletion Items section of the Bid Form. The Contract price will be recalculated by subtracting the Deletion Item(s) from all Bidders' Base Bid price until the Contract Price is within the County's Project budget.

The same unit prices bid for the base bid items shall be utilized for the corresponding deletion items. Union County shall have the right to delete as few or as many items in numerical order as deemed necessary to stay within the Project budget.

Bidders are advised that where deletion items are composed of a delete portion and an add portion, the net deletion will constitute the difference between the total extension of the delete item and the total extension of the add item.

When two or more low bids are equal in all respects, awards will be made according to the provisions of N.J.S.A. 40A:11-6.1(d).

Where unit prices have already been established by the Bid Documents, the Bidder agrees that such unit prices shall prevail. All unit prices, whether filled in by the Bidder or established by the Contract Documents, shall become part of the Contract. A bid will be considered non-responsive and automatically rejected, unless all applicable unit prices, as required, are provided.

The County reserves the right to reject all bids pursuant to N.J.S.A 40A:11-13.2 and any bid that is non-responsive or submitted by a bidder that is not responsible. The County also reserves the right to waive any minor informalities or non-material exceptions in the bids.

Conditional bids will not be accepted. Bids may be withdrawn prior to the opening of bids or in accordance with the provisions of N.J.S.A. 40A:11-23.3 as discussed below. Bids received after the advertised time shall not be considered. Bidders shall be solely responsible for premature opening or late delivery of bids not properly marked, addressed, or directed.

2. WITHDRAWAL OF BID DUE TO MISTAKE

N.J.S.A. 40A:11-23.3 authorizes a bidder to request withdrawal of a public works bid due to a mistake on the part of the bidder within five (5) business days after bid opening. A mistake is defined by N.J.S.A. 40A:11-2(42) as a clerical error that is an unintentional and substantial computational error or an unintentional omission of a substantial quantity of labor, material, or both, from the final bid computation.

A bidder claiming a mistake under N.J.S.A. 40A:11-23.3 must submit a request for withdrawal, in writing, by certified or registered mail to Michele Hagopian, Assistant Director, Division of Purchasing, County of Union, New Jersey, Union County Administration Building, 10 Elizabethtown Plaza, Elizabeth, New Jersey 07207.

A bidder's request to withdraw the bid shall contain evidence, including any pertinent documents, demonstrating that a mistake was made. Such evidence shall be reviewed and evaluated by the County's the purchasing agent, legal counsel or the chief administrative officer pursuant to the statutory criteria of N.J.S.A. 40A:11-23.3.

3. QUALIFICATIONS OF BIDDERS AND REQUIRED SUBMISSIONS

The Bidder should submit with its bid the "Statement of Bidder's Qualification." In the event there is a question concerning the Bidder's responsibility to perform, the County may

make such investigation as it deems necessary to determine the ability of the Bidder to perform the Work, which may include an investigation into the Bidder's references, or any of the subcontractors listed with the bid. After the bid is opened, the Bidder shall furnish any information requested for this purpose.

4. INTERPRETATIONS AND ADDENDA

Any explanation desired by a bidder regarding the meaning or interpretation of the Contract Documents must be requested in writing to the Assistant Director, Division of Purchasing at ucbids@ucnj.org. Any interpretation or instruction made by the County Engineer will be in the form of an addendum to the Contract Documents and will be furnished to all prospective bidders. Oral explanations or instructions given before the award of the Contract will not be binding. Bidders are required to bring to the attention of the Assistant Director, Division of Purchasing at ucbids@ucnj.org, the discovery of any apparent ambiguity, inconsistency, error, discrepancy, omission in the Contract Documents for interpretation and correction at least ten (10) business days before opening of bids with the exception of Saturdays, Sundays and holidays.

All Addenda issued through the Division of Purchasing are amendments to the Contract Documents and shall be considered in preparing bids. Same shall become part of the Contract Documents.

Addenda take precedence over all earlier documents and over each other according to the latest date. Addenda, unless themselves interpretive, remain subject to interpretation the same as any other document incorporated into the Contract.

Addenda shall be issued by the Assistant Director, Division of Purchasing no later than seven (7) days, Saturdays, Sundays, and holidays excepted, prior to the opening of bids. Failure of any bidder to receive an addendum shall not relieve such bidder from the obligation imposed by such addendum. Notice of the addenda will be made pursuant to N.J.S.A. 40A:11-23 (c)2 and the County will post any addendum to the County website. Bidders should also keep themselves currently acquainted with the Bid Documents during the entire bidding period and make inquiry on their own initiative as to issuance of any Addenda.

Receipts of all Addenda shall be acknowledged on the *"Acknowledgement of Addendum"* included in the Bid Documents and must be submitted with the bid.

5. INSPECTION OF SITE AND CONTRACT DOCUMENTS

While a site inspection is not mandatory, it is recommended. At the time of the opening of bids, each Bidder is presumed to have read, and be thoroughly familiar with

the Contract Documents. The failure or neglect of any Bidder to receive or examine any form, instrument, or document shall in no way relieve any Bidder from any obligation in respect to its bid.

The Bidder shall examine the contents of the Project Specifications and the set of Drawings and assure itself that all pages of the Project Specifications, Project Technical Specifications, Drawings, and other Contract Documents are included in the documents obtained for bidding purposes. Should the Project Specifications, Project Technical Specifications, Drawings, and other Contract Documents be incomplete, the Bidder shall notify the County Engineer in writing, who will supply all Bidders with any missing pages of Project Specifications, Project Technical Specifications , Drawings, or other Contract Documents via addendum. The lack of such written notification by the Bidder will be construed as evidence that the Project Specifications, Project Technical Specifications, Drawings, or other Contract Documents supplied it for bidding purposes are full and complete and as a waiver of any subsequent claim to the contrary.

Per N.J.A.C. 17:44-2.2: "Union County shall maintain all documentation related to products, transactions or services under this contract for a period of five years from the date of final payment. Such records shall be made available to the New Jersey Office of the State Comptroller upon request."

6. BID AND PERFORMANCE GUARANTEE

Pursuant to the Section 59 of the Project Specifications and 2 CFR 200.326, a bid guarantee is required from each bidder equivalent to five percent of the bid price. The “bid guarantee” must consist of a firm commitment such as a bid bond, certified check, or other negotiable instrument accompanying a bid as assurance that the bidder will, upon acceptance of the bid, execute such contractual documents as may be required within the time specified.

Each bidder must furnish with the bid a Consent of Surety, stating that in the event of the contract being awarded to said bidder, such Surety Company will provide the Contractor with bonds guaranteeing the faithful performance of the Work in accordance with the plans and specifications, and the payment for labor, materials, and all other indebtedness which may accrue on the account of this Work. The County has provided its Consent of Surety form for your use. The use of this form will expedite the bid review process. If, however, the Bidder should need to use another form, please use language similar to that used on the County form and avoid making any additions or deletions to the County form language. In lieu of the Consent of Surety you may submit a Certified Check in the full amount of the bid. A Payment, Performance, Labor and Materials Bond(s) will be furnished by the Contractor upon an award of Contract, and will be in the amount of 100% of the contract price. Upon acceptance of the Work after completion, a one-year Maintenance Bond will be

required by the County in the amount as stated in Section 14 of the General Specifications. Bonds will be written by a firm authorized to issue the bonds under the laws of the State of New Jersey and be in a form acceptable to the County Counsel and substantially the same form as required by N.J.S.A. 2A:44-147.

N.J.S.A. 40A:11-1 et seq. allows the Contractor to furnish the Performance Security for their Subcontractors. The County requires Performance Security to be furnished by the Contractor for the entire job in the total amount of the Contract.

The County will return all bid security, except those of the three (3) apparent lowest responsible bidders, within ten (10) days after the opening of the bids, Sundays and holidays excepted unless otherwise requested by the bidders. The County will return the bid security of the remaining unsuccessful bidders, within three (3) days, Sundays and holidays excepted, after the awarding and signing of the contract and the approval of the Contractor's performance bond.

If the successful bidder refuses or neglects to sign an agreement and furnish the required bonds, the Bid Bond will be held and used by the County to offset any damages for such refusal or neglect.

7. COMMENCEMENT AND COMPLETION

Work shall not commence until a Notice to Proceed is received from the County Engineer.

Upon substantial completion of the Project, the Contractor must request an inspection with the County Engineer, and its consultants, if any. Upon completion of this inspection, the County Engineer will prepare a list of incomplete or incorrect items (punch list) and have Contractor initial and date same. The Contractor shall rectify all deficiencies noted on the punch list within thirty (30) calendar days of receipt of the list. The County Engineer may approve extensions for extenuating circumstances when needed and in the sole discretion of the County Engineer, which extension will not be unreasonably withheld.

8. BIDDER CERTIFICATION

It is recommended that Bidders complete, sign, and submit with their Bid, the attached "Federal Non-Debarment Certification". (See form enclosed). If the Federal Non-Debarment Certification is not submitted with the Bid, it is required prior to award.

9. LABOR AND MATERIALS

The prices will cover all costs of any nature incident to and growing out of the Work, including all labor, material, equipment, transportation, loss by damage or destruction of the

Project, settlement of damages, and for replacement of defective work or materials. N.J.S.A. 54:32B-1 et seq. exempts all materials sold to the County of Union from sales or use taxes and should not be included in the prices provided on the Bid Form.

10. INSURANCE REQUIREMENTS

The County requires all Contractors to be able to comply with the following insurance requirements. In the event a bid is accepted by the County, the Contractor must accept the applicable insurance requirements, as set forth below, as part of any contract awarded to it by the County.

Contractor shall carry and maintain at all times while the contract is in full force and effect, the following insurance coverage with an insurance company or companies acceptable to the County and placed with insurers authorized to conduct business in the State with a current A.M. Best's rating of no less than A: VII, unless otherwise acceptable to the County, with limits not less than those shown below. A Certificate of Insurance shall be filed with the County prior to commencement of any Work indicating the following:

a) Commercial General Liability (CGL): Coverage for all operations including, but not limited to, contractual, products and completed operations, and personal injury with limits no less than $5,000,000 per occurrence/$10,000,000 aggregate. The County of Union, its Board of County Commissioners, officers, employees, agents and servants shall be included as an additional insured. Coverage is provided on a primary and non-contributory basis to the County of Union, et al.

b) Automobile Liability: Coverage for all owned, non-owned and hired vehicles with limits not less than $5,000,000 per occurrence, combined single limits (CSL) or its equivalent.

c) Workers Compensation: As required by the State of New Jersey and Employers Liability with limits not less than $1,000,000 per accident for bodily injury or disease.

d) Professional Liability (if design/build): Coverage with limits not less than $1,000,000 per occurrence or claim, $2,000,000 aggregate

e) Contractor's Pollution Legal Liability and/or Asbestos Legal Liability and/or Errors & Omissions (if project involves environmental hazards): Coverage with limits no less than $1,000,000 per occurrence or claim/$2,000,000 aggregate.

f) Builders Risk (for major renovations): During the course of construction utilizing an "All Risk" coverage form with limits equal to the completed value of the project and no coinsurance penalty provisions.

Where applicable, a waiver of subrogation in favor of the County of Union, its Board of County Commissioners, officers, employees, agents, servants and the State of New Jersey is to be included in those policies of insurance where permitted by law.

Notice of Cancellation: Each insurance policy required above shall provide that coverage shall not be canceled, except with notice to the County.

Special Risks or Circumstances: The County reserves the right to modify these requirements, including limits, based on the nature of the risk, prior experience, insurer, coverage, or other special circumstances.

11. INDEMNIFICATION REQUIREMENTS

The County requires all bidders to accept the following indemnification requirements in the event the County accepts their bid. The Contract awarded by the County to the successful bidder will contain the following provision:

> "To the fullest extent permitted by law the Contractor shall indemnify, defend, and hold harmless the Owner and the Owner's consultants, agents, representatives, and employees from and against any and all claims, damages, losses, costs, and expenses, including, but not limited to attorneys' fees, legal costs and legal expenses arising out of or resulting from the performance of the Contractor's work under this contract, provided that such claim, damage, loss, cost, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself) caused or alleged to be caused by the negligent acts, negligent omissions, and/or fault of the Contractor, anyone directly or indirectly employed or retained by the Contractor, or anyone for whose acts the Contractor may be liable regardless of whether caused in part by the negligent act or omission of a party indemnified hereunder provided it is not caused by the sole negligence of a party indemnified hereunder. Contractor shall further indemnify and hold harmless the County and the County's consultants, agents, representative, and employees from and against any and all claims, damages, losses, costs, and expenses, including, but not limited to attorneys' fees, legal costs and legal expenses, arising out of or resulting from performance of the work, provided that such claim, damage, loss, cost, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself) caused or alleged to be caused by the negligent acts, negligent omissions, and/or fault of the County or the County's consultants, agents, representatives, or employees and arises out of this project and provided such claim, damage, loss, cost, or expense is not caused by the sole negligence of a party indemnified hereunder."

12. ROYALTIES AND PATENTS

The Contractor shall pay all royalties and license fees as be needed to complete the Work herein. They shall defend all suits or claims for infringement of any patent rights and shall hold the County harmless from loss on account thereof.

13. PLANS AND SPECIFICATIONS

In carrying out the Work, the plan(s) and the specifications will be followed by the Contractor. Minor alterations in the plan may be made or permitted by the County Engineer from time to time and, if no additional Work is necessary, there will be no additional charge for carrying out such minor alterations.

The Contractor shall provide the County Engineer a set of reproducible as-built drawings upon completion of the Project. The Contractor shall maintain an updated construction progress plan in the Project field office at all times.

When applicable, The New Jersey Department of Transportation Standard Specifications for Road and Bridge Construction, as amended, and Supplemental Specifications for State Aid Projects, herein after referred to as the "Standard Specifications", are made a part of these specifications and contract for the improvements, and will govern the construction of this Project, the material used and the execution of this Project, except as revised and modified herein. The references to these specifications are given herein for the purpose of aiding in the rapid location of the description of the various items herein specified. The entire Work must be carried on and completed to the satisfaction of the County. The Standard Specifications are amended as follows:

"Any reference to the Commissioner, Department, Department Laboratory, Engineer or Inspector should be redefined to be the County of Union".

14. GUARANTEE AGAINST DEFECTIVE WORK

Prior to final payment being made or before the release of the performance security required by Section 6 above, the Contractor shall execute and deliver to the County an original Maintenance Bond with an original signature and seal having a penal sum equal to:

A) One hundred percent (100%) of the final adjusted Contract amount, if such amount is $50,000.00 or less;
B) Fifty percent (50%) of the final adjusted Contract amount, if such amount be greater than $50,000.00 but less than $250,000.00; and,
C) Twenty-five percent (25%) of the final adjusted contract amount, if such amount is $250,000.00 or more.

The Bond shall be satisfactory to the Union County Counsel. The Surety shall hold a Certificate of Authorization to do business in the State of New Jersey and shall conform to N.J.S.A. 2A:44-143 et seq. The Surety Disclosure Statement and Certification required by N.J.S.A. 2A: 44-143, 144, shall be attached to the Bond. Such Maintenance Bond shall remain in full force and effect for a period of one (1) year from the date of Final Completion. Such Maintenance Bond shall also provide that the Contractor and the Surety guarantee to replace for the said period of one (1) year from the date of Final Completion, all Work performed and/or all materials furnished that were not performed or were not furnished in accordance to the terms and performance requirements of the Contract Documents, and will make good any defects thereof which become apparent before the expiration of one (1) year. If, during that period, any part of the Project, in the judgment of the County Engineer, is found defective, the Contractor will repair or replace same within five (5) business days of receipt of notice from the County Engineer. If the Contractor refuses or neglects to do such Work in the time specified, the County Engineer may have the Work done by others and the Contractor or their Surety thereof will pay the cost.

The Contractor will furnish the County a Maintenance Bond for a percentage of the final adjusted contract price, as stated above. The one (1) year period will start the day of Final Completion of Project by the County. Final payment is conditional on the receipt of a maintenance bond in a form acceptable to County Counsel.

15. TRAFFIC AND STREET MAINTENANCE

The Work must be started and performed by the Contractor in such a manner as to minimize delays to the traveling public. It must be completed in a timely fashion, with little or no inconvenience to traffic and pedestrians, where such inconvenience may be avoided.

All municipal, county, and state roadways shall remain open to traffic unless otherwise provided for in the Project Technical Specifications.

If modified traffic patterns are authorized by the proper entity within that jurisdiction in order to provide a safe working or traveling environment, the Contractor is responsible for providing all equipment, barrels, cones, signs, and barricades to implement the work zone and detours, unless otherwise specified in the Project Technical Specifications. All work zones and detours shall be established in accordance with the technical plans and specifications if provided or in strict compliance with the current version of the Manual for Uniform Traffic Control Devices (MUTCD). The Contractor shall obtain approval for these work zones and detour plans from the Municipal Police or applicable police agency and the Union County Bureau of Traffic Maintenance prior to implementation.

All traffic control plans as discussed in Section 159 of the Project Technical Specification shall provide for safe movement of vehicular, bicycle, and pedestrian traffic.

Particular attention shall be given to requirements of the Americans with Disabilities Act.

No portion of any street or alleyway may be used for the storage of any materials or equipment without the approval of the Municipal Police or other applicable police agency. Sidewalks, gutters, drains, fire hydrants and private drives shall be maintained for their intended use unless specifically approved by the County Engineer in writing.

Upon suspension of Work, at the end of the day or for protracted periods, the Contractor shall remove all rubbish and materials from the Work site to the approved storage/staging location. All road cuts, saw cuts, and trenches that may pose hazard to vehicular, pedestrian, or bicycle traffic, to include handicapped users, shall be filled to the surface of the roadway or sidewalk. At no time will steel plates or settled trenches be allowed at the daily suspension of Work, unless specifically approved by the County Engineer.

In accordance with the provisions of N.J.S.A. 40A:11-23.1(c), the use of traffic control officers will be necessary for this Project. An allowance for same is set forth in the Bid Form.

With respect to pedestrian traffic, the Contractor shall install signs restricting access of the general public and, as necessary, Union County employees to the area of construction. The Contractor shall provide safe access to required areas and place physical barriers to restricted areas. These barriers may range from caution tape to actual barriers, at the direction of the County Engineer.

16. CONTRACTOR'S EMPLOYEES

The Contractor must employ only suitable and competent labor in the Work, and must remove from the Work any incompetent, unsuitable, or disorderly person upon complaint from the County Engineer.

The parties to any Contract resulting from this Bid do hereby agree that the provisions of N.J.S.A. 10:2-1 through 10:2-4 (discrimination in employment on public works contracts): N.J.S.A.34:11-56.25 et seq. (payment of prevailing rate of wages determined pursuant to N.J.S.A. 34:11-56.30 by the Commissioner), and the Rules and Regulations promulgated pursuant thereto, are hereby made a part of any contract and are binding upon them.

The Bidder hereby agrees to comply with the following mandatory provisions:

N.J.S.A. 10:2-1 Antidiscrimination provisions.

10:2-1. Antidiscrimination provisions. Every contract for or on behalf of the State or any county

or municipality or other political subdivision of the State, or any agency of or authority created by any of the foregoing, for the construction, alteration or repair of any public building or public work or for the acquisition of materials, equipment, supplies or services shall contain provisions by which the Contractor agrees that:

a. In the hiring of persons for the performance of work under this contract or any subcontract hereunder, or for the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under this contract, no Contractor, nor any person acting on behalf of such Contractor or subcontractor, shall, by reason of race, creed, color, national origin, ancestry, marital status, gender identity or expression, affectional or sexual orientation or sex, discriminate against any person who is qualified and available to perform the work to which the employment relates;

b. No Contractor, subcontractor, nor any person on their behalf shall, in any manner, discriminate against or intimidate any employee engaged in the performance of work under this contract or any subcontract hereunder, or engaged in the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under such contract, on account of race, creed, color, national origin, ancestry, marital status, gender identity or expression, affectional or sexual orientation or sex;

c. There may be deducted from the amount payable to the Contractor by the contracting public agency, under this contract, a penalty of $50.00 for each person for each calendar day during which such person is discriminated against or intimidated in violation of the provisions of the contract; and

d. This contract may be canceled or terminated by the contracting public agency, and all money due or to become due hereunder may be forfeited, for any violation of this section of the contract occurring after notice to the Contractor from the contracting public agency of any prior violation of this section of the contract.

Any person, firm, or corporation violating the provisions of this Section will be deemed and judged a disorderly person.

17. OWNERSHIP DISCLOSURES REQUIRED

Pursuant to N.J.S.A. 52:25-24.2, no corporation, partnership, or limited liability company shall be awarded any contract nor shall any agreement be entered into for the performance of any work or the furnishing of any materials or supplies the County unless prior to the receipt of the bid or accompanying the bid, of said corporation, said partnership, or said limited liability company there is submitted a statement setting forth the names and addresses of all stockholders in the corporation who own ten percent (10%) or more of its stock, of any class, or of all individual partners in the partnership who own a ten percent (10%) or greater interest therein, or of all members in the limited liability company who own a ten percent (10%) or greater interest therein, as the case may be. If one or more such stockholder or partner or member is itself a corporation or partnership or limited liability company, the stockholders holding ten percent (10%) or more of that corporation's stock, or the individual partners owning ten percent (10%) or

greater interest in that partnership, or the members owning ten percent (10%) or greater interest in that limited liability company, as the case may be, shall also be listed. The disclosure shall be continued until names and addresses of every non corporate stockholder, and individual partner, and member, exceeding the ten percent (10%) ownership criteria has been listed.

To comply with this section, a bidder with any direct or indirect parent entity which is publicly traded must submit the name and address of each publicly traded entity and the name and address of each person that holds a ten percent (10%) or greater beneficial interest in the publicly traded entity as of the last annual filing with the federal Securities and Exchange Commission ("SEC") or the foreign equivalent, and, if there is any person that holds a ten percent (10%) or greater beneficial interest, also shall submit links to the websites containing the last annual filings with the federal SEC or the foreign equivalent and the relevant page numbers of the filings that contain the information on each person that holds a ten percent (10%) or greater beneficial interest. See form attached.

18. NON-COLLUSION AFFIDAVIT

The Bidder should submit with its bid either the attached completed "Non-Collusion Affidavit" or a statement of non-collusion with verbiage similar to the Non-Collusion Affidavit.

19. EQUAL EMPLOYMENT OPPORTUNITY COMPLIANCES

The Contractor should complete and submit an Initial Project Workforce Report, New Jersey Department of Treasury Form AA-201, upon notification of award **SUBJECT TO A PROJECT LABOR AGREEMENT TO BE EXECUTED BY THE CONTRACTOR AND CONSTRUCTION MANAGER PRIOR TO COMMENCEMENT OF THE WORK. FAILURE OF ANY CONTRACTOR TO COMPLY WITH THIS PROVISION CONSTITUTES A DEFAULT, RESULTING IN IMMEDIATE STOPPAGE OF THE WORK. ANY LOSSES OR OTHER DAMAGES INCURRED BY OTHER PARTIES AS A RESULT OF SAID DEFAULT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.**

The foregoing reference to specific laws will not be deemed to be a limitation of obligation of the Contractor to perform their obligations in full compliance with the provisions and requirements of all federal and state statues and local ordinances applicable to the Work to be done under the contract.

It is agreed and understood that any contracts and/or orders placed as a result of this Bid will be governed and construed and the rights and obligations of the parties hereto will be determined in accordance with the laws of the State of New Jersey.

Upon completion of the Work, the Contractor shall furnish a Certification of Compliance with the New Jersey Prevailing Wage Act. The certificate in a form acceptable

to County Counsel is a condition of the final payment. (See form attached)

20. BRAND NAME OR EQUAL

When the Project Specifications and Project Technical Specifications, Forms, and other Contract Documents use “brand name or equivalent” or similar language, the listed brand name shall serve as a reference or point of comparison for the functional or operational characteristic desired for the goods or services being requested. Where a bidder attempts to submit an equivalent product for a brand name, it shall be the responsibility of the bidder to fully describe and document the product to be provided with the bid in order to establish the equivalence claim.

A. If the Bidder proposes to offer substitute goods as an equal to those specified herein, the bidder shall so indicate with the Bid. For the purposes of this paragraph, a proposed item shall be considered equal to goods specified herein if:

1. The County, in its sole discretion, determines that: (i) the goods conform substantially, even with deviations, to the brand name goods specified herein; (ii) the goods are equal to or greater than the brand name goods specified herein in terms of quality, durability, functionality, appearance, strength and design; (iii) the goods are capable, at least as well as the brand name goods specified herein, or performing with existing equipment; and (iv) the goods do not cost the County more than the brand name goods specified herein costs the County.

B. To offer substitute goods as an equal to those specified herein, it is necessary that:

1. The Bidder submits sufficient information with its bid to permit the County to determine that the goods are equivalent to the brand name goods specified herein, including, but not necessarily limited to the brand, catalog number and specifications/data sheets;

2. The Bidder fully identifies and describes the variations of the goods from the brand name goods specified herein on a separate sheet that is to be submitted with the Bid.

Bidder's literature WILL NOT suffice in explaining exceptions to these specifications.

3. The Bidder certifies that the goods (i) are similar in substance to the brand name goods specified, and (ii) are suited to the same use as the item specified;

C. The County shall be allowed a reasonable time within which to evaluate the Bidder's proposal to offer substitute goods as an equal to those specified herein. The County shall be the sole judge of acceptability. No "or-equal" goods shall be ordered, delivered, assembled, set-up or utilized until the County's evaluation is complete. The County's determination as to equivalency shall be deemed final and absolute.

In the event the Bidder does not provide sufficient supporting documentation with the bid, it will be presumed and required that the brand name goods and services as described in the specifications will be provided.

21. LINES AND GRADES

Normally, horizontal and vertical control points will be provided in the Project Technical Specifications. All other surveying will be the responsibility of the Contractor unless otherwise noted.

22. NUMBER OF WORKING DAYS

In accordance with N.J.S.A. 40A:11-17, the Work for the within Project shall be completed as specified on the Time of Completion Form and pursuant to Section 013216. (See form attached).

There shall be taken a deduction from the contract price, or any wages paid by the County, to any inspector(s) necessarily employed by it on the Work, for any number of days in excess of the number allowed in the Project Specifications.

23. PROMPT PAYMENT OF CONSTRUCTION CONTRACTS (NJ Prompt Payment Act)

The Prompt Payment Act (N.J.S.A. 2A:30A-1 et seq.) requires a local governmental entity to pay the prime Contractor the amount due for each periodic payment, final payment, or retainage monies no more than thirty (30) days after the billing date, except as explained below. The billing is deemed to be approved and certified twenty (20) days after receipt by the local governmental entity, unless it provides a written

statement to the prime Contractor explaining why an amount has been withheld. Accordingly, payment to the Contractor for each periodic payment, final payment or retainage monies, where applicable, shall be processed and paid as follows:

1. All Contractor bills shall be either approved for payment, or notice provided as to why the bill or any portion of it will not be approved by the representative(s) of the governing body in writing within twenty (20) days after receipt of the bill, and if the Owner does object it must specify the objected amount and provide the reasons for the objection.
2. If a governing body is required to vote on the authorizations for each payment, the amount due may be approved and certified at the next scheduled public meeting of the entity's governing body, and paid during the entity's subsequent payment cycle.

Pursuant to N.J.S.A. 2A:30A-2(f), all contracts for the improvement of structures between Owners, prime Contractors, subcontractors or subsubcontractors shall provide that disputes regarding whether a party has failed to make payments required pursuant to this section may be submitted to a process of alternative dispute resolution.

25. STOPPING WORK ON ACCOUNT OF BAD WEATHER

The County and Contractor will coordinate to ensure that the Work is performed in weather suitable for the type of construction planned or underway. Extremes in temperature, humidity, precipitation, evaporation, etc. can detrimentally affect the constructed product.. The Bidder should refer to the NJDOT specifications for the weather conditions required for the types of construction for this Project.

26. ACCESS FOR OTHER CONTRACTORS

The Contractor for this Work will give proper access to other subcontractors who may be employed upon the Project and must not hinder or delay unnecessarily any Work that may be progressing under other contracts.

27. CONDEMNED MATERIALS AND WORK

Any materials and or part of the Work that may be condemned by the County Engineer will be removed and replaced by the Contractor or otherwise rectified, as may be directed by the County Engineer. No payment will be made upon the Work until such faulty work has been made good as may be directed. In the event the Contractor refuses or neglects to make good such faulty work, they will be deemed to have abandoned the

contract and proceedings may be taken against them as provided herein.

28. STORAGE

In the event that it is necessary for the Contractor to stockpile or store materials or equipment on the job site, the Contractor shall inform the County at the pre-construction meeting of such necessity and the County may offer available space, if any, for storage of such materials or equipment. The Contractor shall use said space only for such purpose. Any and all materials which may be stored in such space or which may be brought onto the job site at any time by the Contractor will be at the Contractor's sole risk. The County will not be responsible for loss of or damage to said materials or equipment for any cause whatsoever. The Contractor shall take necessary measures to protect any such storage area and shall be responsible for any and all damages.

29. FINAL CLEAN UP

Upon completion of the Work, the Contractor will remove all equipment, unused materials, rubbish, etc., and will repair, or replace in an a manner acceptable to the County Engineer, all areas that may have been damaged in the prosecution of the Work. Same shall be a condition precedent to final payment. Should said Contractor fail to comply with this requirement, the County shall undertake the clean-up with its own forces and charge the cost of same against the Contractor's contract balance.

30. SUB-LETTING OF WORK

Except for the List of Subcontractors, pursuant to N.J.S.A. 40A:11-16 (See form attached), no portion of the Work will be subcontracted by the Contractor to any other entity, without prior notification to the County in writing. A complete list of subcontractors must be submitted to the County Engineer at the preconstruction meeting. If the job does not warrant a preconstruction meeting, the Contractor must submit such list prior to the start of Work.

N.J.S.A. 40A:11-16 requires the bidder to list in the bid the name or names of all subcontractors involved in the following types of Work:

(1) The plumbing and gas fitting and all kindred work;

(2) Steam power plants, steam and hot water heating and ventilating and refrigeration apparatus and all kindred work;

(3) Electrical work, including any electrical power plants, tele-data, fire alarm, or security system;

(4) Structural steel and ornamental iron work; and

(5) General construction, which shall include all other work required for the completion of the project.

If these trades are expected to be part of the contract, such subcontractors must be listed on the "Subcontractor Identification Statement List of Subcontractors" and Bidder shall certify same on the accompanying sheet titled "Subcontractor Identification Certification". (See forms attached) **Bidder's failure to submit these two (2) forms is a material defect and will result in the rejection of Bidder's bid.** Substitutions of any listed subcontractors pursuant to N.J.S.A. 40A:11-16 will not be permitted.

31. SAFETY

The Contractor shall observe all rules and regulations of the Federal, State, and local health officials. Attention is directed to Federal, State, and local laws, rules, and regulations concerning construction safety and health standards. The Contractor shall not require any worker to work in surroundings or under conditions that are unsanitary, hazardous, or dangerous to the worker's health or safety.

The Contractor shall admit to the site, without delay and without the presentation of an inspection warrant, any inspector of OSHA or other legally responsible agency involved in safety and health administration upon presentation of proper credentials.

The Contractor shall make available to the Contractor's employees, subcontractors, the County Engineer, and the public, all information pursuant to OSHA 29 CFR Part 1926.59 of The Hazard Communication Standard 29 CFR 1910.1200, and shall also maintain a file on each job site containing all Material Safety Data Sheets (MSDS) for products in use at the Project. These Material Safety Data Sheets shall be made available to the County Engineer upon request.

The Contractor shall at all times conduct the Work to provide for the safety and convenience of the general public and protection of persons and property. The safety provisions of applicable laws, OSHA regulations, building and construction codes, and the rules and regulations of the New Jersey Department of Labor and Workforce Development shall be observed.

32. QUALITY, SAFETY AND PERFORMANCE STANDARDS

All goods and services must be constructed and provided with the highest quality materials and workmanship. It is the intent of these Project Specifications that only equipment equal to, or exceeding, the standard specified will be acceptable in order to protect the safety of the occupants of the Building.

33. MATTERS NOT MENTIONED IN CONTRACT DOCUMENTS

Any Work, material, or method, not specifically described in the Project Specifications and Project Technical Specifications, but shown upon the plans of the Work, will be carried out as shown on said plan.

34. PERMITS

The Contractor will obtain all necessary permits required by law and provide the County with necessary approvals prior to commencement of permitted Work.

Bidders are hereby notified that the Project cannot be awarded until a permit is issued by the New Jersey Department of Environmental Protection ("NJDEP"). The County has applied to NJDEP for a permit and will be responsible for securing it. There may be an impact to the scope of work based on the requirements of the permit, which may be addressed through addenda to the bid documents or legally authorized change orders to the contract. The County may seek to wait to award the bid until receipt of the necessary permit(s) by NJDEP . Additionally, in accordance with LPCL, the County will award the contract or reject all bids not later than 60 days from receipt of bids, except that the bids of any bidders who consent thereto, upon request of the County, may be held for consideration for such longer period as may be agreed, in accordance with N.J.S.A. 40A:11-24. Therefore, the County reserves the right to award to the lowest responsible bidder, seek extensions of the time to award, if and when necessary, or reject all bids in accordance with applicable laws.

35. CONTRACTOR TO PROVIDE PROOF OF PAYMENT

Upon the completion of the Work, the Contractor will furnish a General Release as proof that all claims for labor, materials, etc., have been settled by the Contractor. The General Release, in a form acceptable to County Counsel, is a condition of final payment.

36. CHANGE ORDERS

The applicability of change orders and change order procedures shall comply with N.J.S.A. 40A:11-16.7 and N.J.A.C. 5:30-11.1 et seq. Specifically, N.J.S.A. 40:A11-16.7 states the following:

40A:11-16.7 Changed conditions clauses for certain local public contracts.

1. All construction contracts issued by a contracting unit for bids which were advertised on or after the effective date of P.L.2017, c.317 (C.40A:11-16.7 et seq.) shall include the changed conditions contract provisions set forth in this section, which provisions shall be deemed to be a part of any such contract even if not expressly incorporated therein, and which provisions may not be modified in any manner by the contracting unit.

a. A contract subject to this section shall include the following differing site conditions provisions:

(1) If the Contractor encounters differing site conditions during the progress of the work of the contract, the Contractor shall promptly notify the contracting unit in writing of the specific differing site conditions encountered before the site is further disturbed and before any additional work is performed in the impacted area.

(2) Upon receipt of a differing site conditions notice in accordance with paragraph (1) of this subsection, or upon the contracting unit otherwise learning of differing site conditions, the contracting unit shall promptly undertake an investigation to determine whether differing site conditions are present.

(3) If the contracting unit determines different site conditions that may result in additional costs or delays exist, the contracting unit shall provide prompt written notice to the Contractor containing directions on how to proceed.

(4) (a) The contracting unit shall make a fair and equitable adjustment to the contract price and contract completion date for increased costs and delays resulting from the agreed upon differing site conditions encountered by the Contractor .

(b) If both parties agree that the contracting unit's investigation and directions decrease the Contractor 's costs or time of performance, the contracting unit shall be entitled to a fair and equitable downward adjustment of the contract price or time of performance.

(c) If the contracting unit determines that there are no differing site conditions present that would result in additional costs or delays, the contracting unit shall so advise the Contractor , in writing, and the Contractor shall resume performance of the contract, and shall be entitled to pursue a differing site conditions claim against the contracting unit for additional compensation or time attributable to the alleged differing site conditions.

(5) Execution of the contract by the Contractor shall constitute a representation that the Contractor has visited the site and has become generally familiar with the local conditions under which the work is to be performed.

(6) As used in this subsection, "differing site conditions" mean physical conditions at the contract work site that are subsurface or otherwise concealed and which differ materially from those indicated in the contract documents or are of such an unusual nature that the conditions differ materially from those ordinarily encountered and generally recognized as inherent in the work of the character provided for in the contract.

b. A contract subject to this section shall include the following suspension of work provisions:

(1) The contracting unit shall provide written notice to the Contractor in advance of any suspension of work lasting more than 10 calendar days of the performance of all or any portion of the work of the contract.

(2) If the performance of all or any portion of the work of the contract is suspended by the contracting unit for more than 10 calendar days due to no fault of the Contractor or as a consequence of an occurrence beyond the contracting unit's control, the Contractor shall be entitled to compensation for any resultant delay to the project completion or additional Contractor expenses, and to an extension of time, provided that, to the extent feasible, the Contractor , within 10 calendar days following the conclusion of the suspension, notifies the contracting unit, in writing, of the nature and extent of the suspension of work. The notice shall include available supporting information, which information may thereafter be supplemented by the Contractor as needed and as may be reasonably requested by the contracting unit. Whenever a work suspension exceeds 60 days, upon seven days' written notice, either party shall have the option to terminate the contract for cause and to be fairly and equitably compensated therefor.

(3) Upon receipt of the Contractor 's suspension of work notice in accordance with paragraph (2) of this subsection, the contracting unit shall promptly evaluate the Contractor 's notice and promptly advise the Contractor of its determination on how to proceed in writing.

(4) (a) If the contracting unit determines that the Contractor is entitled to additional compensation or time, the contracting unit shall make a fair and equitable upward adjustment to the contract price and contract completion date.

(b) If the contracting unit determines that the Contractor is not entitled to additional compensation or time, the Contractor shall proceed with the performance of the contract work, and shall be entitled to pursue a suspension of work claim against the contracting unit for additional compensation or time attributable to the suspension.

(5) Failure of the Contractor to provide timely notice of a suspension of work shall result in a waiver of a claim if the contracting unit can prove by clear and convincing evidence that the lack of notice or delayed notice by the Contractor actually prejudiced the contracting unit's ability to adequately investigate and defend against the claim.

c. A contract subject to this section shall include the following change in character of work provisions:

(1) If the Contractor believes that a change directive by the contracting unit results in a material change to the contract work, the Contractor shall so notify the contracting unit in writing. The Contractor shall continue to perform all work on the project that is not the subject of the notice.

(2) Upon receipt of the Contractor 's change in character notice in accordance with paragraph (1) of this subsection, the contracting unit shall promptly evaluate the Contractor 's notice and promptly advise the Contractor of its determination on how to proceed in writing.

(3) (a) If the contracting unit determines that a change to the Contractor 's work caused or directed by the contracting unit materially changes the character of any aspect of the contract work, the contracting unit shall make a fair and equitable upward adjustment to the contract price and contract completion date. The basis for any such price adjustment shall be the difference between the cost of performance of the work as planned at the time of contracting and the actual cost of such work as a result of its change in character, or as otherwise mutually agreed upon by the Contractor and the contracting unit prior to the Contractor performing the subject work.

(b) If the contracting unit determines that the Contractor is not entitled to additional compensation or time, the Contractor shall continue the performance of all contract work, and shall be entitled to pursue a claim against the contracting unit for additional compensation or time attributable to the alleged material change.

(4) As used in this subsection, "material change" means a character change which increases or decreases the Contractor 's cost of performing the work, increases or decreases the amount of time by which the Contractor completes the work in relation to the contractually required completion date, or both.

d. A contract subject to this section shall include the following change in quantity provisions:

(1) The contracting unit may increase or decrease the quantity of work to be performed by the Contractor .

(2) (a) If the quantity of a pay item is cumulatively increased or decreased by 20 percent or less from the bid proposal quantity, the quantity change shall be considered a minor change in quantity.

(b) If the quantity of a pay item is increased or decreased by more than 20 percent from the bid proposal quantity, the quantity change shall be considered a major change in quantity.

(3) For any minor change in quantity, the contracting unit shall make payment for the quantity of the pay item performed at the bid price for the pay item.

(4) (a) For a major increase in quantity, the contracting unit or Contractor may request to renegotiate the price for the quantity in excess of 120 percent of the bid proposal quantity. If a mutual agreement cannot be reached on a negotiated price for a major quantity increase, the contracting unit shall pay the actual costs plus an additional 10 percent for overhead and an additional 10 percent for profit, unless otherwise specified in the original bid.

(b) For a major decrease in quantity, the contracting unit or Contractor may request to renegotiate the price for the quantity of work performed. If a mutual agreement cannot be reached on a negotiated price for a major quantity decrease, the contracting unit shall pay the actual costs plus an additional 10 percent for overhead and an additional 10 percent for profit, unless otherwise specified in the original bid; provided, however, that the contracting

unit shall not make a payment in an amount that exceeds 80 percent of the value of the bid price multiplied by the bid proposal quantity.

(5) As used in this subsection, the term "bid proposal quantity" means the quantity indicated in the bid proposal less the quantities designated in the project plans as "if and where directed."

Also, incorporated herein these Project Specifications are the requirements of N.J.S.A. 40A:11-13g (asphalt); N.J.S.A. 40A:11-23.1a (soil testing); and N.J.A.C. 5:30-11.1 et seq., “Change Orders and Open End Contracts”.

37. SUPPLEMENTAL WORK

In case any supplemental work is necessary, it will be performed by the Contractor at a price fixed by agreement between the Contractor and the County Engineer and approved by the County as specified in Section 36. The Contractor will not do any supplemental work of any character, for which the Contractor will demand payment, except upon the written order of the County.

38. FORM OF CONTRACT

The Contract will be subject to all statutory provisions on the matter of Public Works, Public Contracts, The Law Against Discrimination, the Laws Governing Affirmative Action and Prevailing Rates of Wages under the laws of New Jersey.

The Agreements shall be executed by both parties not later than twenty-one (21) days from the date of the award by the County (Sundays and holidays excluded); however, such time frame may be extended by agreement of the parties.

39. PROGRESS PAYMENTS

Monthly progress payments will be made based on the value of labor and materials incorporated in the Work and of materials suitably stored at the site. An itemized schedule of values shall be submitted with each Application for Payment.

(Refer to the Owner/Contractor Agreement for Retainage and other conditions pertaining to payment and the application of N.J.S.A. 2A:30A-1 et seq.)

All Applications for Payment shall be accompanied by paid invoices for materials incorporated in the Work and for materials suitably stored at the site, and affidavit(s) by Subcontractors whose Work was included in the next to the last application to the effect such Work and such materials have been paid for.

No payment shall be made without Contractor having provided all submittals set forth in this Section, and the approval of same by the County.

For contracts exceeding $100,000.00, monthly payments will be made on the Work to the extent of 98% of the value of the Work done which is considered to be retainage.

When the Project is completed, the final cost of the Project will be based on actual quantities of authorized Work done under each item scheduled in the bidding sheet and approved Change Orders, if any. The money due to the Contractor as determined by said final certificate after deduction of previous monthly payments on account, will be paid to the Contractor in accordance with the terms of the contract dealing with Prompt Payment, providing, however that before such final payment is made, all outstanding claims against the Contractor must be satisfied. Before final payment is released, the Contractor must furnish: a**)** Maintenance Bond (see Section 6 of these Project Specifications); **b)** Certification of Compliance, New Jersey Prevailing Wage Act (see Sections 21 and 51); and **c)** General Release (see Section 36) in a form satisfactory to County Counsel; **d)** complete set of as-built plans in the latest AutoCad or equal on a flash drive; and e) a complete set of in-progress photos in jpg, jpeg, or bmp digital format on a compact disc.

40. INSPECTION

The Work must be done in accordance with the plans and specifications, and will be inspected by the County Engineer. An inspector may be placed upon the Work at any time by the County Engineer to see that the plans, specifications, and instructions of the County Engineer are carried out. In connection herewith, bidders are referred to N.J.S.A. 40A:11-17.

41. DAMAGES

The Contractor will be held responsible for all damages that may occur to Work, or to persons or property by reason of the nature of the Work or from the elements, or by reason of inadequate protection of the Work, or from any carelessness or negligence on its part or on the part of their employees. The County will withhold payments on the Work until all suits or claims for damages sustained on, or by reason of, this Work will have been settled by the Contractor.

The construction and final completion of this Work will be guaranteed by the Contractor. Any damages that may be done to the Work or any part thereof, by the elements or otherwise, during its construction, will be made good by the Contractor.

42. LIQUIDATED DAMAGES

If the Project is not completed within the time specified herein or within such further time as may have been granted by the County Engineer, then the Contractor hereby agrees to pay to the County as liquidated damages, but not as a penalty, $1,000.00 per

day for each and every calendar day that they are in default on time to complete the Work. The said sum will be deducted from moneys due the Contractor and if the damages exceed this amount, then the Contractor or their Surety Company will pay the excess. These damages may be waived at the option of the County.

43. AFFIRMATIVE ACTION REQUIREMENTS

(REVISED 01/2022)

EXHIBIT B

MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE

N.J.S.A. 10:5-31 et seq. (P.L.1975, c.127)

N.J.A.C. 17:27-1.1 et seq.

CONSTRUCTION CONTRACTS

During the performance of this contract, the Contractor agrees as follows:

The Contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Except with respect to affectional or sexual orientation and gender identity or expression, the Contractor will ensure that equal employment opportunity is afforded to such applicants in recruitment and employment, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Such equal employment opportunity shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause.

The Contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex.

The Contractor or subcontractor will send to each labor union, with which it has a collective bargaining agreement, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the Contractor's commitments under this act and shall post

copies of the notice in conspicuous places available to employees and applicants for employment.

The Contractor or subcontractor, where applicable, agrees to comply with any regulations promulgated by the Treasurer, pursuant to N.J.S.A. 10:5-31 et seq., as amended and supplemented from time to time and the Americans with Disabilities Act.

When hiring or scheduling workers in each construction trade, the Contractor or subcontractor agrees to make good faith efforts to employ minority and women workers in each construction trade consistent with the targeted employment goal prescribed by N.J.A.C. 17:27-7.2; provided, however, that the Dept. of LWD, Construction EEO Monitoring Program, may, in its discretion, exempt a Contractor or subcontractor from compliance with the good faith procedures prescribed by the following provisions, A, B, and C, as long as the Dept. of LWD, Construction EEO Monitoring Program is satisfied that the Contractor or subcontractor is employing workers provided by a union which provides evidence, in accordance with standards prescribed by the Dept. of LWD, Construction EEO Monitoring Program, that its percentage of active "card carrying" members who are minority and women workers is equal to or greater than the targeted employment goal established in accordance with N.J.A.C. 17:27-7.2. The Contractor or subcontractor agrees that a good faith effort shall include compliance with the following procedures:

(A) If the Contractor or subcontractor has a referral agreement or arrangement with a union for a construction trade, the Contractor or subcontractor shall, within three business days of the contract award, seek assurances from the union that it will cooperate with the Contractor or subcontractor as it fulfills its affirmative action obligations under this contract and in accordance with the rules promulgated by the Treasurer pursuant to N.J.S.A. 10:5-31 et. seq., as supplemented and amended from time to time and the Americans with Disabilities Act. If the Contractor or subcontractor is unable to obtain said assurances from the construction trade union at least five business days prior to the commencement of construction work, the Contractor or subcontractor agrees to afford equal employment opportunities minority and women workers directly, consistent with this chapter. If the Contractor's or subcontractor's prior experience with a construction trade union, regardless of whether the union has provided said assurances, indicates a significant possibility that the trade union will not refer sufficient minority and women workers consistent with affording equal employment opportunities as specified in this chapter, the Contractor or subcontractor agrees to be prepared to provide such opportunities to minority and women workers directly, consistent with this chapter, by complying with the hiring or scheduling procedures prescribed under (B) below; and the Contractor or subcontractor further agrees to take said action immediately if it determines that the union is not referring minority and women workers consistent with the equal employment opportunity goals set forth in this chapter.

(B) If good faith efforts to meet targeted employment goals have not or cannot be met for each construction trade by adhering to the procedures of (A) above, or if the Contractor does not

have a referral agreement or arrangement with a union for a construction trade, the Contractor or subcontractor agrees to take the following actions:

(l) To notify the public agency compliance officer, the Dept. of LWD, Construction EEO Monitoring Program, and minority and women referral organizations listed by the Division pursuant to N.J.A.C. 17:27-5.3, of its workforce needs, and request referral of minority and women workers;

(2) To notify any minority and women workers who have been listed with it as awaiting available vacancies;

(3) Prior to commencement of work, to request that the local construction trade union refer minority and women workers to fill job openings, provided the Contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade;

(4) To leave standing requests for additional referral to minority and women workers with the local construction trade union, provided the Contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade, the State Training and Employment Service and other approved referral sources in the area;

(5) If it is necessary to lay off some of the workers in a given trade on the construction site, layoffs shall be conducted in compliance with the equal employment opportunity and nondiscrimination standards set forth in this regulation, as well as with applicable Federal and State court decisions;

(6) To adhere to the following procedure when minority and women workers apply or are referred to the Contractor or subcontractor:

(i) The contactor or subcontractor shall interview the referred minority or women worker.

(ii) If said individuals have never previously received any document or certification signifying a level of qualification lower than that required in order to perform the work of the construction trade, the Contractor or subcontractor shall in good faith determine the qualifications of such individuals. The Contractor or subcontractor shall hire or schedule those individuals who satisfy appropriate qualification standards in conformity with the equal employment opportunity and non-discrimination principles set forth in this chapter. However, a Contractor or subcontractor shall determine that the individual at least possesses the requisite skills, and experience recognized by a union, apprentice program or a referral agency, provided the referral agency is acceptable to the Dept. of LWD, Construction EEO Monitoring Program. If necessary, the Contractor or subcontractor shall hire or schedule minority and

women workers who qualify as trainees pursuant to these rules. All of the requirements, however, are limited by the provisions of (C) below.

(iii) The name of any interested women or minority individual shall be maintained on a waiting list, and shall be considered for employment as described in (i) above, whenever vacancies occur. At the request of the Dept. of LWD, Construction EEO Monitoring Program, the Contractor or subcontractor shall provide evidence of its good faith efforts to employ women and minorities from the list to fill vacancies.

(iv) If, for any reason, said Contractor or subcontractor determines that a minority individual or a woman is not qualified or if the individual qualifies as an advanced trainee or apprentice, the Contractor or subcontractor shall inform the individual in writing of the reasons for the determination, maintain a copy of the determination in its files, and send a copy to the public agency compliance officer and to the Dept. of LWD, Construction EEO Monitoring Program.

(7) To keep a complete and accurate record of all requests made for the referral of workers in any trade covered by the contract, on forms made available by the Dept. of LWD, Construction EEO Monitoring Program and submitted promptly to the Dept. of LWD, Construction EEO Monitoring Program upon request.

(C) The Contractor or subcontractor agrees that nothing contained in (B) above shall preclude the Contractor or subcontractor from complying with the union hiring hall or apprenticeship policies in any applicable collective bargaining agreement or union hiring hall arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement. However, where the practices of a union or apprenticeship program will result in the exclusion of minorities and women or the failure to refer minorities and women consistent with the targeted county employment goal, the Contractor or subcontractor shall consider for employment persons referred pursuant to (B) above without regard to such agreement or arrangement; provided further, however, that the Contractor or subcontractor shall not be required to employ women and minority advanced trainees and trainees in numbers which result in the employment of advanced trainees and trainees as a percentage of the total workforce for the construction trade, which percentage significantly exceeds the apprentice to journey worker ratio specified in the applicable collective bargaining agreement, or in the absence of a collective bargaining agreement, exceeds the ratio established by practice in the area for said construction trade. Also, the Contractor or subcontractor agrees that, in implementing the procedures of (B) above, it shall, where applicable, employ minority and women workers residing within the geographical jurisdiction of the union.

After notification of award, but prior to signing a construction contract, the Contractor shall

submit to the public agency compliance officer and the Dept. of LWD, Construction EEO Monitoring Program an initial project workforce report (Form AA-201) electronically provided to the public agency by the Dept. of LWD, Construction EEO Monitoring Program, through its website, for distribution to and completion by the Contractor, in accordance with N.J.A.C. 17:27-7. The Contractor also agrees to submit a copy of the Monthly Project Workforce Report once a month thereafter for the duration of this contract to the Dept. of LWD, Construction EEO Monitoring Program, and to the public agency compliance officer.

The Contractor agrees to cooperate with the public agency in the payment of budgeted funds, as is necessary, for on-the-job and/or off-the-job programs for outreach and training of minorities and women. (D) The Contractor and its subcontractors shall furnish such reports or other documents to the Dept. of LWD, Construction EEO Monitoring Program as may be requested by the Dept. of LWD, Construction EEO Monitoring Program from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Dept. of LWD, Construction EEO Monitoring Program for conducting a compliance investigation pursuant to N.J.A.C. 17:27-1.1 et seq.

44. INVESTMENT ACTIVITIES IN IRAN

Omitted.

45. NON-INVOLVEMENT ACTIVITIES IN RUSSIA OR BELARUS

Omitted.

46. COMPLIANCE WITH THE PUBLIC WORKS CONTRACTOR REGISTRATION ACT - (N.J.S.A. 34:11-56.48 et. seq.)

Pursuant to the above-referenced law, Bidders are required to be registered with the New Jersey Department of Labor and Workforce Development and to be in compliance with the Act prior to the time and date that bids are received, and proof of such compliance is due prior to award Bidders are notified of this requirement of their compliance. Such certificates or applications shall also be provided for each named subcontractor pursuant to N.J.S.A. 40A:11-16.

47. UTILITIES

Attention of the bidder is directed to the fact that the approximate locations of known utility structures and facilities that may be encountered within and adjacent to the limits of the Work are shown on the plans and described herein. The accuracy and completeness of this information is not guaranteed by the County Engineer and the Bidder is advised to ascertain for itself all the facts concerning the location of these and other utilities.

The Contractor will not proceed with its Work until it has made diligent inquiries of all public utility and municipal officials to determine the exact location of all-underground structures and pipes within the site of the Project. The Contractor will notify utility providers not less than ten (10) days in advance of the time it proposes to perform any Work that will endanger or affect their facilities in compliance with **New Jersey One-Call.** In excavating in any part of the Work, care must be taken not to remove or damage any gas, water, sewer, or other pipe, conduit, or structure, - public or private - without the concurrence of the Owner and the County Engineer. The Contractor will, at its own expense, shore up, secure and maintain a continuous flow in such structures, and will keep them in repair until final acceptance of the Work.

When pipes or other structures are encountered or when the removal, relocation or protection of these utilities are necessary in carrying out the Project as planned, the Contractor will cooperate with the Owner of said utilities and will permit the Owners or their agents access to the site of the Work in order to relocate or protect their facilities and not hinder or delay unnecessarily the Work of the Owners in moving same. No extra allowance of payment will be made to the Contractor for the use of any materials, equipment, etc., or for the performance of any Work in connection with the moving of said structures unless the Contractor is specifically ordered by the County Engineer to furnish such materials, equipment, or services. If directed by the County Engineer to do any Work or furnish any materials or equipment, payment will be allowed the Contractor in accordance with the unit prices bid for such Work, or, if such items are not scheduled in the proposal, such Work shall be allowed “Supplemental Work” as provided in Section 39 of these Project Specifications. The corporations, companies, agencies or municipalities owning or controlling the utilities, and the name, and telephone numbers are listed on the coversheet of the Drawings.

48. MATERIAL COMPLIANCE AND SHOP DRAWINGS

The Contractor will require the manufacturer or supplier to furnish three (3) copies of Certification of Compliance with each delivery of materials, components and manufactured items for the Project. Two (2) copies will be furnished to the County Engineer; one copy will be retained by the Contractor. Certificates of Compliance will contain the following information:

1. Project to which material is consigned;
2. Name of the Contractor to which the material is supplied;
3. Kind of material supplied;
4. Quantity of material represented by the Certificate;
5. Means of identifying the consignment, such as label marking, seal number, etc.;
6. Date and method of shipment;
7. That the material is in conformity with the pertinent Specifications stated in the

certificate; and

8. Signature of a person having legal authority to bind the supplier.

The Contractor will submit to the County Engineer for their approval five (5) copies of complete and fully detailed shop or working drawings for those items listed in the beginning of the Technical Specifications.

Each drawing will identify the name of the job, location, and Contractor.

All drawings will be approved in accordance with the standard Project Specifications and Project Technical Specifications. Refer to the Project Technical Specifications for specific items.

All materials or articles used in the Work will be of American manufacture, insofar as same are available, in conformance with N.J.S.A. 40A:11-18.

49. PRECONSTRUCTION

In order to provide full coordination of this Project among the parties concerned, the County Engineer will arrange for a preconstruction meeting between the Contractor, County Engineer and the County's consultants, if any, as soon as possible after the contract is executed. At this meeting the Contractor will present their proposed schedule of Work which shall be subject to review and approval of the County through its designated representatives.

50. DISPUTES UNDER THE CONTRACT

A dispute arising under the Contract shall be submitted in writing to the County Engineer with all facts and supporting data. The County Engineer will review the dispute and issue their decision or request additional facts or documentation after which theywill render their decision.

In the event the dispute is not then resolved, the matter shall, pursuant to law, be submitted to mediation before being submitted to a court of competent jurisdiction venued in Union County.

The County Engineer will notify the County Counsel when a matter is to be submitted to mediation. The County Counsel will communicate with the parties and inform them of the procedures to be followed in making such a submission.

51. CONTRACTOR BUSINESS REGISTRATION CERTIFICATE

Pursuant to N.J.S.A. 52:32-44, the County of Union is prohibited from entering into a contract with an entity unless the Bidder, and each subcontractor that is required by law to be named in this bid has a valid Business Registration Certificate on file with the Division of Revenue and Enterprise Services within the Department of the Treasury.

Prior to contract award or authorization, the Contractor shall provide the County with its proof of business registration and that of any named subcontractor(s).

Subcontractors named in a bid shall provide proof of business registration to the Bidder, who in turn, shall provide it to the County prior to the time a contract, purchase order, or other contracting document is awarded or authorized.

Proof of registration must show that the bidder was in fact registered with the State of New Jersey Department of the Treasury, Division of Revenue and obtained the business registration prior to the receipt of bids. If subcontractors are named on the bid, proof of the business registration for each must be provided prior to the award of a contract. Similarly, to the bidder, the proof must show that each subcontractor was registered with the State of New Jersey Department of the Treasury, Division of Revenue and obtained the business registration prior to the receipt of bids.

During the course of contract performance:

1) the Contractor shall not enter into a contract with a subcontractor unless the subcontractor first provides the Contractor with a valid proof of business registration.
2) the Contractor shall maintain and submit to the County of Union a list of subcontractors and their addresses that may be updated from time to time.
3) the Contractor and any subcontractor providing goods or performing services under the contract, and each of their affiliates, shall collect and remit to the Director of the Division of Taxation in the Department of the Treasury, the use tax due pursuant to the Sales and Use Tax Act, (N.J.S.A. 54:32B-1 et seq.) on all sales of tangible personal property delivered into the State. Any questions in this regard can be directed to the Division of Taxation at (609)292-6400. Form NJ-REG can be filed online at http://www.state.nj.us/treasury/revenue/busregcert.shtml.

Before final payment is made under the contract, the Contractor shall submit to the County of Union a complete and accurate list of all subcontractors used and their addresses.

Pursuant to N.J.S.A. 54:49-4.1, a business organization that fails to provide a copy of a business registration as required, or that provides false business registration information, shall be liable for a penalty of $25 for each day of violation, not to exceed $50,000, for each

proof of business registration not properly provided under a contract with a contracting agency.

52. PROJECT LABOR AGREEMENT (To be signed where the overall project cost exceeds $5 Million, irrespective of phasing)

An Executive Order of Governor James E. McGreevey dated January 17, 2002, requires the use of a Project Labor Agreement in public construction contracts. This Executive Order was codified as N.J.S.A. 52:38-1 et seq. as a result of P.L. 2002, Chapter 44. Contractor must be prepared to abide by the terms of the within Project Labor Agreement, including obtaining the necessary and applicable Letters of Assent from subcontractors (of any tier). Through said Letters of Assent the subcontractors (of any tier) also must be prepared to abide by the terms of the Project Labor Agreement.

Contractor's failure to enter into this Project Labor Agreement shall result in the County's valid refusal to enter into a contract, for the performance of the Work with Contractor and shall constitute a default under the Contract. In addition, Contractor will be required to submit the completed Letters of Assent to the County with the executed Project Labor Agreement prior to the notice to proceed. The Project Labor Agreement is to be executed only where the total Project cost is $5 Million or more, irrespective of Phasing.

PROJECT LABOR AGREEMENT

ARTICLE 1 - PREAMBLE

WHEREAS, as the General Contractor and the Project Management Firm, on behalf of themselves, and reflecting the objectives of the County of Union as Owner, desire to provide for the efficient, safe, quality, and timely completion of (the "Project"), in a manner designed to afford lower reasonable costs to the County of Union, (hereinafter referred to as the "County" or "Owner"), and the public it represents, and the advancement of public policy objectives;

WHEREAS, this Project Labor Agreement will foster the achievement of these goals, inter alia by:

(1) ensuring a reliable source of skilled and experienced labor;

(2) standardizing the terms and conditions governing the employment of labor on the Project;

(3) permitting wide flexibility in work scheduling and shift hours and times from those which otherwise might obtain;

(4) receiving negotiated adjustments as to work rules and staffing requirements from those which otherwise might obtain;

(5) providing comprehensive and standardized mechanisms for the settlement of work disputes, including those relating to jurisdiction;

(6) avoiding the costly delays of potential strikes, slowdowns, walkouts, picketing and other disruptions arising from work disputes, and promote labor harmony and peace for the duration of the Project.

(7) furthering public policy objectives as to improved employment opportunities for minorities, women, and the economically disadvantaged in the construction industry and expediting the construction process; and

WHEREAS, the signatory Unions desire the stability, security and work opportunities afforded by a Project Labor Agreement; and

WHEREAS, the Parties desire to maximize Project safety conditions for both workers and the public.

NOW, THEREFORE, the Parties enter into this Agreement:

SECTION 1. PARTIES TO THE AGREEMENT

This is a Project Labor Agreement (this "Agreement") entered into by and between (the "GC" or "General Contractor") and (the "PMF" or "Project Management Firm"), and their successors and assigns, for the Project's construction work to be performed on the property of the County in the State of New Jersey and by the Union County Building and Construction Trades Council, AFL-CIO, on behalf of itself and its affiliates and members, and the signatory Local Unions on behalf of themselves and their members.

ARTICLE 2 - GENERAL CONDITIONS

SECTION 1. DEFINITIONS

Throughout this Agreement, the Union party and the Building Trades Council are referred to singularly and collectively as "the Union(s)" where specific reference is made to "Local Unions" that phrase is sometimes used; the term "Contractor(s)" shall include the General Contractor ("GC"), Project Management Firm ("PMF"), and all signatory Contractors, and their subcontractors of whatever tier, engaged in on-site Project construction work within the scope of this Agreement as defined in Article 3; the County of Union is referenced as "Owner"; the Union County Building and Construction Trades Council, AFL-CIO is referenced as the "BTC", and the work covered by this Agreement (as defined in Article 3) is referred to as the "Project".

SECTION 2. CONDITIONS FOR AGREEMENT TO BECOME EFFECTIVE

This Agreement shall not become effective unless executed by the BTC and the GC

and/or PMF and will remain in effect until the final completion of the Project.

SECTION 3. ENTITIES BOUND & ADMINISTRATION OF AGREEMENT

This Agreement shall be binding on all signatory Unions and the General Contractor and the Project Management Firm and all signatory Contractors performing on-site Project work, including site preparation and staging areas, as defined in Article 3. The Contractors shall include in any subcontract that they let, for performance during the term of this Agreement, a requirement that their subcontractors, of whatever tier, become signatory and bound by this Agreement with respect to subcontracted work performed within the scope of Article 3 and execute the Letter of Assent attached as Schedule B. This Agreement shall be administered by the GC and/or PMF on behalf of all Contractors.

SECTION 4. SUPREMACY CLAUSE

This Agreement, together with the local Collective Bargaining Agreements appended hereto as Schedule A represents the complete understanding of all signatories and supersedes any national agreement, local agreement or other collective bargaining agreement of any type which would otherwise apply to this Project, in whole or in part, except for all work performed under the NTD Articles of Agreement, the National Stack/Chimney Agreement, the National Cooling Tower Agreement, all instrument calibration work and loop checking shall be performed under the terms of the UA/IBEW Joint National Agreement for Instrument an Control Systems Technicians, and the National Agreement of the International Union of Elevator Constructors, with the exception of Article 7, 9, and 10 of this Agreement, which shall apply to such work. Where a subject covered by the provisions, explicit or implicit, of this Agreement is also covered by a Schedule A, the provisions of this Agreement shall prevail. It is further understood that neither the GC nor any Contractor shall be required to sign any other trade agreement as a condition of performing work on this Project. No practice, understanding or agreement between a Contractor and Local Union, which is not explicitly set forth in this Agreement, shall be binding on this Project unless endorsed in writing by the GC.

SECTION 5. LIABILITY

The liability of any Contractor and the liability of any Union under this Agreement shall be several and not joint. The GC and/or PMF and any Contractor shall not be liable for any violations of this Agreement by any other Contractor and the BTC and Local Unions shall not be liable for any violations of this Agreement by any other Union.

SECTION 6. THE GENERAL CONTRACTOR OR PROJECT MANAGEMENT FIRM

The GC and PMF shall require in its bid specifications for all work within the scope of Article 3 that all successful bidders, and their subcontractors of whatever tier, become bound by, and signatory to, this Agreement. The County is not a party to and shall not be liable in any manner under this Agreement. It is understood that nothing in this Agreement shall be construed as limiting the sole discretion of the County in determining which

Contractors shall be awarded contracts for Project work. It is further understood that the County has sole discretion at any time to terminate, delay, or suspend the work, in whole or part, on this Project.

SECTION 7. AVAILABILITY AND APPLICABILITY TO ALL SUCCESSFUL BIDDERS

The Unions agree that this Agreement will be made available to, and will fully apply to any successful bidder for Project work who becomes signatory thereto, without regard to whether that successful bidder performs work at other sites on either a union or non-union basis and without regard to whether employees of such successful bidder are, or are not, members of any unions. This Agreement shall not apply to the work of any Contractor or GC or PMF, which is performed at any location other than the Project site, as defined in Article 3, Section 1.

ARTICLE 3 - SCOPE OF THE AGREEMENT

The Project work covered by this Agreement shall be as defined and limited by the following sections of this Article.

SECTION 1: THE WORK

This Agreement shall apply to all on-site public construction work, including site preparation, demolition and hazardous waste remediation, for the Owner performed on the Project. The scope of work is confined to the on-site Project work contained in the scope of the final construction contract of the General Contractor and/or PMF awarded work on the Project.

SECTION 2. EXCLUDED EMPLOYEES

The following persons are not subject to the provisions of this Agreement, even though performing work on the Project:

A. Superintendents, supervisors (excluding superintendents and general supervisors and forepersons specifically covered by a craft's Schedule A), engineers, inspectors and testers (excluding divers specifically covered by a craft's Schedule A), quality control/assurance personnel, timekeepers, mail carriers, clerks, office workers, messengers, guards, non-manual employees, and all professional, engineering, administrative and management persons;

B. Employees of Owner or any State agency, authority or entity or employees of any municipality or other public employer;

C. Employees and entities engaged in off-site manufacture, modifications, repair, maintenance, assembly, painting, handling or fabrication of project components,

materials, equipment or machinery, unless such offsite operations are covered by the New Jersey Prevailing Wage Act (for example, by being dedicated exclusively to the performance of the public works contract or building project and are adjacent to the site of work), or involved in deliveries to and from the Project site, excepting local deliveries of all major construction materials including fill, ready mix concrete and cement, asphalt and other items which are covered by this Agreement. Provided, however, local deliveries of ready mix, concrete, cement and asphalt shall not be contracted except to a subcontractor who pays wages and benefits not less than the economic equivalent of the wages and benefits set forth in Exhibit A.

D. Employees of the GC and/or PMF, excepting those performing manual, on-site construction labor who will be covered by this Agreement;

E. Employees engaged in on-site equipment warranty.

F. Employees engaged in geophysical testing (whether land or water) other than boring for core samples;

G. Employees engaged in laboratory or specialty testing or inspections;

H. Employees engaged in ancillary Project work performed by third parties such as electric utilities, gas utilities, telephone utility companies, and railroads.

SECTION 3. NON-APPLICATION TO CERTAIN ENTITIES

This Agreement shall not apply to the parents, affiliates, subsidiaries, or other joint or sole ventures of any Contractor or of GC and/or PMF, which do not perform work at this Project. It is agreed, for the purposes of this Agreement only, that this Agreement does not have the effect of creating any joint employment, single employer or alter ego status among the Owner, the GC and/or PMF and/or any Contractor. The Agreement shall further not apply to the Owner or any other state or county agency, authority, or other municipal or public entity and nothing contained herein shall be construed to prohibit or restrict the Owner or its employees of any other state authority, agency or entity and its employees from performing on or off-site work related to the Project. As the contracts which comprise the Project work are completed and accepted, the Agreement shall not have further force or effect on such items or areas except where inspections, additions, repairs, modifications, check-out and/or warranty work are assigned in writing (copy to Local Union involved) by the General Contractor and/or Project Management Firm for performance under the terms of this Agreement.

ARTICLE 4 - UNION RECOGNITION AND EMPLOYMENT

SECTION 1. PRE-HIRE RECOGNITION

The Contractors recognize the signatory Unions as the sole and exclusive bargaining

representatives of all craft employees who are performing on-site Project work within the scope of this Agreement as defined in Article 3.

SECTION 2. UNION REFERRAL

A. The Contractors agree to hire Project, craft employees covered by this Agreement through the job referral systems and hiring halls (where the referrals meet the qualifications set forth in items 1,2, and 4 subparagraph B) established in the Local Unions' area collective bargaining agreements (attached as Schedule A to this Agreement), subject to the goals of any applicable local ordinances or agreements pertaining to hiring and apprenticeship goals for minorities, women, residents of disadvantaged communities, and local residents. Notwithstanding this, the Contractors shall have sole rights to determine the competency of all referrals; the number of employees required (except with regard to pile driving and cranes); the selection of employees to be laid-off (subject to the applicable procedures in Schedule A for permanent and/or temporary layoffs and except as provided in Article 5, Section 3); and the sole right to reject any applicant referred by a Local Union, subject to the show-up payments required in the applicable Schedule A. In the event that a Local Union is unable to fill any request for qualified employees within a 48-hour period after such requisition is made by the Contractor (Saturdays, Sundays, and holidays excepted), the Contractor may employ qualified applicants from another competent source. In the event that the Local Union does not have a job referral system, the Contractor shall give the Local Union first preference to refer applicants, subject to the other provisions of this Article. The Contractor shall notify the Local Union of the Project, craft employees hired within its jurisdiction from any source other than referral by the Union.

B. A Contractor may request by name, and the Local will honor, referral of persons who have applied to the Local for Project work and who meet the following qualifications as determined by a Committee of 3 designated, respectively, by the applicable Local Union, the GC and/or PMF and a mutually selected third party or, in the absence of agreement, the permanent arbitrator (or designee) designated in Article 7:

(1) possess any license required by New Jersey law for the Project work to be performed;

(2) have worked a total of at least 1000 hours in the Construction craft during the prior 3 years;

(3) were on the Contractor's active payroll for at least 60 out of the 180 calendar days prior to the contract award;

(4) have demonstrated ability to safely perform the basic function of the applicable trade.

Following the employment of the first employee in each craft under Schedule A or the procedure set forth above in paragraph A, no more than twelve (12%) per centum of the employees covered by this Agreement, per Contractor by craft, shall be hired through the special provisions above which, consistent with N.J.S.A. 52:38-4, permit Contractors and subcontractors working on the public works project to retain a percentage of their current workforce (any fraction shall be rounded to the next highest whole number).

C. A certified MBE/WBE Contractor may request from the Workforce Coordinator, through the GC and/or PMF, an exception to, and waiver of, the above per centum limitation upon the number of its employees to be hired through the special provision of Section 2.B above. This exception is based upon hardship and demonstration by the Contractor that the Project work would be the Contractor's only job and that it would be obliged to lay off qualified minority and female employees in its current workforce moving from the last job. The exception and waiver are also conditioned upon the employees meeting the qualifications as set forth in Section 2.B above.

SECTION 3. NON-DISCRIMINATION IN REFERRALS

The Unions represent that their hiring halls and referral systems will be operated in a non-discriminatory manner and in full compliance with all applicable federal, state and local laws and regulations, which require equal employment opportunities. Referrals shall not be affected in any way by the rules, regulations, bylaws, constitutional provisions or any other aspects or obligations of union membership, policies or requirements and shall be subject to such other conditions as are established in this Article. No employment applicant shall be discriminated against by any referral system or hiring hall because of the applicant's union membership, or lack thereof.

SECTION 4. WORKFORCE DIVERSITY

To the extent applicable, the parties hereby agree that each will implement and abide by the requirements of the Owner with regard to workforce diversity. Furthermore, General Contractor, Contractors and the Unions will comply with such affirmative action plan, including but not limited to: (1) the parties will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, sex or any other protected category used by government regulation; (2) the parties will endeavor to include in any solicitations or advertisements for employees or subcontractors, a notice that all qualified applicants will receive consideration for employment, and Contractors and subcontractors for work, without regard to age, race, creed, color, national origin, ancestry, marital status, sex or any other protected category used by government regulation; and (3) the parties agree to utilize the best efforts to ensure that minority business enterprises and women-owned business enterprises shall have the

maximum practicable opportunity to provide Construction Work under this Agreement.

The Local Unions agree and support the importance the Owner places on having and maintaining a diverse workforce. The Unions agree to refer any and all Union County resident journeymen and apprentices who are registered on the Out-of-Work list of the local union referral systems at the time of a Contractor's request. The Local Unions will cooperate with Contractor requests for residents of Union County, residents of disadvantaged communities, minority or women referrals to meet the requirements of the Owner.

In the event a Union either fails, or is unable, to refer qualified minority or female applicants in percentages equaling Project affirmative action goals as set forth in the Owners bid specifications, the Contractor may employ qualified minority or female applicants from any other available source as Apprentice Equivalents. Apprentice Equivalents will have completed a DOL approved training program, applied to take a construction Apprenticeship test, and will be paid at not less than the applicable equivalent Apprentice rate. With the approval of the Local Administrative Committee ("LAC"), experience in construction related areas may be accepted as meeting the above requirements.

SECTION 5. CROSS AND QUALIFIED REFERRALS

The Unions shall not knowingly refer to a Contractor an employee then employed by another Contractor working under this Agreement. The Local Unions will exert their utmost efforts to recruit sufficient numbers of skilled and qualified craft employees to fulfill the requirements of the Contractor.

SECTION 6. UNION DUES / WORKING ASSESSMENTS

The union security provisions contained in the applicable Schedule A local agreements, shall not apply to the employees covered by this Agreement as for the period of time during which they are performing on-site Project work. No employee shall be discriminated against at the Project site because of the employee's union membership or lack thereof. In the case of unaffiliated employees who have voluntarily executed dues checkoff authorization cards provided in a Schedule A local agreement, the dues payment can be received by the Unions as a working assessment fee.

SECTION 7. CRAFT FOREPERSONS AND GENERAL FOREPERSONS

The selection of craft forepersons and/or general forepersons and the number of forepersons required shall be solely the responsibility of the Contractor except where otherwise provided by specific provisions of an applicable Schedule A. All forepersons shall take orders exclusively from the designated Contractor representatives. Craft foreperson shall be designated as working forepersons at the request of the Contractor, except when an existing local Collective Bargaining Agreement prohibits a foreperson from working when the craftsperson they are leading exceed a specified number.

ARTICLE 5 - UNION REPRESENTATION

SECTION 1. LOCAL UNION REPRESENTATIVE

Each Local Union representing on-site Project employees shall be entitled to designate in writing (copy to General Contractor involved and/or Project Management Firm) representatives, including the Business Manager, who shall be afforded access to the Project.

SECTION 2. STEWARDS

A. Each Local Union shall have the right to designate a working journey person as a Steward and an alternate, and shall notify the Contractor and GC and/or PMF of the identity of the designated Steward (and alternate) prior to the assumption of such duties. Stewards shall not exercise supervisory functions and will receive the regular rate of pay for their craft classifications. There will be no non-working Stewards on the Project.

B. In addition to their work as an employee, the Steward shall have the right to receive complaints or grievances and to discuss and assist in their adjustment with the Contractor's appropriate supervisor. Each Steward shall be concerned with the employees of the Steward's Contractor and, if applicable, subcontractors of that Contractor, but not with the employees of any other Contractor. The Contractor will not discriminate against the Steward in the proper performance of Union duties.

C. The Stewards shall not have the right to determine when overtime shall be worked, or who shall work overtime, except pursuant to a Schedule A provision providing procedures for the equitable distribution of overtime.

SECTION 3. LAYOFF OF A STEWARD

Contractors agree to notify the appropriate Union 24 hours prior to the layoff of a Steward, except in cases of discipline or discharge for just cause. If a Steward is protected against layoff by a Schedule A, such provisions shall be recognized to the extent the Steward possesses the necessary qualifications to perform the work required. In any case in which a Steward is discharged or disciplined for just cause, the Local Union involved shall be notified immediately by the Contractor.

ARTICLE 6 - MANAGEMENT'S RIGHTS

SECTION 1. RESERVATION OF RIGHTS

Except as expressly limited by a specific provision of this Agreement, Contractors retain full and exclusive authority for the management of their Project operations including, but not limited to: the right to direct the work force, including determination as to the number to be hired and the qualifications therefore; the promotion, transfer, layoff of its employees; or the discipline or discharge for just cause of its employees; the assignment

and schedule of work; the promulgation of reasonable Project work rules; and, the requirement, timing and number of employees to be utilized for overtime work. No rules, customs, or practices, which limit or restrict productivity or efficiency of the individual, as determined by the Contractor, GC and/or PMF, and/or joint working efforts with other employees shall be permitted or observed.

SECTION 2. MATERIALS, METHODS & EQUIPMENT

There shall be no limitations or restriction upon the Contractors' choice of materials, techniques, methods, technology or design, or, regardless of source or location, upon the use and installation of equipment, machinery, package units, pre-cast, pre-fabricated, pre-finished, or pre-assembled materials, tool, or other labor-saving devices. Contractors may, without restriction, install or use materials, supplies or equipment regardless of their source. The on-site installation or application of such items shall be performed by the craft having jurisdiction over such work; provided, however, it is recognized that other personnel having special qualifications may participate, in a supervisory capacity, in the installation, check-out or testing of specialized or unusual equipment or facilities as designated by the Contractor. Notwithstanding the foregoing statement of Contractor rights, prefabrication issues relating to work traditionally performed at the job site shall be governed pursuant to the terms of the applicable Schedule A. There shall be no restrictions as to work, which is performed off-site for the Project, except for 1) offsite operations work covered under the New Jersey Prevailing Wage Act or 2) done in a fabrication center, tool yard, or batch plant dedicated exclusively to the performance of work on the Project, and located adjacent to the "site of work". Where available locally, offsite operations work covered under the New Jersey Prevailing Wage Act shall be performed within the territorial jurisdiction of the local unions signatory to this Agreement.

ARTICLE 7 - WORK STOPPAGES AND LOCKOUTS

SECTION 1. NO STRIKES-NO LOCKOUT

There shall not be strikes, sympathy strikes, picketing, work stoppages, slowdowns, hand billing, demonstrations or other disruptive activity at the Project for any reason by any Union or employee against any Contractor or employer while performing work at the Project. There shall be no other Union, or concerted or employee activity which disrupts or interferes with the operation of the existing free flow of traffic in the project area. Failure of any Union or employee to cross any picket line established by any union, signatory or non-signatory to this Agreement, or the picket or demonstration line of any other organization, at or in proximity to the Project site is a violation of this Article. There shall be no lockout at the Project by any signatory Contractor. Contractors and Unions shall take all steps necessary to ensure compliance with this Section 1 and to ensure uninterrupted construction and the free flow of traffic in the project area for the duration of this Agreement.

SECTION 2. DISCHARGE FOR VIOLATION

A Contractor may discharge any employee violating Section 1, above, and any such employee will not be eligible thereafter for referral under this Agreement for a period of 100 days.

SECTION 3. NOTIFICATION

If a Contractor contends that any Union has violated this Article, it will notify the appropriate district or area council of the Local Union involved advising of such fact, with copies of the notification to the Local Union and the BTC. The district or area council, and the BTC shall each instruct, order and otherwise use their best efforts to cause the employees, and/or the Local Unions to immediately cease and desist from any violation of this Article. A district or area council, or the BTC complying with these obligations shall not be liable for the unauthorized acts of a Local Union or its members.

SECTION 4. EXPEDITED ARBITRATION

Any Contractor or Union alleging a violation of Section 1 of this Article may utilize the expedited procedure set forth below (in lieu of, or in addition to, any actions at law or equity) that may be brought.

A. A party invoking this procedure shall notify J.J. Pierson, Esq., FCIArb., The Arbitration Centre, 51 JFK Parkway, First Floor West, Short Hills, New Jersey 07078, telephone number (973) 359-8100, fax number (973) 359-8161, or e-mail jjpierson@jjpierson.com, who shall serve as Arbitrator under this expedited arbitration procedure. In the event that J.J. Pierson is unable to serve, a party invoking this procedure shall notify Louis Verrone, who shall serve as arbitrator under this expedited procedure. Copies of such notification will be simultaneously sent to the alleged violator and, if a Local Union is alleged to be in violation, it's International, the GC and/or PMF, and the BTC.

B. The Arbitrator shall thereupon, after notice as to time and place to the Contractor, the GC and/or PMF, the Local Union involved, and the BTC, hold a hearing within 48 hours of receipt of the notice invoking the procedure it is contended that the violation still exists. The hearing will not, however, be scheduled for less than 24 hours after the notice to the district or area council required by Section 3 above. Hearings shall be held at the jobsite or at the Newark office of the New Jersey State Board of Mediation, as directed by the Arbitrator.

C. All notices pursuant to this Article may be by telephone, telegraph, hand delivery, or fax, confirmed by overnight delivery, to the arbitrator, Contractor or Union involved. The hearing may be held on any day including Saturdays or Sundays. The hearing shall be completed in one session, which shall not exceed 8 hours duration (no more than 4 hours being allowed to either side to present their case, and conduct their cross

examination) unless otherwise agreed. A failure of any Union or Contractor to attend the hearing shall not delay the hearing of evidence by those present or the issuance of an award by the Arbitrator.

D. The sole issue at the hearing shall be whether a violation of Section 1, above, occurred. If a violation is found to have occurred, the Arbitrator shall issue a Cease and Desist Award restraining such violation and serve copies on the Contractor and Union involved. The Arbitrator shall have no authority to consider any matter in justification, explanation or mitigation of such violation or to award damages, which issue is reserved solely for court proceedings, if any. The Award shall be issued in writing within 3 hours after the close of the hearing, and may be issued without an Opinion. If any involved party desires an Opinion, one shall be issued within 15 calendar days, but its issuance shall not delay compliance with, or enforcement of, the Award.

E. An Award issued under this procedure may be enforced by any court of competent jurisdiction upon the filing of this Agreement together with the Award. Notice of the filing of such enforcement proceedings shall be given to the Union or Contractor involved. In any court proceeding to obtain a temporary or preliminary order enforcing the arbitrator's Award as issued under this expedited procedure, the involved Union and Contractor waive their right to a hearing and agree that such proceedings may be ex parte, provided notice is given to opposing counsel. Such agreement does not waive any party's right to participate in a hearing for a final court order of enforcement or in any contempt proceeding.

F. Any rights created by statue or law governing arbitration proceedings which are inconsistent with the procedure set forth in this Article, or which interfere with compliance thereto, are hereby waived by the Contractors and Unions to whom they accrue.

G. The fees and expenses of the Arbitrator shall be equally divided between the involved Contractor and Union.

SECTION 5. ARBITRATION OF DISCHARGES FOR VIOLATION

Procedures contained in Article 9 shall not be applicable to any alleged violation of this Article, with the single exception that an employee discharged for violation of Section 1, above, may have recourse to the procedures of Article 9 to determine only if the employee did, in fact, violate the provisions of Section 1 of this Article; but not for the purpose of modifying the discipline imposed where a violation is found to have occurred.

ARTICLE 8. - LOCAL ADMINISTRATIVE COMMITTEE ("LAC")

SECTION 1. MEETINGS

The Local Administrative Committee ("LAC") will meet on a regular basis to: 1) Implement and oversee this Agreement's procedures and initiatives; 2) monitor the effectiveness of this Agreement; and 3) identify opportunities to improve efficiency and work execution.

SECTION 2. COMPOSITION

The LAC will be co-chaired by the President of the Union County Building and Construction Trades Council or their designee, and designated official of the GC and/or PMF. It will be comprised of representatives of the local unions signatory to this Agreement and representatives of the GC and/or PMF and other Contractors on the project.

ARTICLE 9 - GRIEVANCE & ARBITRATION PROCEDURE

SECTION 1. PROCEDURE FOR RESOLUTION OF GRIEVANCES

Any question, dispute or claim arising out of, or involving the interpretation or application of this Agreement (other than jurisdictional disputes or alleged violations of Article 7, Section 1) shall be considered a grievance and shall be resolved pursuant to the exclusive procedure of the steps described below; provided, in all cases, that the question, dispute or claim arose during the term of this Agreement.

Step 1:

A. When any employee covered by this Agreement feels aggrieved by a claimed violation of this Agreement, the employee shall, through the Local Union business representative or job steward give notice of the claimed violation to the work site representative of the involved Contractor. To be timely, such notice of the grievance must be given within 7 calendar days after the act, occurrence, or event giving rise to the grievance, or after the act, occurrence or event became known or should have become known to the Union. The business representative of the Local Union or the job steward and the work site representative of the involved Contractor shall meet and endeavor to adjust the matter within 7 calendar days after timely notice has been given. If they fail to resolve the matter within the prescribed period, the grieving party, may, within 7 calendar days thereafter, pursue Step 2 of the grievance procedure by serving the involved Contractor and the General Contractor and/or Project Management Firm with written copies of the grievance setting forth a description of the claimed violation, the date on which the grievance occurred, the provisions of this Agreement alleged to have been violated. Grievances and disputes settled at Step 1 are non-precedential except as to the specific Local Union, employee and Contractor directly involved, unless the settlement is accepted in writing, by the General Contractor and/or Project Management Firm, as creating a precedent.

B. Should any signatory to this Agreement have a dispute (excepting jurisdictional disputes or alleged violations of Article 7, Section 1) with any other signatory to this Agreement and, if after conferring, a settlement is not reached within 7 calendar days, the dispute shall be reduced to writing and proceed to Step 2 in the same manner as outlined in subparagraph (a) for the adjustment of employee grievances.

Step 2:

The Business Manager or designee of the involved Local Union, together with representatives of the BTC, the involved Contractor, and the General Contractor and/or Project management Firm shall meet in Step 2 within 5 calendar days of the written grievance to arrive at a satisfactory settlement.

Step 3:

If the grievance shall have been submitted but not resolved in Step 2, any of the participating Step 2 entities may, within 14 calendar days after the initial Step 2 meeting, submit the grievance in writing (copies to other participants) to J.J. Pierson, Esq., FCIArb.,The Arbitration Centre, 51 JFK Parkway, First Floor West, Short Hills, New Jersey 07078, telephone number (973) 359-8100, fax number (973) 359-8161, who shall act as the Arbitrator under this procedure. In the event that J.J. Pierson is unable to serve, a party invoking this procedure shall notify Louis Verrone, who shall serve as arbitrator under this expedited procedure. The Labor Arbitration Rules of the American Arbitration Association shall govern the conduct of the arbitration hearing, at which all Step 2 participants shall be parties. Hearings shall be held at the jobsite or at the Newark office of the New Jersey State Board of Mediation, as directed by the Arbitrator.

The decision of the Arbitrator shall be final and binding on the involved Contractor, Local Union and employees and the fees and expenses of such arbitration's shall be borne equally by the involved Contractor and Local Union.

A. Failure of the grieving party to adhere to the time limits set forth in this Article shall render the grievance null and void. These time limits may be extended only by written consent of the GC and/or PMF, involved Contractor and involved Local Union at the particular step where the extension is agreed upon. The Arbitrator shall have authority to make decisions only on the issues presented to them and shall not have the authority to change, add to, delete or modify any provision of this Agreement.

SECTION 2. LIMITATION AS TO RETROACTIVITY

No arbitration decision or award may provide retroactivity of any kind exceeding 30 calendar days prior to the date of service of the written grievance on the construction Project Manager and the involved Contractor or Local Union.

SECTION 3. PARTICIPATION BY GENERAL CONTRACTOR AND/OR PROJECT MANAGEMENT FIRM

The General Contractor and/or Project Management Firm shall be notified by the involved Contractor of all actions at Steps 2 and 3 and, at its election, may participate in full in all proceedings at these Steps, including Step 3 arbitration.

ARTICLE 10 - JURISDICTIONAL DISPUTES

SECTION 1. NO DISRUPTIONS

There will be no strikes, sympathy strikes, work stoppages, slowdowns, picketing or other disruptive activity of any kind arising out of any jurisdictional dispute. Pending the resolution of the dispute, the work shall continue uninterrupted and as assigned by the Contractor. No jurisdictional dispute shall excuse a violation of Article 7.

SECTION 2. ASSIGNMENT

A. There shall be a mandatory pre-job markup / assignment meeting prior to the commencement of any work. Attending such meeting shall be designated representatives of the Union signatories to this Agreement, the GC, and the involved Contractors. Best efforts will be made to schedule the pre-job meeting in a timely manner after Notice to Proceed is issued but not later than 30 days prior to the start of the Project.

B. All Project construction work assignments shall be made by the Contractor according to criteria set forth in Section 3, Subsection D 1-3.

C. When a Contractor has made an assignment of work, they shall continue the assignment without alteration unless otherwise directed by an arbitrator or there is agreement between the National or International Unions involved. Claims of a change of original assignment shall be processed in accordance with Article I of the Procedural Rules of the Plan for the Settlement of Jurisdictional Disputes in the Construction Industry ("the Plan").

D. In the event that a Union involved in the change of original assignment dispute is an affiliate of a National or International Union that is not affiliated with the Building and Construction Trades Department and does not wish to process a case through the Plan, the parties shall mutually select one of the following Arbitrators: Arbitrator J.J. Pierson, Arbitrator Paul Greenberg or Arbitrator Richard K. Hanft and submit the dispute directly to the Arbitrator. The selected Arbitrator shall determine whether the case requires a hearing or may be decided upon written submissions. In rendering their determination on whether there has been a change of original assignment, the Arbitrator shall be governed by the following:

1. The Contractor who has the responsibility for the performance and installation shall make a specific assignment of the work which is included in their contract to a particular union(s). For instance, if Contractor A subcontracts certain work to Contractor B, then Contractor B shall have the responsibility for making the specific assignments for the work included in their contract. If Contractor B, in turn, shall subcontract certain work to Contractor C, then Contractor C shall have the responsibility for making the specific assignment for the work included in their contract. After work has been so assigned, such assignment will be maintained even though the assigning Contractor is replaced and such work is subcontracted to another Contractor. It is a violation of the Agreement for the

Contractor to hold up disputed work or shut down a project because of a jurisdictional dispute.

2. When a Contractor has made an assignment of work, they shall continue the assignment without alteration unless otherwise directed by an arbitrator or there is agreement between the National or International Unions involved.

3. Unloading and/or handling of materials to stockpile or storage by a trade for the convenience of the responsible Contractor when their employees are not on the job site, or in an emergency situation, shall not be considered to be an original assignment to that trade.

4. Starting of work by a trade without a specific assignment by an authorized representative of the responsible Contractor shall not be considered an original assignment to that trade, provided that the responsible Contractor, or their authorized representative, promptly, and, in any event, within eight working hours following the start of work, takes positive steps to stop further unauthorized performance of the work by that trade.

SECTION 3. PROCEDURE FOR SETTLEMENT OF DISPUTES

A. Any Union having a jurisdictional dispute with respect to Project work assigned to another Union will submit through its International the dispute in writing to the Administrator of the Plan within 72 hours and send a copy of the letter to the other Union involved, the Contractor involved, the General Contractor, the BTC, and the district or area councils of the unions involved. Upon receipt of a dispute letter from any Union, the Administrator will invoke the procedures set forth in the Plan to resolve the jurisdictional dispute. The jurisdictional dispute letter shall contain the information described in Article IV of the Procedural Rules of the Plan.

B. Within 5 calendar days of receipt of the dispute letter, there shall be a meeting of the General Contractor, the Contractor involved, the Local Unions involved and designees of the BTC and the district or area councils of the Local Unions involved for the purpose of resolving the jurisdictional dispute.

C. In order to expedite the resolution of jurisdictional disputes, the parties have agreed in advance to mutually select one of the following designated Arbitrators: Arbitrator J. J. Pierson, Arbitrator Paul Greenberg or Arbitrator Richard K. Hanft to hear all unresolved jurisdictional disputes arising under this Agreement. All other rules and procedures of the Plan shall be followed. If none of the three Arbitrators is available to hear the dispute within the time limits of the Plan, the Plan’s arbitrator selection process shall be utilized to select another arbitrator.

D. In the event that a Union involved in the dispute is an affiliate of a National or International Union that is not affiliated with the Building and Construction Trades Department and does not wish to process a case through the Plan as described in paragraphs A-C above, the parties to the dispute shall mutually select one of the following

Arbitrators: Arbitrator J. J. Pierson, Arbitrator Paul Greenberg or Arbitrator Richard K. Hanft to hear the dispute and shall submit the dispute directly to the selected arbitrator. The time limits for submission and processing disputes shall be the same as provided elsewhere in this Section. The selected Arbitrator shall schedule the hearing within seven business days from the date of submission. If they cannot hear the case within the required timeframe, one of the other Arbitrators will be selected to hear the case unless all parties to the dispute agree to waive the seven (7) day time limit. In rendering their decision, the Arbitrator shall determine:

1. First whether a previous agreement of record or applicable agreement, including a disclaimer agreement, between the National and International Unions to the dispute governs;

2. Only if the Arbitrator finds that the dispute is not covered by an appropriate or applicable agreement of record or agreement between the crafts to the dispute, they shall then consider the established trade practice in the industry and prevailing practice in the locality. Where there is a previous decision of record governing the case, the Arbitrator shall give equal weight to such decision of record, unless the prevailing practice in the locality in the past ten years favors one craft. In that case, the Arbitrator shall base their decision on the prevailing practice in the locality. Except, that if the Arbitrator finds that a craft has improperly obtained the prevailing practice in the locality through raiding, the undercutting of wages or by the use of vertical agreements, the Arbitrator shall rely on the decision of record and established trade practice in the industry rather than the prevailing practice in the locality.

3. Only if none of the above criteria is found to exist, the Arbitrator shall then consider that because efficiency, cost or continuity and good management are essential to the wellbeing of the industry, the interests of the consumer or the past practices of the employer shall not be ignored.

The Arbitrator shall set forth the basis for their decision and shall explain their findings regarding the applicability of the above criteria. If lower-ranked criteria are relied upon, the Arbitrator shall explain why the higher-ranked criteria were not deemed applicable. The Arbitrator’s decision shall only apply to the job in dispute.

Each party to the arbitration shall bear its own expense for the arbitration and agrees that the fees and expenses of the Arbitrator shall be borne by the losing party or parties as determined by the Arbitrator.

E. The Arbitrator shall render a short-form decision within 5 days of the hearing based upon the evidence submitted at the hearing, with a written decision to follow within 30 days of the close of hearing.

F. This Jurisdictional Dispute Resolution Procedure will only apply to work performed by Local Unions that represent workers employed on the Project.

G. Any Local Union involved in a jurisdictional dispute on this Project shall continue working in accordance with Section 2 above and without disruption of any kind.

SECTION 4. AWARD

Any award rendered pursuant to this Article and the Plan shall be final and binding on the disputing Local Unions and the involved Constructor on this Project only and may be enforced in accordance with the provisions of Article VII of the Plan. Any award rendered pursuant to the alternate procedures of this Article shall be final and binding on the disputing Local Unions and the involved Contractor on this Project only, and may be enforced in any court of competent jurisdiction. Such award or resolution shall not establish a precedent on any other construction work not covered by this Agreement. In all disputes under this Article, the General Contractor and the involved Contractors shall be considered parties in interest.

SECTION 5. LIMITATIONS

The Arbitrator shall have no authority to assign work to a double crew, that is, to more employees than the minimum required by the Contractor to perform the work involved; nor to assign work to employees who are not qualified to perform the work involved; nor to assign work being performed by non-union employees to union employees. This does not prohibit the establishment, with the agreement of the involved Contractor, of composite crews where more than 1 employee is needed for the job. The aforesaid determinations shall decide only to whom the disputed work belongs.

SECTION 6. NO INTERFERENCE WITH WORK

A. There shall be no interference or interruption of any kind with the work of the Project while any jurisdictional dispute is being resolved. The work shall proceed as assigned by the Contractor until finally resolved under the applicable procedure of this Article. The award shall be confirmed in writing to the involved parties. There shall be no strike, work stoppage or interruption in protest of any such award. Any claims of a violation of this section shall be submitted and processed in accordance with the impediment to job progress provisions of the Plan.

B. In the event a Union alleged to have engaged in an impediment to job progress is an affiliate of a National or International Union that is not affiliated with the Building and Construction Trades Department and does not wish to have the impediment to job progress charge processed through the Plan, the parties to the dispute shall mutually select one of the three Arbitrators designated in this Article to hear the dispute. The selected Arbitrator shall schedule the hearing within two business days from the date of submission. If they cannot hear the case within the required timeframe, one of the other Arbitrators shall be selected by the parties to hear the case unless all parties to the dispute agree to waive the two day time limit. The sole issue at the hearing shall be whether or not a violation of this Section has in fact occurred, and the Arbitrator shall have no authority to consider any matter in justification, explanation or mitigation of such violation or to award damages. The Arbitrator’s decision shall be issued in writing within 3 hours after the close of the hearing, and may be issued without an opinion. If any party desires an opinion, one shall be issued within 15 days, but its issuance shall not delay

compliance with, or enforcement of, the decision. The Arbitrator may order cessation of the violation of this Section and other appropriate relief, and such decision shall be served on all parties by facsimile upon issuance. Each party to the arbitration shall bear its own expense for the arbitration and agrees that the fees and expenses of the Arbitrator shall be borne by the losing party or parties as determined by the Arbitrator.

ARTICLE 11 - WAGES AND BENEFITS

SECTION 1. CLASSIFICATION AND BASE HOURLY RATE

All employees covered by this Agreement shall be classified in accordance with the work performed and paid the base hourly wage rates for those classifications as specified in the attached Schedules A, as amended during this Agreement. Recognizing, however, that special conditions may exist or occur on the Project, the parties, by mutual agreement may establish rates and/or hours for one or more classifications, which may differ from Schedules A. Parties to such agreements shall be the General Contractor and/or Project Management Firm, the Contractor involved, the involved Local Unions and the BTC.

SECTION 2. EMPLOYEE BENEFIT FUNDS

A. The Contractors agree to pay contributions on behalf of all employees covered by this Agreement to the established employee benefit funds in the amounts designated in the appropriate Schedule A. Bona fide jointly trusted fringe benefit plans established or negotiated through collective bargaining during the life of this Agreement may be added. However, if a defined benefit pension fund covered by the terms and conditions of this Agreement has not adopted the building and construction industry exemption authorized by subsection (b) of Section 4203 of the Employee Retirement Income Security Act of 1974, the Contractor shall not be obligated to hire employees covered by that fund.

B. The Contractor agrees to be bound by the written terms of the legally established Trust Agreements specifying the detailed basis on which payments are to be paid into, and benefits paid out of, such Trust Funds but only with regard to work done on this Project and only for those employees to whom this Agreement requires such benefit Payments.

C. Should any Contractor or sub-contractor become delinquent in the payment of contributions to the fringe benefit funds, then the subcontractor at the next higher tier, or upon notice of the delinquency claim from the Union or the Funds, agrees to withhold from the subcontractor such disputed amount from the next advance, or installment payment for work performed and the amount claimed and owed will be paid within thirty (30) days after receipt of the notification by the General Contractor and/or Project Management Firm, if not paid prior to said date by the delinquent Contractor/subcontractor.

ARTICLE 12 - HOURS OF WORK, PREMIUM PAYMENTS, SHIFTS AND HOLIDAYS

SECTION 1. WORK WEEK AND WORK DAY

A. The standard work week shall consist of 40 hours of work at straight time rates per one of the following schedules:

1) Five-Day Work Week: Monday-Friday, 5 days, 8 hours plus 1/2 hour unpaid lunch period each day.

B. The Day Shift shall commence between the hours of 6:00 a.m. and 9:00 a.m. and shall end between the hours of 2:30 p.m. and 5:30 p.m. Starting and quitting times shall occur at the employees' place of work as may be designated by the Contractor in accordance with area practice.

C. Notice - Contractors shall provide not less than 5 days prior notice to the Local Union involved as to the work week and work hours schedules to be worked or such lesser notice as may be mutually agreed upon.

SECTION 2. OVERTIME

Overtime pay for hours outside of the standard work week and work day, described in paragraph A above, shall be paid in accordance with the applicable Schedule A. There will be no restriction upon the Contractor's scheduling of overtime or the non-discriminatory designation of employees who shall be worked, except as noted in Article 5, Section 2. There shall be no pyramiding of overtime pay under any circumstances. The Contractor shall have the right to schedule work so as to minimize overtime.

SECTION 3. SHIFTS

A. Flexible Schedules - Scheduling of shift work shall remain flexible in order to meet Project schedules and existing Project conditions including the minimization of interference with traffic. It is not necessary to work a day shift in order to schedule a second shift. Shifts must be worked a minimum of five consecutive work days, must have prior approval of the Construction Project Manager and must be scheduled with not less than five work days' notice to the Local Union.

B. Second/Shift - The second shift (starting between 2 p.m. and 8p.m.) shall consist of 8 hours work (or 10 hours of work) for an equal number of hours pay at the straight time rate plus 15% in lieu of overtime and exclusive of a 1/2 hour unpaid lunch period.

C. Flexible Starting Times – Shift starting times will be adjusted by the Contractor as necessary to fulfill Project requirements subject to the notice requirements of Paragraph

D. It is agreed that when project circumstances require a deviation from the above shifts, the involved unions, Contractors and the General Contractor and/or Project Management Firm shall adjust the starting times of the above shifts or establish shifts which meet the project requirements. It is agreed that neither party will unreasonably withhold their agreement.

SECTION 4. HOLIDAYS

A. Schedule - There shall be 8 recognized holidays on the Project:

New Year's Day	Labor Day
Presidents Day	Veterans Day
Memorial Day	Thanksgiving Day
Fourth of July	Christmas Day

* Presidential Election Day shall be observed as a holiday in a general election year. Work shall be scheduled on Good Friday pursuant to the craft's Schedule A. Columbus Day and the Friday after Thanksgiving shall be observed as a holiday for Elevator Constructors Local 1 only.

All said holidays shall be observed on the dates designated by New Jersey State Law. In the absence of such designations, they shall be observed on the calendar date except those holidays which occur on Sunday shall be observed on the following Monday. Holidays falling on Saturday are to be observed on the preceding Friday.

B. Payment - Regular holiday pay, if any, and/or premium pay for work performed on such a recognized holiday shall be in accordance with the applicable Schedule A.

C. Exclusivity - No holidays other than those listed in Section 4-A above shall be recognized nor observed.

SECTION 5. REPORTING PAY

A. Employees who report to the work location pursuant to regular schedule and who are not provided with work or whose work is terminated early by a Contractor, for whatever reason, shall receive minimum reporting pay in accordance with the applicable Schedule A.

B. When an employee, who has completed their scheduled shift and left the Project site, is "called back" to perform special work of a casual, incidental or irregular nature, the employee shall receive pay for actual hours worked with a minimum guarantee, as may be required by the applicable Schedule A.

C. When an employee leaves the job or work location of their own volition or is discharged for cause or is not working as a result of the Contractor's invocation of Section 7 below, they shall be paid only for the actual time worked.

D. Except as specifically set forth in this Article there shall be no premiums, bonuses, hazardous duty, high time or other special payments of any kind.

E. There shall be no pay for time not actually worked except as specifically set forth in this Agreement or except where specifically provided in an applicable Schedule A.

SECTION 6. PAYMENT OF WAGES

A. Payday - Payment shall be made by check, drawn on a New Jersey bank with branches located within commuting distance of the job site. Paychecks shall be issued by the Contractor at the job site by 10 a.m. on Thursdays. In the event that the following Friday is a bank holiday, paychecks shall be issued on Wednesday of that week. Not more than 3 days wages shall be held back in any pay period. Paycheck stubs shall contain the name and business address of the Contractor, together with an itemization of deductions from gross wages.

B. Termination-Employees who are laid-off or discharged for cause shall be paid in full for that which is due them at the time of termination. The Contractors shall also provide the employee with a written statement setting forth the date of lay off or discharge.

SECTION 7. EMERGENCY WORK SUSPENSION

A Contractor or GC and/or PMF may, if considered necessary for the protection of life and /or safety of employees or others, suspend all or a portion of Project work. In such instances, employees will be paid for actual time worked; provided, however, that when a Contractor request that employees remain at the job site available for work, employees will be paid for “stand-by” time at their hourly rate of pay.

SECTION 8. INJURY/DISABILITY

An employee who, after commencing work, suffers a work-related injury or disability while performing work duties, shall receive no less than 8 hours wages for that day. Further, the employee shall be rehired at such time as able to return to duties provided there is still work available on the Project for which the employee is qualified and able to perform.

SECTION 9. TIME KEEPING

A Contractor may utilize brassing or other systems to check employees in and out. Each employee must check in and out. The Contractor will provide adequate facilities for checking in and out in an expeditious manner.

SECTION 10. MEAL PERIOD

A Contractor shall schedule an unpaid period of not more than 1/2 hour duration at the work location between the 3rd and 5th hour of the scheduled shift. A Contractor may, for efficiency of operation, establish a schedule which coordinates the meal periods of two or more crafts. If an employee is required to work through the meal period, the employee shall be compensated in a manner established in the applicable Schedule A.

SECTION 11. BREAK PERIODS

There will be no rest periods, organized coffee breaks or other non-working time established during working hours. Individual coffee containers will be permitted at the

employee's work location. Local area practice will prevail for coffee breaks that are not organized.

ARTICLE 13 - APPRENTICES

SECTION 1. RATIOS

Recognizing the need to maintain continuing supportive programs designed to develop adequate numbers of competent workers in the construction industry and to provide craft entry opportunities for minorities, women and economically disadvantaged non-minority males, Contractors will employ apprentices in their respective crafts to perform such work as is within their capabilities and which is customarily performed by the craft in which they are indentured. Contractors may utilize apprentices and such other appropriate classifications as are contained in the applicable Schedule A in a ratio not to exceed the ratio provided in the applicable Schedule A collective bargaining agreements providing prevailing wage and fringe benefits as defined in N.J.S.A. 34:11-56.26(9) for the classification in Union County, New Jersey. Apprentices and such other classifications as are appropriate shall be employed in a manner consistent with the provisions of the appropriate collective bargaining agreement listed in Schedule A.

SECTION 2. DEPARTMENT OF LABOR

To assist the Contractors in attaining a maximum effort on this Project, the Unions agree to work in close cooperation with, and accept monitoring by, the New Jersey State and Federal Departments of Labor to ensure that minorities, women, or economically disadvantaged are afforded opportunities to participate in apprenticeship programs which result in the placement of apprentices on this Project. To further ensure that this Contractor effort is attained, up to 50% of the apprentices placed on this Project should be first year, minority, women or economically disadvantaged apprentices. The Local Unions will cooperate with Contractor request for minority, women or economically disadvantaged referrals to meet this Contractor effort.

SECTION 3. HELMETS TO HARDHATS

The Employers and the Unions recognize a desire to facilitate the entry into the building and construction trades of veterans who are interested in careers in the building and construction industry. The Employers and Unions agree to utilize the services of the Center for Military Recruitment, Assessment and Veterans Employment (hereinafter "Center") and the Center's "Helmets to Hardhats" program to serve as a resource for preliminary orientation, assessment of construction aptitude, referral to apprenticeship programs or hiring halls, counseling and mentoring, support network, employment opportunities and other needs as identified by the parties.

The Unions and Employers agree to coordinate with the Center to create and maintain an integrated database of veterans interested in working on the Project and of apprenticeship and employment opportunities for the Project. To the extent permitted by law, the Unions will give credit to such veterans for bona fide, provable past experience.

ARTICLE 14 - SAFETY PROTECTION OF PERSON AND PROPERTY

SECTION 1. SAFETY REQUIREMENTS

Each Contractor will ensure that applicable OSHA requirements and other requirements set forth in the contract documents are at all times maintained on the Project and the employees and Unions agree to cooperate fully with these efforts. Employees must perform their work at all times in a safe manner and protect themselves and the property of the Contractor and the Owner from injury or harm. Failure to do so will be grounds for discipline, including discharge.

SECTION 2. CONTRACTOR RULES

Employees covered by this Agreement shall at all times be bound by the reasonable safety, security, and visitor rules as established by the Contractors and the GC and/or PMF for this Project. Such rules will be published and posted in conspicuous places throughout the Project.

SECTION 3. INSPECTIONS

The Contractors and GC and/or PMF retain the right to inspect incoming shipments of equipment, apparatus, machinery, and construction materials of every kind.

ARTICLE 15 - NO DISCRIMINATION

SECTION 1. COOPERATIVE EFFORTS

The Contractors and Unions agree that they will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin or age in any manner prohibited by law or regulation. It is recognized that special procedures maybe established by Contractors and Local Unions and the New Jersey State Department of Labor for the training and employment of persons who have not previously qualified to be employed on construction projects of the type covered by this Agreement. The parties to this Agreement will assist in such programs and agree to use their best efforts to ensure that the goals for female and minority employment are met on this Project.

SECTION 2. LANGUAGE OF AGREEMENT

The use of the masculine or feminine gender in this Agreement shall be construed as including both genders.

ARTICLE 16 - GENERAL TERMS

SECTION 1. PROJECT RULES

The Project Management Firm and the Contractors shall establish such reasonable Project rules as are appropriate for the good order of the Project, provided they do not violate the terms of this Agreement. These rules will be explained at the pre-job

conference and posted at the Project site and may be amended thereafter as necessary. Failure of an employee to observe these rules and regulations shall be grounds for discipline, including discharge. The fact that no order was posted prohibiting a certain type of misconduct shall not be a defense to an employee disciplined or discharged for such misconduct when the action taken is for cause.

SECTION 2. TOOLS OF THE TRADES

The welding/cutting torch and chain fall are tools of the trade having jurisdiction over the work performed. Employees using these tools shall perform any of the work of the trade. There shall be no restrictions on the emergency use of any tools or equipment by any qualified employee, or on the use of any tools or equipment for the performance of work within the employee's jurisdiction.

SECTION 3. SUPERVISION

Employees shall work under the supervision of the craft foreperson or general foreperson.

SECTION 4. TRAVEL ALLOWANCES

There shall be no payments for travel expenses, travel time, subsistence allowance or other such reimbursements or special pay except as expressly set forth in this Agreement and in Schedule A.

SECTION 5. FULL WORK DAY

Employees shall be at their staging area at the starting time established by the Contractor and shall be returned to their staging area by quitting time after performing their assigned functions under the supervision of the Contractor. The signatories reaffirm their policy of a fair day's work for a fair day's wage.

SECTION 6. COOPERATION

The Project Management Firm and/or General Contractor and the Unions will cooperate in seeking any New Jersey State Department of Labor approvals that may be required for implementation of any terms of this Agreement.

ARTICLE 17 - SAVINGS AND SEPARABILITY

SECTION 1. THIS AGREEMENT

In the event that the application of any provision of this Agreement is enjoined, on either an interlocutory or permanent basis, or otherwise found in violation of law, the provision involved shall be rendered, temporarily or permanently, null and void but the remainder of the Agreement shall remain in full force and effect. In such event, this Agreement shall remain in effect for contracts already bid and awarded or in construction where the Contractor voluntarily accepts this Agreement. The parties to this Agreement will enter

into negotiations for a substitute provision in conformity with the law and the intent of the parties for contracts to be let in the future.

SECTION 2. THE BID SPECIFICATIONS

In the event that the General Contractor's and/or Project Management Firm's bid specifications, or other action, requiring that a successful bidder become signatory to this Agreement is enjoined, on either an interlocutory or permanent basis, or otherwise found in violation of law such requirement shall be rendered, temporarily or permanently, null and void but this Agreement shall remain in full force and effect to the extent allowed by law. In such event, this Agreement shall remain in effect for contracts already bid and awarded or in constructions where the Contractor voluntarily accepts this Agreement. The parties will enter into negotiations as to modifications to this Agreement to reflect the court action taken and the intent of the parties for contracts to be let in the future.

SECTION 3. NON-LIABILITY

In the event of an occurrence referenced in Section 1 or Section 2 of this Article, neither the Owner, the Project Management Firm and/or General Contractor, or any Contractor, or any signatory Union shall be liable, directly or indirectly, for any action taken, or not taken, to comply with any court order, injunction or determination. Project bid specifications will be issued in conformance with court orders in effect and no retroactive payments or other action will be required if the original court determination is ultimately reversed.

SECTION 4. NON-WAIVER

Nothing in this Article shall be construed as waiving the prohibitions of Article 7 as to signatory Contractors and signatory Unions.

ARTICLE 18 - FUTURE CHANGES IN SCHEDULE A AREA CONTRACTS

SECTION 1. CHANGES TO AREA CONTRACTS

A. Schedules A to this Agreement shall continue to full force and effect until the Contractor and/or Union parties to the Area Collective Bargaining Agreements, which are the basis for Schedules A, notify the General Contractor and/or Project Management Firm in writing of the mutually agreed upon changes in provisions of such agreements which are applicable to the Project, and their effective dates.

B. It is agreed that any provisions negotiated into Schedules A collective bargaining agreements will not apply to work on this Project if such provisions are less favorable to this Project than those uniformly required of Contractors for construction work normally covered by those agreements; nor shall any provisions be recognized or applied on this Project if it may be construed to apply exclusively, or predominantly, to work covered by this Project Agreement.

C. Any disagreement between signatories to this Agreement over the incorporation into Schedules “A” of provisions agreed upon in the renegotiations of Area Collective Bargaining Agreements shall be resolved in accordance with the procedure set forth in Article 9 of this Agreement.

SECTION 2. LABOR DISPUTES DURING AREA CONTRACT NEGOTIATIONS

The Unions agree that there will be no strikes, work stoppages, sympathy actions, picketing, slowdowns or other disruptive activity or other violations of Article 7 affecting the Project by any Local Union involved in the renegotiations of Area Local Collective Bargaining Agreements nor shall there by any lock-out on the Project affective a Local Union during the course of such renegotiations.

IN WITNESS WHEREOF the parties have caused this Agreement to be executed and effective as of_____, 202___.

ATTEST:

JAMES E. PELLETTIERE, Clerk
Board of County Commissioners

County of Union

EDWARD T. OATMAN
County Manager

APPROVED AS TO FORM:

BRUCE H. BERGEN, ESQ.
County Counsel

Affirmative Action Compliant

ATTEST:

Union County Building and Construction Trades Council AFL-CIO

_____ _____

Corporate Secretary/Notary Public Authorized Signatory

_____

Print Name

_____

Print Title

ATTEST:

(General Contractor)

_____ _____

Corporate Secretary/Notary Public Authorized Signatory

_____

Print Name

_____

Print Title

ATTEST:

(Project Management Firm)

_____ _____

Corporate Secretary/Notary Public Authorized Signatory

_____

Print Name

_____

Print Title

UNION AFFILIATES	**SIGNATURES**
ASBESTOS WORKER LOCAL 32	_____
BOILER MAKERS LOCAL 28	_____
BRICKLAYERS AND ALLIED CRAFTS LOCAL 4	_____
CARPENTERS LOCAL 254	_____
DOCKBUILDERS LOCAL 1556	_____
ELECTRICAL WORKERS LOCAL 102	_____
ELECTRICAL WORKERS LOCAL 164 (TELECOM)	_____
ELEVATOR CONSTRUCTORS LOCAL 1	_____
OPERATING ENGINEERS LOCAL 825	_____
IRONWORKERS LOCAL 11	_____

STEAMFITTERS LOCAL 475 _____

LABORERS LOCAL 3 _____

HEAVY CONSTRUCTION
LABORERS LOCAL 472 _____

PAINTERS AND ALLIED TRADES,
DISTRICT COUNCIL 21 _____

PLUMBERS LOCAL 24 _____

RESILIENT FLOORING LOCAL 251 _____

ROOFERS LOCAL 4 _____

SHEET METAL WORKERS LOCAL 22 _____

SHEET METAL WORKERS LOCAL 25 _____

SPRINKLER FITTERS LOCAL 696 _____

TILE/MARBLE/TERRAZO WORKERS
LOCAL 7 _____

TEAMSTERS LOCAL 560 _____

OPERATIVE PLASTERER LOCAL 29 _____

MILLWRIGHTS LOCAL 715 _____

PROJECT LABOR AGREEMENT

TELE-DATA ADDENDUM

The parties hereby agree that all Tele-data work and associated electrical work performed on any of the sites during construction shall be done by employees represented by the signatory unions. For the purpose of this Agreement, Tele-data work shall include, but not limited to, the following: All receiving, placement, installation, operation, testing, inspection, maintenance, repair and service of radio, television, video, data, voice, sound, emergency call, microwave and visual production and reproduction apparatus, equipment and appliances used for domestic, commercial, education and entertainment purposes; all installation and erection of equipment, apparatus or appliance, cables and/or wire, emergency power (batteries) and all directly related work which becomes an integral part of the telecommunication and/or telecommunications related systems repair and service maintenance work of telecommunications systems and devices including, but not limited to, Private Branch Exchanges (PBX-PABX), Key equipment-owned, CCTV, CATV, card access, Systems RS 232 ethernet and/or any local area network system associated with computer installation.

_____

SIGNATORY UNIONS

BY:_____ BY:_____

PROJECT LABOR AGREEMENT

SHEET METAL ADDENDUM

(General Contractor) and (Project Management Firm) agrees that when subcontracting for prefabrication of H.V.A.C. duct and other related sheet metal, such prefabrication shall be subcontracted to fabricators who pay their employees engaged in such fabrication not less than the prevailing wage for comparable sheet metal fabrication as established under agreements between local affiliates of Sheet Metal Workers' International Association and local sheet metal fabricators.

General Contractor and Project Management Firm and the Sheet Metal Workers' International Association agree to work with fabrication shops referenced in the Addendum. This joint effort will be directed at improving fabricators' competitiveness through the application of continuous improvement principles.

(General Contractor)	Sheet Metal Workers' International Assoc. Local #25
(Project Management Firm)	Sheet Metal Workers' International Assoc. Local #22

TEAMSTERS LOCAL 560 ADDENDUM

1. Notwithstanding the provisions of Article 11, Section 2 of the Project Labor Agreement, a Contractor who becomes signatory to this Project Labor Agreement who is not already a participating and contributing employer to the pension fund(s) specified in the Exhibit A collective bargaining agreement (currently the Trucking Employees of North Jersey Pension Fund;, hereinafter the "TENJ Pension Fund," and the Teamsters Local No. 408 Pension Fund), shall make direct all contributions required by the Exhibit A collective bargaining agreement exclusively to the Trucking Employees of North Jersey Annuity Fund, a defined contribution plan. Any such Contractor shall not participate in nor contribute to the TENJ or Local 408 Pension Funds, and shall have no obligation to the TENJ or Local 408 Pension Funds.

2. Any Contractor who is already participating in and contributing to the TENJ or Local 408 Pension Fund, separately from this Project Labor Agreement, shall pay contributions as provided for in Article 11, Section 2 of this Project Labor Agreement.

Agreed to and accepted this_____day

of_____, 202__:

For the General Contractor: For Teamsters Local 560

_____ _____

SCHEDULE A

SCHEDULE B

LETTER OF ASSENT

Re: Project Labor Agreement
The Union County Building & Trades Council, AFL-CIO and

dated _____ (the "Agreement')

The undersigned, as a General Contractor and/or Project Management Firm, Contractor(s) or Subcontractor(s) on a Contract which is part of the Construction of the
_____Project in_____,
New Jersey (the "Project"), for and in consideration of the award of a Contract to perform work on said Project, and in further consideration of the mutual promises made in the Project Labor Agreement, a copy of which was received and is acknowledged, hereby:

(1) On behalf of itself and all its employees, accepts and agrees to be bound by the terms and conditions of the Project Labor Agreement, together with any and all amendments and supplements now existing or which are later made thereto, and understands that any act of non-compliance with all such terms and conditions will subject the non-complying Contractor or employee(s) to being prohibited from the Project Site until full compliance is obtained.

(2) Certifies that it has no commitments or agreements that would preclude its full compliance with the terms and conditions of said Projects Labor Agreement.

(3) Agrees to secure from any Contractor(s) (as defined in said Project Labor Agreement) which is or becomes a Subcontractor(s) (of any tier), a duly executed Letter of Assent in form identical to this document prior to commencement of any work.

Company Name

By: _____ Contract Number_____

Title:_____ General Contractor_____

Date: _____

cc: (Unions employed by Contractor)

EXHIBIT A

Prevailing Wage Rates

53. BID PROTEST – LEGAL FEES AND COSTS

In the event a of a bid protest, neither party shall be entitled to the payment of reasonable legal costs and fees incurred by the prevailing party unless expressly permitted by statute, case law, or contract.

54. AMERICAN GOODS AND PRODUCTS WHERE POSSIBLE

Bidder shall comply with the requirements of N.J.S.A. 40A:11-18 and use only manufactured and farm products of the United States, wherever available, for the Project.

55. NEW JERSEY PAY-TO-PLAY REQUIREMENTS

This Contract is required by law to be publicly advertised for bids. As such, lists of political contributions pursuant to N.J.S.A. 19:44A-1 et seq. are NOT REQUIRED to be provided with the bids.

56. STATEMENT OF EQUIPMENT TO BE USED IN CONSTRUCTION

Pursuant to N.J.S.A. 40A:11-20the County requires a Certification from all bidders submitting a bid showing that the Bidder owns, leases, or controls all necessary equipment required by the Project Specifications and Project Technical Specifications. All Bidders should provide this information at the time of the bid opening using the attached form entitled, “CERTIFICATE OF BIDDER SHOWING ABILITY TO PERFORM CONTRACT’.

If the Bidder is not the actual Owner of the equipment, it shall state the source from which the equipment will be obtained and shall attach a certificate from the Owner or person in control of the equipment demonstrating that the equipment Owner has granted the Bidder control of the requisite equipment during such time as may be necessary for completion of the portion of the contract for which the equipment is necessary.

57. NEW JERSEY SALES AND USE TAX REQUIREMENTS,

Contractors are required to comply with the following:

New Jersey Sales and Use Tax Requirements: All Contractors with subcontractors, or any of their affiliates, who enter into contracts for the provision of goods or services with or for New Jersey local government entities, are required to collect and remit to the New Jersey Director of Taxation in the Department of the Treasury the use tax due on all of their

sales of tangible personal property delivered into the State of New Jersey pursuant to the "Sales and Use Tax Act," (N.J.S.A. 54:32B-1 et seq.), regardless of whether the tangible personal property is intended for a contract with the contracting agency. This tax shall be remitted for the term of the Contract.

For purposes herein "affiliate" shall mean any entity that: (a) directly, indirectly, or constructively controls another entity, (b) is directly, indirectly, or constructively controlled by another entity, or (c) is subject to the control of a common entity. For purposes of the immediately preceding sentence, an entity controls another entity if it owns, directly or indirectly, more than fifty percent (50%) of the ownership interest in that entity. N.J.S.A. 52:32- 44(g)(3).

58. RESOLUTION NO. 2014-408 (OMITTED)

59. FEDERAL TERMS

TERMS AND CONDITIONS APPLICABLE TO ALL CONTRACTS/PURCHASES FUNDED, IN WHOLE OR IN PART, BY FEDERAL FUNDS.

The provisions set forth below apply to all contracts funded, in whole or in part, by Federal funds as required by 2 CFR 200.317.

1. CONTRACTING WITH SMALL AND MINORITY BUSINESSES, WOMEN'S BUSINESS ENTERPRISES, AND LABOR SURPLUS AREA FIRMS

   Pursuant to 2 CFR 200.321, the State must take all necessary affirmative steps to assure that minority businesses, women's business enterprises, and labor surplus area firms are used when possible. Accordingly, if subawards are to be made the Contractor shall:

   (1) Include qualified small and minority businesses and women's business enterprises on solicitation lists;
   (2) Assure that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;
   (3) Divide total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;
   (4) Establish delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises; and,
   (5) Use the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

2. DOMESTIC PREFERENCE FOR PROCUREMENTS

Pursuant to 2 CFR 200.322, where appropriate, the State has a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). If subawards are to be made the Contractor shall include a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). For purposes of this section:

(1) "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

(2) "Manufactured products" means items and construction materials composed in whole or in part of nonferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

3. PROCUREMENT OF RECOVERED MATERIALS

Where applicable, in the performance of contract, pursuant to 2 CFR 200.323, the Contractor must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR Part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds $ 10,000 or the value of the quantity acquired during the preceding fiscal year exceeded $10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

To the extent that the scope of work or specifications in the contract requires the Contractor to provide recovered materials the scope of work or specifications are modified to require that as follows.

i. In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired—
    1. Competitively within a timeframe providing for compliance with the contract performance schedule;
    2. Meeting contract performance requirements; or
    3. At a reasonable price.

ii. Information about this requirement, along with the list of EPA-designated items, is available at EPA's Comprehensive Procurement Guidelines web site, https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program.

iii. The Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act."

4. EQUAL EMPLOYMENT OPPORTUNITY

Except as otherwise provided under 41 CFR Part 60, all contracts that meet the definition of "federally assisted construction contract" in 41 CFR Part 60-1.3 must include the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, "Equal Employment Opportunity" (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and implementing regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor." See, 2 CFR Part 200, Appendix II, para. C.

During the performance of this contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:
Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor , state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

(3) The Contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such

employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the Contractor 's legal duty to furnish information.

(4) The Contractor will send to each labor union or representative of workers with which he/she has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor 's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(5) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(6) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his/her books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(7) In the event of the Contractor 's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(8) The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.
The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: Provided, That if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a Contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

5. DAVIS-BACON ACT, 40 U.S.C. 3141-3148, AS AMENDED

Not Applicable.

6. COPELAND ANTI-KICKBACK ACT

Where applicable, the Contractor must comply with Copeland "Anti-Kickback" Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States").

a. Contractor. The Contractor shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into the OGS centralized contract.
b. Subcontracts. The Contractor or subcontractor shall insert in any subcontracts the clause above and such other clauses as FEMA may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses.
c. Breach. A breach of the clauses above may be grounds for termination of the OGS centralized contract, and for debarment as a Contractor and subcontractor as provided in 29 C.F.R. § 5.12.

7. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT, 40 U.S.C. 3701-3708

Where applicable, all contracts awarded by the non-Federal entity in excess of $ 100,000 that involve the employment of mechanics or laborers must comply with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5).

(1) Overtime requirements. No Contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on

such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of $27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The unauthorized user shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor under any such contract or any other Federal contract with the same prime Contractor , or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime Contractor , such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Subcontracts. The Contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

8. RIGHTS TO INVENTIONS MADE UNDER A CONTRACT OR AGREEMENT

If the Federal award meets the definition of "funding agreement" under 37 CFR § 401.2 (a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the recipient or subrecipient must comply with the requirements of 37 CFR Part

401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

9. CLEAN AIR ACT, 42 U.S.C. 7401-7671Q, AND THE FEDERAL WATER POLLUTION CONTROL ACT, 33 U.S.C. 1251-1387, AS AMENDED

Where applicable, Contracts and subgrants of amounts in excess of $150,000, must comply with the following:

Clean Air Act

1. The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.
2. The Contractor agrees to report each violation to the Division of Purchase and Property and understands and agrees that the Division of Purchase and Property will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.
3. The Contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by FEMA.

Federal Water Pollution Control Act

1. The Contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.
2. The Contractor agrees to report each violation to the Division of Purchase and Property and understands and agrees that the Division of Purchase and Property will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.
3. The Contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by FEMA.

10. DEBARMENT AND SUSPENSION (EXECUTIVE ORDERS 12549 AND 12689)

(1) This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such, the Contractor is required to verify that none of the Contractor ’s principals (defined at 2 C.F.R. § 180.995) or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).

(2) The Contractor must comply with 2 C.F.R. pt. 180, subpart C and2 C.F.R. pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.
(3) This certification is a material representation of fact relied upon by the State or authorized user. If it is later determined that the Contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to the State or authorized user, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.
(4) The bidder or proposer agrees to comply with the requirements of2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

11. BYRD ANTI-LOBBYING AMENDMENT, 31 U.S.C. 1352

Contractors that apply or bid for an award exceeding $100,000 must file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

12. PROHIBITION ON CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT

(a) Recipients and subrecipients are prohibited from obligating or expending loan or grant funds to:
(1) Procure or obtain;
(2) Extend or renew a contract to procure or obtain; or
(3) Enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in Public Law 115–232, section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

(i) For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).

(ii) Telecommunications or video surveillance services provided by such entities or using such equipment.

(iii) Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

13. CONTRACTS FOR MORE THAN THE SIMPLIFIED ACQUISITION THRESHOLD

Contracts for more than the simplified acquisition threshold, which is the inflation adjusted amount determined by the Civilian Agency Acquisition Council and the Defense Acquisition Regulations Council (Councils) as authorized by 41 U.S.C. 1908, must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate.

14. TERMINATION FOR CONVENIENCE PROVISION

All contracts in excess of $10,000 must address termination for cause and for convenience by the non-Federal entity including the manner by which it will be effected and the basis for settlement.

15. BONDING REQUIREMENTS

For construction or facility improvement contracts or subcontracts exceeding the Simplified Acquisition Threshold, the Federal awarding agency or pass-through entity may accept the bonding policy and requirements of the non-Federal entity provided that the Federal awarding agency or pass-through entity has made a determination that the Federal interest is adequately protected. If such a determination has not been made, the minimum requirements must be as follows:

(a) A bid guarantee from each bidder equivalent to five percent of the bid price. The “bid guarantee” must consist of a firm commitment such as a bid bond, certified check, or other negotiable instrument accompanying a bid as assurance that the bidder will, upon acceptance of the bid, execute such contractual documents as may be required within the time specified.

(b) A performance bond on the part of the Contractor for 100 percent of the contract price. A “performance bond” is one executed in connection with a contract to secure fulfillment of all the Contractor 's requirements under such contract.

(c) A payment bond on the part of the Contractor for 100 percent of the contract price. A “payment bond” is one executed in connection with a contract to assure payment as required by law of all persons supplying labor and material in the execution of the work provided for in the contract.

60. EXECUTIVE ORDER 166 REQUIREMENT

Notice of Executive Order 166 Requirement for Posting of Winning Proposal and Contract Documents

Principal State departments, agencies and independent State authorities must include the following notice in any solicitation:

Pursuant to Executive Order No. 166, signed by Governor Murphy on July 17, 2020, the Office of the State Comptroller ("OSC") is required to make all approved State contracts for the allocation and expenditure of COVID-19 Recovery Funds available to the public by posting such contracts on an appropriate State website. Such contracts will be posted on the New Jersey transparency website developed by the Governor's Disaster Recovery Office (GDRO Transparency Website).

The contract resulting from this [RFP/RFQ] is subject to the requirements of Executive Order No. 166. Accordingly, the OSC will post a copy of the contract, including the [RFP/RFQ], the winning bidder's proposal and other related contract documents for the above contract on the GDRO Transparency website.

In submitting its proposal, a bidder/proposer may designate specific information as not subject to disclosure. However, such bidder must have a good faith legal or factual basis to assert that such designated portions of its proposal: (i) are proprietary and confidential financial or commercial information or trade secrets; or (ii) must not be disclosed to protect the personal privacy of an identified individual. The location in the proposal of any such designation should be clearly stated in a cover letter, and a redacted copy of the proposal should be provided. A Bidder's/Proposer's failure to designate such information as confidential in submitting a bid/proposal shall result in waiver of such claim.

The State reserves the right to make the determination regarding what is proprietary or confidential and will advise the winning bidder/proposer accordingly. The State will not honor any attempt by a winning bidder/proposer to designate its entire proposal as proprietary or confidential and will not honor a claim of copyright protection for an entire proposal. In the event of any challenge to the winning bidder's/proposer's assertion of confidentiality with which the State does not concur, the bidder /proposer shall be solely responsible for defending its designation.

Bidders name _____

EDWARD T. OATMAN
COUNTY MANAGER

MICHELE HAGOPIAN, ASSISTANT DIRECTOR
DIVISION OF PURCHASING

BID DOCUMENT SUBMISSION CHECKLIST

ALL SIGNATURES AND SEALS SHALL BE ORIGINALS UNLESS OTHERWISE SPECIFIED. BID DOCUMENTS SHOULD NOT BE SUBMITTED ON DOUBLE SIDED PAGES, (SINGLE SIDE ONLY) UNLESS SPECIFIED BELOW.

EACH BIDDER SHALL COMPLETE THIS FORM AND INITIAL EACH ENTRY.
DATE COMPLETED: _____

PLEASE SUBMIT BID DOCUMENTS ON SINGLE SIDED PAPER ONLY, WITH THE EXCEPTION OF THE SURETY AND BID BOND DOCUMENTS.

IN ACCORDANCE WITH THE BID SPECIFICATIONS I HAVE REVIEWED, COMPLETED / EXECUTED AND INCLUDED THE FOLLOWING FORMS:

____ Bid Form **(Bid on all deletion items, if applicable to the Work)**.

____ Security in the form of:

____Bid bond; or

____Certified check or cashier's check

____ Consent of Surety form signed by a Surety Company for the total amount of your Bid.
If your bid is accepted, the Surety Company that provided the Consent shall be required to furnish a Performance, Labor and Materials Bond in the amount of 100% of the award of the contract.

The County of Union has provided its Consent of Surety form for your use. The use of this form by your Surety Company will expedite the bid review process and eliminate the possibility of having your bid rejected. If, however, you should need to use another form, please use language similar to that used on the Union County form and avoid making any additions or deletions to the Union County form language. In lieu of the Consent of Surety you may submit a Certified Check in the full amount of the bid.

_____ STATEMENT OF OWNERSHIP DISCLOSURE Please provide pursuant to N.J.S.A. 52:25-24.2.

____ SUBCONTRACTOR IDENTIFICATION. Pursuant to N.J.S.A. 40A:11-16, which includes **BOTH** of the following documents:

- Subcontractor Identification Statement: List of Subcontractors **(only for certain types of work)**
- Subcontractor Identification Certification

____ Acknowledgement of Addendum form.

For ease of processing this Bid and to avoid any potential missed deadlines later, kindly provide the following documents with your Bid. If not submitted with this Bid, the documents requested below must be received prior to award.

____ A copy of the State of New Jersey Department of the Treasury, Division of Revenue, **Business Registration Certificate ("BRC")** should be included with the bids, but it must be received by the County prior to the award of the contract. The BRC provided must show that the Bidder was registered at the time of receipt of bids or the bid will be rejected.

____ A copy of the State of New Jersey Department of the Treasury, Division of Revenue, **Business Registration Certificate ("BRC")** of all named subcontractors pursuant to NJSA 40A:11-16 should be included with the bid, but the BRC(s) must be received by the County prior to the award of the contract. Each subcontractor's certificate provided must show that the subcontractor was registered at the time of the receipt of bids or the bid will be rejected.

_____ Bidder Signature Page

_____ Affirmative Action Requirement

_____Experience Statement

_____Certificate of Bidder showing ability to perform Contract

_____Non-Collusion Affidavit – Fill out completely and notarize

_____Certificates from New Jersey Department of Labor and Workforce and Workforce Development – Public Works Contractor Registration Act. **(Only for certain types of work)**

_____Americans with Disabilities Act

_____Statement of Bidder's Qualifications

_____Contractor Performance Record

_____Prior Negative Experience Questionnaire

_____Contractor's Certification of Compliance – New Jersey Prevailing Wage Act

_____Certificate of Insurance Statement

_____Collection of Use Tax on Sales to Local Government Statement

_____Acknowledgment of Project Labor Agreement (PLA)

_____Time of Completion

_____Federal Non-Debarment Certification

_____Byrd Anti-Lobbying Amendment

_____Certification Regarding Lobbying

_____Disclosure of Lobbying Activities (LLL Form)

I HAVE TAKEN THE FOLLOWING ACTIONS: (Please initial)

_____I have visited the site (not mandatory)

_____I have not visited the site

_____attended the Pre-Bid Meeting **(Where applicable)**

_____Reviewed the Contract Documents (including any permits the County or its professionals may have obtained), Work, Site, Locality, and Local Conditions and Laws and Regulations that in any manner may affect Cost, Progress, Performance or Furnishing of Work.

_____Reviewed Bond Requirements

_____Provided Proof of Compliance with New Jersey Prevailing Wage Act

_____Reviewed Form of Owner/Contractor Agreement and General Conditions to the Contract

NOTE: QUESTIONS PERTAINING TO THIS BID ARE TO BE DIRECTED TO THE DIVISION OF PURCHASING AT ucbids@ucnj.org.

BIDDING DOCUMENTS

The Bidding Documents consist of the following items:

- **ADDENDA, if issued**
- **INSTRUCTION TO BIDDERS**
- **BID FORM**
- **OWNER-CONTRACTOR AGREEMENT (AIA 101) AND GENERAL CONDITIONS (AIA 201)**
- **SPECIFICATIONS: As outlined in the Table of Contents and included in the specifications.**
- **DRAWINGS: As per List of Drawings, indicated on the Project Title Sheet.**

BID FORM

I/We have carefully examined the all the Bidding Documents for bid for the

Clark Reservoir Improvements
Clark, County of Union, New Jersey

that is on file in the Union County Division of Engineering. The County recommends that the Bidder inspect the site of the Project The Bidder will contract to do all the work and furnish all materials mentioned in Bidding Documents. Work will be accomplished in the manner prescribed therein.

Bid Forms must be completed legibly. The prices in the Bid Form shall be typed or written in pen and ink. Erasures or alterations must be initialed by the bidder in ink. The Unit Price and Amount of each item on the form must be stated in numerals. In case of a conflict unit prices shall take precedence over total price extensions, and the sum of individual items, including unit prices multiplied by estimated quantities, and/or individual lump sum and/or allowance amounts will take precedence over the Total Bid or Deletion Item Bid price.

BASE BID ITEMS:

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
1	MOBILIZATION	LS	LUMP SUM		
2	FIELD OFFICE TYPE B	UNIT	1		
3	SILT FENCE	LF	13,185		
4	HAYBALE	UNIT	33		
5	INLET FILTER, TYPE 1	SF	264		
6	FLOATING TURBIDITY BARRIER, TYPE 1	LF	257		
7	CONSTRUCTION DRIVEWAY	TON	1,245		
8	BREAKAWAY BARRICADE (IF AND WHERE DIRECTED)	UNIT	5		
9	DRUM (IF AND WHERE DIRECTED)	UNIT	20		
10	TRAFFIC CONE (IF AND WHERE DIRECTED)	UNIT	50		
11	CONSTRUCTION SIGNS (IF AND WHERE DIRECTED)	SF	60		
12	TRAFFIC DIRECTOR, MUNICIPAL POLICE ALLOWANCE (IF AND WHERE DIRECTED)	ALL	ALLOWANCE	$100,000.00	$100,000.00
13	FLASHING ARROW BOARD, 4'x8' (IF AND WHERE DIRECTED)	UNIT	1		

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
14	PORTABLE VARIABLE MESSAGE SIGN (IF AND WHERE DIRECTED)	UNIT	2		
15	TRAFFIC CONTROL TRUCK WITH MOUNTED CRASH CUSHION (IF AND WHERE DIRECTED)	UNIT	1		
16	ASPHALT PRICE ADJUSTMENT (IF AND WHERE DIRECTED)	DOLL.	DOLLARS	$13,500.00	$13,500.00
17	FUEL PRICE ADJUSTMENT (IF AND WHERE DIRECTED)	DOLL.	DOLLARS	$41,000.00	$41,000.00
18	VIBRATION MONITORING	LS	LUMP SUM		
19	CLEARING SITE	LS	LUMP SUM	$35,000.00	$35,000.00
20	REMOVE AND RESET BRICK WALK/PAVERS	SF	36		
21	STRIPPING	SY	41,775		
22	EXCAVATION, UNCLASSIFIED	CY	18,171		
23	DISPOSING OF HAZARDOUS MATERIAL (IF AND WHERE DIRECTED)	ALL	ALLOWANCE	$750,000.00	$750,000.00
24	DISPOSING OF REGULATED MATERIAL (IF AND WHERE DIRECTED)	ALL	ALLOWANCE	$500,000.00	$500,000.00
25	EXCAVATION, TEST PIT (IF AND WHERE DIRECTED)	CY	550		
26	I-14 SOIL AGGREGATE	CY	735		
27	FISH COLLECTION, RELOCATION, AND RESTOCKING	LS	LUMP SUM		
28	LAKE EXCAVATION INCLUDING LAKE LOWERING, DEWATERING, AND TRANSPORTATION AND DISPOSAL OF DREDGE SPOILS	CY	153,566		
29	MAINTENANCE OF TEMPORARY FLOW DIVERSION CHANNEL	LS	LUMP SUM		
30	ALLOWANCE FOR LABORATORY TEST / MATERIAL TESTING	ALL	ALLOWANCE	$500,000.00	$500,000.00
31	2" TO 2-1/2" CLEAN STONE SUBBASE, INCLUDING EXCAVATION, UNCLASSIFIED (IF AND WHERE DIRECTED) (MINIMUM UNIT PRICE BID $10.00/CY)	CY	4,996		

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
32	GEOTEXTILE ROADWAY STABILIZATION (IF AND WHERE DIRECTED)	SY	8,822		
33	DENSE GRADED AGGREGATE BASE COURSE (MINIMUM UNIT PRICE BID $10.00/CY)	CY	1,312		
34	HMA MILLING, 3" OR LESS	SY	1,571		
35	TACK COAT	GAL	1,411		
36	PRIME COAT	GAL	4,699		
37	POLYMERIZED JOINT ADHESIVE	LF	12,119		
38	HOT MIX ASPHALT 9.5M64 SURFACE COURSE	TON	1,107		
39	HOT MIX ASPHALT 19M64 BASE COURSE	TON	2,772		
40	PERMANENT SHEETING, DPW WALL	SF	8,580		
41	FURNISHING EQUIPMENT FOR DRIVING PILES, DPW WALL	LS	LUMP SUM		
42	NO ITEM				
43	FURNISHING EQUIPMENT FOR DRIVING PILES, KAYAK STORAGE PIER	LS	LUMP SUM		
44	TEST PILE, FURNISHED, STEEL PILE, W 30 X 211	LF	110		
45	TEST PILE, FURNISHED, TIMBER PILE, 12" DIAMETER	LF	55		
46	TEST PILE, FURNISHED, STEEL H-PILE, HP 10 X 42	LF	165		
47	TEST PILE, DRIVEN, STEEL PILE, W 30 X 211	LF	110		
48	TEST PILE, DRIVEN, TIMBER PILE, 12" DIAMETER	LF	55		
49	TEST PILE, DRIVEN, STEEL H-PILE, HP 10 X 42	LF	165		
50	DYNAMIC PILE LOAD TEST	UNIT	6		
51	STEEL PILE, FURNISHED, W 30 X 211, DPW WALL	LF	3,432		

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
52	STEEL PILE, DRIVEN, W 30 X 211, DPW WALL	LF	3,432		
53	NO ITEM				
54	TIMBER PILE, FURNISHED, 12" DIAMETER, KAYAK STORAGE PIER	LF	1,100		
55	NO ITEM				
56	TIMBER PILE, DRIVEN, 12" DIAMETER, KAYAK STORAGE PIER	LF	1,100		
57	CONSTRUCT REINFORCED CONCRETE BRIDGE FOUNDATION "A", INCLUDING COFFERDAMS, EXCAVATION, STONE BASE, REINFORCEMENT STEEL, CONCRETE FOOTINGS, ABUTMENTS, WINGWALLS, BACKFILL AND RAILINGS	LS	LUMP SUM		
58	FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE "A"	LS	LUMP SUM		
59	CONSTRUCT REINFORCED CONCRETE BRIDGE FOUNDATION "B", INCLUDING COFFERDAMS, EXCAVATION, STONE BASE, REINFORCEMENT STEEL, CONCRETE FOOTINGS, ABUTMENTS, WINGWALLS, BACKFILL AND RAILINGS	LS	LUMP SUM		
60	FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE "B"	LS	LUMP SUM		
61	CONSTRUCT REINFORCED CONCRETE BRIDGE FOUNDATION "C", INCLUDING COFFERDAMS, EXCAVATION, STONE BASE, REINFORCEMENT STEEL, CONCRETE FOOTINGS, ABUTMENTS, WINGWALLS, BACKFILL AND RAILINGS	LS	LUMP SUM		
62	FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE "C"	LS	LUMP SUM		

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
63	EXCAVATION, UNCLASSIFIED, BRIDGE "E"	CY	1,342		
64	I-9 SOIL AGGREGATE, BRIDGE "E"	CY	1,122		
65	COARSE AGGREGATE, SIZE NO.57, BRIDGE "E"	CY	88		
66	TEMPORARY COFFERDAM, BRIDGE E	LS	LUMP SUM		
67	REINFORCEMENT STEEL, GALVANIZED, BRIDGE "E"	LB	47,300		
68	CONCRETE FOOTING, BRIDGE "E"	CY	198		
69	CONCRETE WINGWALL, BRIDGE "E"	CY	110		
70	CONCRETE ABUTMENT WALL, BRIDGE "E"	CY	55		
71	FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE "E"	LS	LUMP SUM		
72	EXCAVATION, UNCLASSIFIED, BRIDGE "F"	CY	2,123		
73	I-9 SOIL AGGREGATE, BRIDGE "F"	CY	935		
74	COARSE AGGREGATE, SIZE NO.57, BRIDGE "F"	CY	110		
75	TEMPORARY COFFERDAM, BRIDGE F	LS	LUMP SUM		
76	FURNISHING EQUIPMENT FOR DRIVING PILES, BRIDGE "F"	LS	LUMP SUM		
77	STEEL H-PILE, FURNISHED, HP 10 X 42, BRIDGE "F"	LF	4,125		
78	STEEL H-PILE, DRIVEN, HP 10 X 42, BRIDGE "F"	LF	4,125		
79	REINFORCEMENT STEEL, GALVANIZED, BRIDGE "F"	LB	154,000		
80	CONCRETE FOOTING, BRIDGE "F"	CY	374		
81	CONCRETE WINGWALL WITH STONE FORMLINERS, BRIDGE "F"	CY	77		
82	CONCRETE ABUTMENT WALL WITH STONE FORMLINERS, BRIDGE "F"	CY	66		
83	CONCRETE PIER WALL WITH STONE FORMLINERS, BRIDGE "F"	CY	275		

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
84	FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE "F"	LS	LUMP SUM		
85	CONSTRUCT REINFORCED CONCRETE FOOTINGS, WALLS AND BEAMS FOR BOARDWALKS AT BOAT RAMP, INCLUDING SUPPORT OF EXCAVATION, EXCAVATION, STONE BASE, REINFORCEMENT STEEL AND BACKFILL	CY	37		
86	NO ITEM				
87	CONSTRUCT BOARDWALKS FOR BOAT RAMP	SF	440		
88	NO ITEM				
89	NO ITEM				
90	CONSTRUCT KAYAK STORAGE PIER	SF	957		
91	MODULAR BLOCK RETAINING WALL	SF	429		
92	NO ITEM				
93	NO ITEM				
94	NO ITEM				
95	6" HIGH DENSITY POLYETHYLENE PIPE	LF	27		
96	8" HIGH DENSITY POLYETHYLENE PIPE	LF	49		
97	15" HIGH DENSITY POLYETHYLENE PIPE	LF	280		

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
98	15" REINFORCED CONCRETE PIPE, CLASS V	LF	951		
99	18" REINFORCED CONCRETE PIPE, CLASS V	LF	161		
100	24" REINFORCED CONCRETE PIPE, CLASS V	LF	583		
101	NO ITEM				
102	NO ITEM				
103	NO ITEM				
104	36" REINFORCED CONCRETE PIPE, CLASS V	LF	22		
105	DENSE GRADED AGGREGATE FOR PIPE TRENCH (IF AND WHERE DIRECTED)	CY	1,653		
106	FURNISH & INSTALL 10" DIA. HIGH DENSITY POLYETHYLENE PIPE (HDPE) CROSSINGS WITH FIELD MITERED FLARED ENDS	LF	237		
107	MANHOLE, 4' SQUARE, STORM SEWER	UNIT	20		
108	MANHOLE, 4' SQUARE, STORM SEWER, SHALLOW CASTING	UNIT	1		
109	OUTLET CONTROL STRUCTURE	UNIT	2		
110	SUBSURFACE INFILTRATION BASIN #1, FURNISH AND INSTALL COMPLETE SUBSURFACE INFILTRATION BASIN, INCLUDING EXCAVATION AND BACKFILL, GEOTEXTILES, DEWATERING, NO. 57 STONE AGGREGATE, I-9 SOIL, PIPING, STRUCTURES, AND ALL ASSOCIATED WORK AND ALL MATERIALS	LS	LUMP SUM		

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
111	SUBSURFACE INFILTRATION BASIN #2, FURNISH AND INSTALL COMPLETE SUBSURFACE INFILTRATION BASIN, INCLUDING EXCAVATION AND BACKFILL, GEOTEXTILES, DEWATERING, NO. 57 STONE AGGREGATE, I-9 SOIL, PIPING, STRUCTURES, AND ALL ASSOCIATED WORK AND ALL MATERIALS	LS	LUMP SUM		
112	REINFORCED CONCRETE HEADWALL	CY	24		
113	CONTECH FILTERRA HC PEAK DIVERSION 6' X 6' MEDIA BAY, OR APPROVED EQUAL	UNIT	5		
114	CONTECH FILTERRA HC PEAK DIVERSION 6' X 8' MEDIA BAY, OR APPROVED EQUAL	UNIT	1		
115	CONTECH FILTERRA HC PEAK DIVERSION 6' X 10' MEDIA BAY, OR APPROVED EQUAL	UNIT	1		
116	CONTECH FILTERRA HC PEAK DIVERSION 7' X 10' MEDIA BAY, OR APPROVED EQUAL	UNIT	1		
117	CONTECH FILTERRA HC PEAK DIVERSION 8' X 10.5' MEDIA BAY, OR APPROVED EQUAL	UNIT	2		
118	CONTECH MODULAR WETLAND 8' X 16', OR APPROVED EQUAL	UNIT	1		
119	HIGH CAPACITY, KRAKEN OR APPROVED EQUAL FILTER, 72” MANHOLE	UNIT	1		
120	18” HIGH DENSITY POLYETHYLENE PIPE	LF	97		
121	24” HIGH DENSITY POLYETHYLENE PIPE	LF	29		
122	LAWN INLET	UNIT	5		
123	HIGH CAPACITY KRAKEN FILTER PEAK DIVERSION 4'X6' VAULT, OR APPROVED EQUAL	UNIT	1		
124	INLET, TYPE D, 6" HEAD	UNIT	1		

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
125	INLET, TYPE E	UNIT	3		
126	INLET, TRENCH DRAIN	LF	50		
127	NO ITEM				
128	RESET EXISTING CASTING	UNIT	3		
129	RIPRAP STONE SLOPE PROTECTION, 12" THICK (D50 = 6")	SY	49		
130	RIPRAP STONE CHANNEL PROTECTION, 36" THICK (D50 = 6")	SY	7		
131	RIPRAP STONE SLOPE PROTECTION, 48" THICK (D50 = 24")	SY	219		
132	RIPRAP STONE CHANNEL PROTECTION, 36" THICK (D50 = 24")	SY	123		
133	GABION MATTRESS	CY	22		
134	NO ITEM				
135	NO ITEM				
136	TEMPORARY CHAIN LINK FENCE, 10' HIGH (IF AND WHERE DIRECTED)	LF	475		
137	TEMPORARY 10' HIGH BY 24' WIDE CHAIN LINK FENCE TWO-SECTION GATE (IF AND WHERE DIRECTED)	UNIT	1		
138	NO ITEM				
139	FURNISH AND INSTALL 6' HIGH BLACK VINYL COATED CHAIN LINK FENCE	LF	829		
140	FURNISH AND INSTALL POST AND RAIL FENCE	LF	282		
141	FURNISH AND INSTALL TIMBER ACCESS GATE, DOUBLE LEAF, 20' WIDE	UNIT	1		
142	NO ITEM				
143	4' WIDE DECORATIVE STEEL DOCK GATE INCLUDING CONCRETE FOUNDATION	UNIT	1		

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
144	WOODEN SNOW FENCE	LF	2,848		
145	FURNISH AND INSTALL 8’ WIDE AGGREGATE WALKING TRAIL INCLUDING 2” THICK QUARRY PROCESS CRUSHED CLEAN STONE NJDOT NO. 10 SCREENINGS, 4” THICK QUARRY PROCESS COARSE CLEAN AGGREGATE NJDOT TYPE 57, SUBSURFACE GEOTEXTILE FABRIC, METAL EDGING AND ALL ASSOCIATED WORK	SY	6,169		
146	CONCRETE SIDEWALK, 4" THICK	SF	1,533		
147	HOT MIX ASPHALT SIDEWALK, 6" THICK	SY	2,158		
148	HOT MIX ASPHALT DRIVEWAY, 6" THICK, COMMERCIAL	SY	547		
149	CONCRETE DRIVEWAY, REINFORCED, 10" THICK, COMMERCIAL	SF	264		
150	NO ITEM				
151	DETECTABLE WARNING SURFACE	SY	9		
152	GRADE, COMPACT AND TOP DRESS WITH NJDOT NO. 57 TYPE STONE, UP TO 4" THICK	SY	170		
153	9"x20" CONCRETE VERTICAL CURB	LF	247		
154	GRANITE BLOCK CURB	LF	3,837		
155	SLOPED GRANITE BLOCK CURB	LF	282		
156	RESET BEAM GUIDE RAIL WITH EXISTING POSTS	LF	50		
157	TRAFFIC STRIPES, LONG-LIFE, "THERMOPLASTIC", 4" WIDE, WITH GLASS BEADS	LF	2,719		

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
158	TRAFFIC STRIPES, LONG-LIFE, "THERMOPLASTIC", 8" WIDE, WITH GLASS BEADS	LF	132		
159	TRAFFIC STRIPES, LONG-LIFE, "THERMOPLASTIC", 12" WIDE, WITH GLASS BEADS	LF	97		
160	TRAFFIC STRIPES, LONG LIFE, "THERMOPLASTIC", 24" WIDE, WITH GLASS BEADS	LF	148		
161	TRAFFIC MARKINGS, SYMBOLS, LONG-LIFE THERMOPLASTIC"	SF	213		
162	FURNISH AND INSTALL REGULATORY AND WARNING SIGNS	SF	75		
163	HANDICAPPED PARKING SIGN ASSEMBLY INCLUDING SECONDARY SIGNS, POSTS, AND ALL APPURTENANCES	UNIT	4		
164	TEMPORARY TRENCH REPAIR	SY	159		
165	ROADWAY TRENCH REPAIR	SY	159		
166	MISCELLANEOUS CONCRETE, CLASS B (IF AND WHERE DIRECTED)	CY	50		
167	NO ITEM				
168	NO ITEM				
169	REMOVABLE BOLLARD (IF AND WHERE DIRECTED)	UNIT	10		
170	FURNISH AND INSTALL WASTE AND RECYCLING CONTAINERS, INCLUDING LINER, CONCRETE PAD AND ALL APPURTENANCES (IF AND WHERE DIRECTED)	UNIT	10		
171	FURNISH AND INSTALL BENCH, 6' LONG INCLUDING CONCRETE PAD AND ALL APPURTENANCES (IF AND WHERE DIRECTED)	UNIT	10		

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
172	NO ITEM				
173	NO ITEM				
174	FURNISH AND INSTALL 60' ALUMINUM GANGWAY, INCLUDING DECKING, CONNECTION HARDWARE, HANDRAIL, TRANSITION PLATE, UTILITY CONNECTION HARDWARE AND ALL APPURTENANCES	UNIT	3		
175	FURNISH AND INSTALL FLOATING DOCK SYSTEM (A), INCLUDING CONNECTIONS, HARDWARE, CLEATS, SECURITY CURBING, LADDER, TIMBER PILES, TIMBER PILE CAPS, AND ALL APPURTENANCES	LS	LUMP SUM		
176	FURNISH AND INSTALL FLOATING DOCK SYSTEM (B), INCLUDING CONNECTIONS, HARDWARE, UTILITY CHANNELS, LIGHT/POWER PEDESTALS, CLEATS, SECURITY CURBING, LADDER, TIMBER PILES, TIMBER PILE CAPS, KAYAK LAUNCH, DRIVE THROUGH ADA KAYAK LAUNCH AND ALL APPURTENANCES	LS	LUMP SUM		
177	NO ITEM				
178	FURNISH AND INSTALL WATERFRONT ARTICULATED PRE-CAST CONCRETE MATTRESS BOAT RAMP AT CENTRAL LAKE WITH STONE SUB-BASE, GEOTEXTILE FABRIC, GEOGRID, ANCHORS, SHEETING, STABILIZATION, AND ALL APPURTENANCES	LS	LUMP SUM		
179	NO IEM				

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
180	KAYAK STORAGE UNIT	UNIT	1		
181	TRAIL MARKER (IF AND WHERE DIRECTED)	UNIT	10		
182	GRASS PAVER WALKING TRAIL, 6" THICK	SF	1,346		
183	NO ITEM				
184	WATERWAY BOAT BARRIER	LF	478		
185	NO ITEM				
186	NO ITEM				
187	48" HIGH, 30" WIDE STONE VENEER PILLAR (INCLUDING FOOTINGS)	UNIT	2		
188	NO ITEM				
189	RESET WATER VALVE BOX TO GRADE (IF AND WHERE DIRECTED)	UNIT	1		
190	FURNISH AND INSTALL 8” DIA. CEMENT LINED DIP CLASS 56 WATER MAIN (MINIMUM 4’-0” BELOW GRADE) INCLUDING EXCAVATION, BACKFILL, NJDOT NO. 57 STONE BEDDING TO 1" OVER TOP OF THE PIPE, GEOTEXTILE FILTER FABRIC, FITTINGS, CONCRETE ENCASEMENT, THRUST BLOCKS, RESTRAINING RODS AND COLLARS, TESTING, DISINFECTING, APPURTENANCES AND ALL ASSOCIATED WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS	LF	1,205		
191	NO ITEM				

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
192	FURNISH AND INSTALL 8” BURIED M.J. GATE VALVE AND VALVE BOX WITHIN A PROPOSED WATER MAIN, INCLUDING BEDDING, FITTINGS, SPOOL PIECES, EXCAVATION, BACKFILL, APPURTENANCES, AND ALL ASSOCIATED WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS	UNIT	4		
193	FURNISH AND INSTALL NEW FIRE HYDRANT ASSEMBLY ON NEW WATER MAIN WITH 6” ISOLATION GATE VALVE AND BOX, 6” CEMENT LINED DIP, EXCAVATION, BEDDING, RESTRAIN RODDING, THRUST BLOCKS, POLYETHYLENE FABRIC, GRANULAR BACKFILL, AND ALL OTHER ASSOCIATED WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS	UNIT	3		
194	NO ITEM				
195	FURNISH AND INSTALL 2" HIGH DENSITY POLYETHYLENE PIPE DR-11 WATER SERVICE FROM ALUMINUM HEATED ENCLOSURE TO CURB BOX, INCLUDING EXCAVATION, BACKFILL AND CONNECTION TO PROPOSED WATER MAIN, FITTINGS AND APPURTENANCES	LF	33		
196	NO ITEM				

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
197	INSTALL ALUMINUM HEATED ENCLOSURE WITH INSULATED WALLS (20'L X 8'W X 6.5'H) INCLUDING 4” DUCTILE IRON PIPE, 8" DUCTILE IRON PIPE, DIP FITTINGS, 4" RPZ BACKFLOW PREVENTION ASSEMBLY, 8" BACKFLOW PREVENTION ASSEMBLY, 4" GATE VALVES, 8" GATE VALVES, PIPE PAINTING, METER INSTALLATION, CONCRETE SLAB, EXCAVATION, BACKFILLING AND STONE BEDDING IN ACCORDANCE WITH THE NEW JERSEY AMERICAN WATER DETAIL, INCLUDING ALL WORK, LABOR, MATERIALS AND ALL ELSE NECESSARY AND INCIDENTAL THERETO	LS	LUMP SUM		
198	FURNISH AND INSTALL 4” DIA. CEMENT LINED DIP CLASS 56 WATER SERVICE (MINIMUM 4’-0” BELOW GRADE) INCLUDING EXCAVATION, BACKFILL, NJDOT NO. 57 STONE BEDDING TO 1" OVER TOP OF THE PIPE, GEOTEXTILE FILTER FABRIC, FITTINGS, CONCRETE ENCASEMENT, THRUST BLOCKS, RESTRAINING RODS AND COLLARS, TESTING, DISINFECTING, APPURTENANCES AND ALL ASSOCIATED WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS	LF	1,169		
199	FURNISH AND INSTALL 4” BURIED M.J. GATE VALVE AND VALVE BOX WITHIN A PROPOSED WATER MAIN, INCLUDING BEDDING, FITTINGS, SPOOL PIECES, EXCAVATION, BACKFILL, APPURTENANCES, AND ALL ASSOCIATED WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS	UNIT	2		

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
200	FURNISH AND INSTALL 6’ DIA PRECAST CONCRETE SANITARY DROP, DOGHOUSE SEWER MANHOLE INCLUDING EXCAVATION, REMOVAL OF EXISTING MANHOLE, 6” PVC SDR-35 SANITARY SEWER LATERAL STUB AND CAP, 6” OF NJDOT NO. 57 STONE BEDDING, CONCRETE MAT, CASTING AND COVER, LADDER RUNGS, FLEXIBLE MECHANICAL CONNECTIONS, AND DEWATERING WHERE REQUIRED, BACKFILLING AND ALL ASSOCIATED WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS	UNIT	1		
201	FURNISH AND INSTALL 4" SCH80 PVC CONDUIT	LF	4,719		
202	FURNISH AND INSTALL 2" SCH80 PVC CONDUIT	LF	5,814		
203	FURNISH AND INSTALL 1" SCH80 PVC CONDUIT	LF	1,210		
204	NO ITEM				
205	NO ITEM				
206	NO ITEM				
207	FURNISH AND INSTALL 4" RIGID ALUMINUM CONDUIT	LF	743		
208	NO ITEM				
209	FURNISH AND INSTALL XHHW-2 #6 AWG WIRE	LF	831		
210	FURNISH AND INSTALL UTILITY TRANSFORMER CONCRETE PAD, 800A MAIN DISTRIBUTION PANEL, 100A LIGHTING DISTRIBUTION PANEL, REINFORCED CONCRETE PAD, WOODEN PERIMETER FENCE, AND ALL ASSOCIATED MISCELLANEOUS COMPONENTS NECESSARY FOR FULL SYSTEMS INTEGRATION AND OPERATION	LS	LUMP SUM		

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
211	NO ITEM				
212	FURNISH AND INSTALL TYPE W #2/0 AWG WIRE	LF	1,254		
213	FURNISH AND INSTALL TYPE W #6 AWG WIRE	LF	627		
214	FURNISH AND INSTALL XHHW-2 #10AWG	LF	4,895		
215	FURNISH AND INSTALL XHHW-2 #8AWG	LF	6,435		
216	NO ITEM				
217	FURNISH AND INSTALL XHHW-2 #2AWG	LF	2035		
218	NO ITEM				
219	NO ITEM				
220	FURNISH AND INSTALL XHHW-2 #600KMCIL WIRE	LF	176		
221	FURNISH AND INSTALL 3/4" X 10' COPPER GROUND ROD	UNIT	1		
222	NO ITEM				
223	FURNISH AND INSTALL XHHW-2 #2/0 AWG WIRE	LF	1,601		
224	FURNISH AND INSTALL 24"X 24" X 16" ELECTRICAL HANDHOLE AND ALL APPURTENANCES	UNIT	17		
225	FURNISH AND INSTALL 36"X 36" X 36" ELECTRICAL HANDHOLE AND ALL APPURTENANCES	UNIT	2		
226	FURNISH AND INSTALL 48"X 48" X 36" ELECTRICAL HANDHOLE AND ALL APPURTENANCES	UNIT	3		
227	ELECTRICAL TRENCHING	CY	2,200		
228	FURNISH AND INSTALL SINGLE POLE MOUNTED LED LUMINAIRE, INCLUDING CONDUIT, WIRE, POLE, CONCRETE FOUNDATIONS AND ALL OTHER ASSOCIATED WORK	UNIT	15		

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
229	TRAIL SECURITY SYSTEM ALLOWANCE	ALL	ALLOWANCE	$100,000.00	$100,000.00
230	FURNISH AND INSTALL FULLY AUTOMATIC IRRIGATION SYSTEM FOR ALL OPEN LAWNS AND LANDSCAPED BEDS WHERE INDICATED, INCLUDING LATERALS, HEADS, FITTINGS, NOZZLES, BOOSTER PUMPS, IRRIGATION CONTROLLER, IRRIGATION MAIN, UTILITY CONNECTIONS, ELECTRICAL CIRCUIT AND ALL HARDWARE NECESSARY FOR A COMPLETE INSTALLATION	LS	LUMP SUM		
231	SELECTIVE CLEARING	SY	41,888		
232	SELECTIVE THINNING	SY	1,228		
233	TOPSOIL SPREADING, 4" THICK	SY	24,020		
234	BORROW TOPSOIL (IF AND WHERE DIRECTED)	CY	100		
235	FERTILIZING AND SEEDING, TYPE D	SY	19,676		
236	FERTILIZING AND SEEDING, MODIFIED ERNMX-123	SY	1,219		
237	FERTILIZING AND SEEDING, MODIFIED ERNMX-122	SY	2,636		
238	NO ITEM				
239	TOPSOIL STABILIZATION, TYPE 1 MAT	SY	1,269		
240	STRAW MULCHING (IF AND WHERE DIRECTED)	SY	23,531		
241	RIVER BIRCH, 2"-2.5" CAL., B&B, 8'-10' HT.	UNIT	100		
242	SWEETSHADE YELLOWWOOD, 2"-2.5" CAL., B&B, 8'-10' HT.	UNIT	43		

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
243	BLACKGUM, 2.5"-3" CAL., B&B, 8' - 10' HT.	UNIT	107		
244	SWAMP WHITE OAK, 2"-2.5" CAL., B&B, 8' - 10' HT.	UNIT	90		
245	SPLENDID RED BUCKEYE 2"-2.5" CAL., B&B, 7' - 8' HT.	UNIT	3		
246	AMERICAN HORNBEAM 2"-2.5" CAL., B&B, 7' - 8' HT.	UNIT	7		
247	FOREST PANSY EASTERN REDBUD 2"-2.5" CAL., B&B, 7' - 8' HT.	UNIT	11		
248	GREEN SHADOW SWEETBAY MAGNOLIA 2"-2.5" CAL., B&B, 7' - 8' HT.	UNIT	6		
249	SASSAFRAS 2"-2.5" CAL., B&B, 7' - 8' HT.	UNIT	5		
250	LEYLAND CYPRESS, B&B, 8' - 10' HT.	UNIT	22		
251	AMERICAN HOLLY, B&B, 8' - 10' HT.	UNIT	27		
252	CORCORCOR EASTERN RED CEDAR, B&B, 8' - 10' HT.	UNIT	47		
253	BRACKEN'S BROWN BEAUTY SOUTHERN MAGNOLIA, B&B, 7'-8" HT.	UNIT	10		
254	LITTLE GEM SOUTHERN MAGNOLIA, B&B, 7'-8" HT.	UNIT	11		
255	BOTTLEBRUSH BUCKEYE, #5 CAN, 30"-36" HT.	UNIT	30		
256	HUMMINGBIRD SUMMERSWEET, #3 CAN, 18"-24" HT.	UNIT	7		
257	DWARF FOTHERGILLA, #3 CAN, 18"-24" HT.	UNIT	10		
258	INKBERRY HOLLY, #5 CAN, 30"-36" HT.	UNIT	99		
259	SHAMROCK INKBERRY HOLLY, #3 CAN, 18"-24" HT.	UNIT	3		
260	ROSEBAY RHODODENDRON, #5 CAN, 30"-36" HT.	UNIT	71		

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
261	MAPLELEAF VIBURNUM, #5 CAN, 30"-36" HT.	UNIT	25		
262	BLACKHAW VIBURNUM, #5 CAN, 30"-36" HT.	UNIT	19		
263	YELLOWROOT, #5 CAN, 30"-36" HT.	UNIT	66		
264	LIVE STAKES, CORNUS AMOMUM, SILKY DOGWOOD (TYPE 21.D)	UNIT	780		
265	RIPRAP STONE SLOPE PROTECTION, 30" THICK (D50 = 15")	SY	333		
266	RIPRAP STONE CHANNEL PROTECTION, 36" THICK (D50 = 15")	SY	69		
267	NO ITEM				
268	NO ITEM				
269	BALD CYPRESS 2"-2.5" CAL., B&B, 8' - 10' HT.	UNIT	31		
270	NO ITEM				
271	NO ITEM				
272	NO ITEM				
273	NO ITEM				
274	NO ITEM				
275	FERTILIZING AND SEEDING, MODIFIED ERNMX-280	SY	490		
276	NO ITEM				
277	OCTOBER GLORY RED MAPLE 2"-2.5" CAL., B&B	UNIT	64		
278	SWEETGUM, 2"-2.5" CAL., B&B	UNIT	85		
279	PIN OAK, 2"-2.5" CAL., B&B	UNIT	90		

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
280	FURNISH AND INSTALL TIMBER ACCESS GATE, DOUBLE LEAF 26' WIDE	UNIT	1		
281	NO ITEM				
282	NO ITEM				
283	NO ITEM				
284	NO ITEM				
285	NO ITEM				
286	BID CONTINGENCY ALLOWANCE (To be used if and when directed by the County per Section 1 of the Project Specifications) (Bid Contingency Allowance may include one-half of one percent of contract amount set aside for local training if and when directed by the County.)	ALL	ALLOWANCE	$1,000,000.00	$1,000,000.00
287	NO ITEM				
288	NO ITEM				
289	STATIC PILE LOAD TEST	UNIT	2		

TOTAL OF PRICES BID:

_____ _____

Written Figures

ADDITION ITEM 2-B (SHALL BE USED IN CONJUNCTION WITH DELETION ITEM #2):

ITEM NO	DESCRIPTION	UNIT	CONTRACT QUANTITY	UNIT PRICE	AMOUNT
ADD. 2-1	MSE RETAINING WALL	SF	2,827		

TOTAL OF PRICE ADD BID ITEM:

_____ _____

Written Figure

NAME OF BIDDER: _____

ORIGINAL SIGNATURE: _____

PRINTED NAME AND TITLE: _____

DATE: _____

DELETION ITEMS

All Bidders are advised that Union County has a limited budget for the construction of this Project. In order to minimize time delays in the commencement of the contract and the inconvenience to all Bidders that normally occurs when bids for projects exceed their respective budgets, the Owner has also included deletion items which may be utilized by the Owner as described below.

The determination of the low bid shall be made based on the total base bid. Where necessary to reduce the Contract price to be within the Project budget, the low bid shall be determined based on the total base bid and the least amount of Deletion Items in the order specified necessary to stay within the Project budget. The Contract price will be recalculated by subtracting the Deletion Item(s) from all Bidders' Base Bid price until the Contract Price is within the County's Project budget.

The same unit prices bid for the base bid items shall be utilized for the corresponding deletion items. Union County shall have the right to delete as few or as many items in numerical order (Deletion Item 1 shall be the first Deletion Item utilized and Deletion item 5 the last Deletion item utilized) as deemed necessary to stay within the Project budget.

Bidders are advised that where deletion items are composed of a delete portion and an add portion, the net deletion will constitute the difference between the total extension of the delete item and the total extension of the add item.

DELETION ITEM 1
(DEL. 1-1 TO DEL. 1-36)(PARKING LOT "A")

BASE BID ITEM	DEL. ITEM	DESCRIPTION	UNIT	DELETION QUANTITY
3	DEL. 1-1	SILT FENCE	LF	427
21	DEL. 1-2	STRIPPING	SY	3083
22	DEL. 1-3	EXCAVATION, UNCLASSIFIED	CY	1451
31	DEL. 1-4	2" TO 2-1/2" CLEAN STONE SUBBASE, INCLUDING EXCAVATION, UNCLASSIFIED (IF AND WHERE DIRECTED) (MINIMUM UNIT PRICE BID $10.00/CY)	CY	441
32	DEL. 1-5	GEOTEXTILE ROADWAY STABILIZATION (IF AND WHERE DIRECTED)	SY	1321
33	DEL. 1-6	DENSE GRADED AGGREGATE BASE COURSE (MINIMUM UNIT PRICE BID $10.00/CY)	CY	244
35	DEL. 1-7	TACK COAT	GAL	219
36	DEL. 1-8	PRIME COAT	GAL	728
37	DEL. 1-9	POLYMERIZED JOINT ADHESIVE	LF	1807
38	DEL. 1-10	HOT MIX ASPHALT 9.5M64 SURFACE COURSE	TON	172
39	DEL. 1-11	HOT MIX ASPHALT 19M64 BASE COURSE	TON	513

BASE BID ITEM NO.	DEL. ITEM	DESCRIPTION	UNIT	DELETION QUANTITY
98	DEL. 1-12	15" REINFORCED CONCRETE PIPE, CLASS V	LF	146
105	DEL. 1-13	DENSE GRADED AGGREGATE FOR PIPE TRENCH (IF AND WHERE DIRECTED)	CY	73
107	DEL. 1-14	MANHOLE, 4' SQUARE, STORM SEWER	UNIT	2
116	DEL. 1-15	CONTECH FILTERRA HC PEAK DIVERSION 7' X 10' MEDIA BAY, OR APPROVED EQUAL	UNIT	1
117	DEL. 1-16	CONTECH FILTERRA HC PEAK DIVERSION 8' X 10.5' MEDIA BAY, OR APPROVED EQUAL	UNIT	1
146	DEL. 1-17	CONCRETE SIDEWALK, 4" THICK	SF	120
147	DEL. 1-18	HOT MIX ASPHALT SIDEWALK, 6" THICK	SY	179
151	DEL. 1-19	DETECTABLE WARNING SURFACE	SY	2
153	DEL. 1-20	9"x20" CONCRETE VERTICAL CURB	LF	18
154	DEL. 1-21	GRANITE BLOCK CURB	LF	609
157	DEL. 1-22	TRAFFIC STRIPES, LONG-LIFE, "THERMOPLASTIC", 4" WIDE, WITH GLASS BEADS	LF	933
158	DEL. 1-23	TRAFFIC STRIPES, LONG-LIFE, "THERMOPLASTIC", 8" WIDE, WITH GLASS BEADS	LF	16
161	DEL. 1-24	TRAFFIC MARKINGS, SYMBOLS, LONG-LIFE THERMOPLASTIC"	SF	102
162	DEL. 1-25	FURNISH AND INSTALL REGULATORY AND WARNING SIGNS	SF	17
163	DEL. 1-26	HANDICAPPED PARKING SIGN ASSEMBLY INCLUDING SECONDARY SIGNS, POSTS, AND ALL APPURTENANCES	UNIT	2
202	DEL. 1-27	FURNISH AND INSTALL 2" SCH80 PVC CONDUIT	LF	1650
203	DEL. 1-28	FURNISH AND INSTALL 1" SCH80 PVC CONDUIT	LF	440
212	DEL. 1-29	FURNISH AND INSTALL TYPE W #2/0 AWG WIRE	LF	880
213	DEL. 1-30	FURNISH AND INSTALL TYPE W #6 AWG WIRE	LF	440

BASE BID ITEM NO.	DEL. ITEM	DESCRIPTION	UNIT	DELETION QUANTITY
224	DEL. 1-31	FURNISH AND INSTALL 24"X 24" X 16" ELECTRICAL HANDHOLE AND ALL APPURTENANCES	UNIT	1
228	DEL. 1-32	FURNISH AND INSTALL SINGLE POLE MOUNTED LED LUMINAIRE, INCLUDING CONDUIT, WIRE, POLE, CONCRETE FOUNDATIONS AND ALL OTHER ASSOCIATED WORK	UNIT	3
231	DEL. 1-33	SELECTIVE CLEARING	SY	3083
233	DEL. 1-34	TOPSOIL SPREADING, 4" THICK	SY	1438
235	DEL. 1-35	FERTILIZING AND SEEDING, TYPE D	SY	1438
240	DEL. 1-36	STRAW MULCHING (IF AND WHERE DIRECTED)	SY	1438

TOTAL DELETION ITEM 1 (DEL. 1-1 TO DEL. 1-36) $_____

DELETION ITEM 2-A
(DEL 2-1 TO DEL. 2-5)(REMOVE 160' OF RETAINING WALL – FROM STA. 28+68 – STA. 30+07 ON N. CENTRAL TRAIL)

BASE BID ITEM	DEL. ITEM	DESCRIPTION	UNIT	DELETION QUANTITY
40	DEL. 2-1	PERMANENT SHEETING, DPW WALL	SF	2591
44	DEL. 2-2	TEST PILE, FURNISHED, STEEL PILE, W 30 X 211	LF	55
47	DEL. 2-3	TEST PILE, DRIVEN, STEEL PILE, W 30 X 211	LF	55
51	DEL. 2-4	STEEL PILE, FURNISHED, W 30 X 211, DPW WALL	LF	1100
52	DEL. 2-5	STEEL PILE, DRIVEN, W 30 X 211, DPW WALL	LF	1100

TOTAL DELETION ITEM 2-A (DEL 2-1 TO DEL. 2-5) $_____

ADDITION ITEM 2-B
(ADD. 2-1)(PROPOSE MECHANICALLY STABILIZED EARTH [MSE] WALL – FROM STA. 28+68 – STA. 30+07 ON N. CENTRAL TRAIL)

BASE BID ITEM	ADD. ITEM	DESCRIPTION	UNIT	ADDITION QUANTITY
-	ADD. 2-1	MSE RETAINING WALL	SF	2,570

TOTAL ADDITION ITEM 2-B (ADD. 2-1) $_____

NET TOTAL DELETION ITEM 2 $_____

DELETION ITEM 3
(DEL 3-1 TO DEL 3-13)(BRIDGE F)

BASE BID ITEM	DEL. ITEM	DESCRIPTION	UNIT	DELETION QUANTITY
72	DEL. 3-1	EXCAVATION, UNCLASSIFIED, BRIDGE "F"	CY	2,123
73	DEL. 3-2	I-9 SOIL AGGREGATE, BRIDGE "F"	CY	935
74	DEL. 3-3	COARSE AGGREGATE, SIZE NO.57, BRIDGE "F"	CY	110
75	DEL. 3-4	TEMPORARY COFFERDAM, BRIDGE F	LS	LUMP SUM
76	DEL. 3-5	FURNISHING EQUIPMENT FOR DRIVING PILES, BRIDGE "F"	LS	LUMP SUM
77	DEL. 3-6	STEEL H-PILE, FURNISHED, HP 10 X 42, BRIDGE "F"	LF	4,125
78	DEL. 3-7	STEEL H-PILE, DRIVEN, HP 10 X 42, BRIDGE "F"	LF	4,125
79	DEL. 3-8	REINFORCEMENT STEEL, GALVANIZED, BRIDGE "F"	LB	154,000
80	DEL. 3-9	CONCRETE FOOTING, BRIDGE "F"	CY	374
81	DEL. 3-10	CONCRETE WINGWALL WITH STONE FORMLINERS, BRIDGE "F"	CY	77
82	DEL. 3-11	CONCRETE ABUTMENT WALL WITH STONE FORMLINERS, BRIDGE "F"	CY	66
83	DEL. 3-12	CONCRETE PIER WALL WITH STONE FORMLINERS, BRIDGE "F"	CY	275
84	DEL. 3-13	FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE "F"	LS	LUMP SUM

TOTAL DELETION ITEM 3 (DEL 3-1 TO DEL. 3-13) $_____

DELETION ITEM 4
(DEL. 4-1 TO DEL. 4-40)(N. CENTRAL LAKE TRAIL)

BASE BID ITEM	DEL. ITEM	DESCRIPTION	UNIT	DELETION QUANTITY
3	DEL. 4-1	SILT FENCE	LF	3,732
20	DEL. 4-2	REMOVE AND RESET BRICK WALK/PAVERS	SF	36
21	DEL. 4-3	STRIPPING	SY	9,590
22	DEL. 4-4	EXCAVATION, UNCLASSIFIED	CY	2,615
57	DEL. 4-5	CONSTRUCT REINFORCED CONCRETE BRIDGE FOUNDATION "A", INCLUDING COFFERDAMS, EXCAVATION, STONE BASE, REINFORCEMENT STEEL, CONCRETE FOOTINGS, ABUTMENTS, WINGWALLS, BACKFILL AND RAILINGS	LS	LUMP SUM
58	DEL. 4-6	FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE "A"	LS	LUMP SUM
59	DEL. 4-7	CONSTRUCT REINFORCED CONCRETE BRIDGE FOUNDATION "B", INCLUDING COFFERDAMS, EXCAVATION, STONE BASE, REINFORCEMENT STEEL, CONCRETE FOOTINGS, ABUTMENTS, WINGWALLS, BACKFILL AND RAILINGS	LS	LUMP SUM
60	DEL. 4-8	FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE "B"	LS	LUMP SUM
61	DEL. 4-9	CONSTRUCT REINFORCED CONCRETE BRIDGE FOUNDATION "C", INCLUDING COFFERDAMS, EXCAVATION, STONE BASE, REINFORCEMENT STEEL, CONCRETE FOOTINGS, ABUTMENTS, WINGWALLS, BACKFILL AND RAILINGS	LS	LUMP SUM
62	DEL. 4-10	FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE "C"	LS	LUMP SUM
63	DEL. 4-11	EXCAVATION, UNCLASSIFIED, BRIDGE "E"	CY	1,342
64	DEL. 4-12	I-9 SOIL AGGREGATE, BRIDGE "E"	CY	1,122
65	DEL. 4-13	COARSE AGGREGATE, SIZE NO.57, BRIDGE "E"	CY	88
66	DEL. 4-14	TEMPORARY COFFERDAM, BRIDGE E	LS	LUMP SUM
67	DEL. 4-15	REINFORCEMENT STEEL, GALVANIZED, BRIDGE "E"	LB	47,300

BASE BID ITEM NO.	DEL. ITEM	DESCRIPTION	UNIT	DELETION QUANTITY
68	DEL. 4-16	CONCRETE FOOTING, BRIDGE "E"	CY	198
69	DEL. 4-17	CONCRETE WINGWALL, BRIDGE "E"	CY	110
70	DEL. 4-18	CONCRETE ABUTMENT WALL, BRIDGE "E"	CY	55
71	DEL. 4-19	FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE "E"	LS	LUMP SUM
106	DEL. 4-20	FURNISH & INSTALL 10" DIA. HIGH DENSITY POLYETHYLENE PIPE (HDPE) CROSSINGS WITH FIELD MITERED FLARED ENDS	LF	15
139	DEL. 4-21	FURNISH AND INSTALL 6' HIGH BLACK VINYL COATED CHAIN LINK FENCE	LF	373
140	DEL. 4-22	FURNISH AND INSTALL POST AND RAIL FENCE	LF	282
145	DEL. 4-23	FURNISH AND INSTALL 8’ WIDE AGGREGATE WALKING TRAIL INCLUDING 2” THICK QUARRY PROCESS CRUSHED CLEAN STONE NJDOT NO. 10 SCREENINGS, 4” THICK QUARRY PROCESS COARSE CLEAN AGGREGATE NJDOT TYPE 57, SUBSURFACE GEOTEXTILE FABRIC, METAL EDGING AND ALL ASSOCIATED WORK	SY	2,573
146	DEL. 4-24	CONCRETE SIDEWALK, 4" THICK	SF	108
147	DEL. 4-25	HOT MIX ASPHALT SIDEWALK, 6" THICK	SY	359
148	DEL. 4-26	HOT MIX ASPHALT DRIVEWAY, 6" THICK, COMMERCIAL	SY	547
152	DEL. 4-27	GRADE, COMPACT AND TOP DRESS WITH NJDOT NO. 57 TYPE STONE, UP TO 4" THICK	SY	170
169	DEL. 4-28	REMOVABLE BOLLARD (IF AND WHERE DIRECTED)	UNIT	9
231	DEL. 4-29	SELECTIVE CLEARING	SY	9,590
233	DEL. 4-30	TOPSOIL SPREADING, 4" THICK	SY	5,608
235	DEL. 4-31	FERTILIZING AND SEEDING, TYPE D	SY	1,971
236	DEL. 4-32	FERTILIZING AND SEEDING, MODIFIED ERNMX-123	SY	711

BASE BID ITEM NO.	DEL. ITEM	DESCRIPTION	UNIT	DELETION QUANTITY
237	DEL. 4-33	FERTILIZING AND SEEDING, MODIFIED ERNMX-122	SY	2,631
239	DEL. 4-34	TOPSOIL STABILIZATION, TYPE 1 MAT	SY	1,076
240	DEL. 4-35	STRAW MULCHING (IF AND WHERE DIRECTED)	SY	5,311
264	DEL. 4-36	LIVE STAKES, CORNUS AMOMUM, SILKY DOGWOOD (TYPE 21.D)	UNIT	680
265	DEL. 4-37	RIPRAP STONE SLOPE PROTECTION, 30" THICK (D50 = 15")	SY	333
266	DEL. 4-38	RIPRAP STONE CHANNEL PROTECTION, 36" THICK (D50 = 15")	SY	69
275	DEL. 4-39	FERTILIZING AND SEEDING, MODIFIED ERNMX-280	SY	297
ADD. 2-1	DEL. 4-40	MSE RETAINING WALL	SF	2,570

TOTAL DELETION ITEM 4 (DEL. 4-1 TO DEL. 4-40) $_____

DELETION ITEM 5
(DEL. 5-1)(HEADWATER DREDGING)

BASE BID ITEM NO.	DEL. ITEM	DESCRIPTION	UNIT	DELETION QUANTITY
28	DEL. 5-1	LAKE EXCAVATION INCLUDING LAKE LOWERING, DEWATERING, AND TRANSPORTATION AND DISPOSAL OF DREDGE SPOILS	CY	5,191

TOTAL DELETION ITEM 5 (DEL. 5-1) $_____

CONSENT OF SURETY
TO ACCOMPANY BID

_____ (hereinafter called Surety), organized and existing under the laws of the State of _____duly authorized and qualified to transact business in the State of New Jersey, in consideration of the sum of One Dollar ($1.00), lawful money of the United States of America, to it in hand paid, receipt whereof is hereby acknowledged, and in consideration, hereby certifies and agrees that if the contract for which the attached proposal is made be awarded to_____(hereinafter called Contractor) for the performance of certain work and labor or the supplying of certain materials, or both, as more particularly set forth in said proposal and described for purposes of this instrument as a proposal for_____to the COUNTY OF UNION and if Contractor shall enter into the contract, Surety will become bound as surety for its faithful performance, labor and material payment and will provide the Contractor with a performance, labor and material payment bond in the full amount of the contract price.

NOTE:
Expiration date
Needed if Annual
Surety

_____

_____
NAME OF INSURANCE COMPANY

ADDRESS:_____
_____
_____

_____
ORIGINAL SIGNATURE
ATTORNEY-IN-FACT FOR INSURANCE CO.

NOTE: PROOF OF AUTHORITY OF OFFICERS OF SURETY COMPANY TO EXECUTE THIS DOCUMENT MUST BE SUBMITTED.

BIDDER SIGNATURE PAGE

THE BIDDER MUST READ THE FOLLOWING INSTRUCTIONS TO COMPLETE THIS PAGE:

1. If doing business under a **trade name, partnership or a sole proprietorship**, you must submit the bid under exact title of the trade name, partnership, or proprietorship, and the bid must be signed by either the **owner**, or a **partner** and **witnessed** by a **notary public**.

2. If a **Corporation**, the bid must be signed by the **President** or **Vice President** and **witnessed** by a **Corporate Secretary** (corporate title must be exact) and **affix corporate seal**. If a Corporate Secretary does not exist, President or Vice President's signature shall be witnessed by a Notary Public.

3. Other persons **authorized** by **corporate resolution** to execute agreements in its behalf may also sign the bid documents (pages). **Copy of a resolution must accompany the bid**.

4. The person who signs this bid form **must also** sign the **Non-Collusion Affidavit**.

5. You **cannot** witness your own signature.

_____
NAME OF BIDDER

_____
_____
_____
ADDRESS OF BIDDER

_____
ORIGINAL SIGNATURE
CORPORATE SECRETARY

_____
PRINT NAME AND TITLE
CORPORATE SECRETARY

TEL: _____
FAX: _____
E-Mail: _____

BY: _____
ORIGINAL SIGNATURE

Corporate Seal

_____

_____
PRINT OR TYPE NAME AND TITLE

WARNING: IF YOU FAIL TO FULLY, ACCURATELY, AND COMPLETELY SUPPLY THE INFORMATION REQUESTED ON THIS PAGE, YOUR BID MAY BE REJECTED.

STATEMENT OF OWNERSHIP DISCLOSURE

N.J.S.A. 52:25-24.2 (P.L. 1977, c.33, as amended by P.L. 2016, c.43)

This statement shall be completed, certified to, and included with all bid and proposal submissions. Failure to submit the required information is cause for automatic rejection of the bid or proposal.

Name of Organization: _____

Organization Address: _____

Part I Check the box that represents the type of business organization:

☐ Sole Proprietorship ☐ Non-Profit Corporation (skip Parts II and III, execute certification in Part IV)

☐ For-Profit Corporation (any type) ☐ Limited Liability Company (LLC)

☐ Partnership ☐ Limited Partnership ☐ Limited Liability Partnership (LLP)

☐ Other (be specific): _____

Part II

☐ The list below contains the names and addresses of all stockholders in the corporation who own 10 percent or more of its stock, of any class, or of all individual partners in the partnership who own a 10 percent or greater interest therein, or of all members in the limited liability company who own a 10 percent or greater interest therein, as the case may be. (**COMPLETE THE LIST BELOW IN THIS SECTION**)

OR

☐ No one stockholder in the corporation owns 10 percent or more of its stock, of any class, or no individual partner in the partnership owns a 10 percent or greater interest therein, or no member in the limited liability company owns a 10 percent or greater interest therein, as the case may be. (**SKIP TO PART IV**)

(Please attach additional sheets if more space is needed):

Name of Individual or Business Entity	Address

Part III DISCLOSURE OF 10% OR GREATER OWNERSHIP IN THE STOCKHOLDERS, PARTNERS OR LLC MEMBERS LISTED IN PART II

If a bidder has a direct or indirect parent entity which is publicly traded, and any person holds a 10 percent or greater beneficial interest in the publicly traded parent entity as of the last annual

federal Security and Exchange Commission (SEC) or foreign equivalent filing, ownership disclosure can be met by providing links to the website(s) containing the last annual filing(s) with the federal Securities and Exchange Commission (or foreign equivalent) that contain the name and address of each person holding a 10% or greater beneficial interest in the publicly traded parent entity, along with the relevant page numbers of the filing(s) that contain the information on each such person. **Attach additional sheets if more space is needed**.

Website (URL) containing the last annual SEC (or foreign equivalent) filing	Page #'s

Please list the names and addresses of each stockholder, partner or member owning a 10 percent or greater interest in any corresponding corporation, partnership and/or limited liability company (LLC) listed in Part II **other than for any publicly traded parent entities referenced above**. The disclosure shall be continued until names and addresses of every noncorporate stockholder, and individual partner, and member exceeding the 10 percent ownership criteria established pursuant to N.J.S.A. 52:25-24.2 has been listed. **Attach additional sheets if more space is needed.**

Stockholder/Partner/Member and Corresponding Entity Listed in Part II	Address

Part IV Certification

I, being duly sworn upon my oath, hereby represent that the foregoing information and any attachments thereto to the best of my knowledge are true and complete. I acknowledge: that I am authorized to execute this certification on behalf of the bidder/proposer; that the ***County of Union*** is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the completion of any contracts with ***County of Union*** to notify the ***County of Union*** in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the, permitting the ***County of Union*** to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print):		Title:	
Signature:		Date:	

SUBCONTRACTOR IDENTIFICATION STATEMENT

LIST OF SUBCONTRACTORS

This form is required for the named subcontractors pursuant to NJSA 40A:11-16, which include the plumbing and gas fitting all kindred work, steam and hot water heating and ventilating apparatus and all kindred work, steam power plants, electrical work, structural steel, ornamental iron work.

☐ **CHECK THIS BOX IF NONE OF THE ABOVE LISTED TRADES ARE TO BE USED TO PERFORM THE WORK**

In compliance with N.J.S.A. 40A:11-16, the undersigned hereby lists the name or names of the following subcontractors:

Company Name:_____

Address:_____

Telephone:_____ Subcontract Amount: $_____

Specific Scope of Work Subcontracted: _____

License No. _____

Company Name:_____

Address:_____

Telephone:_____ Subcontract Amount: $_____

Specific Scope of Work Subcontracted: _____

License No. _____

Company Name:_____

Address:_____

Telephone:_____ Subcontract Amount: $_____

Specific Scope of Work Subcontracted: _____

License No. _____

Company Name:_____

Address:_____

Telephone:_____ Subcontract Amount: $_____

Specific Scope of Work Subcontracted: _____

License No. _____

IF MORE THAN FOUR SUBCONTRACTORS, PLEASE COPY THIS SHEET AS NECESSARY AND ATTACH TO THE BID PACKAGE.

(Continued on following page)

SUBCONTRACTOR IDENTIFICATION CERTIFICATION

Note the law does not permit the listing of alternate subcontractors. However, multiple subcontractors for the same trade are permitted to be named provided the bidder meets the following requirements:

- Bidder identifies each subcontractor named for that category;
- Bidder states the scope of work, goods and services (the portion of the work) to be performed by each subcontractor; and

Bidder provides the price quote provided by each subcontractor.

The undersigned Bidder certifies and declares that the subcontractors listed above shall be used as subcontractors to complete certain portions of the work in this project as set forth in N.J.S.A. 40A: 11-16.

_____ _____

Witness **NAME OF BIDDER**

_____

Date _____

_____

ADDRESS

By: _____

ORIGINAL SIGNATURE ONLY

_____

_____

PRINT NAME AND TITLE

ACKNOWLEDGMENT OF ADDENDUM

Mandatory at the time of bid submission for any Addenda or Addendum issued

☐ **CHECK THIS BOX IF NO ADDENDUM WAS ISSUED FOR THE PROJECT.**

COUNTY OF UNION

_____

(Name of Construction /Public Works Project) **(Project or Bid Number)**

Pursuant to N.J.S.A. 40A:11-23.1(a) the undersigned bidder, hereby acknowledges receipt of the following addenda to the Bidding Documents. By indicating date of receipt, bidder acknowledges the submitted bid takes into account the provisions of the addendum. Note that the County of Union's record of notice to bidders shall take precedence and that failure to include provisions of changes in a bid proposal may be subject for rejection of the bid.

Local Unit Reference Number or Title of Addendum	How Received (mail, fax, pick-up, etc.)	Date Received

ACKNOWLEDGMENT BY BIDDER:

NAME OF BIDDER: _____

ORIGINAL SIGNATURE: _____

PRINTED NAME AND TITLE: _____

DATE: _____

CONTRACTOR BUSINESS REGISTRATION CERTIFICATE

Pursuant to N.J.S.A. 52:32-44, the County of Union is prohibited from entering into a contract with an entity unless the bidder, and each subcontractor that is required by law to be named in a bid has a valid Business Registration Certificate on file with the Division of Revenue and Enterprise Services within the Department of the Treasury.

Prior to contract award or authorization, the Contractor shall provide the County of Union with its proof of business registration and that of any named subcontractor(s).

Subcontractors named in a bid shall provide proof of business registration to the bidder, who in turn, shall provide it to the County of Union prior to the time a contract, purchase order, or other contracting document is awarded or authorized.

Proof of registration must show that the bidder was in fact registered with the State of New Jersey Department of the Treasury, Division of Revenue and obtained the business registration prior to the receipt of bids. If subcontractors are named on the bid, proof of the business registration for each must be provided prior to the award of a contract. Similarly to the bidder, the proof must show that each subcontractor was registered with the State of New Jersey Department of the Treasury, Division of Revenue and obtained the business registration prior to the receipt of bids.

During the course of contract performance:

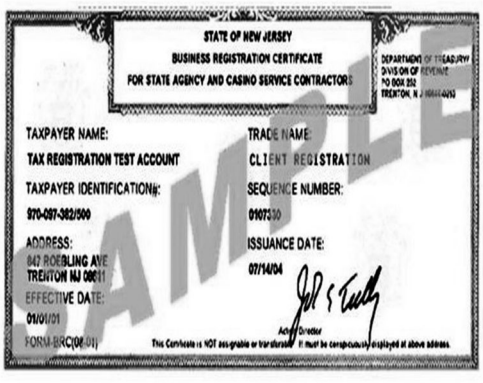
(1) the Contractor shall not enter into a contract with a subcontractor unless the subcontractor first provides the Contractor with a valid proof of business registration.

(2) the Contractor shall maintain and submit to the County of Union a list of subcontractors and their addresses that may be updated from time to time.

(3) the Contractor and any subcontractor providing goods or performing services under the contract, and each of their affiliates, shall collect and remit to the Director of the Division of Taxation in the Department of the Treasury, the use tax due pursuant to the Sales and Use Tax Act, (N.J.S.A. 54:32B-1 et seq.) on all sales of tangible personal property delivered into the State. Any questions in this regard can be directed to the Division of Taxation at (609)292-6400. Form NJ-REG can be filed online at http://www.state.nj.us/treasury/revenue/busregcert.shtml.

Before final payment is made under the contract, the Contractor shall submit to the County of Union a complete and accurate list of all subcontractors used and their addresses.

Pursuant to N.J.S.A. 54:49-4.1, a business organization that fails to provide a copy of a business registration as required, or that provides false business registration information, shall be liable for a penalty of $25 for each day of violation, not to exceed $50,000, for each proof of business registration not properly provided under a contract with a contracting agency.


STATE OF NEW JERSEY
BUSINESS REGISTRATION CERTIFICATE
FOR STATE AGENCY AND CASINO SERVICE CONTRACTORS

TAXPAYER NAME:
TAX REGISTRATION TEST ACCOUNT

TRADE NAME:
CLIENT REGISTRATION

TAXPAYER IDENTIFICATION#:
970-097-382/000

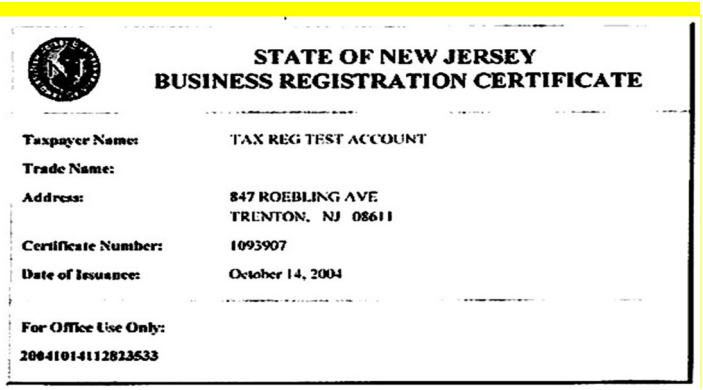
SEQUENCE NUMBER:
0107330

ADDRESS:
847 ROEBLING AVE
TRENTON NJ 08611

ISSUANCE DATE:
07/14/04

EFFECTIVE DATE:
01/01/01

SAMPLE


STATE OF NEW JERSEY
BUSINESS REGISTRATION CERTIFICATE

Taxpayer Name: TAX REG TEST ACCOUNT
Trade Name:
Address: 847 ROEBLING AVE
TRENTON, NJ 08611
Certificate Number: 1093907
Date of Issuance: October 14, 2004

For Office Use Only:
20041014112823533

AFFIRMATIVE ACTION REQUIREMENT

REQUIRED AFFIRMATIVE ACTION EVIDENCE

General Requirements of N.J.S.A. 10:5-31 et seq. (N.J.A.C. 17:27 et seq.): You are hereby put on notice that:

CONSTRUCTION CONTRACTS: The successful Contractor must submit within three (3) days of the notice of intent to award prior to the signing of the contract the initial project manning report (A.A.201). This report should be submitted to the County of Union Attention: *Affirmative Action Officer.*

If the successful contract does not submit the initial project manning report (A.A.201) within the three (3) days of the notice of intent to award prior to the signing of the contract, the County WILL declare the Contractor non-responsive and award the contract to the next lowest responsible bidder.

_____
NAME OF BIDDER

_____
ORIGINAL SIGNATURE

_____
PRINT OR TYPE NAME AND TITLE

_____
DATE THIS FORM IS COMPLETED

EXPERIENCE STATEMENT

I hereby certify that my company has performed the following private or public work, which is relevant to this bid. I further certify that my company has never defaulted under any contract. For prior defaults, please provide details on an attached sheet.

Witness

Date

NAME OF BIDDER

ADDRESS

By:

ORIGINAL SIGNATURE ONLY

PRINT NAME AND TITLE

YOU MAY ATTACH ADDITIONAL SHEETS, BUT YOU MUST SIGN AND WITNESS THIS SHEET.

CERTIFICATE OF BIDDER SHOWING ABILITY TO PERFORM CONTRACT

STATE OF NEW JERSEY /_____)
Specify, if Other) SS:
COUNTY OF_____)

I,_____, of the (City, Town, Borough, etc.) of _____
_____State of_____, of full age, being duly sworn according to law on my oath depose and say that:

I am_____of the firm of_____, the Bidder making the bid for the above named Project ("Contractor'), and that I executed said proposal with full authority to do so; and that said Contractor, pursuant to N.J.S.A. 40A:11-20, certifies that it owns, leases or controls all the necessary equipment required by the Plans, Specifications and Advertisements under this Bids are asked for.

If the Bidder is not the actual Owner or lessee of any such equipment, then the Bidder shall attach to this Certificate information identifying the source from which the equipment will be obtained, and such information shall be accompanied by a certificate from the Owner or person in control of the equipment definitively granting to the Bidder the control of the equipment required during such time as may be necessary for the completion of that portion of the contract.

_____
(Also type or print name of affiant under signature)

By:_____

NON-COLLUSION AFFIDAVIT

(N.J.S.A. 52:34-15)

STATE OF_____)
) **SS:**_____
COUNTY OF_____)

I_____, of the City of _____, in the County of_____, and the State of _____, of full age, being duly sworn according to law, on my oath depose and say that: I am _____of the firm of_____, the bidder making the proposal for the above named project, and that I executed the said proposal for the above named project, and that I executed the said proposal with full authority to do so; that said bidder has not, directly or indirectly, entered into any agreement, participation in any collusion, or otherwise taken any action in restraint of free, competitive bidding in connection with the above named project; and that all statements contained in said proposal and in this Affidavit are true and correct, and made with full knowledge that the COUNTY OF UNION, NEW JERSEY relies upon the truth of the statements contained in said proposal and in the statements contained in the affidavit in awarding the contract for the said project.

I further warrant that no person or selling agency has been employed or retained to solicit or secure such contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, except bona fide employees or bonafide established commercial or selling agencies maintained by _____(N.J.S.A. 52:34-15).

_____

NAME OF BIDDER

_____

ORIGINAL SIGNATURE ONLY

NOTE: The person who signed the bidder signature page for the bidder should sign this form also.

Subscribed and sworn before me
this ____day of_____, 20_____.

_____
Notary Public of the State of _____
My commission expires: _____

WARNING: IF YOU FAIL TO FULLY, ACCURATELY, AND COMPLETELY FILL OUT THIS AFFIDAVIT OF NON-COLLUSION, YOUR BID MAY BE REJECTED.

Contractor Registration Advisement

For Public Works Projects

The "Public Works Contractor Registration Act" (N.J.S.A. 34:11-56.51) provides that the bidder and any named subcontractors must be registered before submitting the bid, but does not require submission of proof of registration with the bid. Under the Act, no Contractor/subcontractor will be permitted to bid on or engage in any contract for public work, as defined in N.J.S.A. 34:11-56.26, unless that Contractor/subcontractor is registered with the New Jersey Department of Labor and Workforce and Workforce Development. The Act provides that upon registration with the Department, a public works Contractor/subcontractor will be issued a certificate by the Department indicating compliance with the Act's requirements. A one year registration fee has been set at $500.00 per year. Upon the effective date of the Act, public bodies will be expected to request production of such a certificate from those bidding on or engaging in public works projects.

It is important to note that the term "Contractor," is defined in the, Act as, "a person, partnership, association, joint stock company, trust, corporation or other legal business entity or successor thereof who enters into a contract which is subject to the provision of the "New Jersey Prevailing Wage Act," (N.J.S.A. 34:11-56.25, et seq.) for the construction, reconstruction, demolition, alteration, repair or maintenance of a public building regularly open to and used by the general public or a public institution, and includes any subcontractor or lower tier subcontractor as defined herein: except that, for the purposes of the act, no pumping station, treatment plant or other facility associated with utility and environmental construction, reconstruction, demolition, alteration, repair or maintenance shall be regarded as a public building regularly open to and used by the general public or a public institution."

Registration forms, copies of the Act, and other relevant information can be obtained by contacting:

Contractor Registration Unit
New Jersey Department of Labor and Workforce and Workforce Development
Division of Wage & Hour Compliance
PO Box 389
Trenton, New Jersey 08625-0389
Telephone: 609-292-9464
Fax: 609-633-8591
E-mail: contreg@dol.state.nj.us

AMERICANS WITH DISABILITIES ACT

EQUAL OPPORTUNITY FOR INDIVIDUALS WITH DISABILITIES

The Contractor and the County of Union (hereafter "Owner") do hereby agree that the provisions of Title II of the Americans With Disabilities Act of 1990 (the "Act") (42 US.C. S12101 et seq.), which prohibits discrimination on the basis of disability by public entities in all services, programs and activities provided or made available by public entities, and the rules and regulations promulgated pursuant thereunto, are made a part of this contract. In providing any aid, benefit, or service on behalf of the Owner pursuant to this Contract, the Contractor agrees that the performance shall be in strict compliance with the Act. In the event the Contractor, its agents, servants, employees, or subcontractors violate or are alleged to have violated the Act during the performance of this contract, the Contractor shall defend the Owner in any action or administrative proceeding commenced pursuant to this Act. The Contractor shall indemnify, protect, and save harmless the Owner, its agents, servants, and employees from and against any and all suits, claims, losses, demands, or damages of whatever kind or nature arising out of or claimed to arise out of the alleged violation. The Contractor shall, at its own expense, appear, defend, and pay any and all charges for legal services and any and all costs and other expenses arising from such action or administrative proceeding or incurred in connection therewith. In any and all complaints brought pursuant to the Owner's grievance procedure, the Contractor agrees to abide by any decision of the Owner which is rendered pursuant to said grievance procedure. If any action or administrative proceeding results in an award of damages against the Owner, or if the Owner incurs any expense to cure a violation of the ADA which has been brought pursuant to its grievance procedure, the Contractor shall satisfy and discharge the same at its own expense.

The Owner shall, as soon as practicable after a claim has been made against it, give written notice thereof to the Contractor along with full and complete particulars of the claim. If any action or administrative proceeding is brought against the Owner or any of its agents, servants, and employees, the Owner shall expeditiously forward or have forwarded to the Contractor every demand, complaint, notice, summons, pleading, or process received by the Owner or its representatives.

It is expressly agreed and understood that any approval by the Owner of the services provided by the Contractor pursuant to this contract will not relieve the Contractor of the obligation to comply with the Act and to defend, indemnify, protect, and save harmless the Owner pursuant to this paragraph.

It is further agreed and understood that the Owner assumes no obligation to indemnify or save harmless the Contractor, its agents, servants, employees and subcontractors for any claim which may arise out of their performance of this Agreement. Furthermore, the Contractor expressly understands and agrees that the provisions of this indemnification clause shall in no way limit the Contractor's obligations assumed in this Agreement, nor shall they be construed to relieve the Contractor from any liability, nor preclude the Owner from taking any other actions available to it under any other provisions of this Agreement or otherwise at law.

Name _____
(Please print or type)

Signature_____ **Date**_____

STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. Questions may be answered on separate attached sheets. The Bidder may submit any additional information it desires.

1. _____
(Name of Bidder)

2. _____
(Permanent Main Office Address)

3. _____
(When Organized)

4. _____
(If a Corporation, where incorporated)

5. Number of years your organization has been engaged in construction or contracting business under present firm or trade name? _____

6. How many years of experience in construction work has your organization had (a) as a general Contractor ? And/or (b) As a subcontractor? _____

7. Contracts on hand: (Attach a list or table showing gross amounts of each Contract and the appropriate dates of completion)_____

_____

_____

_____

8. General character of work performed by you. _____

_____

9. Have you ever failed to complete any work awarded to you? _____

_____

10. Have you ever defaulted on a Contract?_____If so, complete details, including where and why?

_____

_____

STATEMENT OF BIDDER'S QUALIFICATIONS - (continued)

11. Has any officer or partner of your organization ever failed to complete a construction contract handled in its own name? If so, state name of individual, name of Owner, location and type of project, and reason for the failure to complete._____

_____

_____

12. List your major equipment available for this Contract.

_____

_____

13. Experience in the construction work similar in importance to this Project.

_____

_____

14. Have you had any material adverse changes from the trades as listed in NJ Notice of Classification within last five (5) years?_____. If so, list prior classification.

15. Background and experience of the principal members of your organization, including the officers.

Individual's Name	Present Position or Office	Yrs. of Construction Experience	Magnitude & Type of Work	In What Capacity

16. Bank Reference. (Name, Address, Phone, Representative) _____

17. Will you, upon request, fill out a detailed financial Statement? _____

18. The undersigned hereby authorizes and requests any person, firm or corporation to furnish any information requested by the proper agency in verification of the responses comprising this Statement of Bidder's Qualifications.

19. Bidder's telephone number, fax number and e-mail address (if applicable).

Phone _____

Fax _____

E-mail_____

Mobile _____

Dated at_____this_____day of_____, 20____.

_____
BIDDER (Signature)

_____
BIDDER (Print Name)

Subscribed and sworn to before me
this _____day of_____, 20__.

_____
(Seal) Notary Public of New Jersey/
Specify Other State
My Commission Expires _____, 20__.

NOTE: FAILURE TO COMPLETE AND SUBMIT THIS DOCUMENT WITH YOUR PROPOSAL MAY RESULT IN A REJECTION OF YOUR BID.

CONTRACTOR PERFORMANCE RECORD

List all contracts completed by you in the past ten (10) years below or provide separate form.

Name of Owner	Name & Location of Project: Type Of Work	Prime or Sub-Cont.	Engineer or Architect in Charge for Owner	Contract Price (Omit Cost)	Date Completed	Was Time* Extension Necessary	Were Any Penalties* Imposed	Were Liens* Claims or Stop Notice Filed

* If answer is YES, provide explanation of details in connection with non-completion of contracts, time extensions, penalties imposed, labor troubles, liens, claims and notices filed against contracts listed in preceding item “Performance Record” on an attached sheet.

NOTE: FAILURE TO COMPLETE AND SUBMIT THIS DOCUMENT WITH YOUR PROPOSAL MAY RESULT IN A REJECTION OF YOUR BID.

CONTRACTOR PERFORMANCE RECORD CERTIFICATION

The information above is true and complete to the best of my knowledge and belief.

_____
(Name of Organization)

_____
(Signature)

_____
(Title)

Subscribed and sworn to before me
this_____day of_____, 20___.

_____
(Seal) Notary Public of New Jersey/
Specify Other State
My Commission Expires _____, 20___.

PRIOR NEGATIVE EXPERIENCE QUESTIONNAIRE

(N.J.S.A. 40A:11-4)

1. Within the past ten (10) years, have you been found, through either court adjudication, arbitration, mediation, or other contractually stipulated alternate dispute resolution mechanism, to have: failed to provide or perform goods or services; or failed to complete a contract in a timely manner; or otherwise performed unsatisfactorily under a prior contract with a public entity?

   _____yes _____no If yes, please provide full, detailed explanation.
   _____
   _____
   _____
   _____

2. Within the past ten (10) years, have you defaulted on a contract, thereby requiring a public entity to utilize the services of another Contractor to provide the goods or perform the services or to correct or complete the contract?

   _____yes _____no If yes, please provide full, detailed explanation.
   _____
   _____
   _____
   _____

3. Within the past ten (10) years, have you defaulted on a contract, thereby requiring a public entity to look to your surety for completion of the contract or tender of the costs of completion?

   _____yes _____no If yes, please provide full, detailed explanation.
   _____
   _____
   _____
   _____

4. Within the past ten (10) years, have you been debarred or suspended from contracting with any of the agencies or department of the executive branch of the State of New Jersey at the time of the contract award, where the action was based on failure to perform a contact for goods or services with a public entity?

   _____yes _____no If yes, please provide full, detailed explanation.
   _____
   _____
   _____
   _____

PRIOR NEGATIVE EXPERIENCE CERTIFICATION

I hereby certify that the above statements are true and accurate as of this_____day of _____ _____, 20__.

_____
Name of Contractor

By_____
(Signature of Authorized Representative)

Subscribed and sworn to before me
This_____day of_____, 20__.

_____
(Seal) Notary Public of New Jersey/
Specify Other State
My Commission Expires _____, 20__.

NOTE: FAILURE TO COMPLETE AND SUBMIT THIS DOCUMENT WITH YOUR PROPOSAL MAY RESULT IN A REJECTION OF YOUR BID.

TO BE COMPLETED ONLY WHEN FINAL PAYMENT IS REQUESTED

CONTRACTOR'S CERTIFICATION OF COMPLIANCE - NEW JERSEY PREVAILING WAGE ACT

TO: County of Union
Division of Engineering
2325 South Avenue
Scotch Plains, New Jersey 07076

CONTRACT:

PROJECT: _____

In accordance with the requirements of the New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56 et seq.*, the undersigned Contractor on the public work being performed for:

COUNTY OF UNION

hereby certifies that it has complied with the contract requirements regarding the payment of the minimum prevailing wages established under "The New Jersey Prevailing Wage Act" N.J.S.A. 34:11-56 et al.

CONTRACTOR: _____
ADDRESS: _____
_____

BY: _____
ORIGINAL SIGNATURE ONLY

STATE OF NEW JERSEY
COUNTY OF _____

Being by me duly sworn according to law, on his oath deposes and says that _____is_____ of_____the above named Contractor, and that the facts set forth in the above statement are true.

Subscribed and sworn before me this ____day of_____, 20___.

_____

Notary Public: _____
My Commission Expires: _____

* N.J.S.A. 34:11-56.33 requires the Contractor and subcontractor to file written statements with the public body in form satisfactory to the NJDOL Commissioner certifying to the amounts then due and owing from such Contractor and subcontractor filing such statement to any and all workmen for wages due on account of the public work, setting forth therein the names of the persons whose wages are unpaid and the amount due to each respectively. Union County will withhold the amount so deducted for the benefit of the workmen whose wages are unpaid as shown by the verified statement filed, and will pay directly to any workman the amount shown by such statement to be due to them for such wages. Such payment shall thereby discharge the obligation of the Contractor to the person receiving such payment to the extent of the amount thereof.

CERTIFICATE OF INSURANCE STATEMENT

The Bidder fully understands the County of Union insurance requirements as stated in the Instructions to Bidders as well as the Owner/Contractor Agreement and agrees to provide all insurance required by these documents prior to the issuance of the Notice to Proceed.

_____
BIDDER (Signature)

_____
BIDDER (Print Name)

NOTE: FAILURE TO COMPLETE AND SUBMIT THIS DOCUMENT WITH YOUR PROPOSAL MAY RESULT IN A REJECTION OF YOUR BID.

COLLECTION OF USE TAX ON SALES TO LOCAL GOVERNMENTS STATEMENT

The Bidder fully understands the requirements of the use tax on sales to local governments as stated in the General Conditions to the Contract for Construction and the Instructions to Bidders, and agrees at all times to comply with the "Contractor Use Tax Collection Legislation", as defined therein, and the terms relating thereto contained in the Contract Documents.

_____
BIDDER (Signature)

_____
BIDDER (Print Name)

NOTE: FAILURE TO COMPLETE AND SUBMIT THIS DOCUMENT WITH YOUR PROPOSAL MAY RESULT IN A REJECTION OF YOUR BID.

ACKNOWLEDGMENT OF PROJECT LABOR AGREEMENT
(Projects of $5 Million or more irrespective of Phasing)

Contractor_____, hereby acknowledges that the within Project, upon which the undersigned has submitted a Bid Proposal, requires the execution of a Project Labor Agreement (PLA) and the utilization of union employees. The undersigned agrees to execute the PLA (which is included in the Bid Documents) and comply with all terms and conditions of same in the performance of the Work.

Contractor:_____

Attest:

By:_____

_____

TIME OF COMPLETION

The undersigned proposed that if awarded the Contract, the Work will be started within ten (10) calendar days of the notice to proceed and will be substantially completed within **Six Hundred (600) calendar days** from the date of the notice to proceed.

I, _____ of _____
NAME (Print or type) COMPANY

Agree to complete work in the time frame specified

_____
SIGNATURE

OPTIONAL SITE VISIT – GENERAL CONTRACTOR

I, _____ of _____
NAME (Print or type) COMPANY

Visited the site of the work on: _____
DATE OF VISIT

_____
SIGNATURE

Have not visited the site of the work ☐
MARK BOX

_____
SIGNATURE

Bidders name _____

CERTIFICATION OF NON-DEBARMENT
FOR FEDERAL GOVERNMENT CONTRACTS
N.J.S.A. 52:32-44.1 (P.L. 2019, c.406)

This certification shall be completed, certified to, and submitted to the contracting unit prior to contract award, except for emergency contracts where submission is required prior to payment.

PART I: VENDOR INFORMATION	
Individual or Organization Name	
Address of Individual or Organization	
Unique Entity ID (if applicable)	
CAGE/NCAGE Code (if applicable)	
Check the box that represents the type of business organization:	

☐Sole Proprietorship (skip Parts III and IV) ☐Non-Profit Corporation (skip Parts III and IV)

☐For-Profit Corporation (any type) ☐Limited Liability Company (LLC) ☐Partnership

☐Limited Partnership ☐Limited Liability Partnership (LLP)

☐Other (be specific): _____

PART II – CERTIFICATION OF NON-DEBARMENT: Individual or Organization			
I hereby certify that the **individual or organization listed above in Part I** is not debarred by the federal government from contracting with a federal agency. I further acknowledge: that I am authorized to execute this certification on behalf of the above-named organization; that the County of Union is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the date of contract award by the County of Union to notify the County of Union in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the County of Union, permitting the County of Union to declare any contract(s) resulting from this certification void and unenforceable.			
Full Name (Print):		Title:	
Signature:		Date:	

Bidders name _____

PART III – CERTIFICATION OF NON-DEBARMENT: Individual or Entity Owning Greater than 50 Percent of Organization	
Section A (Check the Box that applies)	
☐	Below is the name and address of the stockholder in the corporation who owns more than 50 percent of its voting stock, or of the partner in the partnership who owns more than 50 percent interest therein, or of the member of the limited liability company owning more than 50 percent interest therein, as the case may be.
Name of Individual or Organization	
Address	
OR	
☐	No one stockholder in the corporation owns more than 50 percent of its voting stock, or no partner in the partnership owns more than 50 percent interest therein, or no member in the limited liability company owns more than 50 percent interest therein, as the case may be.
Section B (Skip if no Business entity is listed in Section A above)	
☐	Below is the name and address of the stockholder in the corporation who owns more than 50 percent of the voting stock of the organization's parent entity, or of the partner in the partnership who owns more than 50 percent interest in the organization's parent entity, or of the member of the limited liability company owning more than 50 percent interest in organization's parent entity, as the case may be.
Stockholder/Partner/Member Owning Greater Than 50 Percent of Parent Entity	
Address	
OR	
☐	No one stockholder in the parent entity corporation owns more than 50 percent of its voting stock, no partner in the parent entity partnership owns more than 50 percent interest therein, or no member in the parent entity limited liability company owns more than 50 percent interest therein, as the case may be.
Section C – Part III Certification	
I hereby certify that no individual or organization that is debarred by the federal government from contracting with a federal agency owns greater than 50 percent of the **Organization listed above in Part I** or,	

if applicable, owns greater than 50 percent of a parent entity of **<name of organization>** _____. I further acknowledge: that I am authorized to execute this certification on behalf of the above-named organization; that the County of Union is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the date of contract award by the County of Union to notify the County of Union in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the County of Union, permitting the County of Union to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print):		Title:	
Signature:		Date:	

Part IV – CERTIFICATION OF NON-DEBARMENT: Contractor – Controlled Entities	
Section A	
☐	Below is the name and address of the corporation(s) in which the **Organization listed in Part I** owns more than 50 percent of voting stock, or of the partnership(s) in which the **Organization listed in Part I** owns more than 50 percent interest therein, or of the limited liability company or companies in which the **Organization listed above in Part I** owns more than 50 percent interest therein, as the case may be.
Name of Business Entity	**Address**
Add additional sheets if necessary	
OR	
☐	The **Organization listed above in Part I** does not own greater than 50 percent of the voting stock in any corporation and does not own greater than 50 percent interest in any partnership or any limited liability company.

Bidders name _____

Section B (skip if no business entities are listed in Section A of Part IV)	
☐	Below are the names and addresses of any entities in which an entity listed in Part III A owns greater than 50 percent of the voting stock (corporation) or owns greater than 50 percent interest (partnership or limited liability company).

Name of Business Entity Controlled by Entity Listed in Section A of Part IV	Address

Add additional Sheets if necessary

OR

☐	No entity listed in Part III A owns greater than 50 percent of the voting stock in any corporation or owns greater than 50 percent interest in any partnership or limited liability company.

Section C – Part IV Certification

I hereby certify that the **Organization listed above in Part I** does not own greater than 50 percent of any entity that that is debarred by the federal government from contracting with a federal agency and, if applicable, does not own greater than 50 percent of any entity that in turns owns greater than 50 percent of any entity debarred by the federal government from contracting with a federal agency. I further acknowledge: that I am authorized to execute this certification on behalf of the above-named organization; that the County of Union is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the date of contract award by the County of Union to notify the County of Union in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the County of Union, permitting the County of Union to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print):		Title:	
Signature:		Date:	

Bidders name _____

BYRD ANTI-LOBBYING AMENDMENT CERTIFICATION
(To be submitted with each bid, proposal or offer exceeding $100,000)

The undersigned, [Company]_____certifies, to the best of his or her knowledge, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The Contractor, [Company]_____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. § 3801 et seq., apply to this certification and disclosure, if any.

_____
Signature of Contractor's Authorized Representative

_____
Name and Title of Contractor's Authorized Representative

_____
Date

Bidders name _____

CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents of all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, United States Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Organization: _____

Street address: _____

City, State, Zip: _____

_____

CERTIFIED BY: (type or print)

TITLE: _____

_____ _____

(signature) (date)

Bidders name _____

DISCLOSURE OF LOBBYING ACTIVITIES (LLL Form)

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352 0348-0046

☐ N/A – My agency does not engage in any lobbying activities

1. Type of Federal Action:	**2. Status of Federal Action:**	**3. Report Type:**
☐ a. contract b. grant c. cooperative agreement d. loan e. loan guarantee f. loan insurance	☐ a. bid/offer/application b. Initial award c. Post-award	☐ a. initial filing b. material change **For Material Change Only:** year _____ quarter _____ date of last report _____

4. Name and Address of Reporting Entity:	**5. If Reporting Entity in NO.4 is a Subawardee, enter Name and Address of Prim:**
☐ Prime ☐ Subawardee Tier_____,*if known:* **Congressional District,** *if known:*	**Congressional District,** *if known:*
6. Federal Department/Agency:	**7. Federal Program Name/Description:** CDFA NUMBER, if applicable _____
8. Federal Action Number, *if known:*	**9. Award Amount,** *if known:* $
10. a. Name and address of Lobbying Registrant *(if individual, last name, first name, MI):*	**b. Individuals Performing Services** *(including address if different from No. 10a) (las name, first name, MI):*
11. Information request through this form is authorized by title 31 U.S.C. Section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.	**Signature:** _____ **Print Name:** _____ **Title:** _____ **Telephone NO.:** _____ **Date:** _____

Federal Use Only:	Authorized for Local Reproduction Standard Form LLL (Rev. 7-97)

Bidders name _____

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer of employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a follow-up report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, state and zip code of the reporting entity include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is or expects to be a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, state and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number, Invitation for Bid (IFB) number, grant announcement number, the contract, grant, or loan award number, the application/proposal control number assigned by the Federal agency.) Include prefixes, e.g. "RFP- DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. A) Enter the full name, address, city, state and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.
    B) Enter the full names of the individual(s) performing services, and include full address if different from 10(a). Enter last name, first name and middle initial (MI).
11. The certifying official shall sign and date the form; print his/her name, title, and telephone number.

NJ Department of Labor & Workforce Development

Payroll Certification for Public Works Projects

for Contractor and Subcontractor's Weekly and Final Certification

SUBMIT form via the NJ Wage Hub (*njwages.nj.gov*) or use other submission methods in the portal.

IMPORTANT: For purposes of law, you must *also* submit this form to the appropriate public body or lessor, either via the NJ Wage Hub or other methods.

Name of ❑ Contractor or ❑ Subcontractor F.E.I.N.	Business Address Project Location	Project Name Contract I.D. or Project I.D. Contractor Registration #

Payroll No.	Date Wages Due & Paid	Week Ending Date or ❑ Final Certification

1. Employee Name and Address	2. Work: Job Title *e.g., apprentice, journeyman, foreman*	2. Work: Work Classification/ Occupational Category *e.g., carpenter, mason, plumber*	3. Demographics: Sex *M=Male F=Female N=Non-Binary*	3. Demographics: Race *See Key*	3. Demographics: Ethnicity *H=Hispanic N=Non-Hispanic*	Overtime or Straight Time	4. Day and Date: SU mm/dd	MO mm/dd	TU mm/dd	WE mm/dd	TH mm/dd	FR mm/dd	SA mm/dd	5. Total Hours	6. Hourly Rate of Pay	7. Gross Amt. Earned: This Project	7. Gross Amt. Earned: This Week	8. Deductions: FICA	Federal Tax	State Tax	Other	(specify)	Total Deductions	9. Net Wages Paid for Week	10. Total Fringe Benefit Cost/Hour
						S																			
						O																			
						S																			
						O																			
						S																			
						O																			
						S																			
						O																			
						S																			
						O																			
						S																			
						O																			
						S																			
						O																			
						S																			
						O																			
						S																			
						O																			

KEY **W**= White; **B**= Black or African American;
A= Asian; **N**= American Indian or Native Alaskan;
I = Native Hawaiian or Pacific Islander; **M**= 2 or More

See following page for instructions

❑ Check if additional sheets attached

I, the undersigned, do hereby state and certify:

(1) That I pay or supervise the payment of the persons employed by

_____

(Contractor or Subcontractor)

on the _____

(Project Name & Location)

that during the payroll period beginning on (date) _____, and ending on (date) _____, all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of the aforenamed Contractor or Subcontractor from the full weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in the New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56.25 et seq. and Regulation N.J.A.C. 12:60 et seq. and the Payment of Wages Law, N.J.S.A. 34:11-4.1 et seq.

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered with the United States Department of Labor, Bureau of Apprenticeship and Training and enrolled in a certified apprenticeship program.

(4) That:

(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS OR PROGRAMS

☐ In addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above-referenced payroll, payments of fringe benefits have been or will be made when due to appropriate programs for the benefit of such employ-ees, as noted in Section 4(c) at right.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

☐ Each laborer or mechanic listed in the above-referenced payroll has been paid as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in Section 4(c) at right.

(5) N.J.S.A. 12:60-2.1 and 5.1 – The Public Works employers shall submit to the public body or lessor a certified payroll record each pay period within 10 days of the payment of wages.

☐ By checking this box and typing my name below, I am electronically signing this application. I understand that an electronic signature has the same legal effect as a written signature.

Name _____

Title _____ Date (mm/dd/yy) _____

THE FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION.
— N.J.S.A. 34:11- 56.25 ET SEQ. AND N.J.A.C. 12:60 ET SEQ. AND N.J.S.A. 34:11-4.1 ET SEQ.

4(c) Benefit Program Information in AMOUNT CONTRIBUTED PER HOUR (Must be completed if 4(a) is checked)
To calculate the cost per hour, divide 2,000 hours into the benefit cost per year per employee.

Program Title, Classification Title, or Individual Workers	Health/ Welfare	Vacation/Holiday	Apprenticeship/ Training	Pension	Other Benefit Type and Amount (e.g., training, long-term disability or life ins.)	Name & Address of Fringe Benefit Fund, Plan, or Program Administrator	USDOL Benefit Plan Filing Number/EIN	Third-Party Trustee &/or Contract Person

DRAFT

AIA® Document A101® – 2017

Standard Form of Agreement Between Owner and Contractor

where the basis of payment is a Stipulated Sum

AGREEMENT made as of the _____
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

COUNTY OF UNION
Administration Building
10 Elizabethtown Plaza
Elizabeth, New Jersey 07207

and the Contractor:
(Name, legal status, address and other information)

for the following Project:
(Name, location and detailed description)

BA _____-2024

The Architect:
(Name, legal status, address and other information)

The County Engineer:
Ricardo Matias, PE, CME, CFM
Union County Engineer
County of Union
Department of Engineering, Public Works, and Facilities Management
2325 South Avenue
Scotch Plains, New Jersey 07076

The Owner and Contractor agree as follows:

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101®–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201®–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

AIA Document A101® – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A101," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:30:36 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1802333529)

TABLE OF ARTICLES

1 THE CONTRACT DOCUMENTS

2 THE WORK OF THIS CONTRACT

3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

4 CONTRACT SUM

5 PAYMENTS

6 DISPUTE RESOLUTION

7 TERMINATION OR SUSPENSION

8 MISCELLANEOUS PROVISIONS

9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Project Specifications, Project Technical Specifications, (generally referred to as specifications in the Contract Documents) Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

[« »] The date of this Agreement.

[«X»] A date set forth in a notice to proceed issued by the Owner.

[« »] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

[«X»] Not later than Six Hundred (_600_) calendar days from the Notice to Proceed.

AIA Document A101® – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A101," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:30:36 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1802333529)

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date
	_____ (___) Days from the Notice to Proceed

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be _____ (_____) This Amount includes a Bid Contingency of _One Million Dollars_____ (_$1,000,000_____) to be used if and when directed by the County of Union, and subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates/Deletion Items

§ 4.2.1 Alternates/ Deletion Items, if any, included in the Contract Sum:

Item	Price

§ 4.2.2 Subject to the conditions noted below, the following alternates/deletion items may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 4.3 Allowances, if any, included in the Contract Sum: N/A
(Identify each allowance.)

Item	Price

§ 4.4 Unit prices, if any,
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Unit prices, if any, shall be in accordance with the Bid Specifications and /or Contract Documents.

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

Pursuant to the Contract Documents, should the Contractor fail to complete fully, and in conformity with all provisions of the Contract, the Contractor shall, and hereby agrees to pay the Owner One Thousand Dollars ($1,000.00) per day as liquidated damages, for each consecutive calendar day beyond the number of days, allowed by the Contract, which sum is agreed upon as reasonable and proper measure of damages that the Owner will sustain per diem for failure of Contractor to complete the Work within time stipulated; it is agreed between the Parties that the damages to Owner that could result from a failure of the Contractor to complete the Work on schedule, is uncertain and cannot be computed exactly. In no way shall costs of Liquidated Damages be construed as a penalty to the Contractor.

§ 4.6 Other:
(Insert provisions for bonus or other incentives, if any that might result in a change to the Contract Sum.)

AIA Document A101® – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A101," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:30:36 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1802333529)

BID CONTINGENCY: There is a One Million Dollar ($1,000,000.00) Bid Contingency Allowance to be used if and when directed by the Owner.

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the County Engineer, or his designee by the Contractor and Certificates for Payment issued by the County Engineer, or his designee, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents. All payments under this Agreement shall be made pursuant to the provisions of the Prompt Payment Act (N.J.S.A. 2A:30A-1 et seq.).

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

At the end of the following calendar month preceding the month for which the payment was approved.

§ 5.1.3

The Contractor shall submit a Preliminary Payment Request (Pencil Requisition) to the County Engineer or his designee on the twenty-fifth (25th) day of any given calendar month for Work performed during that month. Upon receipt of the Pencil Requisition from the Contractor, the County Engineer or his designee shall review the Pencil Requisition and approve or disapprove of it in whole or in part as set forth hereafter. Within (4) calendar days of receipt of the Pencil Requisition from the Contractor, the County Engineer or his designee shall return the Pencil Requisition to the Contractor, with those charges that are approved or disapproved, if any, by the County Engineer or his designee, for the Contractor's incorporation into an Application for Payment . Within two (2) calendar days of return of the Pencil Requisition from the County Engineer or his designee, the Contractor shall submit a formal application for Payment to the County Engineer or his designee for review and approval by the County Engineer or his designee incorporating any revisions made by the County Engineer or his designee in the Pencil Requisition submission. Within twenty (20) calendar days of receipt of Contractor's Application for Payment, the County Engineer or his designee shall take any one of the following actions:

1) Certify the entire Application for Payment;
2) Certify partial payment and provide the Contractor with reasons for withholding the remaining portion of the payment; or
3) Withhold certification of the entire Application for Payment and provide the Contractor with reasons for withholding the entire payment,

Once the Application for Payment is certified either in whole or in part, the County Engineer or his designee shall transmit the Certified Payment Application within three (3) calendar days to the Owner for its review and payment. The Owner shall make payment to the Contractor for the Certified Payment Amount by no later than the time period set forth in the New Jersey Prompt Payment Act following receipt of the Certificate for Payment from the County Engineer or his designee. The Owner shall not be obligated to pay any Application for Payment until the Application for Payment is certified by the County Engineer or his designee. Approval of any Application for Payment may be withheld should the Contractor fail to submit Manning Reports in a timely manner.

Pursuant to N.J.S.A. 2A:30A-1 et seq. (the "Prompt Payment Act"), a public or governmental entity that requires the entity's governing body to vote on authorizations for each periodic payment, final payment, or retainage monies, such as the Owner, is excepted from the timing requirements of the Act. Accordingly, the Owner shall not approve the Contractor's Application for Payment until it is certified by the County Engineer or his designee in accordance herewith and shall not approve the Contractor's Certified Payment Application until the next scheduled public meeting of the Owner following the Owner's receipt of the Certified Payment Application from the County Engineer or his designee. The Owner shall not make payment to the Contractor for the Certified Payment Amount until the Owner's subsequent payment cycle following its approval of the Payment Application.

Pursuant to the Prompt PaymentAct, if a payment due pursuant to the provisions herein is not made in a timely manner, the Owner shall be liable for the amount of money owed under the contract, plus interest at a rate equal to the prime rate plus one percent (1%), notwithstanding anything to the contrary in the Contract Documents. Interest on amounts due pursuant to the Act shall be paid to the prime contractor for the period beginning on the day after the required payment date and ending on the day on which the check for payment is received by the Contractor.

AIA Document A101® – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A101," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:30:36 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1802333529)

Pursuant to the Prompt Payment Act, disputes regarding whether a party has failed to make payments required by the Act may be submitted to a process of alternative dispute resolution, notwithstanding anything to the contrary in the Contract Documents, where the parties agree to same. Alternative dispute resolution permitted by the Act shall not apply to disputes concerning any other matters that may arise under or from this Contract. Any civil action brought to collect payments shall be conducted in Union County, State of New Jersey, and the prevailing party shall be awarded reasonable costs and attorneys' fees.

The County Engineer or his designee may decide not to certify payment and may withhold a Certificate for Payment, in whole or in part, to the extent reasonably necessary to protect the Owner if, in the County Engineer or his designee's opinion, the representations as described in Section 5.1.5 below cannot be made to the Owner. If the County Engineer or his designee withholds a Certificate for Payment, the County Engineer or his designee will notify the Contractor and Owner as provided in Section 5.1.3 above. If the Contractor and County Engineer or his designee cannot agree on a revised amount, the County Engineer or his designee will issue a Certificate for Payment for the amount for which the County Engineer or his designee is able to make such representations to the Owner as set forth in Section 5.1.3 above. The County Engineer or his designee may also decide to withhold certifying payment in whole or in part, or, because of subsequently discovered evidence or subsequent observations, to such extent as may be necessary in the County Engineer or his designee's opinion to protect the Owner from loss because of:

.1 Defective Work not remedied;
.2 third party claims filed or reasonable evidence indicating probable filing of such claims;
.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials, or equipment;
.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or another contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or Liquidated Damages for the anticipated delay;
.7 failure to carry out the Work in accordance with the Contract Documents;
.8 avoidable delay in the progress of the Work;
.9 deliberate delay in the submission for approval of names of Subcontractors, material, men, sources of supply, shop drawings, and samples;
.10 failure to maintain the Project Site in a safe and satisfactory condition in accordance with good construction practices as determined by the County Engineer or his designee; or
.11 failure to submit updates as required by the General Conditions.

When the foregoing reasons for withholding certification are resolved, certification will be made for amounts previously withheld in the manner set forth in Section 5.1.3 above.

The issuance of a separate Certificate for Payment will constitute representations made separately by the County Engineer or his designee to the Owner, based on its individual observations at the site and the data comprising the Application for Payment submitted by the Contractor, that the Work has progressed to the point indicated and that, to the best of the County Engineer or his designee's knowledge, information and belief, quality of the Work is in accordance with the Contract Documents.

The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to minor deviations from the Contract Documents correctable prior to completion and to specific qualifications expressed by the County Engineer, or his designee. The issuance of a separate Certificate of Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a separate Certificate for Payment will not be a representation that the County Engineer, or his designees has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed the Contractor's construction means, methods, techniques, sequences or procedures; (3) reviewed copies of Requisitions received from Subcontractor's and materials suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

AIA Document A101® – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A101," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:30:36 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1802333529)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the County Engineer, or his designee may require. This schedule of values, unless objected to by his County Engineer, or his designee, shall be used as a basis for reviewing the Contractor's Applications for Payment, along with the other relevant Contract Documents.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents and the review of the County Engineer, or his designee, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- **.1** That portion of the Contract Sum properly allocable to completed Work, less retainage of two percent (2%) in accordance with governing law
- **.2** That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and less retainage of two percent (2%) in accordance with governing law
- **.3** That portion of Construction Change Directives that the County Engineer, or his designee determines, in the County Engineer, or his designee professional judgment, to be reasonably justified and approved by Owner.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- **.1** The aggregate of any amounts previously paid by the Owner;
- **.2** The amount, if any, for Work that remains uncorrected and for which the County Engineer, or his designee has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- **.3** Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- **.4** For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and
- **.5** Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

Retainage shall be determined as follows: Pursuant to N.J.S.A. 40A:11-16.1 et seq, the Owner will withhold two percent
(2%) of the amount due on each partial payment unit pending completion of the Contract.

§ 5.1.8 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- **.1** the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- **.2** a final Certificate for Payment has been issued by the County Engineer, or his designee.

AIA Document A101® – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A101," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:30:36 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1802333529)

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than thirty (30) days after the issuance of the County Engineer, or his designee's final Certificate for Payment, or as follows: Final payment will also require the Contractor to submit all project closeout documents, including but not limited to, "As Built" Drawings, Manuals and Warranties related to the project.

§ 5.3 Interest
Payments due and unpaid under the Contract shall in no instance bear interest, except as required by law.

ARTICLE 6 DISPUTE RESOLUTION
§ 6.1 Initial Decision Maker
The County Engineer, or his designee will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint another individual, not a party to this Agreement, to serve as the Initial Decision Maker.

Except as provided in Section 5.1.3 of the Standard Form of Agreement between the Owner and Contractor, all claims, disputes or other matters in question between the parties to this Contract, arising out of or relating to the Project or to the Contract, or the alleged breach hereof, shall in all instances be reasonably resolved between the parties together. In the event a mutually agreeable resolution cannot be achieved by the parties, then all claims, disputes or other matters in question between the parties to this Contract, arising out of or relating to the Work, Project, or to the Contract, or the alleged breach hereof, shall be subject to: 1.) review by the Initial Decision Maker, 2.) mediation, and if not resolved, then, 3.) litigation decided in a Court of competent jurisdiction venued in Union County, New Jersey.

N.J.S.A. 40A:11-50 requires the following: "All construction contract documents entered into in accordance with the provisions of P.L.1971, c. 198 (C.40A:11-1 et seq.) after the effective date of P.L.1997, c. 371 (C.40A:11-50) shall provide that disputes arising under the contract shall be submitted to a process of resolution pursuant to alternative dispute resolution practices, such as mediation, binding arbitration or non-binding arbitration pursuant to industry standards, prior to being submitted to a court for adjudication". In the event any claim arising from the Project is beyond the jurisdiction of the court, the Contractor consents to joinder as a party to such action or alternative dispute proceeding.

ARTICLE 7 TERMINATION OR SUSPENSION
§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017, and/or any other applicable provisions within the Contract Documents.

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS
§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:
(Name, address, email address, and other information)

Ricardo Matias, PE, CME, CFM
Union County Engineer
County of Union
Department of Engineering, Public works, and Facilities Management
2325 South Avenue
Scotch Plains, NJ 07076

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

AIA Document A101® – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A101," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:30:36 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1802333529)

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior written notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide all bond(s) in a manner and form that are consistent with the requirements of the Contract Documents.

§ 8.5.3 The Contractor shall provide all types of insurance coverage and amounts that are consistent with the Insurance Requirements contained in and required by the Contract Documents.

§ 8.6 Other provisions:

This Contract will be subject to all applicable statutory provisions, rules, codes, or other regulations or laws, including but not limited to those relating to matters of Public Works, Public Contracts, the Law Against Discrimination, the Laws governing Affirmative Action, and Prevailing Rates of Wages under the laws of New Jersey.

Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§8.7 Payments due and unpaid under the Contract shall in no instance bear interest, except as required by law.

§8.8 The Contractor shall ensure that the Project Site is maintained in a clean and safe condition at all times, based upon Owner's sole discretion. If the Contractor fails to keep the Project Site in a clean and safe condition, said failure shall result in the following:

.1 all claims resulting from the Contractor's failure shall be the Contractor's responsibility;
.2 said failure shall constitute an act of default and a substantial breach of the Contract giving the Owner remedies under the Contract Documents; and
.3 the Owner shall have the right to withhold any payments until the Contractor cures its failure.

Failure to do so shall authorize the Owner to withhold any Applications for Payment until such time as the Contractor has rectified same. Further, if the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the cost thereof shall be charged to the Contractor.

§8.9 Indemnification – Pursuant to the requirements of the Contract Documents.

§8.10 The within Contract shall be governed by and interpreted pursuant to the law of the State of New Jersey.

§8.11 The Contractor shall comply with the anti-discrimination provisions of N.J.S.A. 10:2-1 et seq., the New Jersey Law Against Discrimination, N.J.S.A. 10:5-1 et seq., N.J.A.C. 17:27-1.1 et seq. and shall guarantee to afford equal opportunity in performance of the Work in accordance with an Affirmative Action program approved by the State Treasurer. (See Exhibit B within the Contract Documents)

§8.12 The Contractor shall submit proof of Business Registration for itself and its subcontractors to the Owner prior to award. The requirement of proof of Business Registration extends down through all levels (tiers) of the Project.

AIA Document A101® – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A101," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:30:36 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1802333529)

The Contractor agrees to comply with the rules and regulations promulgated pursuant to the Contractor Use Tax Collection Legislation.

For the term of the contract, the Contractor, any subcontractor, and each of their affiliates [N.J.S.A. 52:32-44(g)93)], shall collect and remit to the New Jersey Director of the Division of Taxation in the Department of Treasury, the use tax due pursuant to the "Sales and Use Tax Act," N.J.S.A. 54:32B-1 et seq.) on all of their sales of tangible personal property delivered into the State of New Jersey, regardless of whether the tangible personal property is intended for a contract with a contracting agency. For purposes herein, "affiliate" shall mean any entity that: (a) directly, indirectly or constructively controls another entity; (b) is directly, indirectly, or constructively controlled by another entity; or (c) is subject to the control of a common entity. For purposes of the immediately preceding sentence, an entity controls another entity if it owns, directly or indirectly, more than fifty percent (50%) of the Ownership interest in that entity.

§8.13 This Standard Form of Agreement and the General Conditions set forth in the Bid Documents shall control in the case of conflict between these documents and the Project Specifications, the Project Manual, and any other exhibits incorporated by reference in this Contract.

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated in the sections below, and incorporated herein as if set forth in their entirety.

§ 9.1.1 The Agreement is this executed AIA Document A101–2017, Standard Form of Agreement Between Owner and Contractor.

§ 9.1.2 The General Conditions are AIA Document A201–2017, General Conditions of the Contract for Construction as supplemented.

§ 9.1.3 The Supplementary and other Conditions of this Contract, if any/as applicable.

§ 9.1.4 The Specifications: As made available by the Owner and downloaded by the Contractor.

§ 9.1.5 The Drawings: As made available by the Owner and downloaded by the Contractor.

§ 9.1.6 The Addendum and Clarifications:

Number	Date	Pages
1.		

§ 9.1.7 Additional documents, if any, forming part of the Contract Documents:

.1 All documents enumerated in Article 1 §1.1.1 of the General Conditions;
.2 Mandatory Equal Opportunity Language (Exhibit B in Contract Documents); and
.3 Schedule A: Additional Terms for Contracts/Purchases Funded in Whole or in Part, by Federal Funds

This Contractor acknowledges that he has a copy of the New Jersey Law Against Discrimination and of the Rules and Regulations thereon issued by the Division of Civil Rights, and shall fully comply therewith as applicable.

AIA Document A101® – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A101," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:30:36 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1802333529)

IN WITNESS WHEREOF, the parties hereto have, either individually or by their duly authorized representative, set their hands and seals the day and year first above written.

ATTEST:

COUNTY OF UNION

_____

JAMES E. PELLETTIERE, CLERK
Board of County Commissioners

BY _____

EDWARD T. OATMAN
County Manager

APPROVED AS TO FORM

_____

BRUCE H. BERGEN, ESQ.
County Counsel

_____

Affirmative Action Compliant

ATTEST:

CONTRACTOR NAME HERE

_____

Corporate Secretary/Notary Public

_____

Authorized Signatory

_____

Print Name

_____

Print Title

AIA Document A101® – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A101," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 10:30:36 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1802333529)

DRAFT

AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:
[CLARK RESERVOIR IMPROVEMENTS]

BA _____-2024 _____ Project

THE OWNER:
(Name, legal status and address)

COUNTY OF UNION
Administration Building
10 Elizabethtown Plaza
Elizabeth, NJ 07207

THE CONTRACTOR:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

THE COUNTY ENGINEER:
Ricardo Matias, PE, CME, CFM
Union County Engineer
County of Union
Department of Engineering, Public works, and Facilities Management
2325 South Avenue
Scotch Plains, NJ 07076

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

TABLE OF ARTICLES

1 GENERAL PROVISIONS

2 OWNER

3 CONTRACTOR

4 ARCHITECT

5 SUBCONTRACTORS

6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

7 CHANGES IN THE WORK

8 TIME

9 PAYMENTS AND COMPLETION

10 PROTECTION OF PERSONS AND PROPERTY

11 INSURANCE AND BONDS

12 UNCOVERING AND CORRECTION OF WORK

13 MISCELLANEOUS PROVISIONS

14 TERMINATION OR SUSPENSION OF THE CONTRACT

15 CLAIMS AND DISPUTES

DRAFT

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

INDEX
(Topics and numbers in bold are Section headings.)

Acceptance of Nonconforming Work
9.6.6, 9.9.3, **12.3**
Acceptance of Work
9.6.6, 9.8.2, 9.9.3, 9.10.1, 9.10.3, 12.3
Access to Work
3.16, 6.2.1, 12.1
Accident Prevention
10
Acts and Omissions
3.2, 3.3.2, 3.12.8, 3.18, 4.2.3, 8.3.1, 9.5.1, 10.2.5, 10.2.8, 13.3.2, 14.1, 15.1.2, 15.2
Addenda
1.1.1
Additional Costs, Claims for
3.7.4, 3.7.5, 10.3.2, 15.1.5
Additional Inspections and Testing
9.4.2, 9.8.3, 12.2.1, **13.4**
Additional Time, Claims for
3.2.4, 3.7.4, 3.7.5, 3.10.2, 8.3.2, **15.1.6**
Administration of the Contract
3.1.3, **4.2**, 9.4, 9.5
Advertisement or Invitation to Bid
1.1.1
Aesthetic Effect
4.2.13
Allowances
3.8
Applications for Payment
4.2.5, 7.3.9, 9.2, **9.3**, 9.4, 9.5.1, 9.5.4, 9.6.3, 9.7, 9.10
Approvals
2.1.1, 2.3.1, 2.5, 3.1.3, 3.10.2, 3.12.8, 3.12.9, 3.12.10.1, 4.2.7, 9.3.2, 13.4.1
Arbitration
8.3.1, 15.3.2, **15.4**
ARCHITECT
4
Architect, Definition of
4.1.1
Architect, Extent of Authority
2.5, 3.12.7, 4.1.2, 4.2, 5.2, 6.3, 7.1.2, 7.3.4, 7.4, 9.2, 9.3.1, 9.4, 9.5, 9.6.3, 9.8, 9.10.1, 9.10.3, 12.1, 12.2.1, 13.4.1, 13.4.2, 14.2.2, 14.2.4, 15.1.4, 15.2.1
Architect, Limitations of Authority and Responsibility
2.1.1, 3.12.4, 3.12.8, 3.12.10, 4.1.2, 4.2.1, 4.2.2, 4.2.3, 4.2.6, 4.2.7, 4.2.10, 4.2.12, 4.2.13, 5.2.1, 7.4, 9.4.2, 9.5.4, 9.6.4, 15.1.4, 15.2
Architect's Additional Services and Expenses
2.5, 12.2.1, 13.4.2, 13.4.3, 14.2.4
Architect's Administration of the Contract
3.1.3, 3.7.4, 15.2, 9.4.1, 9.5
Architect's Approvals
2.5, 3.1.3, 3.5, 3.10.2, 4.2.7
Architect's Authority to Reject Work
3.5, 4.2.6, 12.1.2, 12.2.1
Architect's Copyright
1.1.7, 1.5
Architect's Decisions
3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 4.2.14, 6.3, 7.3.4, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4.1, 9.5, 9.8.4, 9.9.1, 13.4.2, 15.2
Architect's Inspections
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 13.4
Architect's Instructions
3.2.4, 3.3.1, 4.2.6, 4.2.7, 13.4.2
Architect's Interpretations
4.2.11, 4.2.12
Architect's Project Representative
4.2.10
Architect's Relationship with Contractor
1.1.2, 1.5, 2.3.3, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5, 3.7.4, 3.7.5, 3.9.2, 3.9.3, 3.10, 3.11, 3.12, 3.16, 3.18, 4.1.2, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3, 12, 13.3.2, 13.4, 15.2
Architect's Relationship with Subcontractors
1.1.2, 4.2.3, 4.2.4, 4.2.6, 9.6.3, 9.6.4, 11.3
Architect's Representations
9.4.2, 9.5.1, 9.10.1
Architect's Site Visits
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.4
Asbestos
10.3.1
Attorneys' Fees
3.18.1, 9.6.8, 9.10.2, 10.3.3
Award of Separate Contracts
6.1.1, 6.1.2
Award of Subcontracts and Other Contracts for Portions of the Work
5.2
Basic Definitions
1.1
Bidding Requirements
1.1.1
Binding Dispute Resolution
8.3.1, 9.7, 11.5, 13.1, 15.1.2, 15.1.3, 15.2.1, 15.2.5, 15.2.6.1, 15.3.1, 15.3.2, 15.3.3, 15.4.1
Bonds, Lien
7.3.4.4, 9.6.8, 9.10.2, 9.10.3
Bonds, Performance, and Payment
7.3.4.4, 9.6.7, 9.10.3, **11.1.2**, 11.1.3, **11.5**
Building Information Models Use and Reliance
1.8
Building Permit
3.7.1
Capitalization
1.3
Certificate of Substantial Completion
9.8.3, 9.8.4, 9.8.5
Certificates for Payment
4.2.1, 4.2.5, 4.2.9, 9.3.3, **9.4**, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 14.2.4, 15.1.4

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

Certificates of Inspection, Testing or Approval
13.4.4
Certificates of Insurance
9.10.2
Change Orders
1.1.1, 3.4.2, 3.7.4, 3.8.2.3, 3.11, 3.12.8, 4.2.8, 5.2.3, 7.1.2, 7.1.3, **7.2**, 7.3.2, 7.3.7, 7.3.9, 7.3.10, 8.3.1, 9.3.1.1, 9.10.3, 10.3.2, 11.2, 11.5, 12.1.2
Change Orders, Definition of
7.2.1
CHANGES IN THE WORK
2.2.2, 3.11, 4.2.8, **7**, 7.2.1, 7.3.1, 7.4, 8.3.1, 9.3.1.1, 11.5
Claims, Definition of
15.1.1
Claims, Notice of
1.6.2, 15.1.3
CLAIMS AND DISPUTES
3.2.4, 6.1.1, 6.3, 7.3.9, 9.3.3, 9.10.4, 10.3.3, **15**, 15.4
Claims and Timely Assertion of Claims
15.4.1
Claims for Additional Cost
3.2.4, 3.3.1, 3.7.4, 7.3.9, 9.5.2, 10.2.5, 10.3.2, **15.1.5**
Claims for Additional Time
3.2.4, 3.3.1, 3.7.4, 6.1.1, 8.3.2, 9.5.2, 10.3.2, **15.1.6**
Concealed or Unknown Conditions, Claims for
3.7.4
Claims for Damages
3.2.4, 3.18, 8.3.3, 9.5.1, 9.6.7, 10.2.5, 10.3.3, 11.3, 11.3.2, 14.2.4, 15.1.7
Claims Subject to Arbitration
15.4.1
Cleaning Up
3.15, 6.3
Commencement of the Work, Conditions Relating to
2.2.1, 3.2.2, 3.4.1, 3.7.1, 3.10.1, 3.12.6, 5.2.1, 5.2.3, 6.2.2, 8.1.2, 8.2.2, 8.3.1, 11.1, 11.2, **15.1.5**
Commencement of the Work, Definition of
8.1.2
Communications
3.9.1, **4.2.4**
Completion, Conditions Relating to
3.4.1, 3.11, 3.15, 4.2.2, 4.2.9, 8.2, 9.4.2, 9.8, 9.9.1, 9.10, 12.2, 14.1.2, 15.1.2
COMPLETION, PAYMENTS AND
9
Completion, Substantial
3.10.1, 4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3, 12.2, 15.1.2
Compliance with Laws
2.3.2, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 10.2.2, 13.1, 13.3, 13.4.1, 13.4.2, 13.5, 14.1.1, 14.2.1.3, 15.2.8, 15.4.2, 15.4.3
Concealed or Unknown Conditions
3.7.4, 4.2.8, 8.3.1, 10.3
Conditions of the Contract
1.1.1, 6.1.1, 6.1.4
Consent, Written
3.4.2, 3.14.2, 4.1.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3, 13.2, 15.4.4.2
Consolidation or Joinder
15.4.4
CONSTRUCTION BY OWNER OR BY
SEPARATE CONTRACTORS
1.1.4, **6**
Construction Change Directive, Definition of
7.3.1
Construction Change Directives
1.1.1, 3.4.2, 3.11, 3.12.8, 4.2.8, 7.1.1, 7.1.2, 7.1.3, **7.3**, 9.3.1.1
Construction Schedules, Contractor's
3.10, 3.11, 3.12.1, 3.12.2, 6.1.3, 15.1.6.2
Contingent Assignment of Subcontracts
5.4, 14.2.2.2
Continuing Contract Performance
15.1.4
Contract, Definition of
1.1.2
CONTRACT, TERMINATION OR
SUSPENSION OF THE
5.4.1.1, 5.4.2, 11.5, **14**
Contract Administration
3.1.3, 4, 9.4, 9.5
Contract Award and Execution, Conditions Relating to
3.7.1, 3.10, 5.2, 6.1
Contract Documents, Copies Furnished and Use of
1.5.2, 2.3.6, 5.3
Contract Documents, Definition of
1.1.1
Contract Sum
2.2.2, 2.2.4, 3.7.4, 3.7.5, 3.8, 3.10.2, 5.2.3, 7.3, 7.4, **9.1**, 9.2, 9.4.2, 9.5.1.4, 9.6.7, 9.7, 10.3.2, 11.5, 12.1.2, 12.3, 14.2.4, 14.3.2, 15.1.4.2, **15.1.5**, **15.2.5**
Contract Sum, Definition of
9.1
Contract Time
1.1.4, 2.2.1, 2.2.2, 3.7.4, 3.7.5, 3.10.2, 5.2.3, 6.1.5, 7.2.1.3, 7.3.1, 7.3.5, 7.3.6, 7, 7, 7.3.10, 7.4, 8.1.1, 8.2.1, 8.2.3, 8.3.1, 9.5.1, 9.7, 10.3.2, 12.1.1, 12.1.2, 14.3.2, 15.1.4.2, 15.1.6.1, 15.2.5
Contract Time, Definition of
8.1.1
CONTRACTOR
3
Contractor, Definition of
3.1, 6.1.2
Contractor's Construction and Submittal
Schedules
3.10, 3.12.1, 3.12.2, 4.2.3, 6.1.3, 15.1.6.2
Contractor's Employees
2.2.4, 3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3, 11.3, 14.1, 14.2.1.1
Contractor's Liability Insurance
11.1

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

Contractor's Relationship with Separate Contractors and Owner's Forces
3.12.5, 3.14.2, 4.2.4, 6, 11.3, 12.2.4
Contractor's Relationship with Subcontractors
1.2.2, 2.2.4, 3.3.2, 3.18.1, 3.18.2, 4.2.4, 5, 9.6.2, 9.6.7, 9.10.2, 11.2, 11.3, 11.4
Contractor's Relationship with the Architect
1.1.2, 1.5, 2.3.3, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5.1, 3.7.4, 3.10, 3.11, 3.12, 3.16, 3.18, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3, 12, 13.4, 15.1.3, 15.2.1
Contractor's Representations
3.2.1, 3.2.2, 3.5, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.8.2
Contractor's Responsibility for Those Performing the Work
3.3.2, 3.18, 5.3, 6.1.3, 6.2, 9.5.1, 10.2.8
Contractor's Review of Contract Documents
3.2
Contractor's Right to Stop the Work
2.2.2, 9.7
Contractor's Right to Terminate the Contract
14.1
Contractor's Submittals
3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 9.2, 9.3, 9.8.2, 9.8.3, 9.9.1, 9.10.2, 9.10.3
Contractor's Superintendent
3.9, 10.2.6
Contractor's Supervision and Construction Procedures
1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3, 7.3.4, 7.3.6, 8.2, 10, 12, 14, 15.1.4
Coordination and Correlation
1.2, 3.2.1, 3.3.1, 3.10, 3.12.6, 6.1.3, 6.2.1
Copies Furnished of Drawings and Specifications
1.5, 2.3.6, 3.11
Copyrights
1.5, **3.17**
Correction of Work
2.5, 3.7.3, 9.4.2, 9.8.2, 9.8.3, 9.9.1, 12.1.2, **12.2**, 12.3, 15.1.3.1, 15.1.3.2, 15.2.1
Correlation and Intent of the Contract Documents
1.2
Cost, Definition of
7.3.4
Costs
2.5, 3.2.4, 3.7.3, 3.8.2, 3.15.2, 5.4.2, 6.1.1, 6.2.3, 7.3.3.3, 7.3.4, 7.3.8, 7.3.9, 9.10.2, 10.3.2, 10.3.6, 11.2, 12.1.2, 12.2.1, 12.2.4, 13.4, 14
Cutting and Patching
3.14, 6.2.5
Damage to Construction of Owner or Separate Contractors
3.14.2, 6.2.4, 10.2.1.2, 10.2.5, 10.4, 12.2.4
Damage to the Work
3.14.2, 9.9.1, 10.2.1.2, 10.2.5, 10.4, 12.2.4
Damages, Claims for
3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.3.2, 11.3, 14.2.4, 15.1.7
Damages for Delay
6.2.3, 8.3.3, 9.5.1.6, 9.7, 10.3.2, 14.3.2
Date of Commencement of the Work, Definition of
8.1.2
Date of Substantial Completion, Definition of
8.1.3
Day, Definition of
8.1.4
Decisions of the Architect
3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 6.3, 7.3.4, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4, 9.5.1, 9.8.4, 9.9.1, 13.4.2, 14.2.2, 14.2.4, 15.1, 15.2
Decisions to Withhold Certification
9.4.1, **9.5**, 9.7, 14.1.1.3
Defective or Nonconforming Work, Acceptance, Rejection and Correction of
2.5, 3.5, 4.2.6, 6.2.3, 9.5.1, 9.5.3, 9.6.6, 9.8.2, 9.9.3, 9.10.4, 12.2.1
Definitions
1.1, 2.1.1, 3.1.1, 3.5, 3.12.1, 3.12.2, 3.12.3, 4.1.1, 5.1, 6.1.2, 7.2.1, 7.3.1, 8.1, 9.1, 9.8.1, 15.1.1
Delays and Extensions of Time
3.2, **3.7.4**, 5.2.3, 7.2.1, 7.3.1, **7.4**, **8.3**, 9.5.1, **9.7**, 10.3.2, **10.4**, 14.3.2, **15.1.6**, 15.2.5
Digital Data Use and Transmission
1.7
Disputes
6.3, 7.3.9, 15.1, 15.2
Documents and Samples at the Site
3.11
Drawings, Definition of
1.1.5
Drawings and Specifications, Use and Ownership of
3.11
Effective Date of Insurance
8.2.2
Emergencies
10.4, 14.1.1.2, **15.1.5**
Employees, Contractor's
3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3.3, 11.3, 14.1, 14.2.1.1
Equipment, Labor, or Materials
1.1.3, 1.1.6, 3.4, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2
Execution and Progress of the Work
1.1.3, 1.2.1, 1.2.2, 2.3.4, 2.3.6, 3.1, 3.3.1, 3.4.1, 3.7.1, 3.10.1, 3.12, 3.14, 4.2, 6.2.2, 7.1.3, 7.3.6, 8.2, 9.5.1, 9.9.1, 10.2, 10.3, 12.1, 12.2, 14.2, 14.3.1, 15.1.4
Extensions of Time
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3, 7.4, 9.5.1, 9.7, 10.3.2, 10.4, 14.3, 15.1.6, **15.2.5**
Failure of Payment
9.5.1.3, **9.7**, 9.10.2, 13.5, 14.1.1.3, 14.2.1.2
Faulty Work
(See Defective or Nonconforming Work)
Final Completion and Final Payment
4.2.1, 4.2.9, 9.8.2, **9.10**, 12.3, 14.2.4, 14.4.3

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

Financial Arrangements, Owner's
2.2.1, 13.2.2, 14.1.1.4
GENERAL PROVISIONS
1
Governing Law
13.1
Guarantees (See Warranty)
Hazardous Materials and Substances
10.2.4, **10.3**
Identification of Subcontractors and Suppliers
5.2.1
Indemnification
3.17, **3.18**, 9.6.8, 9.10.2, 10.3.3, 11.3
Information and Services Required of the Owner
2.1.2, **2.2**, 2.3, 3.2.2, 3.12.10.1, 6.1.3, 6.1.4, 6.2.5, 9.6.1, 9.9.2, 9.10.3, 10.3.3, 11.2, 13.4.1, 13.4.2, 14.1.1.4, 14.1.4, 15.1.4
Initial Decision
15.2
Initial Decision Maker, Definition of
1.1.8
Initial Decision Maker, Decisions
14.2.4, 15.1.4.2, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5
Initial Decision Maker, Extent of Authority
14.2.4, 15.1.4.2, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5
Injury or Damage to Person or Property
10.2.8, 10.4
Inspections
3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 12.2.1, 13.4
Instructions to Bidders
1.1.1
Instructions to the Contractor
3.2.4, 3.3.1, 3.8.1, 5.2.1, 7, 8.2.2, 12, 13.4.2
Instruments of Service, Definition of
1.1.7
Insurance
6.1.1, 7.3.4, 8.2.2, 9.3.2, 9.8.4, 9.9.1, 9.10.2, 10.2.5, **11**
Insurance, Notice of Cancellation or Expiration
11.1.4, 11.2.3
Insurance, Contractor's Liability
11.1
Insurance, Effective Date of
8.2.2, 14.4.2
Insurance, Owner's Liability
11.2
Insurance, Property
10.2.5, 11.2, 11.4, 11.5
Insurance, Stored Materials
9.3.2
INSURANCE AND BONDS
11
Insurance Companies, Consent to Partial Occupancy
9.9.1
Insured loss, Adjustment and Settlement of
11.5
Intent of the Contract Documents
1.2.1, 4.2.7, 4.2.12, 4.2.13
Interest
13.5
Interpretation
1.1.8, 1.2.3, **1.4**, 4.1.1, 5.1, 6.1.2, 15.1.1
Interpretations, Written
4.2.11, 4.2.12
Judgment on Final Award
15.4.2
Labor and Materials, Equipment
1.1.3, 1.1.6, **3.4**, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2
Labor Disputes
8.3.1
Laws and Regulations
1.5, 2.3.2, 3.2.3, 3.2.4, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 9.9.1, 10.2.2, 13.1, 13.3.1, 13.4.2, 13.5, 14, 15.2.8, 15.4
Liens
2.1.2, 9.3.1, 9.3.3, 9.6.8, 9.10.2, 9.10.4, 15.2.8
Limitations, Statutes of
12.2.5, 15.1.2, 15.4.1.1
Limitations of Liability
3.2.2, 3.5, 3.12.10, 3.12.10.1, 3.17, 3.18.1, 4.2.6, 4.2.7, 6.2.2, 9.4.2, 9.6.4, 9.6.7, 9.6.8, 10.2.5, 10.3.3, 11.3, 12.2.5, 13.3.1
Limitations of Time
2.1.2, 2.2, 2.5, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2.7, 5.2, 5.3, 5.4.1, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3, 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 12.2, 13.4, 14, 15, 15.1.2, 15.1.3, 15.1.5
Materials, Hazardous
10.2.4, **10.3**
Materials, Labor, Equipment and
1.1.3, 1.1.6, 3.4.1, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1.2, 10.2.4, 14.2.1.1, 14.2.1.2
Means, Methods, Techniques, Sequences and Procedures of Construction
3.3.1, 3.12.10, 4.2.2, 4.2.7, 9.4.2
Mechanic's Lien
2.1.2, 9.3.1, 9.3.3, 9.6.8, 9.10.2, 9.10.4, 15.2.8
Mediation
8.3.1, 15.1.3.2, 15.2.1, 15.2.5, 15.2.6, **15.3**, 15.4.1, 15.4.1.1
Minor Changes in the Work
1.1.1, 3.4.2, 3.12.8, 4.2.8, 7.1, **7.4**
MISCELLANEOUS PROVISIONS
13
Modifications, Definition of
1.1.1
Modifications to the Contract
1.1.1, 1.1.2, 2.5, 3.11, 4.1.2, 4.2.1, 5.2.3, 7, 8.3.1, 9.7, 10.3.2
Mutual Responsibility
6.2

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

Nonconforming Work, Acceptance of
9.6.6, 9.9.3, **12.3**
Nonconforming Work, Rejection and Correction of
2.4, 2.5, 3.5, 4.2.6, 6.2.4, 9.5.1, 9.8.2, 9.9.3, 9.10.4, 12.2
Notice
1.6, 1.6.1, 1.6.2, 2.1.2, 2.2.2., 2.2.3, 2.2.4, 2.5, 3.2.4, 3.3.1, 3.7.4, 3.7.5, 3.9.2, 3.12.9, 3.12.10, 5.2.1, 7.4, 8.2.2 9.6.8, 9.7, 9.10.1, 10.2.8, 10.3.2, 11.5, 12.2.2.1, 13.4.1, 13.4.2, 14.1, 14.2.2, 14.4.2, 15.1.3, 15.1.5, 15.1.6, 15.4.1
Notice of Cancellation or Expiration of Insurance
11.1.4, 11.2.3
Notice of Claims
1.6.2, 2.1.2, 3.7.4, 9.6.8, 10.2.8, **15.1.3**, 15.1.5, 15.1.6, 15.2.8, 15.3.2, 15.4.1
Notice of Testing and Inspections
13.4.1, 13.4.2
Observations, Contractor's
3.2, 3.7.4
Occupancy
2.3.1, 9.6.6, 9.8
Orders, Written
1.1.1, 2.4, 3.9.2, 7, 8.2.2, 11.5, 12.1, 12.2.2.1, 13.4.2, 14.3.1
OWNER
2
Owner, Definition of
2.1.1
Owner, Evidence of Financial Arrangements
2.2, 13.2.2, 14.1.1.4
Owner, Information and Services Required of the
2.1.2, **2.2**, 2.3, 3.2.2, 3.12.10, 6.1.3, 6.1.4, 6.2.5, 9.3.2, 9.6.1, 9.6.4, 9.9.2, 9.10.3, 10.3.3, 11.2, 13.4.1, 13.4.2, 14.1.1.4, 14.1.4, 15.1.4
Owner's Authority
1.5, 2.1.1, 2.3.32.4, 2.5, 3.4.2, 3.8.1, 3.12.10, 3.14.2, 4.1.2, 4.2.4, 4.2.9, 5.2.1, 5.2.4, 5.4.1, 6.1, 6.3, 7.2.1, 7.3.1, 8.2.2, 8.3.1, 9.3.2, 9.5.1, 9.6.4, 9.9.1, 9.10.2, 10.3.2, 11.4, 11.5, 12.2.2, 12.3, 13.2.2, 14.3, 14.4, 15.2.7
Owner's Insurance
11.2
Owner's Relationship with Subcontractors
1.1.2, 5.2, 5.3, 5.4, 9.6.4, 9.10.2, 14.2.2
Owner's Right to Carry Out the Work
2.5, 14.2.2
Owner's Right to Clean Up
6.3
Owner's Right to Perform Construction and to Award Separate Contracts
6.1
Owner's Right to Stop the Work
2.4
Owner's Right to Suspend the Work
14.3
Owner's Right to Terminate the Contract
14.2, 14.4
Ownership and Use of Drawings, Specifications and Other Instruments of Service
1.1.1, 1.1.6, 1.1.7, **1.5**, 2.3.6, 3.2.2, 3.11, 3.17, 4.2.12, 5.3
Partial Occupancy or Use
9.6.6, **9.9**
Patching, Cutting and
3.14, 6.2.5
Patents
3.17
Payment, Applications for
4.2.5, 7.3.9, 9.2, **9.3**, 9.4, 9.5, 9.6.3, 9.7, 9.8.5, 9.10.1, 14.2.3, 14.2.4, 14.4.3
Payment, Certificates for
4.2.5, 4.2.9, 9.3.3, **9.4**, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 14.2.4
Payment, Failure of
9.5.1.3, **9.7**, 9.10.2, 13.5, 14.1.1.3, 14.2.1.2
Payment, Final
4.2.1, 4.2.9, **9.10**, 12.3, 14.2.4, 14.4.3
Payment Bond, Performance Bond and
7.3.4.4, 9.6.7, 9.10.3, **11.1.2**
Payments, Progress
9.3, **9.6**, 9.8.5, 9.10.3, 14.2.3, 15.1.4
PAYMENTS AND COMPLETION
9
Payments to Subcontractors
5.4.2, 9.5.1.3, 9.6.2, 9.6.3, 9.6.4, 9.6.7, 14.2.1.2
PCB
10.3.1
Performance Bond and Payment Bond
7.3.4.4, 9.6.7, 9.10.3, **11.1.2**
Permits, Fees, Notices and Compliance with Laws
2.3.1, **3.7**, 3.13, 7.3.4.4, 10.2.2
PERSONS AND PROPERTY, PROTECTION OF
10
Polychlorinated Biphenyl
10.3.1
Product Data, Definition of
3.12.2
Product Data and Samples, Shop Drawings
3.11, **3.12**, 4.2.7
Progress and Completion
4.2.2, **8.2**, 9.8, 9.9.1, 14.1.4, 15.1.4
Progress Payments
9.3, **9.6**, 9.8.5, 9.10.3, 14.2.3, 15.1.4
Project, Definition of
1.1.4
Project Representatives
4.2.10
Property Insurance
10.2.5, **11.2**
Proposal Requirements
1.1.1
PROTECTION OF PERSONS AND PROPERTY
10

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

Regulations and Laws
1.5, 2.3.2, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 9.9.1, 10.2.2, 13.1, 13.3, 13.4.1, 13.4.2, 13.5, 14, 15.2.8, 15.4
Rejection of Work
4.2.6, 12.2.1
Releases and Waivers of Liens
9.3.1, 9.10.2
Representations
3.2.1, 3.5, 3.12.6, 8.2.1, 9.3.3, 9.4.2, 9.5.1, 9.10.1
Representatives
2.1.1, 3.1.1, 3.9, 4.1.1, 4.2.10, 13.2.1
Responsibility for Those Performing the Work
3.3.2, 3.18, 4.2.2, 4.2.3, 5.3, 6.1.3, 6.2, 6.3, 9.5.1, 10
Retainage
9.3.1, 9.6.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3
Review of Contract Documents and Field Conditions by Contractor
3.2, 3.12.7, 6.1.3
Review of Contractor's Submittals by Owner and Architect
3.10.1, 3.10.2, 3.11, 3.12, 4.2, 5.2, 6.1.3, 9.2, 9.8.2
Review of Shop Drawings, Product Data and Samples by Contractor
3.12
Rights and Remedies
1.1.2, 2.4, 2.5, 3.5, 3.7.4, 3.15.2, 4.2.6, 5.3, 5.4, 6.1, 6.3, 7.3.1, 8.3, 9.5.1, 9.7, 10.2.5, 10.3, 12.2.1, 12.2.2, 12.2.4, **13.3**, 14, 15.4
Royalties, Patents and Copyrights
3.17
Rules and Notices for Arbitration
15.4.1
Safety of Persons and Property
10.2, 10.4
Safety Precautions and Programs
3.3.1, 4.2.2, 4.2.7, 5.3, **10.1**, 10.2, 10.4
Samples, Definition of
3.12.3
Samples, Shop Drawings, Product Data and
3.11, **3.12**, 4.2.7
Samples at the Site, Documents and
3.11
Schedule of Values
9.2, 9.3.1
Schedules, Construction
3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.6.2
Separate Contracts and Contractors
1.1.4, 3.12.5, 3.14.2, 4.2.4, 4.2.7, 6, 8.3.1, 12.1.2
Separate Contractors, Definition of
6.1.1
Shop Drawings, Definition of
3.12.1
Shop Drawings, Product Data and Samples
3.11, **3.12**, 4.2.7
Site, Use of
3.13, 6.1.1, 6.2.1
Site Inspections
3.2.2, 3.3.3, 3.7.1, 3.7.4, 4.2, 9.9.2, 9.4.2, 9.10.1, 13.4
Site Visits, Architect's
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.4
Special Inspections and Testing
4.2.6, 12.2.1, 13.4
Specifications, Definition of
1.1.6
Specifications
1.1.1, **1.1.6**, 1.2.2, 1.5, 3.12.10, 3.17, 4.2.14
Statute of Limitations
15.1.2, 15.4.1.1
Stopping the Work
2.2.2, 2.4, 9.7, 10.3, 14.1
Stored Materials
6.2.1, 9.3.2, 10.2.1.2, 10.2.4
Subcontractor, Definition of
5.1.1
SUBCONTRACTORS
5
Subcontractors, Work by
1.2.2, 3.3.2, 3.12.1, 3.18, 4.2.3, 5.2.3, 5.3, 5.4, 9.3.1.2, 9.6.7
Subcontractual Relations
5.3, 5.4, 9.3.1.2, 9.6, 9.10, 10.2.1, 14.1, 14.2.1
Submittals
3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 7.3.4, 9.2, 9.3, 9.8, 9.9.1, 9.10.2, 9.10.3
Submittal Schedule
3.10.2, 3.12.5, 4.2.7
Subrogation, Waivers of
6.1.1, **11.3**
Substances, Hazardous
10.3
Substantial Completion
4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, **9.8**, 9.9.1, 9.10.3, 12.2, 15.1.2
Substantial Completion, Definition of
9.8.1
Substitution of Subcontractors
5.2.3, 5.2.4
Substitution of Architect
2.3.3
Substitutions of Materials
3.4.2, 3.5, 7.3.8
Sub-subcontractor, Definition of
5.1.2
Subsurface Conditions
3.7.4
Successors and Assigns
13.2
Superintendent
3.9, 10.2.6
Supervision and Construction Procedures
1.2.2, **3.3**, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3, 7.3.4, 8.2, 8.3.1, 9.4.2, 10, 12, 14, 15.1.4

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

Suppliers
1.5, 3.12.1, 4.2.4, 4.2.6, 5.2.1, 9.3, 9.4.2, 9.5.4, 9.6, 9.10.5, 14.2.1
Surety
5.4.1.2, 9.6.8, 9.8.5, 9.10.2, 9.10.3, 11.1.2, 14.2.2, 15.2.7
Surety, Consent of
9.8.5, 9.10.2, 9.10.3
Surveys
1.1.7, 2.3.4
Suspension by the Owner for Convenience
14.3
Suspension of the Work
3.7.5, 5.4.2, 14.3
Suspension or Termination of the Contract
5.4.1.1, 14
Taxes
3.6, 3.8.2.1, 7.3.4.4
Termination by the Contractor
14.1, 15.1.7
Termination by the Owner for Cause
5.4.1.1, **14.2,** 15.1.7
Termination by the Owner for Convenience
14.4
Termination of the Architect
2.3.3
Termination of the Contractor Employment
14.2.2

TERMINATION OR SUSPENSION OF THE CONTRACT
14
Tests and Inspections
3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 10.3.2, 12.2.1, **13.4**
TIME
8
Time, Delays and Extensions of
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, **8.3**, 9.5.1, 9.7, 10.3.2, 10.4, 14.3.2, 15.1.6, 15.2.5
Time Limits
2.1.2, 2.2, 2.5, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2, 5.2, 5.3, 5.4, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3, 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 12.2, 13.4, 14, 15.1.2, 15.1.3, 15.4
Time Limits on Claims
3.7.4, 10.2.8, 15.1.2, 15.1.3
Title to Work
9.3.2, 9.3.3
UNCOVERING AND CORRECTION OF WORK
12
Uncovering of Work
12.1
Unforeseen Conditions, Concealed or Unknown
3.7.4, 8.3.1, 10.3
Unit Prices
7.3.3.2, 9.1.2
Use of Documents
1.1.1, 1.5, 2.3.6, 3.12.6, 5.3
Use of Site
3.13, 6.1.1, 6.2.1
Values, Schedule of
9.2, 9.3.1
Waiver of Claims by the Architect
13.3.2
Waiver of Claims by the Contractor
9.10.5, 13.3.2, **15.1.7**
Waiver of Claims by the Owner
9.9.3, 9.10.3, 9.10.4, 12.2.2.1, 13.3.2, 14.2.4, **15.1.7**
Waiver of Consequential Damages
14.2.4, 15.1.7
Waiver of Liens
9.3, 9.10.2, 9.10.4
Waivers of Subrogation
6.1.1, **11.3**
Warranty
3.5, 4.2.9, 9.3.3, 9.8.4, 9.9.1, 9.10.2, 9.10.4, 12.2.2, 15.1.2
Weather Delays
8.3, 15.1.6.2
Work, Definition of
1.1.3
Written Consent
1.5.2, 3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.2, 9.3.2, 9.10.3, 13.2, 13.3.2, 15.4.4.2
Written Interpretations
4.2.11, 4.2.12
Written Orders
1.1.1, 2.4, 3.9, 7, 8.2.2, 12.1, 12.2, 13.4.2, 14.3.1

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Project Specifications, Project Technical Specifications (generally referred to as specifications in the Contract Documents) Addenda, Clarifications, issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties; (2) a Change Order; (3) a Construction Change Directive; or (4) a written order for a minor change in the Work issued by the Engineer, or their designee. The Contract Documents also include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications, including the Project Specifications and Project Technical Specifications, are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Engineer, or their designee and/or the Engineer's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.1.2. The Initial Decision Maker shall be the Engineer, or their designee and the Initial Decision Maker not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles defined in the Contract Documents.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Engineer, or their designee and/or Engineer's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Engineer, or their designee and /or Engineer's consultants reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Engineer, or their designee, and the Engineer, or their designee's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

§ 1.8 Building Information Models Use and Reliance INTENTIONALLY OMITTED

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in the Contract Documents, the Engineer, or their designee does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 INTENTIONALLY OMITTED

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 INTENTIONALLY OMITTED

§ 2.2.2 The Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract, which may be accomplished by furnishing the Contractor with a copy of an authorizing Resolution adopted by the Union County Board of County Commissioners. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor and shall comply N.J.A.C. 5:30-5.4

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 INTENTIONALLY OMITTED

§ 2.3.3 INTENTIONALLY OMITTED

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3. Owner shall in no way be responsible for any delays or claims arising from delays for enforcement of this Section.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within seven (7) calendar days after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Engineer, or their designee's additional services made necessary by such default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Engineer, or their designee in his administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Engineer, or their designee any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Engineer, or their designee may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Engineer, or their designee any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Engineer, or their designee may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Engineer, or their designee issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Engineer or their designee for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract, unless the Contract documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Engineer, or their designee and shall not proceed with that portion of the Work without further written instructions from the Engineer, or their designee. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Engineer, or their designee in accordance with Section 3.12.8 or ordered by the Engineer, or their designee in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Engineer, or their designee and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Engineer, or their designee that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Engineer, or their designee, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. If required by the Engineer, or their designee, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. Such warranty shall continue for a period of one (1) year from the date of Substantial Completion of the Work. Under this warranty, the Contractor shall remedy at his expense any such failure for the Work to be conforming to the requirement of the Contract, or any other defect appearing in the Work. In addition, the Contractor shall remedy at his own expense, any damage to Owner's owned, controlled, real or personal property, when that damage is the result of the Contractor's failure to prove conforming Work as it relates to the Contract Documents or any other defect of equipment, material, workmanship or design. The Contractor shall also restore any Work damaged in fulfilling its obligations under the terms of this provision. The Contractor's warranty with respect to the Work repaired or replaced hereunder will run for a period of one (1) year from the date of repair or replacement.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

Subject to the limitations and exemptions found in N.J.S.A. 54:32B-8.22, the Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions (Intentionally Omitted)

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Engineer, or their designee. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.7.6 Required Provisions Pursuant to N.J.S.A. 40A:11-16.7

40A:11-16.7 Changed conditions clauses for certain local public contracts.

1. All construction contracts issued by a contracting unit for bids which were advertised on or after the effective date of P.L.2017, c.317 (C.40A:11-16.7 et seq.) shall include the changed conditions contract provisions set forth in this section, which provisions shall be deemed to be a part of any such contract even if not expressly incorporated therein, and which provisions may not be modified in any manner by the contracting unit.

a. A contract subject to this section shall include the following differing site conditions provisions:

(1) If the contractor encounters differing site conditions during the progress of the work of the contract, the contractor shall promptly notify the contracting unit in writing of the specific differing site conditions encountered before the site is further disturbed and before any additional work is performed in the impacted area.

(2) Upon receipt of a differing site conditions notice in accordance with paragraph (1) of this subsection, or upon the contracting unit otherwise learning of differing site conditions, the contracting unit shall promptly undertake an investigation to determine whether differing site conditions are present.

(3) If the contracting unit determines different site conditions that may result in additional costs or delays exist, the contracting unit shall provide prompt written notice to the contractor containing directions on how to proceed.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

(4) (a) The contracting unit shall make a fair and equitable adjustment to the contract price and contract completion date for increased costs and delays resulting from the agreed upon differing site conditions encountered by the contractor.

(b) If both parties agree that the contracting unit's investigation and directions decrease the contractor's costs or time of performance, the contracting unit shall be entitled to a fair and equitable downward adjustment of the contract price or time of performance.

(c) If the contracting unit determines that there are no differing site conditions present that would result in additional costs or delays, the contracting unit shall so advise the contractor, in writing, and the contractor shall resume performance of the contract, and shall be entitled to pursue a differing site conditions claim against the contracting unit for additional compensation or time attributable to the alleged differing site conditions.

(5) Execution of the contract by the contractor shall constitute a representation that the contractor has visited the site and has become generally familiar with the local conditions under which the work is to be performed.

(6) As used in this subsection, "differing site conditions" mean physical conditions at the contract work site that are subsurface or otherwise concealed and which differ materially from those indicated in the contract documents or are of such an unusual nature that the conditions differ materially from those ordinarily encountered and generally recognized as inherent in the work of the character provided for in the contract.

b. A contract subject to this section shall include the following suspension of work provisions:

(1) The contracting unit shall provide written notice to the contractor in advance of any suspension of work lasting more than 10 calendar days of the performance of all or any portion of the work of the contract.

(2) If the performance of all or any portion of the work of the contract is suspended by the contracting unit for more than 10 calendar days due to no fault of the contractor or as a consequence of an occurrence beyond the contracting unit's control, the contractor shall be entitled to compensation for any resultant delay to the project completion or additional contractor expenses, and to an extension of time, provided that, to the extent feasible, the contractor, within 10 calendar days following the conclusion of the suspension, notifies the contracting unit, in writing, of the nature and extent of the suspension of work. The notice shall include available supporting information, which information may thereafter be supplemented by the contractor as needed and as may be reasonably requested by the contracting unit. Whenever a work suspension exceeds 60 days, upon seven days' written notice, either party shall have the option to terminate the contract for cause and to be fairly and equitably compensated therefor.

(3) Upon receipt of the contractor's suspension of work notice in accordance with paragraph (2) of this subsection, the contracting unit shall promptly evaluate the contractor's notice and promptly advise the contractor of its determination on how to proceed in writing.

(4) (a) If the contracting unit determines that the contractor is entitled to additional compensation or time, the contracting unit shall make a fair and equitable upward adjustment to the contract price and contract completion date.

(b) If the contracting unit determines that the contractor is not entitled to additional compensation or time, the contractor shall proceed with the performance of the contract work, and shall be entitled to pursue a suspension of work claim against the contracting unit for additional compensation or time attributable to the suspension.

(5) Failure of the contractor to provide timely notice of a suspension of work shall result in a waiver of a claim if the contracting unit can prove by clear and convincing evidence that the lack of notice or delayed notice by the contractor actually prejudiced the contracting unit's ability to adequately investigate and defend against the claim.

c. A contract subject to this section shall include the following change in character of work provisions:

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

(1) If the contractor believes that a change directive by the contracting unit results in a material change to the contract work, the contractor shall so notify the contracting unit in writing. The contractor shall continue to perform all work on the project that is not the subject of the notice.

(2) Upon receipt of the contractor's change in character notice in accordance with paragraph (1) of this subsection, the contracting unit shall promptly evaluate the contractor's notice and promptly advise the contractor of its determination on how to proceed in writing.

(3) (a) If the contracting unit determines that a change to the contractor's work caused or directed by the contracting unit materially changes the character of any aspect of the contract work, the contracting unit shall make a fair and equitable upward adjustment to the contract price and contract completion date. The basis for any such price adjustment shall be the difference between the cost of performance of the work as planned at the time of contracting and the actual cost of such work as a result of its change in character, or as otherwise mutually agreed upon by the contractor and the contracting unit prior to the contractor performing the subject work.

(b) If the contracting unit determines that the contractor is not entitled to additional compensation or time, the contractor shall continue the performance of all contract work, and shall be entitled to pursue a claim against the contracting unit for additional compensation or time attributable to the alleged material change.

(4) As used in this subsection, "material change" means a character change which increases or decreases the contractor's cost of performing the work, increases or decreases the amount of time by which the contractor completes the work in relation to the contractually required completion date, or both.

d. A contract subject to this section shall include the following change in quantity provisions:

(1) The contracting unit may increase or decrease the quantity of work to be performed by the contractor.

(2) (a) If the quantity of a pay item is cumulatively increased or decreased by 20 percent or less from the bid proposal quantity, the quantity change shall be considered a minor change in quantity.

(b) If the quantity of a pay item is increased or decreased by more than 20 percent from the bid proposal quantity, the quantity change shall be considered a major change in quantity.

(3) For any minor change in quantity, the contracting unit shall make payment for the quantity of the pay item performed at the bid price for the pay item.

(4) (a) For a major increase in quantity, the contracting unit or contractor may request to renegotiate the price for the quantity in excess of 120 percent of the bid proposal quantity. If a mutual agreement cannot be reached on a negotiated price for a major quantity increase, the contracting unit shall pay the actual costs plus an additional 10 percent for overhead and an additional 10 percent for profit, unless otherwise specified in the original bid.

(b) For a major decrease in quantity, the contracting unit or contractor may request to renegotiate the price for the quantity of work performed. If a mutual agreement cannot be reached on a negotiated price for a major quantity decrease, the contracting unit shall pay the actual costs plus an additional 10 percent for overhead and an additional 10 percent for profit, unless otherwise specified in the original bid; provided, however, that the contracting unit shall not make a payment in an amount that exceeds 80 percent of the value of the bid price multiplied by the bid proposal quantity.

(5) As used in this subsection, the term "bid proposal quantity" means the quantity indicated in the bid proposal less the quantities designated in the project plans as "if and where directed."

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§ 3.8.2 Unless otherwise provided in the Contract Documents,

.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

.3 Whenever costs are more than or less than allowances/contingency, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances/contingency under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2. The unused balance of any allowance shall be deducted from the Contract Sum upon completion and acceptance of the Work by Credit Change Order.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Engineer, or their designee of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Engineer or their designee may notify the Contractor, stating whether the Owner or the Engineer, or their designee (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Engineer, or their designee to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Engineer, or their designee has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract and before the preconstruction meeting, shall submit for the Owner's and Engineer, or their designee's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and before the preconstruction meeting, and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Engineer, or their designee's approval. The Engineer, or their designee's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Engineer, or their designee reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Engineer, or their designee.

§3.10.4 If the Contractor fails to comply with the scheduling requirements of Article 3, said failure shall result in the following:

.1 all claims resulting from the Contractor's failure to prepare or submit a schedule shall be the Contractor's responsibility;

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

.2 shall constitute an act of default and a substantial breach of the Contract giving the Owner remedies under the Contract Documents; and

.3 the Owner shall have the right to withhold any payments until the Contractor complies with the scheduling requirements of Article 3 herein.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Drawings, Specifications, Addenda, Clarifications, Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Engineer, or their designee and Owner, and delivered to the Engineer, or their designee for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Engineer, or their designee is subject to the limitations of Section 4.2.7. Informational submittals upon which the Engineer, or their designee is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Engineer, or their designee without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Engineer, or their designee, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Engineer, or their designee or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Engineer, or their designee that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Engineer, or their designee.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Engineer or their designee approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Engineer, or their designee of such deviation at the time of submittal and (1) the Engineer, or their designee has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Engineer, or their designee approval thereof.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Engineer, or their designee t on previous submittals. In the absence of such notice, the Engineer, or their designee approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Engineer, or their designee will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Engineer, or their designee. The Owner and the Engineer, or their designee shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Engineer, or their designee have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Engineer, or their designee will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Engineer, or their designee at the time and in the form specified by the Engineer, or their designee.

§ 3.13 Use of Site

§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§3.13.2 The Contractor shall coordinate the Contractor's operations with, and secure the written approval of, the Owner before using any portion of the Site.

§3.13.3 The Contractor shall store its apparatuses, materials, supplies, and equipment in such orderly fashion at the Site of the Work, if permitted, as will not unduly interfere with the progress of the Work or ongoing operations. The Contractor shall provide protective fencing around the designated storage areas.

§3.13.4 The Contractor shall see that stockpiles of materials and storage of equipment are kept to a minimum and neatly stored where directed by the Owner and the Engineer, or their designee.

§3.13.5 If the Work is to be executed in areas occupied by the Owner, the Contractor shall inform the Owner in advance of the areas scheduled to be worked on, so that the Owner's personnel may make proper preparations to protect equipment and records.

§3.13.6 The Contractor understands that some or all the Work of the Contract may be performed while the facilities are occupied by personnel, and accordingly shall make all reasonable and necessary provisions to ensure that the contract Work will be of minimal disruption to the environment.

§3.13.7 Materials and equipment that are to be used only directly in the Work, shall be brought to and stored on the Project site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Project Site. Protection of construction materials and equipment stored at the Project Site from weather, theft, damage and all other adversity is solely the Contractor's responsibility. The Contractor shall bear the

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

responsibility to replace all such materials that may be lost, damaged, or stolen at its expense, whether such materials or equipment have been entirely or partially paid for by the Owner.

§3.13.8 The Contractor and any entity for whom the Contractor is responsibility, shall not erect any sign on the Project Site without the prior written consent of the Owner, which may be withheld in the sole discretion of the Owner.

§3.13.9 Contractor shall ensure that the Work is performed at all times in a manner that affords reasonable access, both vehicular and pedestrian, to the Site of the Work and all adjacent areas. The Work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent to the Site of the Work shall be free from all debris, building materials, and equipment likely to cause hazardous conditions.

§3.13.10 Without prior approval of the Owner, the Contractor shall not permit any workers to use any existing facilities at the Project Site, including, without limitation, the lavatories, toilets, entrances, and parking areas, other than those designated by the Owner. Without limitation of any other provision of the Contract Documents, the Contractor shall use its best efforts to comply with all rules and regulations promulgated by the Owner in connection with the use and occupancy of the Project Site and the Building, as amended from time to time. The Contractor shall immediately notify the Owner in writing, if during the performance of the Work, the Contractor finds compliance with any portion of such rules and regulations to be impracticable. This notification shall set forth the problems of such compliance and shall suggest alternatives through which the same results intended by such portions of the rules and regulations can be achieved. The Owner may, in the Owner's sole discretion, adopt such suggestions, develop new alternatives or require compliance with the existing requirements of the rules and regulations. The Contractor shall also comply with all insurance requirements and collective bargaining agreements applicable to use and occupancy of the Project Site and the Building.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents. Any costs incurred by the Owner for defective cutting or patching shall be borne by the Contractor responsible therefore.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor, or shall be entitled to reduce the Contract Amount in an amount equal to the Owner's cost of clean up

§3.15.3 The Contractor shall, on a daily basis, clean debris resulting from its Work, and protect construction in progress and maintain adjoining materials in place during handling and installation, and provide protective covering where required to assure protection from damage or deterioration until Substantial Completion.

§3.15.4 The Contractor shall clean and provide maintenance on completed construction, after installation, as frequently as necessary through the remainder of the construction period.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§3.15.5 The Contractor shall supervise its construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. The term "clean" shall include the removal of debris from the work area to dumpsters furnished by the Contractor , whichever contracting method shall apply.

3.16 Access to Work

The Contractor shall provide the Owner and Engineer, or their designee with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Engineer, or their designee harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Engineer, or their designee. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Engineer, or their designee.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner and the Owner's consultants, agents, representatives, and employees from and against any and all claims, damages, losses, costs, and expenses, including, but not limited to attorneys' fees, legal costs and legal expenses arising out of or resulting from the performance of the Contractor's work under this contract, provided that such claim, damage, loss, cost, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself) caused or alleged to be caused by the negligent acts, negligent omissions, and/or fault of the Contractor, anyone directly or indirectly employed or retained by the Contractor, or anyone for whose acts the Contractor may be liable regardless of whether caused in part by the negligent act or omission of a party indemnified hereunder provided it is not caused by the sole negligence of a party indemnified hereunder. Contractor shall further indemnify and hold harmless the County and the County's consultants, agents, representative, and employees from and against any and all claims, damages, losses, costs, and expenses, including, but not limited to attorneys' fees, legal costs and legal expenses, arising out of or resulting from performance of the work, provided that such claim, damage, loss, cost, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself) caused or alleged to be caused by the negligent acts, negligent omissions, and/or fault of the County or the County's consultants, agents, representatives, or employees and arises out of this project and provided such claim, damage, loss, cost, or expense is not caused by the sole negligence of a party indemnified hereunder.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT OR ENGINEER, OR THEIR DESIGNEE

§ 4.1 General

§ 4.1.1 The Engineer is the person or entity retained by the Owner and identified as such in the Contract Documents.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Owner's professionals, as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Engineer, or their designee. Consent shall not be unreasonably withheld.

§4.1.3 The Owner, if required, shall retain an Engineer licensed to practice Engineering in the State of New Jersey. That person, or entity, is identified as the Engineer, or their designee in the Agreement herein and is referred to throughout the Contract Documents as if singular in number.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§ 4.2 Administration of the Contract

§ 4.2.1 The Engineer, or their designee will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Engineer, or their designee issues the final Certificate for Payment. The Engineer, or their designee will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Engineer, or their designee will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Engineer, or their designee will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Engineer, or their designee will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Engineer, or their designee will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Engineer, or their designee will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Engineer, or their designee will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Engineer, or their designee in all communications that relate to or affect the Engineer, or their designee's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Engineer, or their designee's consultants shall be through the Engineer, or their designee. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Engineer, or their designee's evaluations of the Contractor's Applications for Payment, the Engineer, or their designee will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Engineer, or their designee has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Engineer, or their designee will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Engineer, or their designee nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Engineer, or their designee to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Engineer, or their designee will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Engineer, or their designee's action will be taken in accordance with the submittal schedule approved by the Engineer, or their designee or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Engineer, or their designee's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Engineer, or their designee's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Engineer, or their designee's review shall not constitute

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Engineer, or their designee will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Engineer, or their designee will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Engineer, or their designee will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Engineer, or their designee agree, the Engineer, or their designee will provide one or more Project representatives to assist in carrying out the Engineer, or their designee's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Engineer, or their designee will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Engineer, or their designee's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Engineer, or their designee will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Engineer, or their designee will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Engineer, or their designee's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Engineer, or their designee will review and respond to requests for information about the Contract Documents. The Engineer, or their designee's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Engineer, or their designee will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2. Identification of Subcontractors required by N.J.S.A. 40A:11-16 shall be provided with the bid submission in accordance with the requirements of that statute. Names of persons or entities for any Subcontractor not covered by N.J.S.A. 40A:11-16 shall be furnished within thirty (30) thirty days of notification of Award of Contract. The Engineer, or their designee will notify the Contractor in writing if the Owner or Engineer, or their designee, after due investigation, has reasonable objection to any such proposed person or entity. This does not apply to named subcontractor pursuant to N.J.S.A 40A:11-16. The list of proposed Subcontractors shall include a description of the materials and equipment each proposes to furnish and install in the Work. The description shall be in sufficient

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

detail to allow the Engineer, or their designee to determine general conformance to Contract requirements. Approval of the submittals as required under this Article shall not relieve the Contractor from conformance to Contract requirements.

§ 5.2.2 Except for named subcontractors per N.J.S.A. 40A:11-16, the Contractor shall not contract with a proposed person or entity to whom the Owner or Engineer, or their designee has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§5.2.3 Written confirmation of award of each subcontract shall be submitted to the Owner by the Contractor, in form subject to his approval, within seven (7) calendar days after receipt of Owner's approval of proposed Subcontractor list as provided under this Article. Every subcontract shall be in writing, shall be submitted to Owner for review and approval prior to execution, and shall specifically provide that the Owner is an intended third (3rd) party beneficiary of such subcontract.

§ 5.2.4 The Contractor shall not contract with a proposed person or entity to whom the Owner or Engineer, or their designee has made reasonable and timely objection. Except for named subcontractors per N.J.S.A. 40A:11-16, the Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.5 If the Owner or Engineer, or their designee has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Engineer, or their designee has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work, as needed and pursuant to the Contract Documents. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.6 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Engineer, or their designee makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

§ 5.3.1 By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Engineer, or their designee. Each subcontract agreement shall preserve and protect the rights of the Owner and Engineer, or their designee under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors. Each subcontract agreement shall preserve and protect the rights of the Owner and Engineer, or their designee under the Contract Documents and at law. No Subcontract shall diminish in any way any rights or benefits conferred upon the Owner by these Contract Documents. The Contractor shall make all Contract Documents available to the Subcontractors.

§5.3.2 Where the Contractor subcontracts portions of the Work, the entire responsibility for the subdividing of Work rests with the Contractor. The Owner and the Engineer, or their designee are not responsible for the manner of the subdivision of the Work, nor will they enter into or settle disagreements or disputes between Contractor and Subcontractors. The Contractor is, and will be held, responsible for the proper execution of the Work of all Subcontractors.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation may be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Engineer, or their designee of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Engineer, or their designee of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Engineer, or their designee will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents. Change Orders and Construction Change Directives shall be subject to and processed in accordance with N.J.A.C. 5:30-11.1 et seq., where applicable.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Engineer, or their designee. A Construction Change Directive requires written agreement by the Owner and Engineer, or their designee and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Engineer, or their designee alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Engineer, or their designee and signed by the Owner, Contractor, and Engineer, or their designee stating their agreement upon all of the following:

.1 The change in the Work;
.2 The amount of the adjustment, if any, in the Contract Sum; and
.3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Engineer, or their designee and signed by the Owner and Engineer, or their designee, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. A Construction Change Directive shall not require the Agreement of the Engineer, or their designee if the Owner specifically waives their consent in writing. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
.2 Unit prices stated in the Contract Documents or subsequently agreed upon;

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Engineer, or their designee shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Engineer, or their designee may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Engineer, or their designee;

.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and

.5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Engineer, or their designee of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time. The Contractor's failure to comply with a Construction Change Directive shall constitute an incident of default and cause for termination by the Owner.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Engineer, or their designee. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Engineer, or their designee will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Engineer, or their designee determines, in the Engineer, or their designee's professional judgment, to be reasonably justified. The Engineer, or their designee's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Engineer, or their designee concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Engineer, or their designee will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§7.3.11 In Sections 7.3.3 and 7.3.4, the allowance for overhead and profit combined shall be based upon the following schedule:

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

.1 For the Contractor, for work performed by his own forces, 15% of cost (inclusive of bond and insurance).

.2 For each Subcontractor, for the work performed by his own forces, 5% of cost (inclusive of bond and insurance).

.3 For the Contractor, for work performed by a subcontractor, 10% of cost (inclusive of bond and insurance).

§7.3.12 Lump sum quotations for changes in the Work will not be accepted. Proposals shall be completely itemized and broken down. They shall be accompanied by such supporting data as the Engineer, or their designee may require, such as copies of subcontractor's or vendor's quotations, quantity take-off sheets, or other similar information.

§ 7.4 Minor Changes in the Work

The Engineer, or their designee may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Engineer, or their designee and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Engineer, or their designee's order for a minor change without prior notice to the Engineer, or their designee that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work and services as required by the Contract Documents. Substantial Completion of the Work shall be accomplished within the period of consecutive calendar days (or by the date), as stated in the Agreement, plus any authorized extension(s) of time as approved by written agreement. Final Completion of the Work shall be no later than thirty (30) consecutive calendar days from the date of Substantial Completion of the Work, unless otherwise set forth in Article 3.3 of the Owner/Contractor Agreement.

§ 8.1.2 The date of Substantial Completion is the date certified by the Engineer, or their designee in accordance with Section 9.8.

§ 8.1.3 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work. There will be no bonus or incentives paid, should the Work, or any portion thereof, be completed in advance of the specified activity milestone dates. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Engineer, or their designee, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Engineer, or their designee determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Engineer, or their designee may determine.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

§8.3.4 No payment, compensation, or adjustment of any kind shall be made to the Contractor by the Owner for damages resulting from hindrances or delays caused by the delays of others, or from foreseeable circumstances not attributable to the Owner's conduct. The Contractor agrees that it will make no claim against the Owner for payment, compensation, damages, mitigation of Liquidated Damages, or adjustment of any kind for such hindrances or delays, and will accept such extensions of time as may be granted by the Owner in the Owner's sole discretion in full satisfaction for any and all alleged claims against the Owner for any and all such hindrances or delays. For purposes of this Agreement, disputes arising between contractors before or during construction, adverse weather conditions, and delays on the part of local authorities issuing permits shall be considered foreseeable circumstances. Notwithstanding the foregoing, nothing herein shall limit the Contractor's remedies for Owner's negligence, bad faith, active interference, tortious conduct, or other reasons uncontemplated by the parties that delay expenditures paid by the Owner to the Engineer, or their designee, other individual or entity, or to any inspector or inspectors necessarily employed by it on the Work, for any number of days in excess of the Contract Time. Per N.J.S.A. 40A:11-17,a deduction shall be taken from the Contract Sum by the Owner for any wages paid by the Owner to any inspector or inspectors necessarily employed by it on the Work, for any number of days in excess of the number allowed in the Contract Documents.

§8.3.5 The provisions of this Article shall not be so interpreted or construed as to preclude or prevent the Contractor from making and prosecuting any claim against any separate Contractor engaged or employed by the Owner for damages alleged to have been caused or occasioned by any such separate Contractor.

§8.3.6 To the extent permitted by law, the Owner may suspend the whole or any part of the Work, if it shall deem it for the best interest of the Owner to do so, without compensation to the Contractor for such suspension, other than extending the time for completion of the Work as much as it may have been delayed by such suspension. During such suspension, all materials delivered upon, but no placed in the Work shall be neatly piled by the Contractor so as not to obstruct public travel, or shall be removed from the line of Work at the direction of the Owner and, unless the materials be moved by the Contractor upon such direction, the materials shall be removed by the Owner and expense thereof will be charged to the Contractor.

§8.4.1 Should the Contractor fail to complete fully, and in conformity with all provisions of the Contract within the Contract Time, the Contractor shall, and hereby agrees to, pay the Owner one thousand dollars ($1,000.00) per day, for each consecutive calendar day beyond the number of days allowed by the Contract, which sum is agreed upon as reasonable and proper measure of damages that the Owner will sustain per diem by failure of Contractor to complete Work within time as stipulated; it being recognized by Owner and Contractor that the injury to Owner that could result from a failure of the Contractor to complete on schedule, is uncertain and cannot be computed exactly, In no way shall costs of Liquidated Damages be construed as a penalty to the Contractor.

§8.4.2 It is expressly understood and agreed by and between the Contractor and Owner that the Contract Time prescribed herein is a reasonable time for the completion of the Work.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted if agreed upon in writing between the parties herein

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Engineer, or their designee before the first Application for Payment, allocating the entire

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Engineer, or their designee. This schedule, unless objected to by the Engineer or their designee, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Engineer, or their designee and supported by such data to substantiate its accuracy as the Engineer, or their designee may require, and if accepted by the Engineer, or their designee, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 See Article 5 of Standard Form of Agreement between Owner/Contractor. All payment shall be made pursuant to the Prompt Payment Act (N.J.S.A. 2A:30A-1 et seq.)

§ 9.3.1.1 Applications for Payment may include requests for payment on account of changes in the Work which have been properly authorized by Construction Change Directives but not yet included in Change Orders.

§ 9.3.1.2 Such applications may not include requests for payment of amounts the Contractor does not intend to pay to a Subcontractor or material supplier because of a dispute or other reason.

§ 9.3.1.3 All applications for payment shall be accompanied by the Application and Certificate of Payment, , fully completed as required or such other application for Payment as the Owner's representative shall use.

§9.3.1.4 In cases where the work is awarded on a Single Overall Contract basis, payments shall be made in accordance with applicable State of New Jersey statutes.

§ 9.3.1.5 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§9.3.3.1 All municipal mechanic's liens filed by a lien claimant shall be governed by N.J.S.A. 2A:44-125 et seq. In the event a municipal mechanic's lien is filed, the Owner reserves the right to withhold the full amount of the lien. The Owner may release the funds to the party against whose account the lien is claimed, only after that party files with the Owner's financial officer, a bond in an amount double of all sums claimed ("Double Bond") under the lien, and such bond's form has been approved by the Owner's chief law officer and financial officer, per N.J.S.A. 2A:44-130 or if an acceptable release of liens is filed by the lien claimant.

§ 9.4 Certificates for Payment

See Article 5 of Standard Form of Agreement between Owner and Contractor.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

See Article 5 of Standard Form of Agreement between Owner and Contractor

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§ 9.6 Progress Payments

§ 9.6.1 After the Engineer, or their designee has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Engineer, or their designee.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than ten (10) calendar days after receipt of payment of the periodic payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Engineer, or their designee will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Engineer, or their designee and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Engineer, or their designee shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Engineer, or their designee does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within the time prescribed by the "Prompt Payment Act", then the Contractor may, upon seven (7) calendar days' written notice to the Owner and Engineer, or their designee, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use provided, however, that a condition precedent to Substantial Completion shall be the Owner's receipt of all certificates of occupancy (permanent or temporary) and any other permits, approvals, licenses, and other documents from any governmental authority having jurisdiction thereof necessary for the

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

occupancy of the Project. The Owner may withhold a certification of Substantial Completion if temporary installations or temporary construction exists in areas requesting certification, or if certificates of occupancy are temporary or conditional.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Engineer, or their designee shall prepare a comprehensive list of items to be completed or corrected ("Punch List"). The Contractor shall proceed immediately to complete and correct items on the list. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Upon receipt of the list, the Engineer, or their designee will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Engineer, or their designee's inspection discloses any item, whether or not included on the list, which is not in accordance with the requirements of the Contract Documents, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Engineer, or their designee. The Contractor shall then submit a request for another inspection by the Engineer, or their designee to determine Substantial Completion. When the Work or designated portion thereof is substantially complete, the Engineer, or their designee will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall establish responsibilities of the Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the List accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to the Contractor for its written acceptance and to the Owner for its approval and acceptance as required by Section 9.8.1 No Certificate of Substantial Completion shall be deemed effective unless executed by both Owner and Contractor.

§ 9.8.3 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Engineer, or their designee as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Engineer, or their designee.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Engineer, or their designee shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§9.9.4 The occupancy of any portion of the Work shall not constitute acceptance of any Work, except as hereinafter stated, nor does it waive the Owner's right to Liquidated Damages. Final Acceptance of the Work shall be for the whole Work only and not part.

§9.9.5 Occupancy by the Owner shall not be deemed to constitute a waiver of existing claims on behalf of the Owner or Contractor against each other.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Engineer, or their designee will promptly make such inspection. When the Engineer, or their designee finds the Work acceptable under the Contract Documents and the Contract fully performed, the Engineer, or their designee will promptly issue a final Certificate for Payment stating that to the best of the Engineer, or their designee knowledge, information and belief, and on the basis of the Engineer, or their designee's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Engineer, or their designee's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Engineer, or their designee (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Engineer, or their designee so confirms, the Owner shall, upon application by the Contractor and certification by the Engineer, or their designee, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Engineer, or their designee prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- **.1** liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents;
- **.3** terms of special warranties required by the Contract Documents; or
- **.4** audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

§9 11 REIMBURSEMENT TO OWNER

If the Owner is entitled to any reimbursement or payment from the Contractor under, or pursuant to, the Contract Documents, such payment shall be made promptly upon demand by the Owner. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due the Owner, or the Owner incurs any costs and expenses to cure any default of the Contractor or to correct defective Work, the Owner shall have an absolute right to offset such amount against the Contract Sum and may, in the Owner's sole discretion, elect either to: (1) deduct an amount equal to that which the Owner is entitled from any payment then, or thereafter, due the Contractor from the Owner; or (2) issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall submit the Contractor's safety program to the Engineer, or their designee for review and coordination with the safety programs of other Contractors.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- **.1** employees on the Work and other persons who may be affected thereby;
- **.2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- **.3** other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.
- **.4** Construction or operations by the Owner or other Contractors.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4, except damage or loss attributable to acts or omissions of the Owner or Engineer, or their designee or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Engineer, or their designee.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

the condition, immediately stop Work in the affected area and notify the Owner and Engineer, or their designee of the condition in writing

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Engineer, or their designee the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance.

§ 10.3.3 INTENTIONALLY OMITTED

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 INTENTIONALLY OMITTED.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents, specifically Section 10 of the Project Specifications. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Engineer, or their designee, and Engineer, or their designee's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 The Contractor shall carry the following insurance:

1. General Liability Insurance will be provided on a Comprehensive General Liability form with a combined single limit of $5,000,000.00 per occurrence/$10,000,000 aggregate for Bodily Injury Liability and Property Damage Liability and will include the interest of the Owner with respect to Work emanating from this Agreement with the Owner. The insurance will include the following:
    a) Personal Injury Liability
    b) Blanket Contractual Liability applies to assumption of liability under any written Contract
    c) Coverage for A, X, C, U exposures, relating to excavation, blasting underground damage
    d) Broad Form Property Damage Liability
    e) Products and/or Completed Operations Liability

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

2. Per the Contract documents, Contractor shall carry and maintain at all times while the contract is in full force and effect, the following insurance coverage with an insurance company or companies acceptable to the Owner, with limits not less than those shown below. A Certificate of Insurance shall be filed with the Owner prior to commencement of any Work indicating the following:

a) Commercial General Liability (CGL): Coverage for all operations including, but not limited to, contractual, products and completed operations, and personal injury with limits no less than $5,000,000 per occurrence/$10,000,000 aggregate. The County of Union, its Board of County Commissioners, officers, employees, agents and servants shall be included as an additional insured. Coverage is provided on a primary and non-contributory basis to the County of Union, et al.

b) Automobile Liability: Coverage for all owned, non-owned and hired vehicles with limits not less than $5,000,000 per occurrence, combined single limits (CSL) or its equivalent.

c) Workers Compensation: As required by the State of New Jersey and Employers Liability with limits not less than $1,000,000 per accident for bodily injury or disease.

d) Professional Liability (if design/build): Coverage with limits not less than $1,000,000 per occurrence or claim, $2,000,000 aggregate

e) Contractor's Pollution Legal Liability and/or Asbestos Legal Liability and/or Errors & Omissions (if project involves environmental hazards): Coverage with limits no less than $1,000,000 per occurrence or claim/$2,000,000 aggregate.

f) Builders Risk (for major renovations): During the course of construction utilizing an "All Risk" coverage form with limits equal to the completed value of the project and no coinsurance penalty provisions.

3. Where applicable, a waiver of subrogation in favor of the County of Union, its Board of County Commissioners, officers, employees, agents, servants and the State of New Jersey is to be included in those policies of insurance where permitted by law.

4. Notice of Cancellation: Each insurance policy required above shall provide that coverage shall not be canceled, except with thirty (30) days' written notice to the Owner.

5. Special Risks or Circumstances: The County reserves the right to modify these requirements, including limits, based on the nature of the risk, prior experience, insurer, coverage, or other special circumstances.

6. The Owner, and its other related parties and agents, shall be named as an additional insured on all the above referenced policies. The Contractor shall provide evidence of same by filing a copy of a Certificate of Insurance prior to the commencement of the Work, and such Certificate of Insurance shall be consistent with the types of coverage(s) and limits provided in the Bid Specifications and the Contract Documents, generally.

§ 11.1.5 The insurance required herein and within the Contract Documents shall remain in effect for the duration of the project, (i.e., from beginning of construction until final payment and closeout).

§ 11.1.6 All insurance required herein and within the Contract Documents shall be issued by insurance companies authorized to do business in the State of New Jersey and rated as "A' or better as determined by A.M. Best Company.

§ 11.1.7 The Contractor waives all rights against the Owner for damages caused by fire or other perils to the extent covered by insurance provided under this Article. Any deductibles, co-insurance, or contribution to the loss will be borne solely by the Contractor.

§11.1.8 A Certificate of Insurance evidencing the coverages required by Section 11.1.1 shall be submitted to the Owner's attorney for approval and transmittal to the Owner and Engineer, or their designee prior to the commencement of the Work. The Certificate must be submitted on the ACORD from Certificate of Insurance. The Certificate(s) and the insurance policies required by this Section shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least thirty (30) days' written notice has been given to the Owner. If requested by the Owner, the Contractor shall provide complete copies of any policies of insurance required by this Contract to be obtained by the Contractor and Subcontractor(s). Information concerning any reduction of coverage shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.

§ 11.1.9 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 PROPERTY INSURANCE

§ 11.2.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance in the amount of the initial Contract Sum as well as subsequent modifications thereto for the entire Work at the site on a replacement cost basis without voluntary deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurance interest in the property required by this Section 11.2 to be covered, whichever is earlier. This insurance shall include the interest of the Owner, Contractor, Subcontractor(s), and Sub-Contractor(s) in the Work.

§ 11.2.1.1 Property insurance shall be on an "all-risk" policy form and shall against the perils of fire and extended coverage and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, falsework, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Engineer, or their designee's services and expenses required as a result of such insured loss. Coverage for all other perils shall not be required unless otherwise provided in the Contract Documents.

§ 11.2.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance which will protect the interests of the Contractor, Subcontractor(s) and Sub-subcontractor(s) in the Work.

§ 11.2.1.3 If the property insurance requires minimum deductibles, and such deductibles are identified in the Contract Documents, the Contractor shall pay costs not covered because of such deductibles. If the Owner or insurer increases the required minimum deductibles over the amounts so identified or of the Owner elects to purchase this insurance with voluntary deductible amounts, the Owner shall be responsible for payment of the additional costs not covered because of such increased or voluntary deductibles.

§ 11.2.1.4 Unless otherwise provided in the Contract documents, this property insurance shall cover portions of the Work stored off the site after written approval of the Owner at the value established in the approval, and also portions of the Work in transit.

§ 11.2.1.5 A loss insured under Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgage clause and of Section 11.3.10. The Contractor shall pay Subcontractor(s) their just shares of insurance proceeds received the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractor(s) to make payments to their Sub-Contractor(s) in a similar manner.

§ 11.2.2 BOILER AND MACHINERY INSURANCE

(INTENITALLY OMITTED)

§ 11.2.3 LOSS OF USE INSURANCE

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire, other hazards, or other causes of loss, however caused.

§ 11.2.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§ 11.3 PERFORMANCE BOND, PAYMENT BOND AND MAINTENANCE BOND

§ 11.3.1 Contractor, at its sole expense, shall furnish bonds covering faithful performance of the contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract, including material and labor.

§ 11.3.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be made.

§11.3.3 The Contractor shall file with the Owner, as a condition of final acceptance, a statement from the Surety of its Performance Bond and Payment Bond, that the Surety is satisfied that all claims for labor and material supplied under its contract have been satisfactorily settled.

§11.3.4 As a condition of Substantial Completion of the Work, the Contractor shall provide an acceptable Maintenance Bond in accordance with the section of Instructions to Bidders entitled "Guarantee Against Defective Work".

§11.4 Adjustment and Settlement of Insured Loss

§ 11.4.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Contractor their just share of insurance proceeds received by the Owner, and by appropriate agreements the Owner and Contractor shall make payments to their consultants and Subcontractors in similar manner, pursuant to applicable law.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Engineer, or their designee's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Engineer, or their designee, be uncovered for Engineer, or their designees examination and be replaced at the Contractor's expense without change in the Contract Time or Contract Sum.

§ 12.1.2 If a portion of the Work has been covered that the Engineer, or their designee has not specifically requested to examine prior to its being covered, the Engineer, or their designee may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Engineer, or their designee or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Engineer, or their designee's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Engineer, or their designee, the Owner may correct it in accordance with Section 2.5. This obligation hereunder shall survive acceptance of the Work under the Contract and termination of the Contract.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 INTENTIONALLY OMITTED

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work, nor to any deficient Work discovered after the one-year period that could not have readily been discovered.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made. However, there shall be no implied or expressed acceptance of the Work not in compliance with all applicable law. The amount of said reduction will be within the exclusive determination of the Owner or it representative(s).

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

§ 13.1.1 The Contract shall be governed by the laws of the State of New Jersey.

§ 13.1.2 Nothing in the Contract Documents shall be construed to permit deviation from the governing law.

§ 13.1.3 In accordance with N.J.S.A. 40A:11-18, American manufactured products or materials shall be used in the Work, wherever possible.

13.1.4 RATE OF WAGES

§13.1.4.1 Where the Project is not subject to a Project Labor Agreement, wage notes shall be paid pursuant to the New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56.25 et seq., the Contractor and Subcontractor are required to do the following:

§ 13.1.4.2 Pay to all workmen engaged in the performance of services, directly upon a public work, the prevailing rate of wages, which shall be those in effect for the Project site(s) on the Contract Date . Such rates shall remain in effect for (2) years, unless superseded by a subsequent determination.

§ 13.1.4.3 Before final payment, furnish Owner with an affidavit stating that all workmen have been paid the prevailing rate of wages specified in the contract.

§ 13.1.4.4 Keep an accurate record showing the name, craft, or trade and actual hourly rate of wages paid to each workman employed by it in connection with any public work. Records shall be preserved for two (2) years from date of payment.

§ 13.1.4.5 Post the prevailing wage rated for each craft and classification involved as determined by the Commissioner of Labor and Industry, including the effective date of any changes thereof in prominent and easily accessible places at the site of the Work, and at such place or places as are used by them to pay workmen their wages.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§ 13.1.4.6 The Owner requires a copy of payroll records from the Contractor and subcontractors. As of August 16, 2024, P.L. 2023, c. 138 requires Contractors to submit certified payrolls online. The Department of Labor and Workforces Development has created the New Jersey Wage Hub for Contractors to register and submit payrolls: https://www.nj.gov/labor/wageandhour/prevailing-rates/njwagehub.shtml. Certified payrolls must be submitted within ten (10) days of the payment of wages each pay period, both online via New Jersey Wage Hub and in hard copy to the contracting public body. Registered public works Contractors are urged to create accounts at New Jersey Wage Hub prior to August 15. New Jersey Wage Hub users must log in with their My New Jersey Account, which must be registered with NJDOL's Employer Accounts Division. User Guides with detailed instructions for Contractors can be found at njwages.nj.gov. Payroll records shall be submitted with each voucher request for payment. Prevailing wage rates may be obtained from the New Jersey Labor, Division of Workplace Standards, Public Contracts Section, (609-292-2259).

§ 13.1.4.7 In the event the Owner finds that any workers employed by the Contractor or Subcontractor, covered by the said contract, have been paid a rate off wages less than the prevailing wage required to be paid by such contract, the Owner may terminate the Contractor's or Subcontractor's right to proceed with the Work, or such part of the Work as to where there has been a failure to pay required wages, and to prosecute the Work to completion or otherwise, the Contractor and its sureties shall be liable to the Owner for any excess costs occasioned thereby,

§ 13.1.4.8 A current wage rate determination is on file at the offices of the Owner for inspection and Contractor's use.

§ 13.1.5 SAFETY AND HEALTH REGULATIONS (OSHA)

§ 13.1.5.1 The Contractor shall comply with the laws, rules, regulations and codes dealing with occupational safety and health, including, but not limited to, the latest amendments to the following:

§ 13.1.5.2 Williams – Steiger Occupational Safety and Health Act of 1970, 29 U.S.C. §§ 651–678.

§ 13.1.5.3 Part 1910 – Occupational Safety and Health Standards Chapter XV11 of Title 29, Code of Federal Regulations.

§ 13.1.5.4 Part 126 – Safety and Health Regulations for Construction, Chapter XVII of Title 29, Code of Federal Regulations.

§ 13.1.5.5 N.J.S.A. 34:5A-30 requires proper labeling of any substances stored in containers pursuant to the Worker and Community Right to Know Act,

§ 13.1.5.6 The Contractor shall observe all rules and regulations of the Federal, State, and local health officials. Attention is directed to Federal, State, and local laws, rules, and regulations concerning construction safety and health standards. The Contractor shall not require any worker to work in surroundings or under conditions that are unsanitary, hazardous, or dangerous to the worker's health or safety. The Contractor shall admit to the site, without delay and without the presentation of an inspection warrant, any inspector of OSHA or other legally responsible agency involved in safety and health administration upon presentation of proper credentials. The Contractor shall make available to the Contractor's employees, subcontractors, the County Engineer, and the public, all information pursuant to OSHA 29 CFR Part 1926.59 of The Hazard Communication Standard 29 CFR 1910.1200, and shall also maintain a file on each job site containing all Material Safety Data Sheets (MSDS) for products in use at the Project. These Material Safety Data Sheets shall be made available to the Engineer upon request.

§ 13.1.5.7 The Contractor shall at all times conduct the Work to provide for the safety and convenience of the general public and protection of persons and property. The safety provisions of applicable laws, OSHA regulations, building and construction codes, and the rules and regulations of the New Jersey Department of Labor and Workforce Development shall be observed.

§13.1.6 ENVIRONMENTAL REGULATIONS

§13.1.6.1 The Contractor shall comply with laws, rules, regulations, and codes dealing with the prevention of environmental pollution and the preservation of public natural resources, including but not limited to, the latest amendments thereto.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§13.1.7 AFFIRMATIVE ACTION EMPLOYMENT LAW
Contractor agrees to comply with the terms of the Mandatory Equal Employment Opportunity Language, a copy of which is annexed to the Contract Documents as **Exhibit B** and incorporated as if set forth herein.

§13.1.7.1 Contractor shall submit a copy of the Monthly Project Workforce Report, New Jersey Department of Treasury Form AA-202, to the New Jersey Department of Treasury's Division of Public Contracts Equal Employment Opportunity Compliance and to the Owner

§13.1.7.2 Contractor shall complete and submit to the Owner an Initial Project Workforce Report, New Jersey Department of Treasury Form AA 201, upon notification of award and no later than the execution of this Agreement. Failure to submit this completed form may result in this Agreement being terminated.

§ 13.2 Successors and Assigns
§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 INTENTIONALLY OMITTED

§ 13.3 Rights and Remedies
§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Engineer, or their designee, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections
§ 13.4.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Engineer, or their designee timely notice of when and where tests and inspections are to be made so that the Engineer, or their designee may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.4.2 If the Engineer, or their designee, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.4.1, the Engineer, or their designee will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Engineer, or their designee of when and where tests and inspections are to be made so that the Engineer, or their designee may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.4.3 If such procedures for testing, inspection or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Engineer, or their designee's services and expenses shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Engineer, or their designee.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§ 13.4.5 If the Engineer, or their designee is to observe tests, inspections or approvals required by the Contract Documents, the Engineer, or their designee will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 INTEREST

Except as required or expressly permitted in the Contract Documents and/or permitted by N.J.S.A. 2A:30A:2(c), the Owner will pay no interest whatsoever for any payments due.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of thirty (30) consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- **.1** Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped; or
- **.2** An act of government, such as a declaration of national emergency that requires all Work to be stopped.

§ 14.1.2 INTENTIONALLY OMITTED

§ 14.1.3 If one of the reasons described in Section 14.1.1 exists, the Contractor may, upon thirty (30) days' written notice to the Owner and Engineer, or their designee, terminate the Contract, unless such condition can be cured by the Owner during such thirty (30) day period.

§ 14.1.4 INTENTIONALLY OMITTED

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor after Notice and an opportunity to cure.

- **.1** refuses or fails to supply enough properly skilled workers or proper materials;
- **.2** fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- **.3** disregards laws, ordinances, rules or regulations, or orders of a public authority having jurisdiction;
- **.4** fails to furnish the Owner with assurances satisfactory to the Owner, evidencing the Contractor's ability to complete the Work in compliance with all requirements of the Contract Documents;
- **.5** fails after commencement of the Work, to proceed continuously with the construction and completion of the Work, for more than three (3) days, except as permitted by the Contract Documents;
- **.6** disregards orders of the Owner or Engineer, or their designee ;
- **.7** fails to maintain the Site in a clean, safe and orderly manner;
- **.8** fails to comply with a Construction Change Directive; or
- **.9** otherwise is guilty of any breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Engineer, or their designee that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- **.1** Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- **.2** Accept assignment of subcontracts pursuant to Section 5.4; and
- **.3** Finish the Work by whatever reasonable method the Owner may deem expedient. And charge the costs incurred against the Contractor's contract balance

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished. The Engineer, or their designee's certification issued pursuant to Section 14.2.2 shall be given a presumption of correctness.

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Engineer or their designee's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Engineer, or their designee, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 INTENTIONALLY OMITTED

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- **.1** cease operations as directed by the Owner in the notice;
- **.2** take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- **.3** except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. Any Contractor Claim seeking the payment of money shall not include consequential damages, which Contractor hereby waives, and shall be calculated in accordance with the terms and provisions herein. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 DECISION OF ENGINEER, OR THEIR DESIGNEE

Owner and Contractor agree that the Engineer, or their designee shall be the initial arbiter of all Claims, including those alleging error or omission by the Engineer, or their designee. All claims, shall be referred, initially to the Engineer, or their designee for action as provided in Article 4 and shall be required as a condition precedent to litigation of a Claim between the Contractor and Owner to all such matters arising prior to the date final payment is due, regardless of: (1) whether such matters relate to execution and progress of the Work; or (2) the extent to which the work has been completed. The decision by the Engineer, or their designee in response to a Claim shall not be a condition precedent to litigation in the event: (1) the position of the Engineer, or their designee is vacant; (2) the Engineer, or their designee has not received evidence or has failed to render a decision within agreed time limits; (3) the Engineer, or their designee has failed to take action required under Article 4 within thirty (30) days after the Claim is made; (4) forty-five (45) days have passed after the Claim has been referred to the Engineer, or their designee; or, (5) the claim relates to a mechanic's lien.

§ 15.1.3 TIME LIMITS ON CLAIMS

Claims must be within twenty one (21) calendar days after the occurrence of the event giving rise to the Claim or within twenty-one (21) calendar days after the claimant first becomes aware of the condition giving rise to the Claim, whichever is later. There shall be no time limitation upon any Claims made by the Owner. Claims must be

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

made by written notice to the Engineer, or their designee. An additional Claim made after the initial Claim has been implemented by Change Order will not be considered unless submitted pursuant to the requirements of this Paragraph. Notice shall be deemed effective upon the Engineer, or their designee's receipt of the Notice.

§ 15.1.4 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, unless otherwise agreed in writing, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments to the extent required by the Contract Documents.

§15.1.5 CLAIMS FOR CONCEALED OR UNKNOWN CONDITIONS

The parties hereto agree to comply with the terms of Section 3.7.6 herein and N.J.S.A. 40A:11-16.7. Where conditions are encountered at the Site which are: (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents; or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for the Contract Documents, the Owner and Contractor mutually agree to give written notice to each other; including the Engineer, or their designee and any affected Contractor or subcontractor, upon the observation of the condition within twenty-four (24) hours if first observation of the condition, The Engineer, or their designee will investigate such conditions within seventy-two (72) hours and will diligently process and render a recommendation within twenty-one (21) days unless otherwise agreed in writing. If the Engineer, or their designee determines that the condition at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified the Engineer, or their designee shall so notify the Owner and Contractor in writing, stating the reasons. Claims by either party in opposition to such determination must be made within seven (7) days after the Engineer, or their designee has given notice of the decision.

§ 15.1.6 CLAIMS FOR ADDITIONAL COST

If the Contractor wishes to make a Claim for an increase in the Contract Sum written notice as provided herein shall be given before proceeding to execute the Work. All documentation in support of the Contractor's request shall, likewise be provided at the time said written request is made. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.3 or elsewhere in the Contract Documents..

§ 15.2 CLAIMS FOR ADDITIONAL TIME

§ 15.2.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work, all documentation in support of the Contractor's request shall, likewise be provided at the time said written request is made. In the case of a continuing delay, only one Claim is necessary.

§ 15.2.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction. The term "abnormal" as used here shall be construed according to the following formula: average rainfall (or snow, low temperature, etc) for the past five (5) years for the month in question, plus ten percent (10%). Accordingly, weather is not deemed to be abnormal unless it is ten percent (10%) worse than the average for the month over the past five (5) years. Claims relating to weather must be submitted within seven (7) calendar days of the occurrence of any such delays.

§ 15.3 CLAIMS FOR INJURY OR DAMAGE TO PERSON OR PROPERTY.

§15.3.1 If either Party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, of any of the other party's employees or agents, or of others for whose acts such party is legally liable, written notice of such injury or damage, whether or not insured, shall be given to the other party, including the Engineer, ortheir designee, within a reasonable time not exceeding twenty-one (21) days after first occurrence, unless another time period is required by law. The notice shall provide sufficient detail to enable the other party to investigate the matter. If a Claim for additional cost or time related to this Claim is to be asserted, it shall be filed as provided for in Article 15.

§ 15.3.2 The Owner is not required to institute a claim under this section in order to terminate this Agreement.

§ 15.4 RESOLUTION OF CLAIMS AND DISPUTES

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

§15.4.1 The Engineer, or their designee will review Claims and take one or more of the following preliminary actions with ten (10) days of receipt of a Claim: (1) request additional supporting data from the claimant; (2) reject the Claim in who or in part, stating reasons for rejection; (3) recommend approval of the Claim by other party; or (4) suggest a compromise.

§ 15.4.2 If a Claim has been resolved, the Engineer, or their designee will prepare or obtain appropriate documentation in consultation with Owner's counsel as circumstances dictate.

§ 15.4.3 If a Claim has not been resolved after consideration of the foregoing and of further evidence presented by the parties or requested by the Engineer, or their designee, the Engineer, or their designee will notify the parties in writing that the Engineer, or their designee's decision will be made within seven (7) days, which decision shall be final. Upon expiration of such time period, the Engineer, or their designee will render to the parties the Engineer, or their designee's written decision relative to the Claim, including any change in the Contract Sum or Contract Time or both.

§ 15.5. CLAIMS FORUM

Unless otherwise required by Section 5.1.3 of the Standard Form of Agreement between the Owner and Contractor, all claims, disputes, or other matters in question between the parties to this Contract arising out of or relating to the Project or to this Contract, or the alleges breach thereof, shall be subject in the first instance to mediation and failing that, there in, a Court of competent jurisdiction venued in Union County, New Jersey, pursuant to N.J.S.A. 40A:11-50. The Owner may not be compelled to submit any dispute concerning the Project to arbitration. By accepting award of the Contract and executing the Agreement, the Contractor consents to its joinder as a party in any litigation, mediation, arbitration or any other legal proceeding involving the Project and any references in the Contract documents.

ARTICLE 16 INTERPRETATIONS IN WRITING

§ 16.1 INTERPRETATIONS IN WRITING

§ 16.1.1 Neither the price bid for the work of any Contract, nor the Contract Sum, shall be based in any manner upon oral opinions, or real or alleged instructions of an oral nature, regardless if whether such opinions or instructions are expressed by the Owner, the Engineer, or their designee or its Consultants, the Contractor, or agents or representative of any of them and no such oral communication shall form the basis of a Claim.

§ 16.1.2 These provisions do not intend to deny, on an oral basis, normal discussion, recommendations, explanations, suggestions, approvals, rejections, and similar activity in pursuit if the work of the Project, such as at job conferences and otherwise at the Site. In such instances, the written minutes, correspondence, shop drawing records, written field orders, and other written data shall govern over personal claims regarding statements made contrary to the written data.

ARTICLE 17 JOB SITE MEETINGS

Job site meetings, when called by the Engineer, or their designee, shall be held at a location and time convenient to the Owner's representatives, the Engineer, or their designee, and Contractor(s). Each Contractor shall attend such meeting, or be represented by a person in authority who is thoroughly familiar with the Project and who can speak and make decisions for the Contractor.

ARTICLE 18 USE TAX TO LOCAL GOVERNMENTS

§ 18.1 CONTRACTOR AND SUBCONTRACTOR COLLECTION OF USE TAX TO LOCAL GOVERNMENTS

§ 18.1.1 The Contractor acknowledges and agrees that pursuant to N.J.S.A. 52:32-44,contractors or contractors with subcontractors, or their affiliates, who enter into contracts with New Jersey local government entities, including without limitation, boards of education, are, effective as of September 1, 2004, required to collect and remit to the New Jersey Director of Taxation in the Department of the Treasury the use tax pursuant to the "Sales and Use Tax Act," N.J.S.A. 54:32B-1 et seq.) on all their sales of tangible personal property delivered into the State of New Jersey (hereinafter referred to as the "Contractor Use Tax Collection Legislation").

§ 18.1.2 The Contractor hereby covenants and agrees that the Contractor, any subcontractor and each of their affiliates, shall collect and remit to the New Jersey Director of the Division of Taxation in the Department of Treasury, the use tax due pursuant to the "Sales and Use Tax Act," N.J.S.A. 54:32B-1 et. seq.) on all their sales of tangible personal property delivered into the State of New Jersey. For purposes herein, "affiliate" shall mean any

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

entity that: (a) directly, indirectly or constructively controls another entity; (b) is directly, indirectly, or constructively controlled by another entity; or (c) is subject to the control of a common entity. For purposes of the immediately preceding sentence, an entity controls another entity if it owns, directly or indirectly, more than fifty percent (50%) of the Ownership interest in that entity.

§ 18.1.3 The parties intend that this Article 18 shall comply with the rules and regulations promulgated pursuant to the Contractor Use Tax Collection Legislation and shall be interpreted consistent therewith.

ARTICLE 19 CONTRACTOR INDEMNIFICATION AND HOLD HARMLESS

§ 19.1 Notwithstanding anything contained in this Agreement or anything to the contrary contained in the requirements of the Contract Documents, the Contractor hereby agrees to indemnify and hold the Owner harmless from and against any and all fines, taxes, penalties, interest, claims, and/or losses. Costs, expenses, liabilities, or damages arising out of or in connection with the Contractor's failure to comply with the terms and conditions of Contract Documents, or the failures of the Contractor's consultant(s) or Subcontractor(s), to the fullest extent permitted by law and public policy.

DRAFT

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

IN WITNESS WHEREOF, the parties hereto have, either individually or by their duly authorized representative, set their hands and seals the day and year first above written.

ATTEST:

COUNTY OF UNION

_____
JAMES E. PELLETTIERE, CLERK
Board of County Commissioners

BY _____
EDWARD T. OATMAN
County Manager

APPROVED AS TO FORM

_____
BRUCE H. BERGEN, ESQ.
County Counsel

_____
Affirmative Action Compliant

ATTEST:

[INSERT CONTRACTOR NAME HERE]

_____
Corporate Secretary/Notary Public

_____
Authorized Signatory

_____
Print Name

_____
Print Title

AIA Document A201® – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This draft was produced by AIA software at 12:06:51 ET on 06/14/2021 under Order No.3129893097 which expires on 05/26/2022, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail copyright@aia.org.
User Notes: (1831875913)

STATE OF NEW JERSEY
Department of Labor and Workforce Development
Division of Wage and Hour Compliance - Public Contracts Section
PO Box 389
Trenton, NJ 08625-0389

PREVAILING WAGE RATE DETERMINATION

The New Jersey Prevailing Wage Act (N.J.S.A. 34:11-56.25 et seq.) requires that the Department of Labor and Workforce Development establish and enforce a prevailing wage level for workers engaged in public works in order to safeguard their efficiency and general well being and to protect them as well as their employers from the effects of serious and unfair competition.

Prevailing wage rates are wage and fringe benefit rates based on the collective bargaining agreements established for a particular craft or trade in the locality in which the public work is performed. In New Jersey, these rates vary by county and by the type of work performed.

Applicable prevailing wage rates are those wages and fringe benefits in effect on the date the contract is awarded. All pre-determined rate increases listed at the time the contract is awarded must also be paid, beginning on the dates specified. Rates that have expired will remain in effect until new rates are posted.

Prevailing Wage Rate

The prevailing wage rate for each craft will list the effective date of the rate and the following information:

W = Wage Rate per Hour **B** = Fringe Benefit Rate per Hour* **T** = Total Rate per Hour

* Fringe benefits are an integral part of the prevailing wage rate. Employers not providing such benefits must pay the fringe benefit amount directly to the employee each payday. Employers providing benefits worth less than the fringe benefit amount must pay the balance directly to the employee each payday.

Unless otherwise stated in the Prevailing Wage Rate Determination, the fringe benefit rate for overtime hours remains at the straight time rate.

When the Overtime Notes in the Prevailing Wage Rate Determination state that the overtime rates are "inclusive of benefits," the benefit rate is increased by the same factor as the wage rate (i.e. multiplied by 1.5 for time and one-half, multiplied by 2 for double time, etc.).

Apprentice Rate Schedule

An “apprentice” is an individual who is registered with the United States Department of Labor - Office of Apprenticeship and enrolled in a certified apprenticeship program during the period in which they are working on the public works project.

The apprentice wage rate is a percentage of the journeyman wage rate, unless otherwise indicated. The apprentice benefit rate is the full journeyman benefit rate, unless otherwise indicated.

If there is no apprentice rate schedule listed, the individual must be paid at least the journeyman rate even if that individual is in a certified apprentice program for that trade.

If there is no ratio of apprentices to journeymen listed for a particular craft, then the ratio shall be one (1) apprentice to every four (4) journeymen.

Comments/Notes

For each craft listed there will be comments/notes that cover the definition of the regular workday, shift differentials, overtime, recognized holidays, and any other relevant information.

Public Works Contractor Registration

The Public Works Contractor Registration Act (N.J.S.A. 34:11-56.48, et seq.) requires that **all** contractors, subcontractors, or lower tier subcontractors who are working on or who bid on public works projects register with the Department of Labor and Workforce Development. Applications are available at *www.nj.gov/labor* (click on Wage & Hour and then go to Registration & Permits).

Pursuant to N.J.S.A. 34:11-56.51:

No contractor shall bid on any contract for public work as defined in section 2 of P.L.1963, c. 150 (C.34:11-56.26) unless the contractor is registered pursuant to this act. No contractor shall list a subcontractor in a bid proposal for the contract unless the subcontractor is registered pursuant to P.L.1999, c.238 (C.34:11-56.48 et seq.) at the time the bid is made. No contractor or subcontractor, including a subcontractor not listed in the bid proposal, shall engage in the performance of any public work subject to the contract, unless the contractor or subcontractor is registered pursuant to that act.

Snow Plowing

Snow plowing contracts are <u>not</u> subject to the New Jersey Prevailing Wage Act or the Public Works Contractor Registration Act.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Air Conditioning & Refrigeration - Service and Repair **PREVAILING WAGE RATE**

	03/01/24
Journeyman (Mechanic)	W45.23 B30.03 T75.26

Craft: Air Conditioning & Refrigeration - Service and Repair **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
As Shown	1st Year	2nd Year	3rd Year	4th Year	5th Year	Wage = %	of Jnymn	Wage		
Wage and Bene	40%	50%	60%	70%	80%	Bene = %	of Jnymn	Bene		

Ratio of Apprentices to Journeymen - 1:4

Craft: Air Conditioning & Refrigeration - Service and Repair **COMMENTS/NOTES**

THESE RATES MAY BE USED FOR THE FOLLOWING:
- Service/Repair/Maintenance Work to EXISTING facilities.
- Replacement or Installation of air conditioning and refrigeration equipment when the combined tonnage does not exceed 15 tons for refrigeration, or 25 tons for air conditioning.
- Replacement or Installation of "packaged" or "unitary" rooftop-type units when the combined tonnage of the units does not exceed 75 tons.

NOTE: These rates may NOT be used for any work in new construction (including work on new additions).

The regular workday shall consist of 8 hours, starting between 6:00 AM and 10:00 AM, Monday through Friday.

SHIFT DIFFERENTIALS:
- The second and third shifts shall be paid an additional 15% of the hourly rate.
- All shifts must run for a minimum of 5 consecutive days.

OVERTIME:
Hours worked in excess of 8 per day or before or after the regular workday, that are not shift work, and all hours on Saturday shall be paid at time and one-half the hourly rate, inclusive of benefits. All hours on Sunday and holidays shall be paid at double the hourly rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Boilermaker **PREVAILING WAGE RATE**

	01/12/24
Foreman	W54.11 B47.08 T101.19
General Foreman	W56.11 B48.14 T104.25
Journeyman	W49.11 B45.31 T94.42

Craft: Boilermaker **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1000 Hours	65%	70%	75%	80%	85%	90%	95%			
Benefit =	38.33	39.30	40.32	41.31	42.32	43.32	44.30			

Ratio of Apprentices to Journeymen - *

* 1 apprentice will be allowed for the first 5 journeymen, 1 apprentice for the next 10 journeymen and 1 apprentice for each succeeding 20 journeymen up to a maximum of 5 apprentices per contractor on any one job.

Craft: Boilermaker **COMMENTS/NOTES**

HIGH WORK: All apprentices working on the erection, repair, or dismantling of smoke stacks, standpipes, or water towers shall be paid the Journeyman rate.

The regular workday shall consist of 8 hours, between 8:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall work 7? hours and receive 8 hours pay, at a rate equal to the regular hourly rate plus 10%.
- The third shift shall work 7 hours and receive 8 hours pay, at a rate equal to the regular hourly rate plus 20%.
- For "Municipal Water Works" projects only, the following shall apply: Two, four day, 10 hour shifts may be worked at straight time Monday through Thursday. The day shift shall work four days, at 10 hours, for 10 hours pay. The second shift shall work four days, at nine and a half hours, for 10 hours pay, plus 10% the hourly rate for new work and .25 cents on repair work. Friday may be used as a make-up day at straight time, due to weather conditions, hoilday or any other circumstances beyond the employer's control.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays (except Labor Day) shall be paid at double the hourly rate. All hours on Labor Day shall be paid at four times the hourly rate.
- If any other craft employed by the same contractor, or a subcontractor thereof, receives double time in lieu of time and one-half, then the Boilermaker shall receive double time in lieu of time and one-half.
- For "Municipal Water Works" projects only, the following shall apply: Four 10 hour days may be worked Monday through Thursday at straight time. Friday may be used as a make-up day for a day lost to inclement weather, holiday or other conditions beyond the control of the employer. Overtime shall be paid for any hours that exceed 10 hours per day or 40 hours per week.

RECOGNIZED HOLIDAYS: New Year's Day, Washington's Birthday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Boilermaker - Minor Repairs **PREVAILING WAGE RATE**

	01/12/24
Foreman	W35.88 B17.89 T53.77
General Foreman	W36.38 B17.89 T54.27
Mechanic	W34.38 B17.89 T52.27

Craft: Boilermaker - Minor Repairs **COMMENTS/NOTES**

NOTE: These rates apply to MINOR REPAIR WORK ONLY (repair work in the field for which the contract amount does not exceed $125,000.00), for boilers that do not produce electric or are not used in the heating of petroleum products.

OVERTIME:
Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays (except Labor Day) shall be paid at double the hourly rate. All hours on Labor Day shall be paid at four times the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Washington's Birthday, Good Friday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Thanksgiving Day, day after Thanksgiving, Christmas Day. Saturday holidays observed the preceding Friday, Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Bricklayer, Stone Mason **PREVAILING WAGE RATE**

	05/09/24
Deputy Foreman	W51.60 B37.68 T89.28
Foreman	W56.35 B37.68 T94.03
Journeyman	W48.60 B37.68 T86.28

Craft: Bricklayer, Stone Mason **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	40%	50%	55%	60%	65%	70%	75%	80%		
Benefits	5.61	6.88	7.50	8.13	28.95	30.86	32.78	34.67		

Ratio of Apprentices to Journeymen - 1:5

Craft: Bricklayer, Stone Mason **COMMENTS/NOTES**

The regular workday shall consist of 8 hours, between 6:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:
- When a 2 shift schedule (including a day shift) is established, the first, or day shift, shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular rate plus 10%, inclusive of benefits.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 10%, inclusive of benefits, and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular rate plus 10%, inclusive of benefits, and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When an irregular shift must be established, this shift shall receive the regular rate plus 10%, inclusive of benefits.

OVERTIME:
- The first 2 hours in excess of 8 per day, or before or after the regular workday that are not shift work, Monday through Friday, shall be paid at time and one-half the regular rate, inclusive of benefits. Any additional overtime shall be paid at double the regular rate, inclusive of benefits. The first 10 hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. Any additional overtime shall be paid at double the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.
- Saturday may be used as a make-up day for hours lost to inclement weather.
- When Bricklayers/Stone Masons work on Saturday with Laborers, and no other crafts are working on the project for the day, benefits may be paid at straight time. If other crafts are present, the applicable overtime rate for benefits shall be paid.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Carpenter **PREVAILING WAGE RATE**

	05/09/24
Foreman	W64.41 B38.73 T103.14
Journeyman	W56.01 B33.76 T89.77

Craft: Carpenter **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	40%	55%	65%	80%	90%					
Benefit	59.25% of	Appren	tice	Wage Rate	for all	intervals	+ $0.57			

Ratio of Apprentices to Journeymen - 1:3

For Solar installation- all work on solar projects that fall under the jurisdiction of the carpenters, and does not require an electrician, the ratio of Apprentices to Journeymen shall be 1:1.

Craft: Carpenter **COMMENTS/NOTES**

APPRENTICE RATE SCHEDULE FOR THOSE APPRENTICES REGISTERED AS OF 5-1-19:

INTERVAL PERIOD AND RATES
Yearly 40% 55% 65% 80%
Benefits 59.25% of apprentice wage rate for all intervals + $0.57

FOREMAN REQUIREMENTS:
- When there are 2 or more Carpenters on a job, 1 shall be designated as a Foreman.
- When there are 21 or more Carpenters on a job, 2 shall be designated as Foremen.

The regular workday shall consist of 8 hours, starting between 6:00 AM and 9:00 AM.

SHIFT DIFFERENTIALS:
- When a 2 shift schedule (including a day shift) is established, the day shift shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular rate plus 10%, inclusive of benefits.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 10% and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular rate plus 10% and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When an irregular shift must be established, this shift shall receive the regular rate plus 15%, inclusive of benefits.
- All time worked before and after a regularly established shift shall be paid at the applicable overtime rate. When a portion of the regularly established shift works into Saturday, Sunday or a holiday, that time worked shall be paid at the established shift rate.

OVERTIME:

- All hours in excess of 8 per day, or before or after an established shift that are not shift work, and all hours on Saturdays shall be paid at time and one-half the hourly rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the hourly rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for a day lost due to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans' Day may be substituted for the day after Thanksgiving.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Carpenter - Resilient Flooring **PREVAILING WAGE RATE**

	05/01/24
Foreman	W64.41 B38.64 T103.05
Journeyman	W56.01 B33.67 T89.68

Craft: Carpenter - Resilient Flooring **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	40%	55%	65%	80%	90%					
Benefit	59.25%	of	Appren	tice	Wage Rate	for all	intervals	+ $0.48		

Ratio of Apprentices to Journeymen - *

* 1 apprentice shall be allowed to every 2 journeymen or major fraction therof. No more than 3 apprentices on any one job or project.

Craft: Carpenter - Resilient Flooring **COMMENTS/NOTES**

APPRENTICE RATE SCHEDULE FOR THOSE APPRENTICES REGISTERED AS OF 5-1-19:

INTERVAL PERIOD AND RATES
Yearly 40% 55% 65% 80%
Benefits 59.25% of apprentice wage rate for all intervals + $0.48.

FOREMAN REQUIREMENTS:
- On any job where there are 4 or more Carpenters of Resilient Flooring, 1 must be designated a Foreman.

FOR SYNTHETIC TURF INSTALLATION ONLY:
- The rate shall be 90% of the wage and benefit rate.

The regular workday consists of 8 hours, starting between 6:00 AM and 9:00 AM.

SHIFT DIFFERENTIALS:
- When a 2 shift schedule (including a day shift) is established, the day shift, shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular wage rate plus 10%.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular wage rate, the second shift shall receive the regular wage rate plus 10% and the third shift shall receive the regular wage rate plus 15%.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular wage rate plus 10% and the third shift shall receive the regular wage rate plus 15%.
- When an irregular shift must be established, this shift shall receive the regular rate plus 15%, inclusive of benefits.

OVERTIME:
- Hours in excess of 8 per day or 40 per week, or before or after the regular workday, Monday through Friday, shall be paid at time and one-half the wage rate. Saturday may be used as a make-up day, at straight time, up to 8 hours, for hours lost to reasons beyond the control of the employer, up to a total of 40 hours per week; hours in excess of 8 on Saturday shall

then be paid at time and one-half the wage rate. If Saturday is not a make-up day, all hours on Saturday shall be paid at time and one-half the wage rate. All hours on Sundays and holidays shall be paid at double the wage rate.
- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for hours lost to reasons beyond the control of the employer. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the wage rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday. Veterans' Day may be substituted for the day after Thanksgiving.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Carpenter-Residential Construction **PREVAILING WAGE RATE**

	05/09/24
Foreman	W54.29 B11.99 T66.28
Journeyman	W47.21 B11.14 T58.35

Craft: Carpenter-Residential Construction **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	40%	55%	65%	80%						
Benefit	12% of	Appren	tice	wage rate	for all	intervals	+ $5.48			

Ratio of Apprentices to Journeymen - 1:3

Craft: Carpenter-Residential Construction **COMMENTS/NOTES**

FOREMAN REQUIREMENTS:
- When there are 2 or more Carpenters on a job, 1 shall be designated as a Foreman.
- When there are 21 or more Carpenters on a job, 2 shall be designated as Foremen.

The regular workday shall consist of 8 hours, starting between 6:00 AM and 9:00 AM.

RESIDENTIAL CONSTRUCTION:
All residential construction (excluding commercial buildings and institutional housing), no more than four (4) floors in height above grade consisting of those projects involving the construction, alteration, or repair of town houses or row houses, single family homes, mobile homes, multi-family homes, mixed-use buildings that include commercial space on the first floor or below grade, and apartment buildings.

SHIFT DIFFERENTIALS:
- When a 2 shift schedule (including a day shift) is established, the day shift shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular rate plus 10%, inclusive of benefits.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 10% and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular rate plus 10% and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When an irregular shift must be established, this shift shall receive the regular rate plus 15%, inclusive of benefits.

OVERTIME:
- All hours in excess of 8 per day, or before or after an established shift that are not shift work, and all hours on Saturdays shall be paid at time and one-half the hourly rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the hourly rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for a

day lost due to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans' Day may be substituted for the day after Thanksgiving.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Cement Mason **PREVAILING WAGE RATE**

See "Bricklayer, Stone Mason" Rates

Craft: Cement Mason **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									

Ratio of Apprentices to Journeymen - 1:4

Craft: Cement Mason **COMMENTS/NOTES**

See "Bricklayer, Stone Mason" Rates

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Commercial Painter **PREVAILING WAGE RATE**

	05/29/24
Foreman	W48.90 B30.71 T79.61
General Foreman	W53.34 B30.71 T84.05
Journeyman	W44.45 B30.71 T75.16

Craft: Commercial Painter **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	40%	45%	55%	65%	70%	75%	80%	80%		
Benefits	9.40	9.40	11.90	11.90	13.00	13.00	15.90	15.90		

Ratio of Apprentices to Journeymen - 1:4

Craft: Commercial Painter **COMMENTS/NOTES**

* Commercial Painters perform work on all commercial structures such as offices, schools, hotels, shopping malls, restaurants, condominiums, etc.

Spraying, sandblasting, lead abatement work on commercial buildings, work performed above 3 stories or 30 feet in height, or using swing scaffolds requires an additional 10% of the wage rate.

FOREMEN REQUIREMENTS:
- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:
- Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate. All hours on Sundays and holidays shall be paid at double the regular rate.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, General Election Day,

Veterans' Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Diver **PREVAILING WAGE RATE**

	05/01/24
Diver	W64.72 B52.74 T117.46
Tender	W52.98 B52.74 T105.72

Craft: Diver **COMMENTS/NOTES**

NOTE: All dive crews must consist of a Tender, a Diver, and a standby Diver (standby Diver is the same rate as a Diver).

DEPTH & PENETRATION RATES: Divers shall be paid the following depth and penetration rates, in addition to the regular hourly rate, when applicable:

AIR DIVES:
0-59 feet: No additional wage
60-74 feet: + $0.25 per foot
75-125 feet: + $0.78 per foot

MIXED GAS DIVES:
0-74 feet: No additional wage
75-125 feet: + $1.00 per foot
126-200 feet: + $2.00 per foot

PENETRATION DIVES:
126-200 feet: + $1.50 per foot
201-275 feet: + $1.75 per foot
276-350 feet: + $2.00 per foot
351-425 feet: + $2.50 per foot

SHIFT DIFFERENTIAL:
- When a 2 shift schedule (including a day shift) is established, the day shift shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis and receive an additional 113% of the wage rate.
- When a three shift schedule is established, all three shifts shall be established on an 8 hour basis, but the second and third shifts shall receive an additional 113% of the wage rate.
- Benefits on shift work shall be paid at the straight-time rate.

OVERTIME:
Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Presidential Election Day, Thanksgiving Day, Christmas Day. Veterans' Day may be switched with the day after Thanksgiving.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Dockbuilder/Pile Driver **PREVAILING WAGE RATE**

	05/01/24
Foreman	W60.93 B52.74 T113.67
Foreman (Concrete Form Work)	W59.82 B39.39 T99.21
Journeyman	W52.98 B52.74 T105.72
Journeyman (Concrete Form Work)	W52.02 B39.39 T91.41

Craft: Dockbuilder/Pile Driver **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
Yearly	21.19	26.49	34.44	42.38						
Benefits	34.70	for all	intervals							

Ratio of Apprentices to Journeymen - *

* When there are 4 or fewer Dockbuilders/Pile Drivers on a job, no more than 1 may be an apprentice. When there are 5 or more Dockbuilders/Pile Drivers, there may be 1 apprentice for every 5 Dockbuilders/Pile Drivers.

Craft: Dockbuilder/Pile Driver **COMMENTS/NOTES**

APPRENTICE RATE SCHEDULE FOR CONCRETE FORM WORK ONLY:

INTERVAL PERIOD AND RATES
Yearly 20.81 26.01 33.81 41.62
Benefits 26.73 for all intervals

CREOSOTE HANDLING:
When handling creosote products on land piledriving, floating marine construction, and construction of wharves, the worker shall receive an additional $0.25 per hour.

HAZARDOUS WASTE WORK:
- Hazardous waste removal work on a state or federally designated hazardous waste site where Level A, B, or C personal protection is required: an additional 20% of the hourly rate, per hour.
- Hazardous waste removal work in Level D, or where personal protection is not required: an additional $1.00 per hour.

CERTIFIED WELDER: When required on the job by the project owner, a Certified Welder shall receive an additional $1.00 per hour.

FOREMAN REQUIREMENTS:
The first Dockbuilder/Pile Driver on the job shall be designated a Foreman.

SHIFT DIFFERENTIAL:
- When a 2 shift schedule (including a day shift) is established, the day shift shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis and receive an additional 113% of the wage rate.
- When a three shift schedule is established, all three shifts shall be established on an 8 hour basis, but the second and third shifts shall receive an additional 113% of the wage rate.
- Benefits on shift work shall be paid at the straight-time rate.

OVERTIME:
Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Presidential Election Day, Thanksgiving Day, Christmas Day. Veterans' Day may be switched with the day after Thanksgiving.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Drywall Finisher **PREVAILING WAGE RATE**

	05/29/24
Foreman	W47.75 B31.11 T78.86
General Foreman	W49.92 B31.11 T81.03
Journeyman	W43.41 B31.11 T74.52

Craft: Drywall Finisher **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
6 Months	40%	50%		60%	70%		80%	90%		
Benefits	Intervals	1 to 2 =	11.90	Intervals	3 to 4 =	15.03	Intervals	5 to 6 =	18.84	

Ratio of Apprentices to Journeymen - 1:4

Craft: Drywall Finisher **COMMENTS/NOTES**

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, and the third shift shall receive 8 hours pay for 7 hours of work.
- Shift work must run for a minimum of 5 consecutive workdays.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Electrician **PREVAILING WAGE RATE**

	06/03/24
Cable Splicer	W69.72 B44.96 T114.68
Foreman (11-20 Journeymen)	W74.15 B47.84 T121.99
Foreman (1-3 Journeymen)	W69.72 B44.96 T114.68
Foreman (4-10 Journeymen)	W72.89 B47.02 T119.91
General Foreman (21-30 Journeymen)	W76.06 B49.06 T125.12
General Foreman (31-60 Journeymen)	W82.39 B53.15 T135.54
General Foreman (61+ Journeymen)	W83.66 B53.97 T137.63
Journeyman	W63.38 B40.89 T104.27
Sub-Foreman	W72.25 B46.61 T118.86

Craft: Electrician **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
Yearly	40%	49%	58%	68%	80%		of Jour	neyman	Wage	Rate
Benefit	40%	49%	58%	68%	80%		of Jour	neyman	Benefit	Rate

Ratio of Apprentices to Journeymen - 2:3

Craft: Electrician **COMMENTS/NOTES**

THESE RATES ALSO APPLY TO THE FOLLOWING:
-All burglar and fire alarm work.
-All fiber optic work.
-Teledata work in new construction.
-Teledata work involving 16 Voice/Data Lines or more.

The regular workday shall be 8 hours, between 8:00 AM and 4:30 PM.

FOREMAN REQUIREMENTS:
- 1 to 3 Journeymen- 1 must be a Foreman (Foreman/1-3 Journeymen rate).
-4 to 10 Journeymen- 1 must be a Foreman (Foreman/4-10 Journeymen rate).
-11 to 20 Journeymen- 1 must be Foreman (Foreman/11-20 Journeymen rate) and 1 must be a Sub-Foreman.
-21 to 30 Journeymen- 1 must be a General Foreman (General Foreman/21-30 Journeymen rate) and 2 must be a Sub-Foreman.
-31 to 40 Journeymen- 1 must be a General Foreman (General Foreman/31-40 Journeymen rate) and 3 must be a Sub-Foreman.
-41 to 50 Journeymen- 1 must be a General Foreman (General Foreman/31-60 Journeymen rate) and 4 must be a Sub-Foreman.
-51 to 60 Journeymen- 1 must be a General Foreman (General Foreman/31-60 Journeymen rate) and 5 must be a Sub-Foreman.
-61+ Journeymen- 1 must be a General Foreman (General Foreman/61+ Journeymen rate) and 6 must be a Sub-Foreman.

SHIFT DIFFERENTIALS:
- Shift work must run for a minimum of 5 consecutive workdays.
- 2nd Shift (4:30 PM to 12:30 AM) shall receive 8 hours pay for 7.5 hours work + an additional 10% of the regular rate, per hour, inclusive of benefits.
- 3rd Shift (12:30 AM to 8:00 AM) shall receive 8 hours pay for 7 hours work + an additional 15% of the regular rate, per hour, inclusive of benefits.

OVERTIME:
Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, and all hours on Saturdays, shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Electrician - Teledata (15 Voice/Data Lines & Less) **PREVAILING WAGE RATE**

	12/02/24
Journeyman Technician (1-2 Workers on Job)	W48.21 B28.45 T76.66
Master Tech/General Foreman (26 + Workers on Job)	W62.67 B36.99 T99.66
Senior Technician/Lead Foreman (16-25 Workers on Job)	W57.37 B33.86 T91.23
Technician A/Foreman (9-15 Workers on Job)	W54.96 B32.43 T87.39
Technician B/Working Foreman (4-8 Workers on Job)	W52.55 B31.01 T83.56
Technician C/Foreman (3 Workers on Job)	W50.14 B29.59 T79.73

Craft: Electrician - Teledata (15 Voice/Data Lines & Less) **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
6 Months	35%	35%	40%	43%	48%	54%	61%	67%	74%	81%
Benefits	7.45	7.45	8.51	9.15	10.22	11.49	12.98	14.26	15.76	17.24

Ratio of Apprentices to Journeymen - 2:3

Craft: Electrician - Teledata (15 Voice/Data Lines & Less) **COMMENTS/NOTES**

APPRENTICE RATE SCHEDULE FOR THOSE APPRENTICES ENTERING PROGRAM AFTER 11-28-22:

NTERVAL PERIOD AND RATES
6 Months 35% 35% 40% 43% 48% 54% 61% 67% 74% 81%
Benefits 7.67 7.67 8.76 9.43 10.52 11.84 13.38 14.69 16.22 17.76

APPRENTICE RATE SCHEDULE FOR THOSE APPRENTICES ENTERING PROGRAM AFTER 12-4-23:

NTERVAL PERIOD AND RATES
6 Months 35% 35% 40% 43% 48% 54% 61% 67% 74% 81%
Benefits 7.88 7.88 9.00 9.68 10.80 12.15 13.73 15.09 16.66 18.23

APPRENTICE RATE SCHEDULE FOR THOSE APPRENTICES ENTERING PROGRAM AFTER 12-2-24:

NTERVAL	PERIOD AND RATES									
6 Months	35%	35%	40%	43%	48%	54%	61%	67%	74%	81%
Benefits	8.07	8.07	9.22	9.91	11.07	12.45	14.06	15.44	17.06	18.68

NOTES:
- These rates are for service, maintenance, moves, and/or changes affecting
15 Voice/Data (teledata) lines or less. These rates may NOT be used for any teledata work in new construction (including additions) or any fiber optic work.
- The number of Teledata workers on the jobsite is the determining factor for which Foreman category applies .

The regular workday shall be 8 hours, between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- Shift work must run for a minimum of 5 consecutive workdays.
- 2nd Shift (4:30 PM to 12:30 AM) shall receive 8 hours pay for 7.5 hours work + an additional 10% of the regular rate, per hour, inclusive of benefits.
- 3rd Shift (12:30 AM to 8:00 AM) shall receive 8 hours pay for 7 hours work + an additional 15% of the regular rate, per hour, inclusive of benefits.

OVERTIME:
Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, that are not shift work, and the first 10 hours on Saturday, shall be paid at time and one-half the regular rate, inclusive of benefits. Hours in excess of 10 on Saturday and all hours on Sunday and holidays shall be paid at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked Monday through Friday, between the hours of 7:00 AM and 5:30 PM. A make-up day may be used for a day not being worked during the four 10-hour day schedule if a holiday occurs during the week or for any other conditions that prevent an employee from working the four 10-hour day schedule.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday. Saturday holidays will be observed the preceding Friday.

County - UNION

Craft: Electrician - Teledata (16 Instruments & More) **PREVAILING WAGE RATE**

See "Electrician" Rates

Craft: Electrician - Teledata (16 Instruments & More) **COMMENTS/NOTES**

See ELECTRICIAN Rates

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Electrician- Outside Commercial **PREVAILING WAGE RATE**

	06/03/24
Cable Splicer	W70.04 B44.66 T114.70
Certified Welder	W66.86 B42.62 T109.48
Equipment Operator	W63.67 B40.60 T104.27
Foreman (11-20 Journeymen workers on job)	W74.50 B47.50 T122.00
Foreman (1-3 Journeymen workers on job)	W70.04 B44.66 T114.70
Foreman (4-10 Journeymen workers on job)	W73.23 B46.70 T119.93
General Foreman (21-30 Journeymen workers on job)	W76.41 B48.71 T125.12
General Foreman (31-60 Journeymen workers on job)	W82.78 B52.76 T135.54
General Foreman (61+ Journeymen workers on job)	W84.05 B53.58 T137.63
Groundman	W38.21 B24.35 T62.56
Journeyman Lineman/Technician	W63.67 B40.60 T104.27
Sub-Foreman	W72.59 B46.27 T118.86

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Electrician- Outside Commercial **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1000 Hours	60%	65%	70%	75%	80%	85%	90%			
Benefits	61.75% of	Journey	man	wage	+ $.01					

Craft: Electrician- Outside Commercial **COMMENTS/NOTES**

APPRENTICE RATE SCHEDULE AS OF 5-29-23:

Interval Period and Rates
1000 Hours 60% 65% 70% 75% 80% 85% 90%
Benefits 62.75% of the Journeyman wage + $.01

APPRENTICE RATE SCHEDULE AS OF 6-3-24:

Interval Period and Rates
1000 Hours 60% 65% 70% 75% 80% 85% 90%
Benefits 63.75% of the Journeyman wage + $.01

* FOR UTILITY WORK PLEASE SEE STATEWIDE RATES

The regular worday shall be 8 hours, between 8:00 AM and 4:30 PM.

FOREMAN REQUIREMENTS:
- 1 to 3 Journeymen- 1 must be a Foreman (Foreman/1-3 Journeymen rate).
-4 to 10 Journeymen- 1 must be a Foreman (Foreman/4-10 Journeymen rate).
-11 to 20 Journeymen- 1 must be Foreman (Foreman/11-20 Journeymen rate) and 1 must be a Sub-Foreman.
-21 to 30 Journeymen- 1 must be a General Foreman (General Foreman/21-30 Journeymen rate) and 2 must be a Sub-Foreman.
-31 to 40 Journeymen- 1 must be a General Foreman (General Foreman/31-40 Journeymen rate) and 3 must be a Sub-Foreman.
-41 to 50 Journeymen- 1 must be a General Foreman (General Foreman/31-60 Journeymen rate) and 4 must be a Sub-Foreman.
-51 to 60 Journeymen- 1 must be a General Foreman (General Foreman/31-60 Journeymen rate) and 5 must be a Sub-Foreman.
-61+ Journeymen- 1 must be a General Foreman (General Foreman/61+ Journeymen rate) and 6 must be a Sub-Foreman.

SHIFT DIFFERENTIALS:
Shift work must run for a minimum of 5 consecutive workdays.
2nd Shift (4:30 PM to 12:30 AM): 8 hrs. pay for 7.5 hrs. work + an additional 10% of the regular rate, inclusive of benefits.
3rd Shift (12:30 AM to 8:00 AM): 8 hrs. pay for 7 hrs. work + an additional 15% of the regular rate per hour, inclusive benefits.

OVERTIME:
Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, and all hours on Saturdays, shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS:
New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day,

Thanksgiving Day and Christmas Day.

County - UNION

Craft: Electrician-Utility Work (North) **PREVAILING WAGE RATE**

Rates are located in the "Statewide" rate package

Craft: Electrician-Utility Work (North) **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
* 6 Months	60%	65%	70%	75%	80%	85%	90%			
Benefits	69% of	Appren	tice	Wage	Rate	for all	intervals			

Craft: Electrician-Utility Work (North) **COMMENTS/NOTES**

Electrician-Utility Work (North) rates are located in the "Statewide" rate package.

* The apprentice wage rate is paid at the percentage of the Journeyman Lineman wage rate located in the "Statewide" rate package.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Electrician-Utility Work (South) **PREVAILING WAGE RATE**

Rates are located in the "Statewide" rate package

Craft: Electrician-Utility Work (South) **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	33.69	36.50	39.31	42.11	44.92	47.73	50.54			
Benefits	29.97	31.72	33.46	35.21	36.96	38.71	40.45			

Craft: Electrician-Utility Work (South) **COMMENTS/NOTES**

Electrician-Utility Work (South) rates are located in the "Statewide" rate package.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Elevator Constructor **PREVAILING WAGE RATE**

	03/29/23
Journeyman	W77.49 B45.23 T122.72

Craft: Elevator Constructor **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	34.60	42.62	50.37	58.12						
Benefits	35.56	36.49	38.02	39.55						

Ratio of Apprentices to Journeymen - 1:1

Craft: Elevator Constructor **COMMENTS/NOTES**

The regular workday shall consist of either 7 or 8 hours to be established at the beginning of the project, between 7:00 AM and 4:30 PM.

OVERTIME:
For all hours worked before or after the regular workday, Monday through Friday, and all hours on Saturday and Sunday , shall be paid at double the hourly rate. Holiday pay is one days wages (8 hours) plus double the hourly rate for all hours worked.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day and the day after, Christmas Day. Saturday holidays shall be observed on the previous Friday and Sunday holidays shall be observed on the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Elevator Modernization & Service **PREVAILING WAGE RATE**

	03/29/23
Journeyman	W60.89 B44.07 T104.96

Craft: Elevator Modernization & Service **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	34.60	33.49	39.58	45.67						
Benefits	35.50	36.07	37.52	38.97						

Ratio of Apprentices to Journeymen - 1:1

Craft: Elevator Modernization & Service **COMMENTS/NOTES**

MODERNIZATION (addition, replacement, refurbishing, relocation, or changes in design or appearance, of elevator equipment in existing buildings):

- The regular workday consists of 8 hours, between 7:00 AM and 4:30 PM.

- Overtime:
Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and all hours on Saturday and Sunday shall be paid at time and one-half the hourly rate. Holiday pay is one days wages (8 hours) plus time and one-half the hourly rate for all hours worked.

SERVICE (repair or replacement of parts for the purpose of maintaining elevator equipment in good operating condition):

- The regular workday consists of 8 hours, between 6:00 AM and 6:00 PM.

- Overtime:
Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and all hours on Saturday shall be paid at time and one-half the hourly rate. All hours on Sunday and holidays shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS (Modernization and Service): New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day and the day after, Christmas Day. Saturday holidays shall be observed on the previous Friday and Sunday holidays shall be observed on the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Glazier **PREVAILING WAGE RATE**

	05/09/24
* Leadman	W53.43 B31.98 T85.41
Foreman	W55.43 B32.22 T87.65
General Foreman	W57.43 B32.47 T89.90
Journeyman	W51.43 B31.74 T83.17

Craft: Glazier **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
6 Months	46%	46%	55%	55%	61%	61%	70%	70%		
Benefits	12.44	12.44	14.76	14.76	18.16	18.16	19.79	19.79		

Ratio of Apprentices to Journeymen - 1:4

Craft: Glazier **COMMENTS/NOTES**

Hazard/Height Pay: +$1.00 per hour

* When there are three (3) men working on a jobsite for three (3) days or longer, 1 Journeyman may be designated as a Leadman for the duration of the job, provided he has his OSHA certification.

FOREMAN REQUIREMENTS:
- When there are 4 or more Glaziers on a job, 1 must be designated a Foreman.
- When there are 15 or more Glaziers on a job, 1 must be designated a General Foreman.

The regular workday shall consist of 8 hours, between 7:00 AM and 5:30 PM, Monday to Friday.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, and the third shift shall receive 8 hours pay for 7 hours of work.

OVERTIME:
Hours in excess of 8 per day, or before or after the regular workday Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate. All hours on Sundays and holidays shall be paid at double the regular

rate.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, General Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Heat & Frost Insulator **PREVAILING WAGE RATE**

	09/25/24
Foreman	W61.97 B39.22 T101.19
General Foreman	W64.31 B40.33 T104.64
Journeyman	W59.44 B38.66 T98.10

Craft: Heat & Frost Insulator **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	27.89	33.09	39.84	46.51						
Benefits	22.35	26.53	29.50	32.61						

Ratio of Apprentices to Journeymen - 1:3

Craft: Heat & Frost Insulator **COMMENTS/NOTES**

NOTE: These rates apply to the installing of insulation on hot and cold mechanical systems.

The regular workday shall be 8 hours between 7:00 AM and 3:30 PM. In addition, the regular workday may also be 8 hours between 6:00 AM and 2:30 PM.

SHIFT DIFFERENTIAL:
- Shift work must run for a minimum of 5 consecutive workdays.
- Second Shift shall work 7.5 hours and receive 8 hours pay, at the regular rate, plus 25% per hour.
- Third Shift shall work 7 hours and receive 8 hours pay, at the regular rate, plus 30% per hour.

OVERTIME:
The first 2 hours in excess of 8 per day, hours outside of the regular workday Monday through Friday that are not shift work, and the first 10 hours on Saturday, shall be paid at time and one-half the regular rate, inclusive of benefits. All hours in excess of 10 per day, and all hours on Sunday and holidays (except Labor Day) shall be paid at double the regular rate, inclusive of benefits. All hours on Labor Day shall be paid at triple the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Presidential Election Day, Thanksgiving Day and Christmas Day. Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Heat & Frost Insulator - Asbestos Worker **PREVAILING WAGE RATE**

	09/25/24
Asbestos Helper Abatement	W36.89 B24.92 T61.81

Craft: Heat & Frost Insulator - Asbestos Worker **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
	SEE	HEAT &	FROST	INSULATOR						

Ratio of Apprentices to Journeymen - 1:3

Craft: Heat & Frost Insulator - Asbestos Worker **COMMENTS/NOTES**

NOTE: These rates apply only to the removal of insulation materials/asbestos from mechanical systems, including containment erection and demolition, and placing material in appropriate containers.

The regular workday shall be 8 hours between 7:00 AM and 3:30 PM. In addition, the regular workday may also be 8 hours between 6:00 AM and 2:30 PM.

SHIFT DIFFERENTIALS:
- Shift work must run for a minimum of 5 consecutive workdays.
- The second shift shall work 7.5 hours and receive 8 hours pay at the regular rate, plus 25% per hour.
- The third shift shall work 7 hours and receive 8 hours pay at the regular rate, plus 30% per hour.

OVERTIME: The first 2 hours in excess of 8 per day, hours outside of the regular workday Monday through Friday that are not shift work, and the first 10 hours on Saturday, shall be paid at time and one-half the regular rate, inclusive of benefits. All hours in excess of 10 per day, and all hours on Sunday and holidays (except Labor Day) shall be paid at double the regular rate, inclusive of benefits. All hours on Labor Day shall be paid at triple the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Presidential Election Day, Thanksgiving Day and Christmas Day. Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Industrial Painter- Bridges **PREVAILING WAGE RATE**

	03/21/24	02/01/25	02/01/26
Foreman	W64.29 B35.91 T100.20	W0.00 B0.00 T102.20	W0.00 B0.00 T104.20
General Foreman	W66.79 B35.91 T102.70	W0.00 B0.00 T104.70	W0.00 B0.00 T106.70
Journeyman	W59.29 B35.91 T95.20	W0.00 B0.00 T97.20	W0.00 B0.00 T99.20

Craft: Industrial Painter- Bridges **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	50%	70%	90%							
Benefits	14.10	21.26	27.88							

Ratio of Apprentices to Journeymen - 1:3

Craft: Industrial Painter- Bridges **COMMENTS/NOTES**

* Industrial Painters perform work on all industrial structures, such as bridges.

These rates apply to: All bridges that span waterways, roadways, railways and canyons. All tunnels, overpasses, viaducts and all appurtenances.

FOREMEN REQUIREMENTS:
- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at double the regular rate, except Veterans Day, which shall be paid at time and one-half the regular rate.
- During a regular work week schedule, Saturday may be used as a make-up day lost to inclement weather, paid at the regular rate.
- Four 10-hour days may be worked, at the regular rate, Monday through Thursday. When the four 10-hour day schedule is used, the 11th and 12th hours shall be paid at time and one-half the regular rate. After the 12th hour, a worker shall be paid at double the regular rate. Friday may be used as a make-up day lost to inclement weather, paid at the regular rate.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Industrial Painter- Structural Steel **PREVAILING WAGE RATE**

	03/21/24	02/01/25	02/01/26
Foreman	W53.03 B33.56 T86.59	W0.00 B0.00 T88.59	W0.00 B0.00 T90.59
General Foreman	W55.53 B33.56 T89.09	W0.00 B0.00 T91.09	W0.00 B0.00 T93.09
Journeyman	W48.03 B33.56 T81.59	W0.00 B0.00 T83.59	W0.00 B0.00 T85.59

Craft: Industrial Painter- Structural Steel **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
	SEE	INDUST	RIAL	PAINTER	BRIDGES					

Ratio of Apprentices to Journeymen - 1:3

Craft: Industrial Painter- Structural Steel **COMMENTS/NOTES**

* Industrial Painters perform work on all industrial structures, such as water tanks, waste water facilitites, refineries, any structural steel work, etc.

These rates apply to: All work in power plants (any aspect). On steeples, on dams, on hangers, transformers, substations, on all open steel, in refineries, tank farms, water/sewerage treatment facilities and on pipelines.

FOREMEN REQUIREMENTS:
- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at double the regular rate, except for Veterans Day, which shall be paid at time and one-half the regular rate.
- During the regular work week schedule, Saturday may be used to make-up a day lost to inclement weather, paid at the regular rate.
- Four 10-hour days may be worked, at the regular rate, Monday through Thursday. When the four 10-hour day schedule is used, the 11th and 12th hours shall be paid at time and one-half the regular rate. After the 12th hour, a worker shall be paid at double the regular rate. Friday may be used as a make-up day lost to inclement weather, paid at the regular rate.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Industrial Painter- Water Tanks **PREVAILING WAGE RATE**

	03/21/24	02/01/25	02/01/26
Foreman	W54.08 B33.21 T87.29	W0.00 B0.00 T89.29	W0.00 B0.00 T91.29
General Foreman	W56.58 B33.21 T89.79	W0.00 B0.00 T91.79	W0.00 B0.00 T93.79
Journeyman	W49.08 B33.21 T82.29	W0.00 B0.00 T84.29	W0.00 B0.00 T86.29

Craft: Industrial Painter- Water Tanks **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	50%	70%	90%							
Benefits	14.10	21.26	27.88							

Ratio of Apprentices to Journeymen - 1:3

Craft: Industrial Painter- Water Tanks **COMMENTS/NOTES**

* Industrial Painters perform work on all industrial structures, such as water tanks, waste water facilitites, refineries, any structural steel work, etc.

These rates apply to: All new and repaint water tanks (interior and exterior).

FOREMEN REQUIREMENTS:
- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at double the regular rate, except Veterans Day, which shall be paid at time and one-half the regular rate.
- During a regular work week schedule, Saturday may be used to make-up a day lost to inclement weather, paid at the regular rate.
- Four 10-hour days may be worked, at the regular rate, Monday through Thursday. When the four 10-hour day schedule is used, the 11th and 12th hours shall be paid at time and one-half the regular rate. After the 12th hour, a worker shall be paid at double the regular rate. Friday may be used as a make-up day lost to inclement weather, paid at the regular rate.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Ironworker **PREVAILING WAGE RATE**

	07/03/24
Rod /Fence Foreman	W53.29 B50.87 T104.16
Rod/Fence Journeyman	W48.44 B50.87 T99.31
Structural Foreman	W55.82 B50.87 T106.69
Structural Journeyman	W50.74 B50.87 T101.61

Craft: Ironworker **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
6 Months	50%	60%		Yearly	70%	80%	90%			
Benefits	same as	journeyman	amount							

Ratio of Apprentices to Journeymen - 1:4

Craft: Ironworker **COMMENTS/NOTES**

HAZARDOUS WASTE WORK: On hazardous waste removal work on a state or federally designated hazardous waste site where the Ironworker is required to wear Level A,B, or C personal protection: + $3.00 per hour

The regular workday consists of 8 hours between 6:00 AM and 4:30 PM.

FOREMAN REQUIREMENTS:
When there are 2 or more Ironworkers on a job, 1 shall be designated a Foreman.

SHIFT DIFFERENTIALS:
- When a 2 shift schedule is established, the first, or day shift , shall be established on an 8 hour basis .The second shift shall be established on an 8 hour basis, and receive the regular rate plus 15%.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 15%, and the third shift shall receive the regular rate plus 20%.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis.
- When an irregular shift is established for the Ironworker (Structural) classification, the rate shall be paid at time and one-half the regular rate, inclusive of benefits. When an irregular shift is established for the Rod /Fence classification, the shift shall be established on an 8 hour basis and receive the regular rate, plus 20%.

OVERTIME:

- All hours in excess of 8 per day, or before or after an established shift that are not shift work, and all hours on Saturday, shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sunday and holidays shall be paid at double the hourly rate, inclusive of benefits. Saturday may be used as a make-up day for a day lost to inclement weather. If Saturday is not a make-up day, all hours on Saturday shall be paid at time and one-half the hourly rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Laborer - Asbestos & Hazardous Waste Removal **PREVAILING WAGE RATE**

	08/21/24
Foreman	W45.88 B26.21 T72.09
Journeyman (Handler)	W40.78 B26.21 T66.99

Craft: Laborer - Asbestos & Hazardous Waste Removal **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	22.47	28.55	32.62	36.70						
Benefits	22.31	for	all	intervals						

Ratio of Apprentices to Journeymen - *

* Ratio of apprentices to journeymen shall not be more than one apprentice for the first journeyman and no more than (1) apprentice for each additional three (3) journeymen.

Craft: Laborer - Asbestos & Hazardous Waste Removal **COMMENTS/NOTES**

NOTE: These rates apply to work in connection with Asbestos, Radiation, Hazardous Waste, Lead, Chemical, Biological, Mold Remediation and Abatement.

The regular workday shall be 8 hours.

OVERTIME:
- Hours in excess of 8 per day, Monday through Saturday, and all hours on Sunday and holidays shall be paid at time and one-half the regular rate.
- Benefits on ALL overtime hours shall be paid at straight time.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Easter, Memorial Day, July 4th, Labor Day, Veterans Day, Thanksgiving Day, Christmas Day. (Holidays start at 12:00 am).

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Laborer - Building **PREVAILING WAGE RATE**

	08/28/24
Class A Journeyman	W39.25 B33.17 T72.42
Class B Journeyman	W38.25 B33.17 T71.42
Class C Journeyman	W32.51 B33.17 T65.68
Foreman	W44.16 B33.17 T77.33
General Foreman	W49.06 B33.17 T82.23

Craft: Laborer - Building **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
6 Months	60%	70%	80%	90%	of Class B	wage rate				
Benefit	29.92	29.92	29.92	29.92						

Ratio of Apprentices to Journeymen - *

* Ratio of apprentices to journeymen shall not be more than one apprentice for the first journeyman and no more than (1) apprentice for each additional three (3) journeymen.

Craft: Laborer - Building **COMMENTS/NOTES**

CLASS A: Specialist laborer including mason tender or concrete pour crew; scaffold builder (scaffolds up to 14 feet in height); operator of forklifts, Bobcats (or equivalent machinery), jack hammers, tampers, motorized tampers and compactors, vibrators, street cleaning machines, hydro demolition equipment, riding motor buggies, conveyors, burners; and nozzlemen on gunite work.
CLASS B: Basic laborer - includes all laborer work not listed in Class A or Class C.
CLASS C: Janitorial-type light clean-up work associated with the TURNOVER of a project, or part of a project, to the owner. All other clean-up work is Class B.

The regular workday shall be 8 hours between 6:00 AM and 6:00 PM.

SHIFT DIFFERENTIALS:
- Shift work must run for a minimum of 5 consecutive workdays.
- When a 2-shift schedule is worked, including a day shift, both shifts shall be established on the basis of 8 hours pay for 8 hours worked. The second shift shall receive the regular rate plus an additional 10%.
- When a 3-shift schedule is worked, the day shift shall be established on the basis of 8 hours pay for 8 hours worked, the second shift shall be established on the basis of 8 hours pay for 7.5 hours worked, and the third shift shall be established

on the basis of 8 hours pay for 7 hours worked. The day shift shall receive the regular rate, the second shift shall receive the regular rate plus an additional 10%, and the third shift shall receive the regular rate plus an additional 15%.
- When a second or third shift is worked with no day shift, the second or third shift shall be established on the basis of 8 hours pay for 8 hours worked. The second shift shall receive the regular rate plus an additional 10%, and the third shift shall receive the regular rate plus an additional 15%.
- When an irregular shift must be established this shift shall receive the regular rate plus an additional 10%.

OVERTIME:
- Hours in excess of 8 per day, or outside the regular workday that are not shift work, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate. Saturday may be used as a make-up day (paid at straight time) for a day lost to inclement weather, or for a holiday that is observed during the work week, Monday through Friday. All hours on Sundays and holidays shall be paid at double the regular rate.
- Four 10-hour days may be worked Monday to Thursday, at straight time, with Friday used a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the regular rate.
- Benefits on ALL overtime hours shall be paid at time and one-half.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Laborer - Heavy & General **PREVAILING WAGE RATE**

Rates are located in the
"Statewide" rate package

Craft: Laborer - Heavy & General **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1000 Hours	60%	70%	80%	90%						
Benefit	25.08	for	all	intervals						

Ratio of Apprentices to Journeymen - *

* No more than 1 apprentice for the first journeyman and no more than 1 apprentice for each additional 3 journeymen.

As of 3-1-25, benefits shall be 26.13.
As of 3-1-26, benefits shall be 27.13.

Craft: Laborer - Heavy & General **COMMENTS/NOTES**

Heavy & General Laborer rates are located in the "Statewide" rate package.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Laborer-Residential and Modular Construction **PREVAILING WAGE RATE**

	04/01/23
* Skilled Tradesman (only applies to Modular Construction)	W27.90 B5.45 T33.35
Foreman (person directing crew, regardless of his skill classification)	W31.90 B5.45 T37.35
Laborer (for single family and stand-alone duplex owned by single owner)	W17.85 B2.95 T20.80
Residential and Modular Construction Laborer	W23.90 B5.45 T29.35

Craft: Laborer-Residential and Modular Construction **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
As shown	800 hours	600 hours	600 hours							
wage & benefits	70%	80%	90%							

Ratio of Apprentices to Journeymen-

One (1) apprentice shall be allowed for the first journeyman on site and no more than one (1) additional apprentice for each additional three (3) journeymen on site.

Craft: Laborer-Residential and Modular Construction **COMMENTS/NOTES**

* SKILLED TRADESMAN-
any worker doing work not typically done by a Building Laborer. Some examples are installing interior doors, sheet rock, hooking up appliances, installing light fixtures, installing railing systems, etc. Please note where local building codes require that certain work be performed under the supervision of a licensed tradesman (i.e. Plumber, Electrician, etc.) Laborers shall work under such supervision.

RESIDENTIAL CONSTRUCTION- All residential construction (not commercial), single-family, stand-alone duplex houses, townhouses and multi-family buildings of not more than four (4) floors. Each housing unit must be fully and independently functional; each housing unit must have its own kitchen and bathroom. The definition includes all incidental items such as site work, parking areas, utilities, streets and sidewalks. Please note the construction must be Residential in nature. A First Floor at or below grade may contain commercial space not to exceed 50% square footage of the floor; at least 50% of the First Floor must contain living accommodations or related nonresidential uses (e.g. laundry space, recreation/hobby rooms, and/or corridor space). Basement stories below grade used for storage, parking, mechanical systems/equipment, etc., are considered basement stories which are not used in determining the building's height. An attic is an unfinished space located immediately below the roof. Such space is not used in determining a building's height even if used for storage purposes. In addition, barracks and dormitories are not considered residential projects.

MODULAR RESIDENTIAL CONSTRUCTION- all aspects of modular residential construction (not commercial) at the site of installation of structures of no more than four (4) stories, including all excavation and site preparation, footings and

foundation systems whether poured on-site or prefabricated, all underground waterproofing, underground utilities, concrete slabs, sidewalks, driveways, paving, hardscape and landscaping. Please note the construction must be Residential as defined above. All work performed by the Set Crew (the crew of workers who set the modular boxes on the foundation), including the rigging, setting, attaching and assembly of all modules and structural members, preparation of the foundation to accept modules, such as sill plates, connection of all in-module and under-module connections including, but not limited to, plumbing, electrical, HVAC, fire suppression, CATS, telephone, television/internet, and fiber optic, the building or installation of any porches or decks regardless of material or method of construction, the on-site installation of, or completion of any roof system, doors, windows and fenestrations, including flashing, gutter and soffit systems, waterproofing, insulation and interior and exterior trim work, and painting. Please note that modular construction does not include on-site stick built construction, tip up construction or panel built construction.

The regular workday shall be 8 hours between 6:00 AM and 6:00 PM.

OVERTIME:
Hours worked in excess of 8 per day/40 per week, Monday through Saturday, and all hours worked on Sunday and holidays shall be paid at time and one-half the hourly rate.

RECOGNIZED HOILDAYS:
New Year's Day, Martin Luther King Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Millwright **PREVAILING WAGE RATE**

	05/01/24
Foreman	W66.04 B39.75 T105.79
Journeyman	W57.43 B34.65 T92.08

Craft: Millwright **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	40%	55%	65%	80%	90%					
Benefits	59.25% of	Appren	tice	Wage	Rate	for all	intervals	+ $0.62		

Ratio of Apprentices to Journeymen - 1:3

Craft: Millwright **COMMENTS/NOTES**

FOREMAN REQUIREMENTS:
- When there are 2 or more Millwrights on a job, 1 shall be designated as a Foreman.

The regular workday shall consist of 8 hours, starting between 6:00 AM and 9:00 AM.

SHIFT DIFFERENTIALS:
- When a 2 shift schedule (including a day shift) is established, the day shift shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular rate plus 15%, inclusive of benefits.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 15% and the third shift shall receive the regular rate plus 20%, inclusive of benefits.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular rate plus 15% and the third shift shall receive the regular rate plus 20%, inclusive of benefits.
- When an irregular shift must be established, this shift shall receive the regular rate plus 15%, inclusive of benefits.

OVERTIME:
- All hours in excess of 8 per day, or before or after an established shift that are not shift work, and all hours on Saturdays shall be paid at time and one-half the hourly rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the hourly rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for a day lost due to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday. Veterans' Day may be substituted for the day after Thanksgiving.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Operating Engineer **PREVAILING WAGE RATE**

Rates are located in the
"Statewide" rate package

Craft: Operating Engineer **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	60%	70%	80%	90%						

Ratio of Apprentices to Journeymen - *

* 1 apprentice for each piece of heavy equipment. At least 10 pieces of heavy equipment or a minimum of 5 Operating Engineers must be on site.

Craft: Operating Engineer **COMMENTS/NOTES**

Operating Engineer rates are located in the "Statewide" rate package.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Operating Engineer - Field Engineer **PREVAILING WAGE RATE**

Rates are located in the
"Statewide" rate package

Craft: Operating Engineer - Field Engineer **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	70%	75%	of Rod/	Chainman	Wage					
Yearly			80%	90%	Transit/	Instrument	man	Wage		

Ratio of Apprentices to Journeymen - *

* No more than 1 Field Engineer Apprentice per Survey Crew.

Craft: Operating Engineer - Field Engineer **COMMENTS/NOTES**

Operating Engineer - Field Engineer rates are located in the "Statewide" rate package.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Painter - Line Striping **PREVAILING WAGE RATE**

	12/03/24
Apprentice (1st year)	W31.33 B16.18 T47.51
Apprentice (2nd year)	W35.74 B27.13 T62.87
Foreman (Charge Person)	W45.12 B27.91 T73.03
Journeyman 1 (at least 1 year of working exp. as a journeyman)	W40.35 B27.91 T68.26
Journeyman 2 (at least 2 years of working exp. as a journeyman)	W44.12 B27.91 T72.03

Craft: Painter - Line Striping **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									

Ratio of Apprentices to Journeymen - 1:1

Craft: Painter - Line Striping **COMMENTS/NOTES**

OVERTIME:
Hours in excess of 8 per day, Monday through Saturday, and all hours on Sundays and holidays shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans Day, Thanksgiving Day and Christmas Day. Veterans Day may be substituted for the day after Thanksgiving.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Paperhanger **PREVAILING WAGE RATE**

	05/29/24
Foreman	W53.79 B30.71 T84.50
Journeyman	W48.90 B30.71 T79.61

Craft: Paperhanger **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
	SEE	COMMER	CIAL	PAINTER						

Craft: Paperhanger **COMMENTS/NOTES**

FOREMEN REQUIREMENTS:
- When there are 4 or more Paperhangers on a job, 1 shall be designated a Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate. All hours on Sundays and holidays shall be paid at double the regular rate.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, General Election Day, Veterans Day, Thanksgiving Day, Christmas Day

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Pipefitter **PREVAILING WAGE RATE**

	05/01/24
Foreman	W59.34 B52.02 T111.36
Journeyman	W55.09 B48.30 T103.39

Craft: Pipefitter **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	35%	45%	55%	65%	75%					
Benefit	27.62	30.78	33.95	37.12	40.29					

Ratio of Apprentices to Journeymen - 1:5

Craft: Pipefitter **COMMENTS/NOTES**

FOREMAN REQUIREMENTS:
- When there are 2 or more Journeyman Pipefitters on a job, 1 shall be designated a Foreman.
- There shall be a Foreman for every 8 Journeyman Pipefitters on a job.

The regular workday shall be 8 hours between 7:00 AM and 3:30 PM.

SHIFT DIFFERENTIAL:
- 2nd Shift (3:30 PM-11:30 PM) shall work 7.5 hours and receive 8 hours pay at the regular rate, plus 10% per hour on the total rate.
- 3rd Shift (11:30 PM-7:00 AM) shall work 7 hours and receive 8 hours pay at the regular rate, plus 15% per hour on the total rate.

OVERTIME:
- All hours worked in excess of 8 per day, Monday through Friday, and all hours worked on Saturday, shall be paid at time and one-half, inclusive of benefits. All hours on Sunday and holidays shall be paid at double time, inclusive of benefits.
- By mutual agreement, employees may work four 10-hour days, Monday to Thursday, at straight time rate. Friday may be used as a make-up day for a day lost to inclement weather, and may be paid at straight time. If Friday is not a make-up day, the first 8 hours shall be paid at time and one-half, inclusive of benefits; hours in excess of 8 shall be paid at double time, inclusive of benefits.

SHIFT DIFFERENTIAL (Maintenance Work Only):
- 2nd Shift (3:30 PM-11:30 PM) shall work 7.5 hours and receive 8 hours pay at the regular rate, plus 10% per hour on the total rate.
- 3rd Shift (11:30 PM-7:00 AM) shall work 7 hours and receive 8 hours pay at the regular rate, plus 15% per hour on the total rate.

OVERTIME (Maintenance Work Only):
- All hours in excess of 8 per day, Monday through Saturday, shall be paid at time and one-half, inclusive of benefits. All

hours on Sundays and holidays shall be paid at double time, inclusive of benefits.

NOTE: Maintenance work is work to repair, restore, or improve the efficiency of existing facilities. This does NOT apply to ANY new construction.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays are observed the following Monday.

County - UNION

Craft: Plasterer **PREVAILING WAGE RATE**

See Bricklayer, Stone Mason Rates

Craft: Plasterer **COMMENTS/NOTES**

See BRICKLAYER, STONE MASON Rates

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Plumber **PREVAILING WAGE RATE**

	05/01/24
Foreman	W65.33 B43.22 T108.55
General Foreman	W69.56 B43.22 T112.78
Journeyman	W60.49 B43.22 T103.71

Craft: Plumber **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	30%	45%	55%	65%	75%					
Benefits	18.23	24.72	27.02	29.31	31.60					

Ratio of Apprentices to Journeymen - *

* Employers may employ 1 apprentice on any job where 1 or 2 journeymen are employed. Thereafter, 1 apprentice may be employed for every 4 journeymen.

Craft: Plumber **COMMENTS/NOTES**

FOREMAN REQUIREMENTS:
- On any job having 2 or more Plumbers, 1 must be designated a Foreman.
- On any job having 9 or more Plumbers, 2 shall be designated as Foremen.

The regular workday shall consist of 8 hours between 7:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:
- Shift work must continue for a minimum of 5 consecutive workdays.
- When two shifts are worked, the second shift shall work 7.5 hours and receive 8 hours pay, at a rate equal to the hourly rate plus 10%, inclusive of benefits.
- When a third shift is worked, the third shift shall work 7 hours and receive 8 hours pay, at a rate equal to the hourly rate plus 15%, inclusive of benefits.

OVERTIME:
- All hours in excess of 8 per day, or before of after the regular workday that are not shift work, Monday through Friday, and all hours on Saturday, shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sunday and holidays, shall be paid at double the hourly rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for a day lost due to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Roofer **PREVAILING WAGE RATE**

	06/01/24
Foreman	W47.52 B32.34 T79.86
Journeyman	W44.52 B32.34 T76.86

Craft: Roofer **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	17.80	22.26	26.71	28.94	31.16	33.39	35.62	40.07		
Benefits	2.19	2.19	28.34	28.34	28.34	28.34	28.34	28.34		

Ratio of Apprentices to Journeymen - *

* A) For roofing jobs that are of the 1 or single ply nature: 1:2 or fraction thereof
B) For roofing jobs on new built up roofs: 1:3 or fraction thereof
C) For roofing jobs that are of a tear-off nature: 1:2 or fraction thereof
D) For roofing jobs {not requiring complete removal of existing systems, installation done over existing roof}: 1:3 or fraction thereof

Craft: Roofer **COMMENTS/NOTES**

Pitch: +.50 per hour

Mop Man: +.30 per hour

The regular workday consists of 8 hours between 8:00 AM and 4:30 PM.

OVERTIME:
Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and all hours on Saturdays, Sundays, and holidays shall be paid at time and one-half the regular rate.

RECOGNIZED HOLIDAYS: New Year's Day, Good Friday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Sheet Metal Sign Installation **PREVAILING WAGE RATE**

	04/17/24
Foreman	W44.19 B43.87 T88.06
Journeyman	W41.69 B43.87 T85.56

Craft: Sheet Metal Sign Installation **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1000 hours	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%
Benefits	14.62	16.66	18.72	20.79	23.33	25.43	27.52	29.62	31.73	33.82

Ratio of Apprentices to Journeymen - 1:3

Craft: Sheet Metal Sign Installation **COMMENTS/NOTES**

FOREMAN REQUIREMENT:
When there are 6 or more Sheet Metal Sign Installers on a job, 1 shall be designated a Foreman.

The regular workday consists of 8 hours, between 7:00 AM and 3:30 PM.

OVERTIME:
Hours before or after the regular workday, Monday though Friday, and all hours worked on Saturday shall be paid at time and one-half the hourly rate. All hours on Sunday and holidays shall be paid at double the hourly rate.

Four(4) 10 hour days may be worked, Monday through Friday, at straight time, for projects lasting at least one week in duration. The fifth day may be used as a make-up day at straight time for a day lost due to inclement weather. However, if the fifth day is not a make-up day, all hours worked will be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day and the day after, Christmas Day. Saturday holidays observed the preceding Friday, Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Sheet Metal Worker **PREVAILING WAGE RATE**

	06/13/24
Foreman	W61.90 B50.32 T112.22
General Foreman	W62.90 B50.32 T113.22
Journeyman	W57.90 B50.32 T108.22

Craft: Sheet Metal Worker **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
Yearly	45%	48%	52%	65%	of	Journey	man	Wage	Rate	
Benefit	45%	48%	52%	65%	of	Journey	man	Benefit	Rate	

Ratio of Apprentices to Journeymen - 1:4

Craft: Sheet Metal Worker **COMMENTS/NOTES**

FOREMAN REQUIREMENTS:
- When there are 2 or more Sheet Metal Workers on a project, 1 must be designated a Foreman.
- When there are 17 or more Sheet Metal Workers on a project, 1 must be designated a General Foreman.
- When there is only 1 Sheet Metal Worker (1 Journeyman) on a project, he/she shall receive $1.00 more than the regular Journeyman's rate.

The regular workday is 8 hours between 7:00 AM and 4:30 PM.

SHIFT DIFFERENTIAL:
- 2nd Shift (3:30 PM - 12:00 AM) : +17% of regular hourly rate
- Shift work must run for a minimum of 5 consecutive workdays.

OVERTIME:
- Hours in excess of 8 per day, or before or after the regular workday, that are not shift work, and the first 10 hours on Saturdays shall be paid at time and one-half of the regular rate, inclusive of benefits. Hours in excess of 10 per day on Saturday, and all hours on Sundays and holidays shall be at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Friday, at straight time, with hours in excess of 10 per day, and hours in excess of 40 per week paid at the overtime rates listed above.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Sprinkler Fitter **PREVAILING WAGE RATE**

	01/01/25
Foreman	W72.47 B40.30 T112.77
General Foreman	W76.12 B40.30 T116.42
Journeyman	W67.97 B40.30 T108.27

Craft: Sprinkler Fitter **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
1000 Hours									80%	85%
Benefits							Intervals	9 to 10	Jourymn	Ben.

Craft: Sprinkler Fitter **COMMENTS/NOTES**

Apprentice rate schedule for those apprentices registered as of 7-1-13:

Interval Period and Rates
1000 Hrs. 25% 30% 40% 45% 55% 60% 70% 75% 85% 90%
Ben. 14.90 14.90 31.30 31.30 31.30 31.30 Intervals 7-10 Journy. Ben.

Apprentice rate schedule for those apprentices registered as of 7-1-22:

Interval Period and Rates
1000 Hrs. 30% 35% 40% 45% 50% 55% 60% 70% 85% 95%
Ben. 14.90 14.90 31.30 31.30 31.30 31.30 Intervals 7-10 Journy. Ben.

The regular workday consists of 8 consecutive hours between 6:00 AM and 4:30 PM.

FOREMAN REQUIREMENTS:
- The first Sprinkler Fitter on the job must be designated a Foreman.
- On any job having 12 or more Sprinkler Fitters, one must be designated a General Foreman.

SHIFT DIFFERENTIALS:
- Shift work must run for a minimum of 2 consecutive workdays.
- 2nd and 3rd shift shall receive an additional 15% of the regular rate, per hour.
- Any "off hours" shift starting at 8:00 PM or later shall receive an additional 25% of the regular rate, per hour.

OVERTIME:
The first 2 hours in excess of 8 per day, after the regular workday that are not shift work, Monday through Friday, shall be paid at time and one-half the regular rate. Hours worked in excess of 10 per day, Monday through Friday, and all hours on Saturday, Sunday and holidays, shall be paid double the regular rate.
Four 10 hour days may be worked, Monday through Friday, at straight-time.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Tile Finisher-Marble **PREVAILING WAGE RATE**

	01/08/25
Finisher	W50.22 B37.84 T88.06

Craft: Tile Finisher-Marble **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
750 Hours	40%	60%	65%	70%	75%	85%	95%			
Benefits	Interval 1	thru 5 =	75% of	jyrnm. ben	rate	Interval 6	thru 7 =	full jyrnm	benefit	rate

Ratio of Apprentices to Journeymen - 1:4

Craft: Tile Finisher-Marble **COMMENTS/NOTES**

OVERTIME:
Hours in excess of 7 per day, Monday through Friday, and the first 7 hours on Saturdays shall be paid at time and one half the regular rate, inclusive of benefits. Hours in excess of 7 on Saturdays and all hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day and the day after, Christmas Day. Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Tile Setter - Ceramic **PREVAILING WAGE RATE**

	12/03/24
Finisher	W49.21 B33.44 T82.65
Setter	W64.16 B36.72 T100.88

Craft: Tile Setter - Ceramic **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
750 Hours	35%	40%	50%	55%	60%	65%	70%	75%	80%	90%

Ratio of Apprentices to Journeymen - 1:4

Craft: Tile Setter - Ceramic **COMMENTS/NOTES**

OVERTIME:
Hours in excess of 7 per day, and the first 10 hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Saturdays after 10 hours shall be paid double the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Tile Setter - Marble **PREVAILING WAGE RATE**

	01/08/25
Tile Setter	W64.21 B40.66 T104.87

Craft: Tile Setter - Marble **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
750 Hours	40%	60%	65%	70%	75%	85%	95%			
Benefits	Interval 1	thru 5 =	75% of	jyrnm. ben	rate	Interval 6	thru 7 =	full jyrnm	benefit	rate

Ratio of Apprentices to Journeymen - 1:4

Craft: Tile Setter - Marble **COMMENTS/NOTES**

OVERTIME:
Hours in excess of 7 per day, Monday through Friday, and the first 7 hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. Hours in excess of 7 on Saturdays, and all hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day and the day after, Christmas Day. Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Tile Setter - Mosaic & Terrazzo **PREVAILING WAGE RATE**

	01/01/25
Grinder or Assistant	W59.72 B42.19 T101.91
Mechanic	W61.33 B42.20 T103.53
Terrazzo Resinous Worker	W51.02 B34.49 T85.51

Craft: Tile Setter - Mosaic & Terrazzo **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1500 Hours	35%	45%	60%	70%	80%	90%				

Ratio of Apprentices to Journeymen - 1:5

Craft: Tile Setter - Mosaic & Terrazzo **COMMENTS/NOTES**

The regular workday consists of 7 hours, between 8:00 AM and 3:30 PM.

OVERTIME:
- Hours in excess of 7 per day, or before or after the regular workday, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Good Friday, Monday after Easter, Memorial Day, July 4th, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day and the day after, Christmas Day. Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Truck Driver **PREVAILING WAGE RATE**

	05/01/24
Bucket, Utility, Pick-up, Fuel Delivery trucks	W45.41 B43.28 T88.69
Dump truck, Asphalt Distributor, Tack Spreader	W45.41 B43.28 T88.69
Euclid-type vehicles (large, off-road equipment)	W45.51 B43.28 T88.79
Helper on Asphalt Distributor truck	W45.41 B43.28 T88.69
Low Boy Driver	W47.01 B43.28 T90.29
Slurry Seal, Seeding/Fertilizing/ Mulching truck	W45.41 B43.28 T88.69
Straight 3-axle truck	W45.41 B43.28 T88.69
Tractor Trailer (all types)	W45.51 B43.28 T88.79
Vacuum or Vac-All truck (entire unit)	W45.41 B43.28 T88.69
Winch Trailer	W45.61 B43.28 T88.89

Craft: Truck Driver **COMMENTS/NOTES**

BLENDED RATE:
When a truck driver is performing work on the site and also serving as a material delivery driver, the driver shall be paid a "blended rate" which shall be 80% of the above-listed wage rates, plus the full benefit rate. This rate shall be used when the driver "round robins" for a minimum of 6 hours during the work day.

HAZARDOUS WASTE REMOVAL:
- On hazardous waste removal work on a State designated hazardous waste site where the driver is in direct contact with hazardous materials and when personal protective equipment is required for respiratory, skin, and eye protection, the driver shall receive an additional $3.00 per hour (with or without protective gear).
- A hazardous waste related certified worker at a designated hazardous waste site who is not working in a zone requiring level A, B or C personal protection shall receive an additional $1.00 per hour.

TRUCK FOREMAN: $.75 cents per hour above regular rate. Overtime shall be increased accordingly.

The regular workday shall be 8 hours, starting between 6:00 AM and 8:00 AM.

SHIFT DIFFERENTIAL:
- Shifts starting at 4:00 PM (2nd Shift): + $3.00 per hour.
- Shifts starting at 12:00 AM (midnight/3rd Shift): time and one-half the hourly rate.
- Shifts starting at a time other than from 6:00 AM to 8:00 AM, when such hours are mandated by the project owner: + $3.00 per hour.

OVERTIME:
- Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, that are not shift work, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Employees may work four 10-hour days at straight time, Monday through Thursday, with Friday used as a make-up day for a lost day. If Friday is not a make-up day, then all hours on Friday shall be paid at time and one-half the hourly rate.
-Benefits on overtime shall be $43.03.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day (Decoration Day), July 4th, Labor Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday. The day after Thanksgiving may be substituted for Veteran's Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Truck Driver-Material Delivery Driver **PREVAILING WAGE RATE**

	05/01/24
Driver	W37.62 B43.28 T80.90

Craft: Truck Driver-Material Delivery Driver **COMMENTS/NOTES**

BLENDED RATE:
When a truck driver is performing work on the site and also serving as a material delivery driver, the driver shall be paid a "blended rate". See the "Truck Driver" craft for the blended rates.

Truck Foreman/Shop Steward: +$0.25 per hour

SHIFT DIFFERENTIALS:
- 2nd Shift shall receive an additional $0.50 per hour
- 3rd Shift shall receive time and one-half the hourly rate.

OVERTIME:
- Hours in excess of 8 per day, or before or after the regular workday that are not shift work, Monday through Friday, and all hours on Saturday shall be paid at time and one-half the hourly rate. All hours on Sunday and holidays shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day (Decoration Day), July 4th, Labor Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday. The day after Thanksgiving may be substituted for Veterans Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION

County - UNION

Craft: Welder **PREVAILING WAGE RATE**

Welder

Craft: Welder **COMMENTS/NOTES**

Welders rate is the same as the craft to which the welding is incidental.

STATEWIDE RATES

TERRITORY
ENTIRE STATE

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION

OPERATING ENGINEERS **Rates Expiration Date :**

{For apprentice rates refer to "Operating Engineers" apprentice rates in any county rate package}

The regular workday consists of 8 hours, Monday to Friday, between 6:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- Shift work must be established for 5 consecutive workdays.
- Any work started outside of the allowed start time, 6:00 AM to 9:00 AM, except for * tidal work, shall be considered an irregular shift and paid at straight time, plus 15% for the first eight hours, inclusive of benefits.
- * FOR TIDAL WORK- a contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work), providing the eight hour shift is completed between the hours of 5:00 AM and 6:30 PM.
- All time worked in excess of an established shift (an established shift is a shift that is determined at the time of the bid) shall be paid at the applicable overtime rate. When a portion of an established shift works into Saturday, Sunday or a holiday, that time worked shall be paid at the established shift rate.
- When working with other trades who receive a higher irregular shift differential, these employees shall also receive the higher differential rate.

OVERTIME:
- Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, that are not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sunday and holidays shall be paid at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with all hours on Friday paid at time and one-half the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veterans Day.

For projects bid after April 1, 2020, on hazardous waste removal work of any kind, including a state or federally designated site, where the operating engineer is required to wear level A, B, or C personal protection, the operating engineer shall receive an hourly wage rate of his regular hourly wage plus $5.00 per hour.
- An operating engineer working at a hazardous waste removal project or site at a task requiring hazardous waste related certification, but who is not working in a zone requiring level A, B, or C personal protection, shall receive an hourly wage rate of his regular rate plus $1.00 per hour.

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
58.88	39.15	98.03	100.53

CLASSIFICATIONS:

A-Frame

Backhoe (combination)

Boom Attachment on loaders (Except pipehook)

Boring & Drilling Machine

Brush Chopper, Brush Shredder, Tree Shredder, Tree Shearer

Bulldozer, finish grade

Cableway

Carryall

Concrete Pump

Concrete Pumping System (Pumpcrete & similar types)

Conveyor, 125 feet or longer

Drill Doctor (Duties include dust collector and maintenance)

Front End Loader (2 cu. yds. but less than 5 cu. yds.)

Grader, finish

Groove Cutting Machine (ride-on type)

Heater Planer

Hoist: Outside Material Tower Hoist (all types including steam, gas, diesel, electric, air hydraulic, single and double drum, concrete, brick shaft caisson, snorkle roof, and other similar types, Except Chicago-boom type) * receives an addtional $1.00 per hour on 100 ft. up to 199 ft. total height, and an additional $2.00 per hour on 200 ft. and over total height.

Hydraulic Crane (10 tons & under)

Hydraulic Dredge

Hydro-Axe

Hydro-Blaster

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

07/01/2024			07/01/2025
Rate	Fringe	Total	Total
58.88	39.15	98.03	100.53

CLASSIFICATIONS:

Jack (screw, air hydraulic, power-operated unit, or console type, Except hand jack or pile load test type)

Log Skidder

Pan

Paver, concrete

Plate & Frame Filter Press

Pumpcrete (unit type)

Pumpcrete, Squeezecrete, or Concrete Pumping machine (regardless of size)

Scraper

Side Boom

Straddle Carrier (Ross and similar types)

Whiphammer

Winch Truck (hoisting)

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
56.97	39.15	96.12	98.62

CLASSIFICATIONS:

Asphalt Curbing Machine

Asphalt Plant Engineer

Asphalt Spreader

Autograde Curb Trimmer & Sidewalk Shoulder Slipform (CMI & similar types)

Autograde Curecrete Machine (CMI & similar types)

Autograde Tube Finisher & Texturing Machine (CMI & similar types)

Bar Bending Machines (Power)

Batcher, Batching Plant, & Crusher [On Site]

Belt Conveyor System

Boom-Type Skimmer Machine

Bridge Deck Finisher

Bulldozer (all sizes)

Captain (Power Boats)

Car Dumper (railroad)

Compressor & Blower unit for loading/unloading of concrete, cement, fly ash, or similar type materials (used independently or truck-mounted)

Compressor (2 or 3 battery)

Concrete Breaking Machine

Concrete Cleaning/Decontamination Machine

Concrete Finishing Machine

Concrete Saw or Cutter (ride-on type)

Concrete Spreader (Hetzel, Rexomatic & similar types)

Concrete Vibrator

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
56.97	39.15	96.12	98.62

CLASSIFICATIONS:

Conveyors - under 125 feet

Crane Signalman

Crushing Machine

Directional Boring Machine

Ditching Machine - Small (Ditchwitch, Vermeer or similar types)

Dope Pot - Mechanical (with or without pump)

Dumpster

Elevator

Fireman

Fork Lift (Economobile, Lull & similar types)

Front End Loader (1 cu. yd. and over but less than 2 cu. yds.)

Generator (2 or 3 battery)

Giraffe Grinder

Goldhofer/Hydraulic Jacking Trailer

Grader & Motor Patrols

Grout Pump

Gunnite Machine (Excluding nozzle)

Hammer - Vibratory (in conjunction with generator)

Heavy Equipment Robotics - Operator/Technician

Hoist (roof, tugger, aerial platform hoist, house car)

Hopper

Hopper Doors (power operated)

Ladder (motorized)

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
56.97	39.15	96.12	98.62

CLASSIFICATIONS:

Laddervator

Locomotive (Dinky-type)

Maintenance Utility Man

Master Environmental Maintenance Technician

Mechanic

Mixer (Except paving mixers)

Pavement Breaker (truck-mounted or small self-propelled ride-on type)

Pavement Breaker - maintenance of compressor or hydraulic unit

Pipe Bending Machine (power)

Pitch Pump

Plaster Pump (regardless of size)

Post Hole Digger (post pounder, auger)

Rod Bending Machines

Roller (black top)

Scale (power)

Seamen Pulverizing Mixer

Shoulder Widener

Silo

Skimmmer Machine (boom type)

Steel Cutting Machine (service & maintenance)

Tamrock Drill

Tractor

Transfer Machines

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

07/01/2024			07/01/2025
Rate	Fringe	Total	Total
56.97	39.15	96.12	98.62

CLASSIFICATIONS:

Tug Captains

Tug Master (Power Boats)

Ultra High Pressure Waterjet Cutting Tool System - Operator/Maintenance Technician

Vacuum Blasting Machine - Operator/Maintenance Technician

Vibrating Plant (used with unloading)

Welder & Repair Mechanic

Effective Dates:

07/01/2024			07/01/2025
Rate	Fringe	Total	Total
51.63	39.15	90.78	93.28

CLASSIFICATIONS:

Assistant Engineer/Oiler

Driller's Helper

Field Engineer - Transit man or Instrument man

Maintenance Apprentice (Deckhand)

Maintenance Apprentice (Oiler)

Mechanic's Helper

Off Road Back Dump

Tire Repair & Maintenance

Effective Dates:

07/01/2024			07/01/2025
Rate	Fringe	Total	Total
49.05	39.15	88.20	90.70

CLASSIFICATIONS:

Field Engineer - Rodman or Chainman

TERRITORY

ENTIRE STATE

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	07/01/2024		**07/01/2025**
Rate	Fringe	Total	Total
59.21	39.15	98.36	100.86

CLASSIFICATIONS:

Lead Engineer, Foreman Engineer, Safety Engineer (minimum)

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
60.47	39.15	99.62	102.12

CLASSIFICATIONS:

Autograde Pavement Profiler (CMI & similar types)

Autograde Pavement Profiler - Recycle Type (CMI & similar types)

Autograde Placer/Trimmer/Spreader Combination (CMI & similar types)

Autograde Slipform Paver (CMI & similar types)

Backhoe (Excavator)

Central Power Plant

Concrete Paving Machine

Cranes, Derricks, Pile Drivers (all types), under 100 tons with a boom (including jib and/or leads) under 100 ft.

Draglines

Drill, Bauer, AMI and similar types

Drillmaster, Quarrymaster

Drillmaster/Quarrymaster (down-the-hole drill), rotary drill, self-propelled hydraulic drill, self-powered drill

Elevator Grader

Field Engineer-Chief of Party

Front End Loader (5 cu. yards or larger)

Gradall

Grader, Rago

Helicoptor Co-Pilot

Helicoptor Communications Engineer

Juntann Pile Driver

Locomotive (large)

Mucking Machine

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

07/01/2024			07/01/2025
Rate	Fringe	Total	Total
60.47	39.15	99.62	102.12

CLASSIFICATIONS:

Pavement & Concrete Breaker (Superhammer & Hoe Ram)

Pile Driver

Prentice Truck

Roadway Surface Grinder

Scooper (loader & shovel)

Shovel (Excavator)

Trackhoe (Excavator)

Tree Chopper with boom

Trenching Machine (cable plow)

Tunnel Boring Machine

Vacuum Truck

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
55.34	39.15	94.49	96.99

CLASSIFICATIONS:

Chipper

Compressor (single)

Concrete Spreader (small type)

Conveyor Loader (Except elevator graders)

Engines, Large Diesel (1620 HP) & Staging Pump

Farm Tractor

Fertilizing Equipment (operation & maintenance)

Fine Grade Machine (small type)

Form Line Grader (small type)

Front End Loader (under 1 cubic yard)

Generator (single)

Grease, Gas, Fuel, & Oil Supply Trucks

Heaters (Nelson or other type)

Lights - portable generating light plant

Mixer, Concrete (small)

Mulching Equipment (operation & maintenance)

Power Broom or Sweeper

Pump (diesel engine & hydraulic - regardless of power)

Pump (larger than 2 inch suction, including submersible pumps)

Road Finishing Machine (small type)

Roller - grade, fill, or stone base

Seeding Equipment (operation & maintenance)

Sprinkler & Water Pump Trucks

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
55.34	39.15	94.49	96.99

CLASSIFICATIONS:

Steam Generator or Boiler

Stone Spreader

Tamping Machine (vibrating ride-on type)

Temporary Heating Plant (Nelson or other type, including proprane, natural gas, and flow-type units)

Water or Sprinkler Truck

Welding Machine (gas, diesel, or electric convertor, of any type)

Welding System - Multiple (rectifier transformer type)

Wellpoint Systems (including installation by bull gang and maintenance)

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
62.29	39.15	101.44	103.94

CLASSIFICATIONS:

Helicoptor Pilot/Engineer

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
66.97	39.15	106.12	108.62

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types), 100 tons and over and TOWER CRANE with boom (including jib and/or leads) 140 ft. and over

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
65.97	39.15	105.12	107.62

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types), 100 tons and over and TOWER CRANE with boom (including jib and/or leads) from 100 ft. to 139 ft.

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
62.47	39.15	101.62	104.12

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types) , under 100 tons with a boom (including jib and/or leads) 140 ft. and over

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
64.97	39.15	104.12	106.62

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types), 100 tons and over and TOWER CRANE with a boom (including jib and/or leads) under 100 ft.

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
61.47	39.15	100.62	103.12

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types), under 100 tons with a boom (including jib and/or leads) from 100 ft. to 139 ft.

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

{For apprentice rates refer to "Operating Engineers" apprentice rates in any county rate package}

The regular workday consists of 8 hours, Monday to Friday, between 6:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- Shift work must be established for 5 consecutive workdays.
- Any work started outside of the allowed start time, 6:00 AM to 9:00 AM, except for * tidal work, shall be considered an irregular shift and paid at straight time, plus 15% for the first eight hours, inclusive of benefits.
- * FOR TIDAL WORK- a contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work), providing the eight hour shift is completed between the hours of 5:00 AM and 6:30 PM.
- All time worked in excess of an established shift (an established shift is a shift that is determined at the time of the bid) shall be paid at the applicable overtime rate. When a portion of an established shift works into Saturday, Sunday or a holiday, that time worked shall be paid at the established shift rate.
- When working with other trades who receive a higher irregular shift differential, these employees shall also receive the higher differential rate.

OVERTIME:
- Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, that are not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sunday and holidays shall be paid at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with all hours on Friday paid at time and one-half the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veterans Day.

For projects bid after April 1, 2020, on hazardous waste removal work of any kind, including a state or federally designated site, where the operating engineer is required to wear level A, B, or C personal protection, the operating engineer shall receive an hourly wage rate of his regular hourly wage plus $5.00 per hour.
- An operating engineer working at a hazardous waste removal project or site at a task requiring hazardous waste related certification, but who is not working in a zone requiring level A, B, or C personal protection, shall receive an hourly wage rate of his regular rate plus $1.00 per hour.

Effective Dates:

	07/01/2024		**07/01/2025**
Rate	Fringe	Total	Total
64.10	39.15	103.25	105.75

CLASSIFICATIONS:

Helicopter Co-Pilot & Communications Engineer

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

Effective Dates:

07/01/2024			07/01/2025
Rate	Fringe	Total	Total
60.04	39.15	99.19	101.69

CLASSIFICATIONS:

A-Frame

Cherry Picker -10 tons or less (Over 10 tons use crane rate)

Hoist (all types Except Chicago-boom)

Jack (screw, air hydraulic, power-operated unit or console type, Except hand jack or pile load test type)

Side Boom

Straddle Carrier

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

Effective Dates:

	07/01/2024		**07/01/2025**
Rate	Fringe	Total	Total
57.38	39.15	96.53	99.03

CLASSIFICATIONS:

Aerial Platform Used On Hoists

Apprentice Engineer/Oiler with Compressor or Welding Machine

Captain (Power Boats)

Compressor (2 or 3 in battery)

Concrete Cleaning/Decontamination Machine Operator

Conveyor or Tugger Hoist

Directional Boring Machine

Elevator or House Car

Fireman

Forklift

Generator (2 or 3)

Heavy Equipment Robotics, Operator/Technician

Maintenance Utility Man

Master Environmental Maintenance Technician

Tug Master (Power Boats)

Ultra High Pressure Waterjet Cutting Tool System Operator/Maintenance Technician

Vacuum Blasting Machine Operator/Maintenance Technician

Welding Machines, Gas or Electric Converters on any type-2 or 3 in battery including diesels

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

Effective Dates:

07/01/2024			07/01/2025
Rate	Fringe	Total	Total
55.85	39.15	95.00	97.50

CLASSIFICATIONS:

Compressor (Single)

Generators

Welding Machines, Gas, Diesel, Or Electric Converters of any type-single

Welding System, Multiple (Rectifier Transformer Type)

Effective Dates:

07/01/2024			07/01/2025
Rate	Fringe	Total	Total
52.09	39.15	91.24	93.74

CLASSIFICATIONS:

Assistant Engineer/Oiler

Drillers Helper

Field Engineer - Transit/Instrument Man

Maintenance Apprentice (Deckhand)

Maintenance Apprentice (Oiler)

Off Road Back Dump

Effective Dates:

07/01/2024			07/01/2025
Rate	Fringe	Total	Total
59.66	39.15	98.81	101.31

CLASSIFICATIONS:

Lead Engineer, Foreman Engineer, Safety Engineer (Minimum)

Effective Dates:

07/01/2024			07/01/2025
Rate	Fringe	Total	Total
49.05	39.15	88.20	90.70

CLASSIFICATIONS:

Field Engineer - Rodman or Chainman

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
60.80	39.15	99.95	102.45

CLASSIFICATIONS:

Field Engineer-Chief of Party

Vacuum Truck

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
68.99	39.15	108.14	110.64

CLASSIFICATIONS:

Cranes (all cranes, land or floating with booms, including jib, 140 ft. and over, above ground). Derricks (all derricks, land, floating or Chicago Boom type with booms including jib, 140 ft. and over, above ground), and Pile Drivers (all types) 100 tons and over and Tower Cranes.

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
67.33	39.15	106.48	108.98

CLASSIFICATIONS:

Cranes (all cranes, land or floating with booms including jib, less than 140 ft. abovr ground), Derricks (all derricks. land, floating or Chicago Boom type with booms including jib, less than 140 ft. above ground), Pile Drivers (all types), 100 tons and over and Tower Crane.

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
64.49	39.15	103.64	106.14

CLASSIFICATIONS:

Cranes (all cranes, land or floating with booms including jib, 140 ft. and over, above ground), Derricks (all derricks, land, floating or Chicago Boom type with booms including jib, 140 ft. and over, above ground), Pile Drivers (all types), under 100 tons.

Effective Dates:

	07/01/2024		07/01/2025
Rate	Fringe	Total	Total
62.83	39.15	101.98	104.48

CLASSIFICATIONS:

Cranes (all cranes, land or floating with booms including jib, less than 140 ft. above ground), Derricks (all derricks, land, floating or Chicago Boom type with booms including jib, less than 140 ft. above ground), Pile Drivers (all types), under 100 tons.

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

Effective Dates:

07/01/2024			07/01/2025
Rate	Fringe	Total	Total
64.49	39.15	103.64	106.14

CLASSIFICATIONS:

Helicopter Pilot & Engineer

TEST BORING PRELIMINARY TO CONSTRUCTION-SOUTH/WEST **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:
Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Hunterdon, Mercer, Monmouth, Ocean, Salem, Sussex, Warren

The regular workday consists of 8 hours, Monday to Friday, between 6:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- Shift work must be established for 5 consecutive workdays.
- Any work started outside of the allowed start time, 6:00 AM to 9:00 AM, except for * tidal work, shall be considered an irregular shift and paid at straight time, plus 15% for the first eight hours, inclusive of benefits.
- * FOR TIDAL WORK- a contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work), providing the eight hour shift is completed between the hours of 5:00 AM and 6:30 PM.
- All time worked in excess of an established shift (an established shift is a shift that is determined at the time of the bid) shall be paid at the applicable overtime rate. When a portion of an established shift works into Saturday, Sunday or a holiday, that time worked shall be paid at the established shift rate.
- When working with other trades who receive a higher irregular shift differential, these employees shall also receive the higher differential rate.

OVERTIME:
- Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, that are not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sunday and holidays shall be paid at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with all hours on Friday paid at time and one-half the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veterans Day.

For projects bid after April 1, 2020, on hazardous waste removal work of any kind, including a state or federally designated site, where the operating engineer is required to wear level A, B, or C personal protection, the operating engineer shall receive an hourly wage rate of his regular hourly wage plus $5.00 per hour.
- An operating engineer working at a hazardous waste removal project or site at a task requiring hazardous waste related certification, but who is not working in a zone requiring level A, B, or C personal protection, shall receive an hourly wage rate of his regular rate plus $1.00 per hour.

Effective Dates:

	07/01/2024		**07/01/2025**
Rate	Fringe	Total	Total
60.47	39.15	99.62	102.12

CLASSIFICATIONS:

Driller

Effective Dates:

	07/01/2024		**07/01/2025**
Rate	Fringe	Total	Total
53.63	39.15	92.78	95.28

CLASSIFICATIONS:

Driller's Helper

FREE AIR TUNNEL JOBS **Rates Expiration Date :**

{For apprentice rates refer to "Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:
- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional $3.00 per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:
-where Level A, B, or C protection is required: + $5.00/hr
-other Hazardous Waste site: + $1.00/hr

Traffic Control Coordinator: When either of the work classifications found below are working as a Traffic Control Coordinator they are to receive $.75 above their current rate of pay.

Effective Dates:

04/17/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
65.06	37.33	102.39	106.26	109.94

CLASSIFICATIONS:

Walking Boss & Superintendent

Effective Dates:

04/17/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
64.69	37.33	102.02	105.88	109.57

CLASSIFICATIONS:

Heading Foreman, Shaft Foreman, Rod Foreman, Electrician Foreman, Rigging Foreman

FREE AIR TUNNEL JOBS **Rates Expiration Date :**

Effective Dates:

	04/17/2024		**03/01/2025**	**03/01/2026**
Rate	Fringe	Total	Total	Total
64.06	37.33	101.39	105.26	108.94

CLASSIFICATIONS:

Iron Foreman, Caulking Foreman, Form Foreman, Cement Finishing Foreman, Concrete Foreman, Track Foreman, Cleanup Foreman, Grout Foreman

Effective Dates:

	04/17/2024		**03/01/2025**	**03/01/2026**
Rate	Fringe	Total	Total	Total
67.19	37.33	104.52	108.38	112.07

CLASSIFICATIONS:

Blaster

Effective Dates:

	04/17/2024		**03/01/2025**	**03/01/2026**
Rate	Fringe	Total	Total	Total
63.38	37.33	100.71	104.57	108.26

CLASSIFICATIONS:

Top Labor Foreman

Effective Dates:

	04/17/2024		**03/01/2025**	**03/01/2026**
Rate	Fringe	Total	Total	Total
62.94	37.33	100.27	104.13	107.82

CLASSIFICATIONS:

Skilled Men (including Caulker, Powder Carrier, all other skilled men)

Skilled Men (including Miner, Drill Runner, Iron Man, Conveyor Man, Manitenance Man, Safety Miner, Rigger, Block Layer, Cement Finisher, Tod Man)

Effective Dates:

	04/17/2024		**03/01/2025**	**03/01/2026**
Rate	Fringe	Total	Total	Total
62.75	37.33	100.08	103.94	107.63

CLASSIFICATIONS:

Semi-Skilled Men (including Bell or Signal Man Top or Bottom, Form Worker & Mover, Concrete Worker, Shaft Man, Tunnel Laborer, Caulker's Helper, all other semi-skilled)

Semi-Skilled Men (including Miner's Helper, Chuck Tender, Track Man, Nipper, Brake Man, Derail Man, Cable Man, Hose Man, Gravel Man, Form Man)

FREE AIR TUNNEL JOBS **Rates Expiration Date :**

Effective Dates:

04/17/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
62.25	37.33	99.58	103.44	107.13

CLASSIFICATIONS:

All Others (including Powder Watchman, Change House Attendant, Top Laborer)

DRILL FOR GROUND WATER SUPPLY **Rates Expiration Date :**

The well driller and/or helper may perform all work relative to the construction, finishing, and servicing of wells, pumps and borings for ground water supply. The present methods of well drilling entailing as they do, many diverse job operations calling for drilling, pump discharge, piping, and the operation of various types of related power equipment, shall all be within the job duties and functions of the well driller and/or helper. In the event that an extension of work should occur beyond water well drilling functions, into the field of general construction work, such extension of work would come under the appropriate rates listed elsewhere in this wage determination.

- For Work Hours, Shift Differentials, Overtime Rates, and Recognized Holidays see the "Operating Engineers" section of this wage determination.

Effective Dates:

07/01/2024			07/01/2025
Rate	Fringe	Total	Total
59.22	39.15	98.37	100.87

CLASSIFICATIONS:

Driller

Effective Dates:

07/01/2024			07/01/2025
Rate	Fringe	Total	Total
52.38	39.15	91.53	94.03

CLASSIFICATIONS:

Driller's Helper

OPERATING ENGINEERS MARINE-DREDGING **Rates Expiration Date :**

NOTE: These wage rates only apply to dredging and other marine construction activities occurring in navigable waters and their tributaries.
Boat crews carrying explosive material (dynamite, pourfex, and other similar materials) shall be paid at 120% of the hourly wage rate for hours engaged in handling of said materials. Employees required to possess a Hazardous Material Certification as a condition of employment shall be compensated at 120% of the hourly wage rate.
OVERTIME:
Hours in excess of 40 per week, and all hours on Saturdays and Sundays, shall be paid at time and one-half the hourly rate. All hours on holidays shall be paid at double the hourly rate.
RECOGNIZED HOLIDAYS: New Year's Day, Martin Luther King Day, Good Friday, Memorial Day, July 4th, Labor Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

Effective Dates:

	10/03/2024		**10/01/2025**	**10/01/2026**
Rate	Fringe	Total	Total	Total
47.07	15.34	62.41	63.92	65.74

CLASSIFICATIONS:

Lead Dredgerman, Operator, Leverman

Licensed Tug Operator with MOTV, Deck Captain

Effective Dates:

	10/03/2024		**10/01/2025**	**10/01/2026**
Rate	Fringe	Total	Total	Total
40.71	14.90	55.61	56.92	58.47

CLASSIFICATIONS:

Derrick Operator, Spider/Spill Barge Operator

Engineer, Electrician, Chief Welder, Chief Mate

Fill Placer, Operator II

Licensed Boat Operator

Maintenance Engineer

Effective Dates:

	10/03/2024		**10/01/2025**	**10/01/2026**
Rate	Fringe	Total	Total	Total
38.31	14.73	53.04	54.27	55.75

CLASSIFICATIONS:

Certified Welder

OPERATING ENGINEERS MARINE-DREDGING **Rates Expiration Date :**

Effective Dates:

10/03/2024			10/01/2025	10/01/2026
Rate	Fringe	Total	Total	Total
37.26	14.66	51.92	53.12	54.54

CLASSIFICATIONS:

Mate, Drag Barge Operator, Steward, Assistant Fill Placer

Welder

Effective Dates:

10/03/2024			10/01/2025	10/01/2026
Rate	Fringe	Total	Total	Total
36.07	14.57	50.64	51.80	53.18

CLASSIFICATIONS:

Boat Operator

Effective Dates:

10/03/2024			10/01/2025	10/01/2026
Rate	Fringe	Total	Total	Total
29.96	14.15	44.11	45.07	46.22

CLASSIFICATIONS:

Shoreman, Deckhand, Rodman, Scowman

Effective Dates:

10/03/2024			10/01/2025	10/01/2026
Rate	Fringe	Total	Total	Total
41.94	14.99	56.93	58.27	59.89

CLASSIFICATIONS:

Crane Operator

MICROSURFACING/SLURRY SEAL **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:
Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, Salem
IN ALL OTHER COUNTIES use the Heavy and General Laborers - North "Slurry Seal Laborer" rates.

SHIFT DIFFERENTIALS:
Any shift starting at 3:30 PM or later shall receive an additional $0.35/hr

OVERTIME:
Hours in excess of 8 per day or 40 per week shall be paid at time and one-half the hourly rate. All hours on holidays shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Washington's Birthday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day.

Effective Dates:

03/01/2017

Rate	Fringe	Total
36.50	21.27	57.77

CLASSIFICATIONS:

Foreman

Effective Dates:

03/01/2017

Rate	Fringe	Total
33.80	21.27	55.07

CLASSIFICATIONS:

Box man

Effective Dates:

03/01/2017

Rate	Fringe	Total
31.75	21.27	53.02

CLASSIFICATIONS:

Microsurface/Slurry Preparation

Effective Dates:

03/01/2017

Rate	Fringe	Total
31.75	21.27	53.02

CLASSIFICATIONS:

Squeegee man

MICROSURFACING/SLURRY SEAL **Rates Expiration Date :**

Effective Dates:

03/01/2017

Rate	Fringe	Total
30.30	21.27	51.57

CLASSIFICATIONS:

Cleaner, Taper

ASPHALT LABORERS - SOUTH **Rates Expiration Date :**

"THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY: Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, Salem
{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}
The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.
SHIFT DIFFERENTIALS:
- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional $3.00 per hour.
OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.
RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.
Hazardous Waste Work:
-where Level A, B, or C protection is required: + $5.00/hr
-other Hazardous Waste site: + $1.00/hr
FOR TIDE WORK (pertains to tidal water): A contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work) providing the eight (8) hour shift is completed between the hours of 5:00 AM and 6:30 PM.

Effective Dates:

03/21/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
53.55	37.33	90.88	94.33	97.58

CLASSIFICATIONS:

Paving Foreman

Effective Dates:

03/21/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
50.10	37.33	87.43	90.88	94.13

CLASSIFICATIONS:

Head Raker

Effective Dates:

03/21/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
50.25	37.33	87.58	91.03	94.28

CLASSIFICATIONS:

Screedman

ASPHALT LABORERS - SOUTH **Rates Expiration Date :**

Effective Dates:

03/21/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
49.70	37.33	87.03	90.48	93.73

CLASSIFICATIONS:

Tampers, Smoothers, Kettlemen, Painters, Shovelers, Roller Boys

Effective Dates:

03/21/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
49.80	37.33	87.13	90.58	93.83

CLASSIFICATIONS:

Milling Controller

Effective Dates:

03/21/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
50.00	37.33	87.33	90.78	94.03

CLASSIFICATIONS:

Traffic Control Coordinator

Effective Dates:

03/21/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
49.95	37.33	87.28	90.73	93.98

CLASSIFICATIONS:

Raker, Luteman

Effective Dates:

Rate	Fringe	Total

CLASSIFICATIONS:

Certified Paving Foreman

TEST BORING PRELIMINARY TO CONSTRUCTION-NORTH **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:
Bergen, Essex, Hudson, Middlesex, Morris, Passaic, Somerset, Union

SHIFT DIFFERENTIAL:
Employees on a shift other than between the hours of 8:00 AM and 5:00 PM shall receive an additional $2.00 per hour.

OVERTIME:
Hours in excess of 8 per day, Monday through Friday, and all hours on Saturday shall be paid at time and one-half the regular rate. All hours on Sundays and holidays shall be paid at double the regular rate.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, and Christmas Day. Sunday holidays observed the following Monday.

Hazardous Waste Pay (for Levels A, B, and C): an additional 15% of the hourly rate, per hour.

A newly hired Helper with no experience in the industry shall be paid as follows:
1st year on the job - 70% of Helper wage rate
2nd year on the job - 80% of Helper wage rate
3rd year on the job - 90% of Helper wage rate
All helpers receive full fringe benefit rate.

Effective Dates:

10/18/2024

Rate	Fringe	Total
37.58	34.49	72.07

CLASSIFICATIONS:

Helper (4th year helper)

Effective Dates:

10/18/2024

Rate	Fringe	Total
47.88	34.49	82.37

CLASSIFICATIONS:

Driller

Effective Dates:

10/18/2024

Rate	Fringe	Total
54.50	34.49	88.99

CLASSIFICATIONS:

Foreman

HEAVY & GENERAL LABORERS - NORTH **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:
Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Passaic, Somerset, Sussex, Union, Warren

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:
- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional $3.00 per hour.
FOR TIDE WORK (pertains to tidal water): A contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work) providing the eight (8) hour shift is completed between the hours of 5:00 AM and 6:30 PM.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:
-where Level A, B, or C protection is required: + $5.00/hr
-other Hazardous Waste site: + $1.00/hr

Effective Dates:

	11/12/2024		**03/01/2025**	**03/01/2026**
Rate	Fringe	Total	Total	Total
49.30	37.33	86.63	90.08	93.33

CLASSIFICATIONS:

"D" Rate:
basic, landscape, asphalt, slurry seal, or railroad track laborer; utility meter installer; flagman; salamander tender; pitman; dumpman; rakers or tampers on cold patch work; wrappers or coaters of pipe; waterproofer; timberman; wagon drill or drill master helper; powder carrier; magazine tender; signal man; power buggy operator; tree cutter; operator of basic power tools

Effective Dates:

	11/12/2024		**03/01/2025**	**03/01/2026**
Rate	Fringe	Total	Total	Total
50.00	37.33	87.33	90.78	94.03

CLASSIFICATIONS:

"C" Rate:
pipe layer; laser man; conduit or duct line layer; operator of jack hammer, chipping hammer, pavement breaker, concrete cutter, asphalt cutter, sheet hammer, or walk-behind saw cutter; sandblaster; acetylene cutting or burning; wagon drill, directional drill, or hydraulic drill operator; drill master; core driller; asphalt raker or lute man

HEAVY & GENERAL LABORERS - NORTH **Rates Expiration Date :**

Effective Dates:

11/12/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
50.25	37.33	87.58	91.03	94.28

CLASSIFICATIONS:

"B" Rate:
concrete finisher; setter of brick or stone pavers; stone cutter; form setter; manhole, catch basin, or inlet builder; asphalt screedman; rammer; hardscaping; gunite nozzle man

Effective Dates:

11/12/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
53.80	37.33	91.13	94.58	97.83

CLASSIFICATIONS:

"A" Rate:
blaster

Effective Dates:

11/12/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
53.55	37.33	90.88	94.33	97.58

CLASSIFICATIONS:

"FOREMAN" Rate:
labor foreman, asphalt foreman, drill foreman, pipe foreman, grade foreman, finisher foreman, concrete foreman

Effective Dates:

11/12/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
54.55	37.33	91.88	95.33	98.58

CLASSIFICATIONS:

"GENERAL FOREMAN" Rate

Effective Dates:

11/12/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
50.75	37.33	88.08	91.53	94.78

CLASSIFICATIONS:

TRAFFIC CONTROL COORDINATOR Rate

HEAVY & GENERAL LABORERS - NORTH **Rates Expiration Date :**

Effective Dates:

11/12/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
54.05	37.33	91.38	95.83	100.08

CLASSIFICATIONS:

" CERTIFIED FOREMAN Rate" :

Effective Dates:

11/12/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
55.05	37.33	92.38	96.83	101.08

CLASSIFICATIONS:

" CERTIFIED GENERAL FOREMAN Rate" :

HEAVY & GENERAL LABORERS - SOUTH **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:
Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, Salem

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:
- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional $3.00 per hour.

FOR TIDE WORK (pertains to tidal water): A contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work) providing the eight (8) hour shift is completed between the hours of 5:00 AM and 6:30 PM.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:
-where Level A, B, or C protection is required: + $5.00/hr
-other Hazardous Waste site: + $1.00/hr

Effective Dates:

	12/31/2024		**03/01/2025**	**03/01/2026**
Rate	Fringe	Total	Total	Total
49.30	37.33	86.63	90.08	93.33

CLASSIFICATIONS:

"D" Rate:
basic, landscape, asphalt, slurry seal, or railroad track laborer; utility meter installer; flagman; salamander tender; pitman; dumpman; rakers or tampers on cold patch work; wrappers or coaters of pipe; waterproofer; timberman; wagon drill or drill master helper; powder carrier; magazine tender; signal man; power buggy operator; tree cutter; operator of basic power tools

Effective Dates:

	12/31/2024		**03/01/2025**	**03/01/2026**
Rate	Fringe	Total	Total	Total
50.00	37.33	87.33	90.78	94.03

CLASSIFICATIONS:

"C" Rate:
pipe layer; laser man; conduit or duct line layer; operator of jack hammer, chipping hammer, pavement breaker, concrete cutter, asphalt cutter, sheet hammer, or walk-behind saw cutter; sandblaster; acetylene cutting or burning; wagon drill, directional drill, or hydraulic drill operator; drill master; core driller; asphalt raker or lute man

HEAVY & GENERAL LABORERS - SOUTH **Rates Expiration Date :**

Effective Dates:

12/31/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
53.80	37.33	91.13	94.58	97.83

CLASSIFICATIONS:

"A" Rate:
blaster

Effective Dates:

12/31/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
53.55	37.33	90.88	94.33	97.58

CLASSIFICATIONS:

"FOREMAN" Rate:
labor foreman, asphalt foreman, drill foreman, pipe foreman, grade foreman, finisher foreman, concrete foreman

Effective Dates:

12/31/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
54.55	37.33	91.88	95.33	98.58

CLASSIFICATIONS:

"GENERAL FOREMAN" Rate

Effective Dates:

12/31/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
50.75	37.33	88.08	91.53	94.78

CLASSIFICATIONS:

TRAFFIC CONTROL COORDINATOR Rate

Effective Dates:

12/31/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
55.05	37.33	92.38	96.83	101.08

CLASSIFICATIONS:

" CERTIFIED GENERAL FOREMAN Rate" :

HEAVY & GENERAL LABORERS - SOUTH **Rates Expiration Date :**

Effective Dates:

12/31/2024			03/01/2025	03/03/2026
Rate	Fringe	Total	Total	Total
54.05	37.33	91.38	95.83	100.08

CLASSIFICATIONS:

" CERTIFIED FOREMAN Rate" :

Effective Dates:

12/31/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
50.25	37.33	87.58	91.03	94.28

CLASSIFICATIONS:

"B" Rate:
concrete finisher; setter of brick or stone pavers; stone cutter; form setter; manhole, catch basin, or inlet builder; asphalt screedman; rammer; hardscaping; gunite nozzle man

PIPELINE - MAINLINE TRANSMISSION **Rates Expiration Date :**

These rates apply to the following: welding on Transportation Mainline pipe lines (cross-country pipe lines, or any segments thereof, transporting coal, gas, oil, water or other transportable materials, vapors or liquids, including portions of such pipe lines within private property boundaries up to the final metering station or connection - the point where a valve, consumer connection, or town border station divides mainline transmission lines or higher pressure lateral and branch lines from lower pressure distribution systems).

PER DIEM PAYMENT:
In addition to the total wage rate paid for each craft, the following per diem (per day) amounts must also be paid - Pipeline Journeyman: $80.50; Pipeline Journeyman Welder: $140.50; and Pipeline Helper: $64.50. Note: in order to receive the per diem payment an employee must work a minimum of 8 hours in a 24 hour period.

NOTES:
- Journeymen employed as "stringer bead" welders and journeymen who are regularly employed as "hot-pass" welders shall receive $1.00 per hour more than other journeymen.
- Welders running "stringer bead" or "hot-pass" on "cutouts" or "tie-ins" on a production basis shall be paid $1.00 per hour above the journeymen rate.
- Whenever a welder helper is employed using a power buffer or power grinder immediately behind the stringer bead and/or hot-pass welders, and the pipe gang is set on a production basis, the helper shall be paid $2.00 per hour above the helper rate.
- If back welding is performed inside a pipe under either or both of the following conditions, the welder engaged in the welding will receive $3.00 per hour above the regular rate for the job only for the days on which such back welding is performed:
  - The employer elects, as a regular procedure, to back weld each line-up. This condition is not intended to apply to occasional back welding performed by the pipe gang to repair a bead, to rectify a "high-lo" condition or wall thickness, etc.
  - A welder is required to back weld a completed weld behind the firing line.
- If the welder helper is required to go inside the pipe for the purpose of brushing, buffing and grinding the weld, they shall receive a wage rate $1.00 per hour above the regular
helper rate for the days involved.
- Welders working on "hot work" shall be paid $2.00 per hour above the regular rate for each day engaged in such work. "Hot work' is defined as work on lines in service where there is the danger of fire or explosion.

The regular workday shall be 8 hours, between 8:00 AM and 4:30 PM.

OVERTIME:
Hours in excess of 8 per day, and all hours on Sundays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, July 4th, Labor Day, Thanksgiving Day, and Christmas Day. Sunday holidays observed the following Monday.

Effective Dates:

06/13/2024

Rate	Fringe	Total
57.34	35.90	93.24

CLASSIFICATIONS:

Pipeline Journeyman Welder

PIPELINE - MAINLINE TRANSMISSION **Rates Expiration Date :**

Effective Dates:

06/13/2024

Rate	Fringe	Total
57.34	35.90	93.24

CLASSIFICATIONS:

Pipeline Journeyman

Effective Dates:

06/13/2024

Rate	Fringe	Total
33.84	25.02	58.86

CLASSIFICATIONS:

Pipeline Helper

PIPELINE - GAS DISTRIBUTION **Rates Expiration Date :**

These rates apply to the following: welding on gas line distribution systems (that portion of the gas distribution system placed in streets, roads, subways, tunnels, viaducts, highways and easements which serves the users of gas).

SHIFT DIFFERENTIALS:
An "irregular" shift may start any time from 5:00 PM to 12:00 AM, Monday through Friday, and shall receive an additional 15% of the regular rate per hour, inclusive of benefits.

OVERTIME:
Hours in excess of forty per week, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, and Christmas Day. Sunday holidays observed the following Monday.

Effective Dates:

11/04/2024

Rate	Fringe	Total
64.70	34.74	99.44

CLASSIFICATIONS:

Pipeline Journeyman Welder

Effective Dates:

11/04/2024

Rate	Fringe	Total
64.70	34.74	99.44

CLASSIFICATIONS:

Pipeline Journeyman

Effective Dates:

11/04/2024

Rate	Fringe	Total
41.73	24.77	66.50

CLASSIFICATIONS:

Pipeline Helper

ASPHALT LABORERS- NORTH **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:
Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Passaic, Somerset, Sussex, Union, Warren
{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}
The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.
SHIFT DIFFERENTIALS:
- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional $3.00 per hour.
OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.
RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.
Hazardous Waste Work:
-where Level A, B, or C protection is required: + $5.00/hr
-other Hazardous Waste site: + $1.00/hr
FOR TIDE WORK (pertains to tidal water): A contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work) providing the eight (8) hour shift is completed between the hours of 5:00 AM and 6:30 PM.

Effective Dates:

11/20/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
53.55	37.33	90.88	94.33	97.58

CLASSIFICATIONS:

Asphalt Foreman

Effective Dates:

11/20/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
50.25	37.33	87.58	91.03	94.28

CLASSIFICATIONS:

Asphalt Screedman

Effective Dates:

11/20/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
50.00	37.33	87.33	90.78	94.03

CLASSIFICATIONS:

Asphalt Raker or Lute Man

ASPHALT LABORERS- NORTH **Rates Expiration Date :**

Effective Dates:

11/20/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
49.30	37.33	86.63	90.08	93.33

CLASSIFICATIONS:

Asphalt Laborer

Effective Dates:

11/20/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
54.05	37.33	91.38	95.83	100.08

CLASSIFICATIONS:

Certified Asphalt Foreman

ELECTRICIAN- UTILITY WORK (NORTH) **Rates Expiration Date :**

Electrician-Utility Work (North)
(For apprentice rates refer to Electrician-Utility Work (North) in any county rate package).
These rates apply to work contracted for by the following utility companies:
Public Service Electric & Gas Co. of NJ, GPU Energy, Borough of Madison Electric Department, Sussex Rural Electric Cooperative, Rockland Utilities, and Butler Municipal Electric Co.
These rates do not apply to work on substations or switching stations.
For Utility work contracted for by a utility company other than those listed above or those listed under "Electrician-Utility Work (South), see the "Outside Commercial Rates" for the county in which the jobsite is located.

* FOR OUTSIDE COMMERCIAL RATES PLEASE SEE COUNTY RATES

The regular workday is 8 hours, between 6:00 AM and 6:00 PM.
FOR EMERGENCY WORK ONLY: (emergency work is defined as work caused by storm, catastrophe, act of god, and circumstances beyond the control of the employer)-all hours of work shall be paid at double the hourly rate.
SHIFT DIFFERENTIALS:
Shift work must run for a minimum of 5 consecutive workdays.
2nd shift (between the hours of 4:30 PM and 1:00 AM): 8 hours of work + 17.3% of the regular rate, inclusive of benefits.
3rd shift (between the hours of 12:30 AM and 9:00 AM): 8 hours of work + 31.4% of the regular rate per hour, inclusive of benefits.

OVERTIME:
Hours in excess of 8 per day, or before or after the regular wokday Monday through Friday, that is not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the hourly rate, inclusive of benefits.
Four 10-hour days may worked, at straight time, between 6:00 AM and 6:00 PM, Monday through Thursday.

RECOGNIZED HOLIDAYS:
New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day and Christmas Day, or day on which they are legally observed.

Effective Dates:

12/01/2024

Rate	Fringe	Total
64.83	44.73	109.56

CLASSIFICATIONS:

Chief Lineman

Effective Dates:

12/01/2024

Rate	Fringe	Total
61.16	42.20	103.36

CLASSIFICATIONS:

Journeyman Lineman

ELECTRICIAN- UTILITY WORK (NORTH) **Rates Expiration Date :**

Effective Dates:

12/01/2024

Rate	Fringe	Total
61.16	42.20	103.36

CLASSIFICATIONS:

Special License Operator

Effective Dates:

12/01/2024

Rate	Fringe	Total
60.55	41.77	102.32

CLASSIFICATIONS:

Transit Man

Effective Dates:

12/01/2024

Rate	Fringe	Total
58.71	40.50	99.21

CLASSIFICATIONS:

Line Equipment Operator

Effective Dates:

12/01/2024

Rate	Fringe	Total
51.37	35.44	86.81

CLASSIFICATIONS:

Dynamite Man

Effective Dates:

12/01/2024

Rate	Fringe	Total
76.45	52.75	129.20

CLASSIFICATIONS:

General Foreman

Effective Dates:

12/01/2024

Rate	Fringe	Total
70.33	48.52	118.85

CLASSIFICATIONS:

Assistant General Foreman

ELECTRICIAN- UTILITY WORK (NORTH) **Rates Expiration Date :**

Effective Dates:

12/01/2024

Rate	Fringe	Total
68.50	47.26	115.76

CLASSIFICATIONS:

Line Foreman

Effective Dates:

12/01/2024

Rate	Fringe	Total
49.54	34.18	83.72

CLASSIFICATIONS:

Street Light Mechanical Leader

Effective Dates:

12/01/2024

Rate	Fringe	Total
47.09	32.49	79.58

CLASSIFICATIONS:

Groundman Winch Operator

Effective Dates:

12/01/2024

Rate	Fringe	Total
47.09	32.49	79.58

CLASSIFICATIONS:

Groundman Truck Operator

Effective Dates:

12/01/2024

Rate	Fringe	Total
46.48	32.07	78.55

CLASSIFICATIONS:

Street Light Mechanic

Effective Dates:

12/01/2024

Rate	Fringe	Total
46.48	32.07	78.55

CLASSIFICATIONS:

Line Equipment Mechanic

ELECTRICIAN- UTILITY WORK (NORTH) **Rates Expiration Date :**

Effective Dates:

12/01/2024

Rate	Fringe	Total
39.75	27.42	67.17

CLASSIFICATIONS:

Groundman 2nd Year

Effective Dates:

12/01/2024

Rate	Fringe	Total
36.70	25.32	62.02

CLASSIFICATIONS:

Groundman 1st Year

Effective Dates:

12/01/2024

Rate	Fringe	Total
60.55	41.77	102.32

CLASSIFICATIONS:

Line Equipment Foreman

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date :**

Electrician-Utility Work (South)
(For apprentice rates refer to Electrician-Utility Work (South) in any county rate package).
These rates apply to work contracted for by the following utility company:
Atlantic City Electric.
These rates do not apply to work on substations or switching stations.
For utility work contracted for by a utility company other than the one listed above or those listed under "Electrician-Utility Work (North), see the "Outside Commercial Rates" for the county in which the jobsite is located.

* FOR OUTSIDE COMMERCIAL RATES PLEASE SEE COUNTY RATES

The regular workday is 8 hours, between 7:00 AM and 4:30 PM.
FOR EMERGENCY WORK ONLY: (emergency work is defined as work caused by storm, catastrophe, act of god, and circumstances beyond the control of the employer)- all hours of work shall be paid at double the hourly rate.
SHIFT DIFFERENTIALS:
Shift work must run for a minimum of 5 consecutive workdays.
When two (2) or three (3) shifts are worked the following shall apply:
1st shift (between the hours of 8:00 AM and 4:30 PM)
2nd shift (between the hours of 4:30 PM and 12:30 AM): 8 hours of work + 10% of the regular rate of pay for 7.5 hours worked.

3rd shift (between the hours of 12:30 AM and 8:00 AM): 8 hours of work + 15% of the regular rate of pay for 7 hours worked.

OVERTIME:
Hours in excess of 8 per day, or before or after the regular wokday Monday through Friday, that is not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate. All hours on Sundays and Holidays shall be paid double the hourly rate.

Four 10-hour days may be worked, at straight time, between 6:00 AM and 6:00 PM, Monday through Thursday with Friday used as a make-up day.

RECOGNIZED HOLIDAYS:
New Year's Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day and Christmas Day or on days celebrated.

WORKING RULES:
There shall be a Foreman in charge of each work crew. No crews are to exceed twelve (12) men, including Foremen.

There shall be a General Foreman designated for transmission work when three (3) or more crews are on the same job and for distribution work where there are are more than twenty (20) employees on site.
A small job crew shall consist of five (5) or less employees, one (1) of the Journeyman Linemen in the crew shall be designated as a Small Job Foreman.
Work performed from ladders and/or mechanical lift equipment shall be the work of Linemen and/or Apprentices.
On new construction, fitting and framing poles, towers or structures may be done by Journeymen and/or Apprentices. Groundmen may assist, but may not perform any work which would be performed by Linemen if assembled in the air.
There shall be a Journeyman Lineman in each pole setting, erection, grounding, wire and cable-pulling crew of more than three (3) men.

Effective Dates:

12/01/2024

Rate	Fringe	Total
71.87	59.12	130.99

CLASSIFICATIONS:

General Foreman

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date :**

Effective Dates:

12/01/2024

Rate	Fringe	Total
64.01	54.22	118.23

CLASSIFICATIONS:

Foreman

Effective Dates:

12/01/2024

Rate	Fringe	Total
60.64	52.12	112.76

CLASSIFICATIONS:

Small Job Foreman

Effective Dates:

12/01/2024

Rate	Fringe	Total
56.15	49.33	105.48

CLASSIFICATIONS:

Heavy Equipment Operator

Effective Dates:

12/01/2024

Rate	Fringe	Total
56.15	49.33	105.48

CLASSIFICATIONS:

Cable Splicer

Effective Dates:

12/01/2024

Rate	Fringe	Total
56.15	49.33	105.48

CLASSIFICATIONS:

Journeyman Lineman

Effective Dates:

12/01/2024

Rate	Fringe	Total
56.15	49.33	105.48

CLASSIFICATIONS:

Journeyman Welder

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date :**

Effective Dates:

12/01/2024

Rate	Fringe	Total
56.15	49.33	105.48

CLASSIFICATIONS:

Journeyman Painter

Effective Dates:

12/01/2024

Rate	Fringe	Total
44.92	42.36	87.28

CLASSIFICATIONS:

Light Equipment Operator

Effective Dates:

12/01/2024

Rate	Fringe	Total
39.31	38.86	78.17

CLASSIFICATIONS:

Groundman Truck Driver

Effective Dates:

12/01/2024

Rate	Fringe	Total
36.50	37.12	73.62

CLASSIFICATIONS:

Groundman 3rd Year

Effective Dates:

12/01/2024

Rate	Fringe	Total
33.69	35.37	69.06

CLASSIFICATIONS:

Groundman 2nd Year

Effective Dates:

12/01/2024

Rate	Fringe	Total
30.88	33.62	64.50

CLASSIFICATIONS:

Groundman 1st Year

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date :**

Effective Dates:

12/01/2024

Rate	Fringe	Total
24.71	29.80	54.51

CLASSIFICATIONS:

Flagman

HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS **Rates Expiration Date :**

THESE RATES APPLY TO CONSTRUCTION ON NEW TRANS HUDSON TUNNELS ONLY

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:
- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional $3.00 per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:
-where Level A, B, or C protection is required: + $5.00/hr
-other Hazardous Waste site: + $1.00/hr

Traffic Control Coordinator: When either of the work classifications found below are working as a Traffic Control Coordinator they are to receive $.75 above their current rate of pay.

Effective Dates:

04/17/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
78.08	37.33	115.41	119.68	123.81

CLASSIFICATIONS:

Walking Boss & Superintendent

Effective Dates:

04/17/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
77.63	37.33	114.96	119.23	123.36

CLASSIFICATIONS:

Heading Foreman, Shaft Foreman, Rod Foreman, Electrical Foreman, Rigging Foreman

HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS **Rates Expiration Date :**

Effective Dates:

04/17/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
76.88	37.33	114.21	118.48	122.61

CLASSIFICATIONS:

Iron Foreman, Caulking Foreman, Form Foreman, Cement Finishing Foreman, Concrete Foreman, Track Foreman, Clean-up Foreman, Grout Foreman

Effective Dates:

04/17/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
80.63	37.33	117.96	122.23	126.36

CLASSIFICATIONS:

Blaster

Effective Dates:

04/17/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
76.05	37.33	113.38	117.66	121.78

CLASSIFICATIONS:

Top Labor Foreman

Effective Dates:

04/17/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
75.53	37.33	112.86	117.13	121.26

CLASSIFICATIONS:

Skilled Men (including Caulker, Powder Carrier, all other skilled men)
Skilled Men (including Miner, Drill Runner, Iron Man, Conveyor Man, Maintenance Man, Safety Miner, Rigger, Block Layer, Cement Finisher, Rod Man)

Effective Dates:

04/17/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
75.30	37.33	112.63	116.91	121.03

CLASSIFICATIONS:

Semi-Skilled Men (including Bell or Signal Man top or bottom, Form Worker & Mover, Concrete Worker, Shaft Man, Tunnel Laborer, Caulker's Helper, all other semi-skilled)
Semi-Skilled Men (including Miner's Helper, Chuck Tender, Track Man, Nipper, Brake Man, Derail Man, Cable Man, Hose Man, Gravel Man, Form Man)

HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS **Rates Expiration Date :**

Effective Dates:

04/17/2024			03/01/2025	03/01/2026
Rate	Fringe	Total	Total	Total
74.70	37.33	112.03	116.31	120.43

CLASSIFICATIONS:

All others (including Powder Watchman, Change House Attendant, Top Laborer, Job Steward)

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, County of Union, New Jersey
BA # 26-2025, Union County Engineering 2020-002

SPECIAL PROVISIONS

1. Existing Utilities

The Contractor shall coordinate all work with the utility companies in the area of construction. Information regarding existing utilities have been collected from various sources and the Contractor is advised that underground object locations, elevations, or types are not warranted to be approximately correct, nor can they be assumed to be the only subsurface objects, proposed or existing, which may be encountered during the excavation of the work. The Contractor shall make all necessary investigations prior to bidding to satisfy himself as to the existing conditions.

According to the Underground Facility Protection Act (N.J.S.A. 48:2-73/N.J.A.C. 14:2-1.1), Contractor must give notice of impending construction not less than three business days or more than ten business days prior to the start of excavation. This is accomplished by calling the New Jersey "One-Call" system at 1-800-272-1000. This procedure must be done so that all underground facilities can be marked out in the field. Any excavation within 24 inches of a gas facility mark out must be done by hand. Any damage done to gas facilities, however minor, must be reported to Elizabethtown Gas immediately by calling 1-800-492-4009.

2. Site Electrical Work and Coordination with PSE&G Utility Company (PSE&G)

The Contractor shall meet with representatives of the Engineer, Owner and PSE&G to coordinate the electrical improvements for the subject project prior to construction.

PSE&G will be responsible for installing underground primary electric service into the site and utility transformer. PSE&G will be responsible for providing new utility service through underground feeders to the utility transformer.

The Contractor will be responsible for the excavation of a trench, the installation of secondary feeders and conduits, conduit sweeps, the installation of light poles, sand bedding, backfill, trench compaction, wire pulls, red metallic wire demarcation tape, and transformer pad bedding preparation and pad installation in accordance with the construction plans, construction details and PSE&G requirements.

The Contractor will allow PSE&G access to the site, make application for the required electrical service(s), coordinate the work and shall stage the improvements so as not to impede the electrical work. The Contractor is responsible for supplying J bolts and ground rods.

The Owner shall be responsible for utility company fees associated with the electric services.

3. Site Gas Work and Coordination with Elizabethtown Gas

The Contractor shall meet with representatives of the Engineer, Owner and Elizabethtown Gas to coordinate the primary gas improvements for the subject project prior to construction.

Elizabethtown Gas will be required to install primary gas service. The Contractor will allow Elizabethtown gas access to the site, make application for the primary gas service, coordinate the work and shall stage the improvements so as not to impede the work.

The Owner shall be responsible for utility company fees associated with the primary gas services.

4. Coordination with New Jersey American Water

The Contractor is herein advised that New Jersey American Water (NJAW) has jurisdiction over the existing water and system that are to be encountered during the execution of the Work required in conjunction with this project.

The Contractor shall meet with representatives of the Engineer, Owner and NJAW to coordinate the water system improvements for the subject project prior to construction

As a specific requirement for this Contract, the Contractor will be required to coordinate all of their activities with NJAW. NJAW will be responsible for turning of all existing valves as may be required in conjunction with this Project.

It is our understanding that the NJAW will be responsible for tapping the existing water main located in Madison Hill Road and extending new fire and domestic services to a shut off valve also to be provided by the water company to be located at the entrance of the project site. The Contractor will be responsible for the extension of the new water service from the shut off valve provided by the NJAW throughout the site to the locations of proposed facilities as depicted on the contract drawings. It should also be noted that the NJAW will furnish and install the new water meter needed for the Project.

5. Construction Contingencies

The Contractor's attention is specifically directed to the fact that various items and extra quantities have been included in the bid form for contingency purposes due to the nature of the work to be performed in conjunction with this project.

Accordingly, the Contractor is hereby advised prior to submitting their bid that they shall take into account the fact that contingencies have been included in the items and that portions of certain items or entire items may not be utilized by the Township, depending upon the conditions encountered during the work.

To that end, the initial contract award amount may be significantly higher than the final contract amount, depending upon the actual conditions encountered.

The Contractor must satisfy himself by personal examination of location of the proposed work and surroundings thereof, and by such other means that they prefers, and shall not at any time after submission of the bid, dispute the original estimate of the work, nor assert that there was any misunderstanding in regard to the contingencies included in the quantities.

6. Construction Access

The Contractor will be required to coordinate traffic safety provisions with the Township of Clark Police Department prior to construction. The Contractor shall provide a traffic plan to the local Police Department for review and approval.

During construction operations, the Contractor may utilize the local Police Department to provide assistance in maintenance and protection of traffic. The inclusion of local police does not relieve the Contractor of its duties with regard to traffic control on the project. The Contractor shall be fully responsible for the set-up and maintenance of the Traffic Control Patterns (TCP) except as required by Local and State law or as specifically set forth in the contract. The use of police in the providing of traffic safety services is supplemental to the TCP and their presence shall not relieve the Contractor of its responsibility to maintain the TCP and safety on the Project.

7. Pre-Construction Conference

The Contractor shall be required to attend a pre-construction conference prior to the start of work. Subcontractors of major components of the project shall also be required to attend.

8. Project Meetings

The Contractor shall prepare for and participate in weekly team meetings throughout the duration of the work, in addition to the project kick-off and close-out meetings. The meetings may be held by teleconference at the discretion of the Owner. The Contractor's on-site foreman shall attend each meeting and the Contractor's representative with responsibility for procuring and allocating resources to the project shall be available to attend every other meeting. Said meetings shall address, but are not limited to, the current status of the work, planning future work, as well as adjustment of timing or work practices, if needed. Any unforeseen matters or developments affecting the nature, timing, cost of the work, etc. shall be raised as soon as they are known and shall not be saved to address at the weekly meeting.

9. Notice of Construction

The Contractor shall provide a minimum of 48 hours notice to the Township and the Engineer prior to the start of construction and prior to implementing any changes that affect existing traffic patterns along the surrounding roadway network.

10. Contractor's Progress Schedule and Schedule of Values

The Contractor shall submit a proposed program of operation for the project prior to commencement of construction, which clearly indicates how they propose to conduct the work to bring about the completion of the project by the stipulated Time of Completion indicated in Section 108.10.

The Contractor is specifically advised of the accelerated contract time for the project. Accordingly, the Contractor shall be prepared to provide the necessary materials and manpower in order to complete the project within the contract time period. The program of operation will clearly indicate how the Contractor intends to conduct the work to guarantee meeting this requirement.

The Contractor shall also provide a Schedule of Values detailing an itemized breakdown of all lump sum bid items for progress payment purposes. Said Schedule shall be submitted to and approved by the Engineer prior to the first request for payment submittal.

11. Shop and Working Drawings

The Contractor shall provide shop drawings, working drawings, submissions and certifications as required for all materials to be provided under this contract.

The Contractor shall promptly prepare and submit layout, detail, and shop drawings after the Notice to Proceed has been issued and prior to the ordering of materials requiring same for such parts of the work as specified hereafter under the specifications for materials, workmanship and Contract Items. These drawings will be known as "Working Drawings".

The drawings shall be numbered to coincide with the Division and article of the specifications related to same, and consecutively numbered for all individual drawings for a particular item or items related to the particular division and article and shall accurately and distinctly present the following:

a. All work and erection dimensions.

b. Arrangement and sectional views.

c. Necessary details, including complete information for making connections between work under this Contract and work under other Contracts.

d. Kinds of materials and finishes.

e. Parts list and description thereof.

Each drawing shall be dated and shall contain the name of the project, contract number, Contract Item and paragraph number, names of equipment or materials, and the locations at which the equipment or materials are to be installed in the work. The Engineer may decline to consider any working drawing that does not contain complete data on the work and full information on related matters.

If the working drawings show departures from the Contract requirements, the Contractor shall make specific mention thereof in his letter of submittal and on the subject drawing or drawings. Otherwise, approval of such submittals shall not constitute approval of the departures. Approval of the drawings shall constitute approval of the subject matter thereof only and not of any structure, material equipment or apparatus shown or indicated. The approval of drawings will be general and shall not relieve the Contractor of responsibility for the accuracy of such drawings, nor for the proper fitting and construction of the work, nor for the furnishing of materials or work required by the Contract and not indicated on the drawings. No work called for by working drawings shall be done until the said drawings have been approved by the Engineer.

The procedure in seeking approval of working drawings shall be as follows:

a. The Contractor shall submit for approval two (2) prints and one (1) reproducible sepia copy, or six (6) prints in the case of manufacturer's catalogue "cuts" and similar items, of each of the drawings to the Engineer. The submission of drawings shall be accomplished by letter of transmittal in duplicate, containing the name of the project, the name of the Contractor, the number of drawings, titles, and other requirements.

b. When a drawing is satisfactory to the Engineer, it will be stamped "NO EXCEPTIONS TAKEN", be dated, and two copies thereof will be returned to the Contractor by letter.

c. Should a drawing be unsatisfactory to the Engineer, he will stamp thereon "REVISE AND RESUBMIT", or "REJECTED", and will return one copy thereof to the Contractor with the necessary corrections and changes indicated. The Contractor must make such corrections and changes and again submit two prints and one reproducible sepia copy of the drawing for approval, within five (5) working days of the date of rejection.

The Contractor shall revise and resubmit the working drawings as required by the Engineer, until "NO EXCEPTIONS TAKEN" thereof is obtained.

123. Tree Preservation and Removal

During the site clearing operations, the Contractor shall make every effort possible to preserve existing trees. The Contractor shall not remove, cut, injure or destroy trees outside the limits of site clearing without authority of the Engineer.

The Contractor is specifically advised that special care during tree removal, trimming and clearing is required to ensure tree saving as directed by the Owner or Engineer. Clearing limits shall be flagged for observation by the Engineer for approval a minimum of 48 hours prior to the start of clearing operations.

The Contractor shall provide a New Jersey certified Forester or New Jersey certified Tree Expert during the construction of the improvements that may impact trees to examine, prune and protect the branch and/or root systems of all trees and shrubs to remain or be relocated on the project.

The name and certifications of this person will be provided to the engineer prior to the commencement of work on the project. All trees to be removed shall be done so by persons certified in New Jersey to work adjacent to overhead electrical lines.

The Contractor must contact the Owner and the engineer prior to beginning tree removal work.

13. Utility Installation Fees

The Contractor shall be responsible for all utility service fees with exception to the proposed electrical transformer costs and gas utility installation costs which shall be paid by the Owner.

14. Private Property

During the construction operations at the work site, the Contractor, their employees, equipment or materials shall not enter onto private property without first obtaining the written consent of the property Owner.

15. Protection of Property

The Contractor shall take reasonable care and caution to preserve and protect all existing pavements, stripes and markings, grass areas, landscaping, sidewalks, structures, private and public property along and adjacent to the lines of work. Any damage or destruction to the above, beyond the limits of work, or caused by careless construction procedures, shall be replaced at the Contractor's own expense.

16. Vandalism

The Contractor is advised that there is a potential for vandalism at the work site and is advised to consider the same during the construction of the improvements and when storing equipment. The Owner accepts no responsibility for any damages to construction equipment, newly placed concrete or other improvements.

It is recommended that concrete pours be scheduled during the morning hours to allow for the adequate curing prior to the Contractor leaving the site.

The Contractor shall provide, install and maintain (on a daily basis) fencing, barricades or other suitable materials to protect all active construction areas and/or damage during the contract time.

Separate payment for said protection measures will not be made. Cost of same shall be included in all contract items requiring protection.

Vandalized improvements will immediately be replaced at no additional cost to the Owner.

17. Site Grading

The Contractor shall prepare and grade the site as required by the site plan and grading plan and as necessary to construct the entire project, including, lighting, utilities, trails/walkways/pathways, storm sewer system, landscaped and topsoil areas, cut/fill areas, detention basin, swales, slopes, and all other necessary site improvements. The Contractor shall grade the site in a manner to accept surface treatments or to the bottom course of structural subbase material, and topsoiling within the project site.

18. Maintenance of Existing Drainage Flows

The Contractor will be responsible to maintain existing drainage systems, drainage patterns and future overland flows throughout the construction of this project. At no time during the course of construction shall the Owners of the property adjacent to the subject improvements be affected by flooding, soil erosion and/or other damage caused by in-active storm sewer facilities or inadequate grading.

Should it become necessary to disrupt the function of the existing drainage facilities during construction, the Contractor will be required to provide a temporary drainage system to maintain storm sewer flows as approved by the Engineer. The Contractor will be responsible for the video inspection and flushing, as necessary, of the existing storm drainage pipe that the proposed drainage system will be connecting into and utilizing as the primary means of stormwater conveyance to the existing outfall for this project.

19. Record "As-Built" Drawings

Three (3) copies of detailed utility, drainage system and irrigation system "As-Built" reproducible drawings shall be provided to and approved by the Township of Clark prior to the issuance of final payment for the project. During the progress of the project work, the Contractor shall keep an accurate record of all deviations, changes and

corrections from the layouts shown on the construction drawings and/or approved shop drawings. After completion of work, submit the drawings to the Engineer for review, comment and approval; upon the Engineer's written authorization, the Contractor shall prepare at their own expense, a set of reproducible drawings on mylar, indicating thereon a complete record of all of the changes or revisions which exist in the completed work. Payment for record drawings shall be included in the prices bid for all items associated with same.

20. Maintenance Manuals

Three (3) paper copies and two (2) electronic copies on CD of operation and maintenance manuals shall be provided to Union County prior to the issuance of final payment. Maintenance manuals shall be composed of instructions and other data from manufacturer's furnishing materials and equipment for this project. Include complete table of contents and arrange the manuals in systematic order for easy reference.

Provide maintenance data for all electrical, mechanical, plumbing and park facility equipment and/or systems. Provide the operation and maintenance manuals in heavy three-ring loose-leaf binders, indexed and arranged for easy reference, after approval by the Engineer for form and contents.

21. Soil Borings

The Contractor is advised that the results of the soil borings and any other subsurface investigations which the Owner has caused to be made are for design purposes only. The Owner and the Engineer accept no responsibility for any inaccuracies in the soil conditions as represented by the boring logs and the corresponding boring location plan. The Contractor may, at their own expense, make the necessary soil borings, or by other adequate measures, satisfy himself regarding the character, groundwater elevations and amount of the various classes of material to be encountered in the work to be performed prior to submitting a bid.

22. Handling Regulated Materials

The Contractor is specifically made aware of the handling of Regulated Materials requirements as specified in Section 202 of the Specifications.

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, County of Union, New Jersey
BA # 26-2025, Union County Engineering 2020-002

SPECIAL PROVISIONS - PERMITS

The Contractor is herein advised that the County of Union has applied for and the following permits are currently pending:

Somerset Union Soil Conservation District Plan Certification

The Contractor shall provide a minimum of 72 hours notice to the Somerset Union Soil Conservation District at (908)-526-2701, prior to the start of ground disturbance. This noticed shall be immediately followed by a written notice to the Somerset union Soil Conservation District.

The Contractor is advised that any deviation from the certified plans may require recertification from the Somerset Union Soil Conservation District.

NJDEP Permits:

- Flood Hazard Area Individual Permit
- Freshwater Wetlands General Permit #11
- Freshwater Wetlands General Permit #13
- Freshwater Wetlands General Permit #17
- Freshwater Wetlands General Permit #19

The Contractor is advised that authorization is required from NJDEP for all permits listed above. The application for same is pending certification from NJDEP. Accordingly, same shall be verified prior to any construction.

The Contractor is advised that the pending NJDEP Permit application indicates that the dredging will be performed utilizing mechanical methods. The NJDEP is acceptable to alternative dredging methods provided that all work is confined to the limit of disturbance indicated on the Plans. An amendment to the approved NJDEP Permit will be required indicating the alternative dredging method prior to the commencement of the dredging.

New Jersey Division of Fish and Wildlife (NJDFW) Permits:

- Water Lowering Permit
- Scientific Collection Permit
- Freshwater Fish Stocking Permit

The Contractor is advised that authorization is required from NJDFW for all permits listed above. The application for same is pending certification from NJDFW. Accordingly, same shall be verified prior to any construction.

The Contractor is advised that upon Award of the Contract, the Contractor shall contact NJDFW regarding the above referenced Permits. The Contractor shall provide the anticipated dates of fish collection and water lowering, the methods of water lowering and fish collection, and the waterbody the fish will be relocated to.

The Contractor shall schedule construction operations such that no work associated with the above items are started or scheduled to be started until they have been informed by the Engineer or County that the necessary permits and approvals have been received.

The Contractor, in entering into this contract with the County of Union, accepts full responsibility for any fines, penalties, work stoppages, and permit revocations resulting from the Contractor's or subcontractor's failure to adhere to the requirements of the above listed permits.

The Contractor is required to secure any and all other permits, including but not limited to building and construction code permits, and road opening permits, that may be necessary to perform the work and complete the improvements for this project.

The Contractor shall not commence any work affected by the pending permits until such time that said permits are received.

PROJECT TECHNICAL SPECIFICATIONS

TABLE OF CONTENTS

DIVISION 100 – GENERAL PROVISIONS

SECTION	
101	GENERAL INFORMATION
102	BIDDING REQUIREMENTS AND CONDITIONS
103	AWARD AND EXECUTION OF CONTRACT
104	SCOPE OF WORK
105	CONTROL OF WORK
106	CONTROL OF MATERIAL
107	LEGAL RELATIONS
108	PROSECUTION AND COMPLETION
109	MEASUREMENT AND PAYMENT

DIVISION 100 – GENERAL PROVISIONS

SECTION 101- GENERAL INFORMATION

101.01 INTRODUCTION
THE FOLLOWING IS ADDED:

Whenever any section, subsection, subpart, or subheading is amended by such terms as changed to, deleted or added it is construed to mean that it amends that section, subsection, part, subpart, or subheading of the 2019 Standard Specifications for Road and Bridge Construction, NJDOT.

Whenever any reference to page number is made, it is construed to refer to the 2019 Standard Specifications for Road and Bridge Construction, NJDOT.

101.02 ABBREVIATIONS

101.03 TERMS
THE FOLLOWING IS ADDED TO THE FIRST SENTENCE OF THIS SECTION:

It is the intent of these amendments to the terms to change all reference to the State of New Jersey (and various Departments and offices thereof) to the County of Union except in those circumstances where the State has jurisdiction.

THE FOLLOWING TERMS ARE CHANGED.

Contract Time. The number of days allowed to complete the work for a milestone or the number of working days allowed to complete the work for a milestone, or the date by which work must be completed, as provided in the Contract and as modified by Change Order. When Interim Completion and Completion requirements are specified as a specific date instead of the number of days or working days, achieve Interim Completion or Completion on or before that date. See Page 10 for allowable Contract Time.

Holiday. A legal holiday as recognized by the County of Union.

Pavement Structure. The combination of pavement, base courses, and when specified, a subbase course, placed on a subgrade to support the traffic load and distribute it to the roadbed (see Figure 101-1). These various courses are defined as follows:

1. **Pavement.** One or more layers of specified material of designed thickness at the top of the pavement structure.
2. **Base course.** One or more layers of specified material of designed thickness placed on the subgrade or subbase.
3. **Subbase.** One or more layers of specified material of designed thickness placed on the subgrade.

Plans.
THE SECOND SENTENCE IS CHANGED TO:

This includes the latest version of the Standard Details in effect at the time of advertisement.

Project Limits.
The areas of construction operations and areas used by the Contractor to perform the work. If only a portion of a lane or shoulder of a road is being constructed, the Project Limits include all lanes and shoulders of the roadway. Where only one direction of a road is being constructed, and the road is divided by a median, island, or barrier curb, the Project Limits include all of the lanes in that direction and the median. Otherwise, the Project Limits include all lanes in both directions.

The longitudinal Project Limits include all safety devices and signs excluding signs greater than 1600 feet outside the Project Limits.

Areas within the R.O.W. provided for Contractor's use.

THE FOLLOWING TERMS ARE ADDED:

Notice to proceed. Form submitted by Owner authorizing Contractor to proceed with the Work under the Contract.

101.04 INQUIRIES REGARDING THE PROJECT:
THIS SUBSECTION IS CHANGED TO:
Submit inquiries regarding discrepancies, errors, or omissions, or concerns regarding the intent or meaning of the Contract to the Owner as follows:

1. Before Award of Contract: Submit inquiries by e-mail or by separate letter directly to Michelle Hagopian, Assistant Director, Division of Purchasing, 10 Elizabethtown Plaza, Elizabeth, NJ 07207, 908 527 4130, ucbids@ucnj.org.

   Include the following in each inquiry:

   1. Name of Bidder.
   2. Telephone Number, fax number, e-mail address, and contact person.
   3. Specifics of the inquiry, including anticipated results.

   The County will investigate the information provided in the inquiry and, if the County determines that a change or response is necessary, the County will issue an addendum. Requests for postponement of bids will not receive a response. The County will issue an addendum postponing bids if warranted.

2. After Award of Contract. Submit inquiries to the County representative identified at the preconstruction meeting with a copy to the County Engineer.

SECTION 102 – BIDDING REQUIREMENTS AND CONDITIONS

102.01 QUALIFICATION TO BID
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

102.02 BIDDER REGISTRATION AND DOWNLOADING OF THE PROPOSAL DOCUMENTS
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

102.3 REVISIONS BEFORE SUBMITTING A BID
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

102.4 EXAMINATION OF CONTRACT AND PROJECT LIMITS

1. Evaluation of Subsurface and Surface Conditions.

THE FIRST PARAGRAPH IS CHANGED TO:

The Bidder is advised that Soil Boring Logs are contained in the Appendix of the Specifications. This investigation is not a substitute for the Bidder's own evaluation or judgment in preparing a bid. The Bidder should not rely on any estimates or quantities included in these investigations. The conditions indicated by such investigations or records thereof, and as shown by the cross-sections in the Plans may not be representative of those existing throughout such areas. The Bidder may encounter materials other than, or in proportions different from, those indicated.

2. Utility Agreements.
THE ENTIRE TEXT IS CHANGED TO:

In addition to what is specified in 105.07, the Bidder may inspect or request, if available, the Utility agreements, modifications, and orders relating to the Contract. The Bidder shall obtain information regarding existing utilities, proposed construction of utilities, or relocation of utilities through the respective Utility.

3. Existing Plans and As-Builts.
THE ENTIRE TEXT IS CHANGED TO:

The Bidder may inspect as-built plans, if available, of County owned facilities upon written request. The Bidder shall obtain plans of Municipality owned facilities through the Municipality. The Bidder shall verify information obtained from the existing documents with respect to its application to bidding and performing the Contract.

102.07 PREPARATION OF THE BID
THE TEXT OF THE FIRST, THIRD, FOURTH AND FIFTH PARAGRAPHS IS DELETED.

102.9 PROPOSAL BOND
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

102.10 SUBMISSION OF BIDS
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

102.11 WITHDRAWAL OF BIDS
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

102.16 REJECTION OF ALL BIDS
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

SECTION 103 - AWARD AND EXECUTION OF CONTRACT

103.01 AWARD OF CONTRACT
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

103.02 CANCELLATION OF AWARD
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

103.03 RELEASE OF PROPOSAL BOND
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

103.04 EXECUTION OF THE CONTRACT
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

103.05 ESCROW OF BID DOCUMENTS
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

103.06 FAILURE TO EXECUTE CONTRACT
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

103.07 ACQUISITION OF DOCUMENTS
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

SECTION 104 – SCOPE OF WORK

104.02 VALUE ENGINEERING
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

104.03 CHANGES TO THE CONTRACT

104.03.01 Authority To Make Changes

2. Change Orders
THE SECOND AND THIRD PARAGRAPHS ARE DELETED.

104.03.03 Types Of Changes

1. Quantity Increases and Decreases
THE FIFTH PARAGRAPH IS DELETED.

104.03.04 Contractual Notice
THE SECOND PARAGRAPH IS CHANGED TO:
Immediately provide written notice to the RE of a circumstance that is believed to be a change to the Contract.

Include the following in the initial written notice:

1. A statement that this is a notice of a change.
2. The date when the circumstances believed to be a change were discovered.
3. A detailed and specific statement describing the nature and circumstances of the change.
4. If the change will or could affect costs to the Department.
5. If the change will or could affect Contract Time as specified in 108.11.01.C

In addition to the hard copy of the notice, email the notice to the RE. It is not necessary to attach listed documents to the email.

SECTION 105 – CONTROL OF WORK

105.01 AUTHORITY OF THE DEPARTMENT

105.01.01 RE

ITEM 1 OF THE SECOND PARAGRAPH IS DELETED.

105.02 RESPONSIBILITIES OF THE CONTRACTOR

105.02.02 Superintendent

THE FOLLOWING IS ADDED:

The Superintendent shall not be removed from the work or replaced without acceptance by the RE of a satisfactory replacement as Superintendent.

105.04 PLANS AND SPECIFICATIONS

THE FOLLOWING IS ADDED:

Field conditions may require modifications in the plans and quantities of work involved. Work under all pay items must be carried out to meet field conditions to the satisfaction of the RE.

105.05 WORKING DRAWINGS

ALL REFERENCES TO 22" X 36" SHEETS ARE REVISED TO 24" X 36" SHEETS.

THE SECOND PARAGRAPH IS CHANGED TO:

Ensure that working drawing submissions also conform to the NJDOT design manuals and other NJDOT standards for the proposed work. Ensure that working drawings are signed and sealed by a Professional Engineer.

THE SECOND SENTENCE OF THE THIRD PARAGRAPH IS CHANGED TO:

Submit 5 copies of working drawings to the Engineer for review. Provide additional copies for Contractor's use depending on the number of sets to be retained by the Engineer.

THE LAST SENTENCE OF THE SEVENTH PARAGRAPH IS CHANGED TO:

The RE's notations of "No Exception Taken" or "Approved as Noted," does not constitute an approval of any materials noted.

THE EIGHTH PARAGRAPH IS CHANGED TO:

The RE's notations of "No Exception Taken" or "Approved as Noted," on working drawings signifies only that the drawings are in general conformance with the contract. These notations do not relieve the Contractor from responsibility for errors and omissions in the working drawings and their correction.

THE NINTH PARAGRAPH IS CHANGED TO:

Submit working drawings as specified in Table 105.05-1. This list is not all inclusive.

TABLE 105.05-1:

REVISE THE HEADING OF TABLE 105.05-1 TO WORKING DRAWING SUBMISSIONS.

DELETE THE HEADINGS "CERTIFIED" AND "APPROVED."

ADD THE FOLLOWING:

Concrete Mix Designs

THE TENTH, ELEVENTH, TWELFTH AND THIRTEENTH PARAGRAPHS ARE CHANGED TO:

The following is a list of additional working drawings required for this project:

- Steel Truss Pedestrian Bridges
- Erection Plans for Steel Truss Pedestrian Bridges
- Cofferdams / Temporary Support of Excavation for Pedestrian Bridges
- Pile and Sheet Pile Layouts for Pedestrian Bridge Foundations, DPW Wall, Boardwalks, and Kayak Storage Pier
- Framing Plans for Boardwalks, and Kayak Storage Pier
- Articulating Block Matting Boat Ramp Layout

. Floating Dock Systems A & B
. Footing/Foundation for benches

Each working drawing submitted shall have a unique submission number assigned to it and clearly indicated on each sheet of the working drawings. For working drawings submitted on 24"x 36" sheets, each working drawing sheet shall include a blank space a minimum of 5" in height and 3-1/2" in width for the RE's review stamp. For working drawings submitted on 8 ½" x 11" sheets (except design calculations), include a blank space a minimum of 5" in height and 3 ½" in width for the RE's review stamp on the cover sheet.

The RE will require 7 business days for review of each submission. The review time shall commence running on the day that the submission is received, except that for any submission received after 12:00 Noon, the review time shall commence running on the following day.

Upon receipt of each submission, the RE will review the submission for conformance with the Contract. The RE may take no exception to the submission, approve the submission as noted with no resubmission required, approve the submission as noted with resubmission required or reject the submission. The RE will sign and stamp the submission as follows:

"No Exception Taken"
"Approved as Noted"
"Note Exception and Confirm in Writing"
"Revise and Resubmit"
"Rejected See Remarks"

For submissions that are stamped "No Exception Taken", the RE will retain three (3) sets for record purposes and return the remaining sets to the Contractor. No resubmission is required and the Contractor may proceed with ordering the materials which are the subject of the submission.

For submissions that are stamped "Approved as Noted," the RE will retain three (3) sets for record purposes and return the remaining sets to the Contractor. No resubmission is required. However, incorporate all comments in the production of the materials which are the subject of the submission. This does not relieve the Contractor of the responsibility for assuring that all comments are incorporated into the final product. If inspection reveals that the comments have not been incorporated into the final product, the work will be considered non-conforming.

Do not deviate from the working drawings stamped "No Exception Taken" or "Approved as Noted," without obtaining prior written approval from the RE.

Furnish subcontractors and other Contractors with accepted working drawings as required.

105.07 COOPERATION WITH UTILITIES

105.07.01 Working in the Vicinity of Utilities

A. Initial Notice
THE FIRST SENTENCE IS CHANGED TO:

Provide preliminary notice, in writing, to the utilities four (4) weeks before it is anticipated construction operations will commence. This notice may have to be provided in advance of any preconstruction meeting for the project. Follow up with subsequent written notice one (1) week before construction operations will commence. Provide copies of all correspondence to the County.

105.07.02 Work Performed by Utilities

THE FOLLOWING IS ADDED:

The following is a list of the work to be performed by each utility on the project and the estimated durations for performing this work:

New Jersey American Water

New Jersey American Water will be responsible for tapping the existing water main located in Madison Hill Road and extending a new service to a shut off valve also to be provided by the water company to be located at the entrance of the project site.

Elizabethtown Gas

Elizabethtown Gas will be responsible to install the primary gas service to the site.

Public Service Electric & Gas Company (Electric)

PSE&G Utility Company will be responsible for extending underground primary electric service into the site and will be responsible for installing a pad mounted transformer. PSE&G will furnish and install the pad mounted transformer and all necessary wiring from the utility pole to the proposed pad mounted transformer location.

Bidders are advised to verify the above information as its accuracy and completeness is not guaranteed by the department. The Contractor shall contact the New Jersey "One-Call" system at least three (3) Business days before digging or completing any other work which may impact the utilities.

When the removal, relocation, de-energization or replacement of utility structures or facilities is deemed non-essential by the RE for carrying out the project, but is performed for the Contractor's convenience, the cost of such work shall be entirely the responsibility of the Contractor. Coordinate construction activities with those of the utility companies involved in the relocation or maintenance of existing or proposed utility facilities. Notify the RE, in writing, whenever it becomes apparent that completion of the project will be delayed because of delays in relocating, de-energizing, etc. of the existing utilities. In the absence of such notification, delays in the completion of work caused by the utilities will be solely the responsibility of the Contractor and liquidated damages will be assessed as elsewhere specified herein.

Valve box covers, which are either indicated on the construction plans or which are discovered during construction, shall be reset or relocated by the Contractor to the correct proposed elevation. All costs for this work shall be included in the lump sum price bid for all items requiring same as listed in the bid form.

It shall be the responsibility of the Contractor to arrange for all utility work essential for the completion of the project and to coordinate the work carried out by the public utilities with his own work. The Contractor shall cooperate with the utility company in the removal, relocation and replacement of utilities. Locations of relocated utilities shall be verified with the respective utility companies. Wherever underground utilities are encountered, the Contractor shall take special precautions to prevent breakage and interruption of service.

No separate payment will be made for coordination with the utility companies and all costs thereof shall be included in the bid prices for the various items in this contract.

The Contractor shall notify the all utility agencies at least one (1) week prior digging the test pits.

Contacts:

Elizabethtown Gas
520 Green Lane
Union, NJ 07083
(908) 662-8370

NJ American Water Company
1341 North Avenue
Plainfield, NJ 07061
(908) 791-3449

PSE&G – Electric
472 Weston Canal Road (Electric)
Somerset, NJ 08873
(732) 764-3157

Verizon – Telephone/Communications
999 W. Main Street
Freehold, NJ 07728
(732) 683-5146

105.10 USE OF EXPLOSIVES
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED. EXPLOSIVES WILL NOT BE PERMITTED ON THIS PROJECT.

SECTION 106 – CONTROL OF MATERIAL

106.01 SOURCE OF SUPPLY AND QUALITY REQUIREMENTS
THE FOLLOWING IS ADDED:

Do not purchase or permit any subcontractor to purchase materials or supplies for the work which are subject to any chattel mortgage or under a conditional sale or other agreement by which an interest is retained by the seller. The Contractor warrants that he has good title to all materials and supplies used by him in the work.

Nothing in these Special Provisions or in the Contract shall be considered as vesting in the Contractor any right or property in the materials used after they shall have been attached or affixed to the work or the soil, but all such materials shall upon being so attached or affixed become the property of the Owner.

Use only products and supplies listed on the QPL.

106.02 DEPARTMENT-FURNISHED MATERIAL
THE ENTIRE SUBSECTION TEXT IS DELETED.

106.05 MATERIALS, INSPECTIONS, TESTS, AND SAMPLES
THE THIRD PARAGRAPH IS DELETED.

106.07 CERTIFICATION OF COMPLIANCE
THE FOLLOWING IS ADDED:

If the RE orders sampling and analysis or tests of materials which are usually accepted on certification of the manufacturer but which appear defective or not conforming to the requirements of the Specifications, the County shall bear the reasonable costs of sampling, transportation, testing, and analysis of the material if it is found to be sound and in

conformance with the Specifications. Otherwise, the Contractor shall bear all such costs if the material is found to be defective or not in conformance with the Specifications.

SECTION 107 – LEGAL RELATIONS

107.01 LEGAL JURISDICTION

107.01.02 Permits, Licenses, and Approvals
THE FOLLOWING IS ADDED:

Obtain the approval and acceptance of work that is to meet the requirements of persons, municipalities or bodies other than the County.

Apply for a permit to use water from hydrants or other outlets, and the use of water shall be subject to the charges, rules, and regulations of the Utility Owner.

107.01.03 Sovereign Immunity

THIS ENTIRE SUBSECTION TEXT IS DELETED. HOWEVER, THE DELETION OF THIS SUBSECTION IS NOT TO BE CONSTRUED AS ANY WAIVER OF THE COUNTY'S RIGHTS TO SOVEREIGN IMMUNITY.

107.03 AFFIRMATIVE ACTION, DISADVANTAGED BUSINESS ENTERPRISES, OR EMERGING SMALL BUSINESS ENTERPRISE
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

107.04 NEW JERSEY CONTRACTUAL LIABILITY ACT
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

107.05 LIMITATION OF LIABILITY
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

107.06 PERSONAL LIABILITY OF PUBLIC OFFICIALS
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

107.09 INDEPENDENT CONTRACTOR
THE SECOND SENTENCE IS CHANGED TO:

It shall neither hold itself out as, nor claim to be, an officer or employee of the Department by reason hereof.

107.10 NON-THIRD PARTY BENEFICIARY CLAUSE
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

107.11 RISKS ASSUMED BY THE CONTRACTOR

Risks of Loss or Damage to the Construction.
THE FOLLOWING IS ADDED:

Except as provided otherwise herein, the liability of the Contractor hereunder for all injuries or damages to persons or to property is absolute and is not dependent upon any question or negligence on his part or on the part of his agents, servants or employees, and neither the approval of the RE of the methods of doing the work nor the failure of the RE to call attention to improper or inadequate methods or to require a change in methods, nor the neglect of the RE to direct the Contractor to take any particular precautions or to refrain from doing any particular task, shall excuse the Contractor in case of any such injury to persons or damages to persons or property.

The whole, or so much of the monies due under and by virtue of the Contract, as shall be considered necessary by the Owner may, at its option, be retained by the Owner until all suits or claims or demands for damages shall have been settled and evidence to that effect furnished to the satisfaction of the Owner.

107.12 THE CLAIMS RESOLUTION PROCESS
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

107.13 LITIGATION OF CLAIMS BY THE CONTRACTOR
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

SECTION 108 – PROSECUTION AND COMPLETION

108.01 SUBCONTRACTING
THE FIRST AND SECOND PARAGRAPHS ARE DELETED.

108.02 COMMENCEMENT OF WORK
THE SUBPART 4 IN THE FIRST PARAGRAPH IS CHANGED TO:

1. Progress schedule as specified in 153.03

ALL REFERENCES TO EXECUTION OF CONTRACT ARE CHANGED TO NOTICE TO PROCEED.

108.04 WORK SITE AND STORAGE
THE FOLLOWING IS ADDED:

Provide the RE a copy of any lease for the use of private property.

Upon completion of all work and prior to the release of final retainage, provide the RE a copy of a letter of release from the property owner stating that the site has been restored in a satisfactory manner.

108.10 CONTRACT TIME

The Contractor must achieve Substantial Completion in 600 calendar days and Final Completion in 660 calendar days.

108.11 MODIFICATIONS TO CONTRACT

108.11.01 Extensions to Contract Time

B. Types of Delays.
2. Excusable, Non-Compensable Delays.
THE LAST PARAGRAPH IS CHANGED TO:

If approved excusable, non-compensable delays exceed a total of 90 days, the time in excess of 90 days will become excusable and compensable as specified in 108.11.01.B.3.

C. Submitting Time Impact Evaluation.
THE FIRST PARAGRAPH IS CHANGED TO:

If an excusable delay occurs, notify the RE, as specified in 104.03.04, detailing how the event or cause is affecting the approved progress schedule that is current at the time the delay occurred. When the full extent of the impact on the approved progress schedule can be determined, submit a request for an extension of Contract Time to the RE. Clearly identify how each change or delay is represented by an activity or group of activities.

108.12 RIGHT-OF-WAY RESTRICTIONS
THE FOLLOWING IS ADDED:

Make no claim for delays by reason that entry upon an Easement or right which is lesser than a fee interest is conditioned upon notice or is limited in duration. Schedule work accordingly and take such limitations into account when planning performance of the work.

Temporary Easements and/or temporary construction rights will in most cases contain a limitation as to the length of time that they are extant. Schedule the Work pursuant to Section 153 so as to accommodate the particular time limitations of an Easement or right which is lesser than a fee interest as reflected on the R.O.W. plans. Provide a written request to the RE that the County procure an extension from the owner of a particular temporary easement or right, which is lesser than a fee simple interest, so as to enable the Contractor to continue occupancy of or re-enter same in the future, beyond the initial time period set forth in the respective property description prior to the expiration thereof.
Where the Contractor fails to complete the work within an area of a temporary easement or right lesser than a fee interest during the time allowed under the property description, by reason of the Contractor's own fault; reimburse the County for the sum payable to the owner of the underlying fee interest for the extended period of occupancy use. The RE may deduct an amount equal to such payments from the monthly estimate of the Work performed after providing 30 day written notice to the Contractor of such action, including a breakdown of the costs sought or to be sought by reason of the delay in timely vacating a temporary easement or right lesser than a fee interest.

Any additional construction staging areas or access areas used by the Contractor not shown in the Plans, is the sole responsibility of the Contractor. The Department will not make payment for gaining and maintaining the access and staging areas and restoring areas. Provide the RE with a copy of the written permission to enter the property prior to the start of Work. Provide written proof from the owner that the property has been restored to the owner's satisfaction. The Department will not make payment for delays and/or claims resulting from gaining permission to enter properties.

108.14 DEFAULT AND TERMINATION OF CONTRACTOR'S RIGHT TO PROCEED
LIST (1) OF THE FIRST PARAGRAPH IS CHANGED TO:

1. Fails to begin construction operations within 30 days of receiving notice to proceed.

108.19 COMPLETION AND ACCEPTANCE
THE FIRST, SECOND AND THIRD PARAGRAPHS ARE DELETED.

THE FOLLOWING IS ADDED:

No Incentive Payment for Early Completion is specified for this project.

SECTION 109 – MEASUREMENT AND PAYMENT

109.01 MEASUREMENTS OF QUANTITIES
THE SECOND AND EIGHTH (LAST) PARAGRAPHS ARE DELETED. ALL QUANTITIES WILL BE MEASURED.

109.02 SCOPE OF PAYMENT
THE THIRD SENTENCE OF THE FIRST PARAGRAPH IS CHANGED TO:

The Department will not make additional or separate payment for work or portion of work unless specifically provided for in the "Measurement and Payment" Subsection.

109.05 ESTIMATES
THE EIGHTH AND NINTH PARAGRAPHS ARE DELETED.

TABLE OF CONTENTS

DIVISION 150 – CONTRACT REQUIREMENTS

SECTION	
151	PERFORMANCE BOND AND PAYMENT BOND
152	INSURANCE
153	PROGRESS SCHEDULE
154	MOBILIZATION
155	CONSTRUCTION FIELD OFFICE
156	MATERIALS FIELD LABORATORY AND CURING FACILITY
157	CONSTRUCTION LAYOUT AND MONUMENTS
158	SOIL EROSION AND SEDIMENT CONTROL, AND WATER QUALITY CONTROL
159	TRAFFIC CONTROL
160	PRICE ADJUSTMENTS
161	FINAL CLEANUP
162	VIBRATION MONITORING

DIVISION 150 – CONTRACT REQUIREMENTS

SECTION 151 – PERFORMANCE BOND AND PAYMENT BOND

151.01 DESCRIPTION
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

151.02 MATERIALS
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

151.03 PROCEDURE
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

151.04 MEASUREMENT AND PAYMENT
THE TEXT OF THIS SUBSECTION IS CHANGED TO:

There will be no separate payment for performance bond and payment bond, distribute all costs among the other items in the proposal.

SECTION 152 – INSURANCE

152.01 DESCRIPTION
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

152.02 MATERIALS
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

152.03 PROCEDURE
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

152.04 MEASUREMENT AND PAYMENT
THE ENTIRE TEXT OF THIS SUBSECTION IS DELETED.

SECTION 153 – PROGRESS SCHEDULE

153.01 DESCRIPTION
THE FOLLOWING IS ADDED:

Submit a CPM Progress Schedule for this project.

153.03 PROCEDURE
153.03.01 CPM Progress Schedule
THE FIRST PARAGRAPH IS CHANGED TO:

Provide a detailed CPM schedule using Primavera or equivalent program.
ITEM 15 OF THE FIFTH PARAGRAPH IS CHANGED TO:

15. Calculate the CPM schedule in days.

1. Preliminary Schedule Submission
THE SECOND PARAGRAPH IS CHANGED TO:

Submit four (4) paper copies of the preliminary schedule, Gantt Chart, as specified in 153.03.02.2e, and a network diagram (PERT) printed on 36”x 24” sheets detailing the activity relationships.

2. Baseline Schedule Submission

THE LAST SENTENCE OF THE FIRST PARAGRAPH IS CHANGED TO:

Submit four (4) paper copies of the baseline schedule on 36”x24” sheets.

ITEM 3 OF THE SECOND PARAGRAPH IS CHANGED TO:

3. Submit four (4) paper copies of the tabular reports, as specified in 153.03.02.2, and a printed network diagram (PERT) on 36”x 24” sheets detailing the activity relationships.

153.03.02 CPM Progress Schedule Updates

THE FIRST, SECOND AND THIRD PARAGRAPHS ARE CHANGED TO:

The RE will designate the due date for the first schedule update when the baseline schedule is approved. The RE will designate the data date to be used for each schedule update.

Schedule progress review meetings to be held approximately 7 days before the schedule update due date. Prepare activity progress in advance of each meeting. Revise the logic to reflect the actual sequence of work. Do not submit schedules showing work performed out of sequence. Provide the RE with a report detailing actual start and actual finish dates of activities in progress since the previous review meeting. At the progress review meeting, present and review the progress since the previous review meeting for incorporation into the schedule.

Within 3 days from the date of the progress review meeting, submit the schedule update to the RE for approval with the agreed upon changes. Within 3 days, the RE will review the update schedule and approve or reject the submission. If rejected, revise and resubmit the schedule update, within 3 days, to the RE for review and approval. The RE will review the revised schedule update submissions and approve or reject the resubmission with 3 days.

2. Tabular Reports
THE FIRST PARAGRAPH IS CHANGED TO:

Submit three (3) paper copies of the longest path sort, total float sort, responsibility sort, area sort, and Gantt chart. Include the following information for each.

ITEM 7 IS CHANGED TO:

Original activity duration and remaining activity duration in days.
THE LAST PARAGRAPH IS CHANGED TO:

If the project falls behind schedule for non-excusable delays so that the schedule indicates the Work will not be completed by the Completion date as specified in 108.10, take the necessary steps to improve progress. Under such circumstances, the RE may direct the Contractor to increase the number of shifts, begin overtime operations, work extra days including weekends and holidays, and supplement its construction plant. Furthermore the RE may require the Contractor to submit for approval a recovery schedule showing how the Contractor proposes to meet the direct acceleration.

153.03.03 Bar Chart Progress Schedule and Updates
A. Schedule.
THE FOLLOWING IS ADDED:

If the project falls behind schedule for non-excusable delays so that the schedule indicates that the Work will not be completed by the Completion date as specified in 108.10, take the necessary steps to improve progress. Under such circumstances, the RE may direct the Contractor to increase the number of shifts, begin overtime operations, work extra days including weekends and holidays, and supplement its construction plant. Furthermore, the RE may require the

Contractor to submit for approval a recovery schedule showing how the Contractor proposes to meet the directed acceleration.

B. Updates.
THE THIRD SENTENCE OF THE FIRST PARAGRAPH IS DELETED.

153.04 MEASUREMENT AND PAYMENT
THIS ENTIRE SUBSECTION IS CHANGED TO:

No separate payment will be made for Progress Schedules, distribute all costs among the various items in the proposal.

The RE may withhold progress payments from the Contractor is scheduled updates and/or revisions are not submitted within the timeframes specified.

SECTION 154 – MOBILIZATION

154.04 MEASUREMENT AND PAYMENT
THE FOLLOWING IS ADDED:

The Department will measure and make payment for Items as follows:

Pay Item	*Pay Unit*
MOBILIZATION	LUMP SUM

SECTION 155 – CONSTRUCTION FIELD OFFICE

155.01 DESCRIPTION

155.02 MATERIALS

155.03 PROCEDURE

155.03.01 Field Office

1. Office Size Requirements

THE FOLLOWING IS ADDED:

Installation of office trailer shall be in accordance with BOCA Section 424, Mobile Units, anchorage shall be by "Dead Men" or other means suitable to the Engineer and local building code official to withstand wind forces and uplift as required by Article 7 (BOCA) for the size unit.

The Contractor shall obtain all legal rights or easements necessary therefore from private owners on whose lands the Field Office will be installed. Said easements or rights shall be written in form satisfactory to the Engineer, signed by both the Contractor and the property owner involved, one copy of such agreement shall be presented to the Engineer prior to the installation of the Field Office.
The Contractor shall maintain the Field Office complete as specified until such time as all punch list items are completed to the satisfaction of the Engineer.

4. Communication Equipment

a) Telephones

THIS SUBHEADING IS CHANGED TO:

Telephones are not needed for this project. Cell phones will be used.

c) Cell Phones

THIS SUBHEADING IS CHANGED TO:

The Contractor shall provide a cell phone with internet capability and with an unlimited data and minutes package. The cell phone shall have a camera of at least 5 megapixels. The network shall be LTE and have a minimum of 32 gigabyte of storage.

d) Computer System

THE FOLLOWING IS ADDED:

The Contractor shall provide a laptop computer including a color ink jet printer and replacement ink cartridges as needed with the minimum requirements listed below:

- 500 GB hard drive
- 14" screen
- Wi-Fi and internet service
- Intel Core i5-4200V processor
- Microsoft Windows 10 (latest edition) or approved equal
- Microsoft Office 365 (latest edition) or approved equal
- 8GB RAM memory
- 52x CD Burner with ten 52x CD-R disks and appropriate burning software
- Norton's AntiVirus for Windows (latest version) or approved equal
- Photo management software (such as ADCSee Photo Studio Professional) or approved equal

THE FOLLOWING SUBHEADINGS ARE ADDED:

e) Internet Services
The Contractor shall provide a 4G LTE mobile hotspot compatible with the cell phone and laptop computer.

f) Copy Machine
The Contractor shall also provide a copy machine for the Engineer's use. The copy machine shall be capable of making both Letter (8-1/2" x 11") and Legal (8-1/2" x 14") copies. The Contractor shall provide ink/toner as needed. The Contractor shall also provide adequate supplies of copy paper. The copy machine and related equipment shall be repaired or replaced within 48 hours of becoming inoperable or defective.

5. Office Furnishings

THE FOLLOWING IS ADDED:

10. Plan rack.
11. Two folding 6' tables.
12. Ten folding chairs.

155.04 MEASUREMENT AND PAYMENT

THE FOLLOWING ITEMS ARE DELETED:

Item	*Pay Unit*
FIELD OFFICE, TYPE___ SET UP	UNIT
FIELD OFFICE, TYPE ___ MAINTENANCE	MONTH

THE FOLLOWING ITEM IS ADDED:

Item	*Pay Unit*
FIELD OFFICE, TYPE B	UNIT

PARAGRAPH ONE IS DELETED AND THE FOLLOWING IS ADDED:

The unit price bid for "Field Office, Type B" shall include all costs for setup and maintenance of the field office as required in this section throughout the scheduled time for completion for the contract.

Upon completion of Field Office setup the Department shall make payment equal to 1/3 of the unit price bid for "Field Office, Type B". Field office setup shall be deemed complete when the field office has been installed and all components

have been provided and activated as required in this section to the satisfaction of the Engineer. Payment for the remaining 2/3 of the unit price bid will be made based upon the percent complete of the total project calculated on a per month basis from the time of completion of field office set up until substantial completion of construction. Upon substantial completion the Contractor may request permission to close/remove the field office. Upon removal and restoration of the area where the field office was located payment may be made in full for the field office item.

The Contractor shall not be permitted to submit any invoices for the project until field office setup has been completed and accepted by the Engineer.

The Contractor shall provide telephone service, maintenance, set up, cell phone service, and internet services at Contractor's expense.

No additional compensation will be made for any costs incurred by the Contractor if it is necessary to maintain the field office beyond the scheduled time for completion due to his failure to complete the work as scheduled.

In the event the Owner is responsible for a delay that results in the Field Office being needed on site beyond the scheduled time for completion, the Owner and the Contractor agree that the Owner will pay the prorated per diem cost as determined by dividing the total bid cost by the scheduled number of days for completion.

SECTION 156 – MATERIALS FIELD LABORATORY AND CURING FACILITY

THIS SECTION IS DELETED.

SECTION 157 – CONSTRUCTION LAYOUT AND MONUMENTS

157.03 PROCEDURE

157.03.01 Construction Layout

THE FOLLOWING IS ADDED:

It shall be the Contractor's sole responsibility for construction of all items of work to the line and grades shown on the plans. Provide the necessary qualified personnel to correctly interpret the survey layout as provided by the licensed New Jersey Professional Land Surveyor.

Give the RE copies of all grade sheets, cut sheets and other data prepared by the licensed New Jersey Professional Land Surveyor prior to the start of any work. This data shall be given to the RE for informational purposes only. No responsibility will be assumed by the RE for its correctness.

Provide written as-built certification from the Licensed New Jersey Land Surveyor that certain phases and/or all of the work has been constructed in accordance with the line and grades shown on the plans prior to final payment as required by the RE.

If in the opinion of the RE, the project cannot be successfully completed with the quality of work performed, he shall order the work redone at the Contractor's expense.

In instances where the RE feels the impact of the defective work is less severe, the RE shall have the option to negotiate a credit to the Owner. If a credit cannot be successfully negotiated, redo the work at no additional cost.

The RE will make every effort to periodically check the work in progress for conformity to plan line and grade, however, no guarantee is implied that said checks will be performed at the Contractor's convenience. If any work is found to be defective, the RE shall within three (3) business days render a decision as to whether the work should be redone or if the RE wishes to negotiate a credit to the County.

When requested by the RE, make available a competent person from his construction force to assist the RE in any manner which may be necessary to check the grades and alignment as well as other features of the work. No extra payment will be made for the services of such an assistant, and payment for the assistance shall be deemed to be included

in the various unit prices bid. Failure to comply with this provision shall be sufficient cause for the RE to stop work on unchecked sections.

157.04 MEASUREMENT AND PAYMENT
THE FOLLOWING TEXT IS ADDED TO THIS SUBSECTION:

No separate payment will be made for monuments, and as-built certification, distribute all costs among the other items in the proposal.

SECTION 158 – SOIL EROSION AND SEDIMENT CONTROL, AND WATER QUALITY CONTROL

158.02 MATERIALS
THE FOLLOWING IS ADDED:

Calcium Chloride.....919.15

158.04 MEASUREMENT AND PAYMENT
THE FOLLOWING ITEMS ARE ADDED:

Pay Item	*Pay Unit*
SILT FENCE	LINEAR FOOT
HAYBALE	UNIT
INLET FILTER, TYPE 1	SQUARE FOOT
FLOATING TURBIDITY BARRIER, TYPE 1	LINEAR FOOT
CONSTRUCTION DRIVEWAY	TON

SECTION 159 – TRAFFIC CONTROL

159.03.08 TRAFFIC DIRECTION

SUBPART B OF THIS SUBSECTION IS DELETED IN ITS ENTIRETY AND REPLACED AS FOLLOWS:

B. Traffic Safety Services. Uniformed Police Officers shall be employed by the Contractor for the protection of any equipment entering, leaving, or crossing active traffic lanes, or as may be required for the routing of traffic around or through the construction. The uniformed police officers shall be employed continuously for the full time such conditions shall exist and as determined by the Engineer. The Contractor is advised to contact the local authorities prior to bidding to determine specific requirements for this project.

The Contractor agrees that it shall make no claims against the County for extra costs resulting from any delays or interruptions to its operations attributable to the actions or inactions of police in the performance of traffic safety services. The Contractor further agrees that it has incorporated in its Proposal any costs that may be incurred by the Contractor as a result of the actions or inactions of police in the performance of traffic safety services, and agrees to bear the risk of loss for any costs not included in its Proposal.

Police providing traffic safety services shall maintain traffic flow at a signalized intersection when the signals are temporarily out of service or as may be required for the routing of traffic as determined by the Engineer.

159.04 MEASUREMENT AND PAYMENT

THE FOLLOWING IS ADDED TO THIS SECTION:

Payment will be made under:

Item	*Pay Unit*
BREAKAWAY BARRICADE (IF AND WHERE DIRECTED)	UNIT
DRUM (IF AND WHERE DIRECTED)	UNIT
TRAFFIC CONE (IF AND WHERE DIRECTED)	UNIT
CONSTRUCTION SIGN (IF AND WHERE DIRECTED)	SQUARE FOOT
FLASHING ARROW BOARD, 4'X 8' (IF AND WHERE DIRECTED)	UNIT
PORTABLE VARIABLE MESSAGE SIGN (IF AND WHERE DIRECTED)	UNIT
TRAFFIC CONTROL TRUCK WITH MOUNTED CRASH CUSHION (IF AND WHERE DIRECTED)	UNIT
TRAFFIC DIRECTOR, MUNICIPAL POLICE ALLOWANCE (IF AND WHERE DIRECTED)	ALLOWANCE

Uniformed Police Officers will be measured by the hour, and paid at the rates set forth in the current local police contracts. Payment will be made from the lump sum allowance only for Uniformed Police Officers used. The Contractor must provide evidence of payment for reimbursement. The Contractor is not entitled for any profit, overhead or administrative fees on this pay item.

No payment will be made for any costs of the Uniformed Police Officers in excess of the lump sum allowance by the County without prior written approval.

Separate payment will not be made for Traffic Directors, Flaggers. All costs thereof shall be included in the prices bid for the various pay items scheduled in the Proposal.

Separate payment will not be made for relocating traffic control devices and lighting systems used for nighttime operations, for changes in staging of the project, or for relocation made for the Contractor's convenience.

Separate payment will not be made for safety ramps provided at the edges and around drainage and utility castings.

Separate payment will not be made for lost, stolen, and replacement of traffic control devices, breakaway barricades, drums, and traffic cones.

Measurement and payment for TRAFFIC DIRECTOR, MUNICIPAL POLICE ALLOWANCE will be made based on the actual cost as evidenced by supporting records and manhours. **An amount of one hundred thousand dollars and zero cents ($100,000.00) is established for this item and is included in the Proposal.** Police Traffic Directors, for the traffic safety services will be measured by the man-hour. All Police Traffic Director fees, including Township Administration, Police car fees etc. will be considered a direct expense and the amount requested by the Contractor shall not exceed the amount paid to the Municipality. Excess "Traffic Director, Municipal Police Allowance" monies shall not be used by the Contractor for any other purpose. Only the amount paid to the Municipality, as supported by the appropriate receipts, shall be reimbursed to the Contractor. Payment for overhead and profit for this item will not be made directly. These costs shall be included in the various other items in the proposal.

SECTION 160 – PRICE ADJUSTMENTS

160.04 MEASUREMENT AND PAYMENT
THE FOLLOWING IS ADDED TO THIS SECTION:

Payment will be made under:

Item	*Pay Unit*
ASPHALT PRICE ADJUSTMENT (IF AND WHERE DIRECTED)	DOLLAR
FUEL PRICE ADJUSTMENT (IF AND WHERE DIRECTED)	DOLLAR

SECTION 161 – FINAL CLEANUP

161.03 PROCEDURE

161.03.01 Final Cleanup
THE FOLLOWING IS ADDED:

Repair or replace in a manner acceptable to the RE any public or private property which may have been damaged or destroyed during the prosecution of the work; clean all drains, sewers, and ditches within and adjacent to the work which have been obstructed by construction operations. Leave the site and adjacent public and private property in a neat and presentable condition wherever his operations have disturbed conditions existing at the start of the work. Submit to the RE releases from affected property owners that his obligations with respect to their individual properties have been fulfilled.

161.04 MEASUREMENT AND PAYMENT
THE SUBSECTION TEXT IS CHANGED TO:

No separate payment will be made for Final Cleanup. Payment for this work shall be included in the unit prices bid for all other items of work in the proposal.

THE FOLLOWING SUBSECTION IS ADDED:

SECTION 162 – VIBRATION MONITORING

162.01 DESCRIPTION

A. Monitor Vibration. Monitor vibration levels and the control of means and methods of construction. This work consists of the following:

1. Pre-construction and post construction inspections including report preparation of all structures within 50 feet of proposed sheeting and pile driving.
2. Development and implementation of a program to limit the construction vibrations to preclude damage to any existing structures.
3. Development and implementation of a program to monitor the ambient and construction vibrations at the structures within 50 feet of the proposed sheeting and pile driving.

B. Quality Assurance. The firm performing this work must have a minimum of five (5) years of demonstrated experience in vibration monitoring. Perform work under the direct supervision of a Professional Engineer registered in the State of New Jersey. The engineer must have a minimum of five (5) years of demonstrated experience in similar work and have professional level capability in related geotechnical and structural evaluations and engineering.

Submit for approval the following information at least 60 calendar days prior to commencement of the proposed sheeting or pile work:

1. Name of firm engaged to perform all vibration monitoring, inspections, and report work.
2. Qualifications of firm including list of similar project experience for previous 5 years.
3. Qualifications / resumes for all key personnel performing work.
4. List of all structures to be inspected / monitored.
5. Schedule for the inspections for all structures with anticipated submission dates for the pre-construction inspection report, vibration monitoring, construction control report, and post construction inspection report.
6. Proposed list of equipment to be used on the project including at least two seismographs. Seismographs must be capable of measuring and recording the peak particle velocities and three components of ground vibration. Seismograph information shall include a certificate of calibration, dated within the previous twelve (12) months on its anticipated use on the project. Certificate of calibration shall be directly traceable to the US Bureau of Standards. The seismographs shall have both a visual and paper (or electronic) readout.

C. Pre-Construction Inspections. Identify all structures / residences within 50 feet of proposed sheeting or pile driving work, unless noted otherwise, and coordinate with owners to enter the structures for the purpose of taking photographs, visual inspection, and measurements necessary to assess vibration susceptibility. The Contractor shall make a detailed pre-construction inspection of the interior and exterior of these structures.

At a minimum, the following locations shall be monitored:

1. Existing DPW building near the DPW wall along the north trail.
2. Existing 21" diameter clay sanitary pipe at the following locations.
   a) Proposed boardwalk at the proposed boat ramp.
   c) Proposed south abutment for Bridge F.
3. Existing Garden State Parkway bridge adjacent to Bridge F.

The pre-construction inspection report shall include the following:

1. General description of structure, type of construction, and materials used.
2. Any pertinent information required to assess vibration susceptibility.
3. Complete interior and exterior photographs of the foundation and walls with close-ups of existing damage.
4. Detailed written notes indicating existing cracks, crack widths, crack lengths, displacements, and other evidence of existing damage or structural deficiencies.

The pre-construction inspection report shall be in 8.5" x 11" format including an index, names, and responsibility of the inspection party, notes, and photographs with date, location, and defect captions. Copies of the report shall be submitted to the RE for review in accordance with Subsection 105.05 at least 30 calendar days prior to commencement of proposed sheeting or pile driving work.

D. Vibration Monitoring and Control Program. Prepare a vibration monitoring and control program to assess the vibration susceptibility of existing structures in relation to predicted construction vibration levels, and determine which structures may be susceptible to vibration damage. Submit to the RE for review in accordance with subsection 105.05 at least 30 days prior to commencement of proposed sheeting or pile work copies of the vibration monitoring and control program report.

1. Summary of program.
2. Assessment of vibration susceptibility of the structures within the 50 foot zone.
3. Identification of structures that could be damaged by the construction vibrations.
4. Description of monitoring program including list of equipment to be used to measure and record vibration at the structures.
5. Predicted construction vibrations at these locations, including estimated damage threshold particle velocities.
6. If necessary, description of modifications to construct equipment or methods to prevent structural damage.

All construction operations and vibration monitoring shall be performed in accordance with the approved program. Changes in the program must be approved by the RE prior to implementation.

At least two properly functioning seismographs shall be on-site at all times during sheeting or pile driving activity.

A concise, daily report shall be prepared and submitted to the RE for review at the end of each day with pile driving activity. The report shall include the following:

1. Seismograph recording including the date and times.
2. Make, model, and serial number of the seismograph(s).

E. Post Construction Inspection. Coordinate with owners to enter the structures within the 50-foot zone for purposes of taking photographs and for visual inspection and measurements to assess the post construction condition of the structures. Perform a detailed inspection of the inside and outside of structures. The post construction report shall be in the same format as the pre-construction report with the following inclusions:

1. Note any changes or damage or the absence of change or damage to the structures.
2. Include photographs similar to those taken for the pre-construction report.

In the case of change or damage note the cause and remedial action to be undertaken.

Submit for review copies of the report in accordance with subsection 105.05 no later than 60 calendar days after completion of the sheeting work.

F. Repairs. Damage to structures due to vibrations created by sheeting, pile driving or other work by the Contractor and its Subcontractors is the sole responsibility of the Contractor. The Contractor at no cost to the Owner shall repair any and all damage.

162.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Pay Item	*Pay Unit*
VIBRATION MONITORING	LUMP SUM

The Department will make payment for VIBRATION MONITORING as follows: 25% upon submission and acceptance of pre-inspection report(s); 50% upon completion of sheeting or pile driving installation(s); and 25% upon submission and acceptance of post inspection report(s).

Separate measurement and payment will not be made to furnish, install, maintain, remove and all associated work for the VIBRATION MONITORING. All costs thereof shall be included in VIBRATION MONITORING.

TABLE OF CONTENTS

DIVISION 200 – EARTHWORK

SECTION	
201	CLEARING SITE
202	EXCAVATION
203	EMBANKMENT
204	FISH COLLECTION AND TEMPORARY FLOW DIVERSION CHANNEL
205	ALLOWANCE FOR LABORATORY TEST / MATERIAL TESTING
206	ALLOWANCE FOR DISPOSING OF HAZARDOUS AND REGULATED MATERIAL

SECTION 201 – CLEARING SITE

201.01 DESCRIPTION

201.02 MATERIALS
THE FOLLOWING IS ADDED:

Dense-Graded Aggregate ..... 901.10.

201.03 CONSTRUCTION

201.03.01 Clearing Site

B. Clearing and Grubbing.
THE FOLLOWING IS ADDED:

Trim trees within 10 feet of the end of utility company pole cross arms. If resulting tree is rendered hazardous, then remove the entire tree according to Section 802.

THE FOLLOWING SUBHEADINGS ARE ADDED:

I. Removing Guiderails, Fences. Remove existing guiderails, terminals, anchorages and fences, backfill and post holes with dense graded aggregate and compact the backfill material to the elevation of the adjacent surface.

J. Removing Headwalls, Retaining Walls. Excavate for the removal of existing headwalls, retaining walls designated for removal. Backfill with dense graded aggregate and compact backfill material using directed method as specified in 203.03.02.B.3.

K. Removing Abandoned Underground Utility Facilities. Remove abandoned underground utility piping and valves, service risers that are abandoned. Dispose of removed materials and debris.

L. Removing and Relocating Underground Sprinkler Heads, Piping and Zone Valves. Remove existing irrigation sprinkler system prior to any disturbance. Reset irrigation sprinkler system to proposed grade as per manufacturer guidelines. Replace material with equal or greater in kind.

M. Remove and Reset Brick Walk/Pavers. Existing brick walks and pavers will be removed, stockpiled, and reset as directed by the Engineer. Damaged bricks and pavers unit shall be replaced, in kind, at no additional cost to the owner.

201.04 MEASUREMENT AND PAYMENT
THIS SUBSECTION IS CHANGED TO:

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
CLEARING SITE	LUMP SUM
REMOVE AND RESET BRICK WALK/PAVER	SQUARE FOOT

Measurement and payment for Clearing Site **shall not** include clearing and grubbing of all vegetation including shrubs, roots, trees, branches, stumps, and debris as denoted on the Construction Documents. Measurement and payment for same shall be included in the unit price bid for "Selective Clearing".

The Department will not make separate payment for all items specified for removal and disposal in parts 201.03.01, unless otherwise noted.

The Department will not make payment for backfill with suitable excavated materials from the project.

Payment for the resetting of existing brick walk/pavers shall be made based on the actual square footage of brick walk/pavers removed and satisfactorily reset and shall include the replacement, in kind, of all damaged brick/pavers.

Payment for any and all items associated with clearing site in excess of the lump sum price indicated shall be included in the prices bid for all items requiring the same.

SECTION 202 – EXCAVATION

202.01 DESCRIPTION
THE FOLLOWING IS ADDED:

This Section also describes the requirements for disposing of unsuitable material, regulated material and acid producing soil and installing of escape ramp.

The excavations shall be made to conform with the lines of the finished structures wherever practical. The excavations shall not be carried below the required grades by machine and back-filled to the grade of foundations, bottom slabs, footings, or pipelines. The trench in which pipe, manholes, or inlets are to be constructed shall be excavated from the surface and to such depths and widths (not less than 12 inches greater than the maximum external dimension of the structure) as will give suitable room for bracing and supporting, pumping and draining, and for removing from the excavation any material which the Engineer may deem inadequate for foundation. All excavations shall be of sufficient width to permit work to be done completely, in the manner intended and of the size specified and/or shown on the plans.

The length of the trench to be opened or the area of the surface to be disturbed and restored at any time will be limited by the Engineer with regard both to expeditious construction, and convenience to the Owner. New trenches will not be excavated if previous trenches are in need of back-filling or labor is needed to restore the surface of the ground to a safe and proper condition.

Trenches for pipes shall be a minimum of 2' wider at the bottom than the outside diameter of the pipe and shall not remain open in excess of 50' in length nor remain open overnight.

Excavation for subsurface structure shall also include the excavation required to provide compacted granular bedding as shown in the Construction Details. Whenever the material at the bottom of a bedding or other subsurface structure excavation is soft or otherwise unsuitable, it shall be removed to such depth as the Engineer may require and the space back-filled with Coarse Aggregate Type 57.

All excavations for pipelines shall be clear of boulders, rock, masonry, or other similar material which shall be excavated to a level at least six inches below the bottom of the pipe, and carefully refilled with approved material mechanically compacted to provide a stable subbase. Rock or boulders shall be removed from sides of trenches to 12 inches outside the wall of the pipe, unless permission to do otherwise is expressly given. Gravel or stone bedding shall be provided, placed and compacted to the minimum depths when indicated on the plans. The bottom of the trench shall be excavated where the earth is suitable for good foundation to the form and size of the lower portion of the pipe or other structure, so that there shall be full and adequate support for the structure which is to be built on it. Ample excavation shall be made under and around the pipe joints for jointing and to relieve the bell of shearing forces.

Excavation, unclassified, shall also include removal of hot mix asphalt pavement overlay, hot mix asphalt pavement, and reinforced and non-reinforced concrete pavement.

In addition, excavation, unclassified, shall include the sawcutting of the existing pavement. This shall be at a distance of one foot from the edge of the existing pavement that is to remain in place to form a proper bond between the new pavement and the existing pavement, or as directed by the Engineer.

Excavation, unclassified, shall also include, as required, the separation and temporary stockpiling of suitable earth materials from excavation and the rehandling of the stockpiled materials for the construction of the roadway embankments, subbase, base courses and backfill if and where directed by the Engineer.

Excavation, unclassified, shall also include removal of unsuitable material in cut sections disclosed by proof rolling.

Where rock is encountered at the locations of the proposed inlets, manholes, and headwalls, the rock shall be dressed to level beds as directed by the Engineer.

Unauthorized Excavation

Special care will be taken with the final six inches of all excavations. In no case shall the excavation be carried below grade by machine and backfill used to establish the required grade. Where the excavation has been carried below grade through error or because of slides or cave-ins, the Contractor shall at his own expense restore such areas with 3/4 inch graded gravel or crushed stone or as directed by the Engineer. If the Contractor excavates below the required grade for structures, the overexcavation shall be filled with material subject to the requirements of the Engineer. The material may include 2000 psi concrete if so ordered by the Engineer.

Sheeting and Bracing

Where necessary for safety or to prevent disturbance, damage, or settlement of adjacent structures, pipelines, utilities, improvements, or paving, excavations shall be sheeted and braced. Any damage to new or existing structures occurring through settlement, water or earth pressure, or other causes due to inadequate construction procedures of the Contractor in any other manner, shall be repaired by the Contractor at his own expense.

Dewatering and Protection from Flooding

The Contractor shall dewater the excavations promptly and continuously throughout the progress of the work and shall keep the excavations dry at all times until the structures to be built therein, are completed. Where work is to be performed below groundwater level, the Contractor shall provide, operate and maintain dewatering facilities sufficient to maintain the excavation free from groundwater for the time required to complete the work in the proper workmanlike manner.

The Contractor shall protect uncompleted work from flooding during storms or from other causes. All pipelines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected.

All necessary precautions shall be taken to prevent disturbance of, and to properly drain, the areas upon which concrete is poured, and upon which pipe is to be laid. All concrete shall be kept dry for one month after pouring except curing.

All water pumped and bailed from the trench or other excavation shall be conveyed in a proper manner through an approved settling basin and to a suitable point of discharge by the Contractor at his own expense.

Construction Safety

The Contractor shall follow the various requirements contained in the Construction Safety Code, latest edition, as prepared by the State of New Jersey, Department of Labor and Industry, Bureau of Engineering and Safety. In addition, the Contractor shall comply with the "Construction Safety and Health Regulations" of the Occupational Safety and Health Administration, Title 29, Chapter XVII, Part 1926 or latest revision.

Protection of Existing Pipelines and Structures

Care shall be taken not to relocate without the consent of the Engineer any sewers, drains, culverts, water or gas pipes or structures near them that could affect their stability. All utilities shall be securely hung, braced, or supported in place until the work is completed. Whenever it is necessary to interfere with said structures or pipelines, the Contractor shall maintain their services at his own expense and repair all damages caused by his act or neglect of work. The integrity of all pipelines and structures shall be maintained throughout the construction and same shall be left in an equivalent condition or improved condition after completion of construction.

Adequate precautions shall be taken to prevent settlement of existing improvements.

In case water pipes, gas pipes, conduits, or other utilities become damaged or broken in the prosecution of the work, the Contractor shall give immediate notice to the proper authorities and shall be responsible for any damage to persons or

property caused by such breaks. Failure to give prompt notice to the authorities shall make the Contractor responsible for any needless loss of water or gas, or for interruption of services.

When house connections or service pipes supplying water or gas as well as underground sprinkler systems are broken during construction, the Contractor shall repair them at his own expense. Delays, such as would result in adjoining buildings having to do without water or gas for a needlessly long period, will not be tolerated. The Municipality reserves the right to remedy such delays by ordering outside parties to make such repairs at the expense of the Contractor.

If so directed in writing, the Contractor shall make permanent changes in the location of water mains if they are obstructing the new structures to be built. The cost of such changes will be paid for as extra work based on the valuation made by the Engineer and depend on his decision as to whether the work done is or is not included in the work required and bid for by the Contractor under the contract. In rendering all such accounts, the Contractor shall itemize both the labor and materials involved and provide other information as may be required by the Engineer.

Underground Objects and Utilities

Information as to the location of existing utilities has been collected from various sources, but the results of such investigations are shown on the contract drawings and are not guaranteed as to accuracy. The Contractor is particularly directed to the fact that underground objects or material location, elevation, or type is not warranted to be approximately correct (nor can they be assumed to be the only subsurface objects or materials which may be encountered in the work). The Contractor shall make all necessary investigations to satisfy himself as to the existing conditions prior to bidding work, including the locating of existing underground sprinkler systems.

DREDGING IMPROVEMENTS

The County of Union intends to remove accumulated sediment and debris from the three Lakes which comprise a portion of the Clark Reservoir along the Robinson Branch Tributary of the Rahway River.

The Lakes are three impoundments created by the construction of Featherbed Lane, Raritan Road and the Garden State Parkway and are referred to as the Head Waters, the West Lake, and the Central Lake.

Grades have been obtained by the County at the top of sediment and the hard bottom of the Original Lakes as indicated on the cross-sections on the Plans.

The Project includes the removal and disposal of debris and/or sediment organic or inorganic nature which has accumulated in the three Lakes identified above. This material shall include, but is not limited to, trees, tree stumps, brush, broken pieces of asphalt, concrete curbs or sidewalk or debris of whatever nature at location(s) secured by the Contractor.

202.02 MATERIALS
THE FOLLOWING IS ADDED:

Dense-Graded Aggregate ..... 901.10.

202.03 CONSTRUCTION

202.03.02 Excavation, Test Pit
THE LAST SENTENCE OF THE SECOND PARAGRAPH IS CHANGED TO:

Backfill test pits with dense graded aggregate in 6-inch lifts and compact using the directed method as specified in 203.03.02.B.3.

202.03.03 Excavation, Unclassified

A. Excavating
THE SECOND AND THIRD SENTENCES OF THE FOURTH PARAGRAPH IS CHANGED TO:

Obtain RE approval before removing unstable material and backfilling the area with dense graded aggregate. Backfill with dense graded aggregate and compact using the directed method as specified in 203.03.02.B.3.

The following is added to this Article of the Standard Specifications:

Excavation shall be carried out to the elevations or depths shown on the plans prior to proofrolling.

The Contractor shall take special precautions necessary to prevent damaging any existing utilities. He shall be held liable for repairs of any damage done to these utilities.

1. Wet Areas

2. Foundation and Bridge Areas

3. Rock Areas

This Article of the Standard Specifications is amended as follows:

Delete the third paragraph of this article and substitute the following:

If it is determined that in-place stabilization is required, use rock bolting or other stabilization techniques as directed. Blasting is prohibited.

The following is added to this subsection:

4. Sawcut

This work shall consist of making longitudinal and transverse cuts in existing pavement as directed by the engineer.

Sawcuts shall be made with an approved power saw full depth in order to prevent damage to the existing pavement, sidewalk, driveways or curbs and to provide a neat edge for the adjacent proposed sidewalk, driveways or curbs as shown on the plans or as directed by the engineer.

B. Temporarily Storing

The following is added to this Article of the Standard Specifications:

The Contractor shall make his own arrangements for storing suitable excavated materials. If any such materials are to be stored on private property, the Contractor shall obtain and deliver written releases from the owners of the property being used for storage to the Engineer. The Contractor shall be responsible for phasing his operation in order to use suitable excavated materials in the embankment areas.

C. Reuse or Disposal of Excess Material

This subsection of the standard specifications is amended as follows:

Excavated on-site soil materials consisting of materials classified as Silts, Clayey Silts, Silt & Clay, Clay & Silt, Silty Clay under the Burmister Soil Classification System or ML, CL, CL-ML, SM, SC with percentage of fines exceeding 35% shall be considered for use as embankment fills provided the following conditions are met:

1. The materials are free of organic material, rubble, debris, or boulders.
2. The materials are placed in the lower sections of embankment fills but above wet area excavations which shall be backfilled with select materials, and or coarse aggregate.

3. The materials are moisture conditioned and/or blended with soil aggregate as required to achieve the required degree of compaction. Requirements for blending are covered in Section 901.11 of the specification.

Materials reused in these areas shall be classified as described in SECTION 203 of the Supplemental specification.

Excess excavated earth may be permitted to be reused to widen or flatten slopes of embankment, or to fade embankments into cuts, or reuse as approved at other locations or disposed of.

Excess rock excavation may be permitted to be used along slopes adjacent to streams for slope protection in accordance with Subsection 603.

Excess broken concrete and bituminous concrete may be permitted to be used in the construction of embankments in accordance with subsection 203.

Excess material other than earth or rock not used as specified above shall be recycled or disposed of in accordance with Subsection 201.03.01-H.

Excess earth or rock not used as specified above and unusable soil or rock shall be placed at sites provided by the Contractor outside of the project.

Unsuitable material shall be disposed of offsite at locations secured by the Contractor.

202.03.05 Excavation, Regulated Material

3. Temporarily Storing.

THE FIRST SENTENCE OF THE FIRST PARAGRAPH IS CHANGED TO:

Temporarily store regulated or hazardous material in stockpiles within the Project Limits and as shown on the Plans.

THE FOLLOWING SUBSECTION IS ADDED:

202.03.12 Dredging Improvements

The Contractor shall lower the lakes at a slow rate of release so as not to cause over-bank flow of the downstream channel and to prevent the stranding of fish in isolated pools.

The Contractor shall be responsible for the dewatering design for the excavation area and should submit all documents signed and sealed by a New Jersey Licensed Professional Engineer prior to initiation of any dewatering activities. The Contractor is advised that the dewatering operation of the dredge material must take place in the Project's limit of disturbance unless an alternative onsite location is approved by the County and Engineer.

The Contractor shall excavate the lakes to the approximate depth as shown on the enclosed design drawings utilizing dredging procedures. The material to be dredged is believed to be mud, sand, gravel, or clay, all or a combination of any. No guarantee will be given of this, however, the County will not be responsible if the actual conditions are found to be different. The Contractor is encouraged to visit the site and if necessary, sample spoils if he is not familiar with the location of work.

The Contractor should take extreme caution when excavating in the area of the Featherbed Lane Bridge, Raritan Road Bridge, and Garden State Parkway Bridge, so as not to cause damage or undermining to the structure. The Contractor shall repair any damage occurring to the outfall structure at no additional cost to the County.

The Contractor is advised that no waters should be lowered from July 1 to September 15 . In addition, all waters in New Jersey located north of Route 195 must be drawn down to their permitted extent by November 15.

The Contractor is advised that the NJDEP prohibits construction, excavation, filling or grading within non-trout water bodies that support general game fish north of Interstate 195 between May 1 through July 31 per N.J.A.C. 7:13-11.5.

The Contractor is required to prevent sediment from traveling downstream and entering the East Lake (Garden State Parkway to Madison Hill Road) or a previously dredged portion of the Headwaters, West Lake, or Central Lake during dredging operations. If sediment enters the East Lake or a previously dredged portion of the other Lakes, the Contractor shall be responsible to remove the sediment at no additional cost to the County.

Due to the wet nature of the excavated material to be disposed of, the Contractor shall take all necessary precautions to prevent any liquid or leachate loss during transport to the disposal location.

The Contractor shall be responsible for the disposal of the dredge materials at an offsite facility in accordance with the conditions of the NJDEP Flood Hazard Area & Freshwater Wetlands Permits . The Contractor shall provide the County and Engineer the following information prior to commencement of construction:

- The location of the licensed disposal facility and a letter from the facility stating that the dredge material from this Project will be accepted, where applicable.
- Contact information, including employee's name, title, email, and phone number, from the disposal facility.

The Contractor shall be responsible to meet all dredge material requirements set for by the disposal facility, if applicable, and NJDEP for the disposal of the dredge material. The Contractor shall notify the County and Engineer of these requirements and what procedures and/or modifications are required to satisfy same.

202.04 MEASUREMENT AND PAYMENT
THIS ARTICLE OF THE STANDARD SPECIFICATIONS IS AMENDED AS FOLLOWS:

Delete the entire text of this Article and substitute the following:

Measurement and payment will be made under:

Item	Pay Unit
STRIPPING	SQUARE YARD
EXCAVATION, UNCLASSIFIED	CUBIC YARD
EXCAVATION, UNCLASSIFIED, "BRIDGE E"	CUBIC YARD
EXCAVATION, UNCLASSIFIED. BRIDGE "F"	CUBIC YARD
EXCAVATION, TEST PIT (IF AND WHERE ORDERED)	CUBIC YARD
LAKE EXCAVATION INCLUDING LAKE LOWERING, DEWATERING, TRANSPORTATION, AND DISPOSAL OF DREDGE SPOILS	CUBIC YARD

THE FOLLOWING IS ADDED:

Separate measurement and payment shall not be made for the excavation of Regulated Material. Same shall be included in the unit prices bid for items requiring same.

Separate measurement and payment shall not be made for the disposal of Regulated Material associated with the dredging of the Headwaters, West Lake, and Central Lake. Same shall be included in the unit price bid for LAKE EXCAVATION INCLUDING LAKE LOWERING, DEWATERING, TRANSPORTATION, AND DISPOSAL OF DREDGE SPOILS.

The Department will not make payment for presplitting but all costs shall be included in the unit price bid for the item Excavation, Unclassified.

The Department will not make payment for removal of pavement but all costs shall be included in the unit price bid for the item Excavation, Unclassified.

The Department will not make payment for sawcutting, stripping and disposal of excess, unstable or unsuitable or unusable material from Excavation, Unclassified.

Excavation unclassified, will be measured in the original position of the excavated materials by the cross section method, and the volumes of excavated material will be computed by averaging the end areas. The distance between cross sections for the purpose of averaging end areas will be measured as the distances between the points of intersection of the cross section and the base line, profile line, center line, curb line, or other such line on which the stationing for the cross sections is carried. The quantities of excavation for which payment will be made will be those shown in the Contract for the various items, provided the project is constructed essentially to the lines and grades shown on the plans.

If the plans have been altered or when disagreement exists between the Contractor and the Engineer as to the accuracy of the plan quantities in any balance, or the entire project, either party shall have the right to request and cause the quantities involved to be measured as specified hereinafter.

When payment is made on a volume basis, all excavation will normally be measured into original position by using cross sectional measurements photogrammetry or electronic computing methods.

When cross sectional measurements are used, the preliminary or construction cross sections will be used as the base cross sections and the final cross sections plotted therein. Additional intermediary cross sections may be interpolated at points where necessary to more accurately determine the quantities.

The average end areas method will be used for computing the volume of earthwork except where it is impractical to measure material by the cross sectional method due to the erratic type or location of the work. In the event of such situation, the excavation may be measured by acceptable method involving three-dimensional measurements.

Separate measurement and payment will not be made for saw cutting of any kind. The cost for this work shall be included in the unit price bid for each item requiring same.

Separate payment will not be made for escape ramps provided at the edges of pavement lifts or excavations but all costs thereof shall be included in the price bid for each item requiring same.

Unstable material disclosed in an embankment which was not constructed properly, in the Engineer's opinion, shall be removed and replaced at no additional cost to the owner.

Payment for excavation of unstable materials in cut sections disclosed by proofrolling and ordered by the Engineer shall be made based on the unit price bid for excavation, unclassified.

Payment for the removal of unsuitable material at the bottom of a bedding or other subsurface structure excavation shall be made based on the unit price bid for excavation, unclassified as listed in the bid form.

No separate payment will be made for the following but cost thereof shall be included in the respective unit prices submitted for the various items listed in the Proposal:

1. All excess and unsuitable excavation for which no use is shown on the plans or prescribed in the specifications shall be disposed of by the Contractor at sites to be provided by the Contractor outside the contract limits of the project.

2. Providing sheeting, shoring, bracing which would be pulled away or left in place as per direction of the Engineer.

3. Dewatering, if necessary, of whatever means.

No separate payment will be made for excavation required to provide bedding for all subsurface structures but the cost thereof shall be included in the respective unit prices submitted for the various items of subsurface structures listed in the Proposal.

No separate payment will be made for Pipe Bedding; rather the cost thereof shall be included in the unit prices of the various pipes in the proposal.

Backfill for the EXCAVATION OF TEST PITS and in the trenches for the various pipes, outside the roadway , shall be with suitable excavated material from the site (as approved by the Engineer) and will not be measured separately for payment rather all costs thereof shall be included in the respective items in the proposal.

Backfill for Excavation of Test Pits and in the trenches for the various pipes within the roadway shall be with suitable excavated material from the site, with Dense Graded Aggregate or Coarse Aggregate NJDOT Type 57 granular backfill, as directed by the Engineer. Backfill with suitable excavated material from the site will not be measured for payment rather all costs thereof shall be included in the respective items in the proposal. The quantity for Dense Graded Aggregate and Coarse Aggregate NJDOT Type 57 granular backfill that will be paid for will be the amount of material placed as directed by the Engineer and shall be measured in place by the cubic yard and paid for as specified in Section 302 and 601.

Lake excavation shall be measured in cubic yards, based on volume removed as measured in place, from the existing hard bottom and top of sediment elevations per bathymetric survey dated June 2023. The volume of sediment is based on cross section average end area method excluding any swell and shrinkage adjustment factor.

If the plans have been altered or when disagreement exists between the Contractor and the Engineer as to the accuracy of the Lake excavation quantity, either party shall have the right to request and cause the quantity involved to be measured.

The Contractor shall perform interim earthwork measurements, approved by the Engineer and County, to determine estimated quantities for payment. Separate measurement and payment shall not be made for the Contractor's Professional Licensed Land Surveyor, but shall be included in the unit prices bid for all items requiring same.

Separate measurement and payment will not be made for dredge mobilization, piping, pumps, and any work necessary to dredge the lakes of the Reservoir. All costs including labor, equipment, fees, and materials are to be included in the bid items requiring same.

Separate measurement and payment will not be made for restoration to the existing bank of the lakes. All costs including labor, equipment, and materials are to be included in the bid items requiring same.

If the Contractor over excavates beyond the limitation of the proposed lake excavation areas, he will be responsible for replacement of the material with clean fill of similar characteristics without compensation to insure that the design elevations are meet for the entire lake area. In addition, the Contractor shall legally dispose of the excess material off-site at no additional cost to the County.

Spoils from lake excavation shall be trucked offsite. Trucks utilized for transportation of dredge spoils shall be capable of moving the material without leakage or spillage on streets and / or roads.

Separate measurement and payment will not be made for the transportation and disposal of the dredge spoils to an offsite facility. All costs including labor, equipment, fees, and materials are to be included in the bid items requiring same.
Separate measurement and payment will not be made for the dewatering design of the dredge spoils. All costs including labor, equipment, fees, and materials are to be included in the bid items requiring same.

Separate measurement and payment will not be made for any procedures and/or modifications to the dredge material required to comply with an offsite disposal facility's requirements, if applicable. All costs including labor, equipment, fees, and materials are to be included in the bid items requiring same.

Separate measurement and payment will not be made for disposal/tipping fees required from an offsite facility, if appliable. All costs including labor, equipment, fees, and materials are to be included in the bid items requiring same.

SECTION 203 – EMBANKMENT

203.01 DESCRIPTION

THIS SUBSECTION IS TO BE REPLACED IN ITS ENTIRETY WITH THE FOLLOWING:

This Section describes the requirements for constructing embankment and fill, and for preparing areas on which embankments and fills are to be placed as part of the site grading. Where the word embankment is used herein, shall also be construed as fill material.

203.02 MATERIALS

THE FOLLOWING IS ADDED TO THIS ARTICLE OF THE STANDARD SPECIFICATIONS:

Embankment shall be constructed of suitable excavated materials obtained from the work specified in Section 202, certified clean quarry dense graded aggregate, and/or soil aggregate fill, I-14 as directed by the Engineer / LSRP. These materials shall be free from stumps, roots, branches, leaves, weeds, sods, rubbish, garbage, organic materials, or any other materials that may decay.

ON SITE BORROW-EMBANKMENT – Excavated on-site soil materials consisting of materials classified as Silts, Clayey Silts, Silt & Clay, Clay & Silt, Silty Clay under the Burmister Soil Classification System or ML, CL, CL-ML, SM, SC containing no more than 35 percent by weight of material passing the No. 200 sieve, and on-site materials conforming to the gradation I-14 shall be considered for use as embankment fills provided the following conditions are met:

1. The materials test clean in accordance with applicable State and Federal requirements and have been approved for reuse on site by the Borough's LSRP.
2. The materials are free of organic material, rubble, debris, or boulders.
3. The materials are placed in the lower sections of embankment fills but above wet area excavations which shall be backfilled with select materials, and or coarse aggregate.
4. The materials are moisture conditioned and/or blended with soil aggregate as required to achieve the required degree of compaction. Requirements for blending are covered in Section 901.11 of the specification.

Structure Backfill Soil Aggregate – specified backfill for structures where indicated on the drawings shall conform to the requirements for standard soil aggregate.

Where the work of subsurface structure excavation is performed within existing site, the backfill material shall be in accordance with the plan detail and/or the direction of the Engineer. All backfill shall be suitable material approved by the Engineer / LSRP.

203.03 CONSTRUCTION

ADD THE FOLLOWING TO THIS ARTICLE OF THE STANDARD SPECIFICATIONS:

Remove bituminous and concrete materials from all embankment areas.

Puddling of backfill will not be permitted.

Thoroughly compact bedding material for pipe to provide uniform support for the pipe barrel. The remainder of the sidefill and backfill shall be as indicated on the construction details.

Bed the pipe in compacted granular material placed on a flat bottom trench. For the bedding material, use a minimum thickness as shown in Construction Details. Use granular material that is well graded crushed stone or crushed gravel meeting the requirements of A.S.T.M. Designation C 33, Gradation 57, in Table 901.03-1 of section 901.03. Densely compact the granular material and completely fill all voids under and around the pipe.

Compact backfill located around inlets, manholes, and other subsurface structures by using approved vibratory compactors or flat-faced mechanical tampers.

Controlled Low Strength Material (CLSM) may be used as alternate backfill material when backfilling trenches for drainage pipe and utility conduit. Combining other backfill materials in the same trench as CLSM shall not be permitted. Begin mixing and placement of CLSM only when the ambient temperature is at least 30°F. During placement, the CLSM mixture shall have a temperature of at least 41°F and shall not be placed on frozen ground. Discharge the CLSM mixture directly from the truck into the trench to be filled with care taken to prevent the pipe from becoming displaced. After placement, cure & protect the CLSM mixture to prevent damage from cold weather according to Subsection 405.14. Do not use CLSM to replace pavement, base courses or drainage layers that form the structure of the roadway.

The Contractor shall place suitable on site material for all embankment and fill areas as directed by Engineer / LSRP, and shall be properly compacted to the satisfaction of the Engineer in accordance with the Technical Specifications. Where directed by the Engineer / LSRP, imported fill material for proposed grading shall consist of suitable onsite materials and/or imported certified clean quarry process stone fill conforming to the gradational envelope of NJDOT dense graded aggregate for grading the site.

203.04 MEASUREMENT AND PAYMENT
THIS SUBSECTION IS CHANGED TO:

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
I-9 SOIL AGGREGATE, “BRIDGE E”	CUBIC YARD
I-9 SOIL AGGREGATE, “BRIDGE F”	CUBIC YARD
1-14 SOIL AGGREGATE	CUBIC YARD

The Department will make payment for removal and disposal of unstable material in cut sections of payment structure during proof rolling of subgrade under EXCAVATION, UNCLASSIFIED, as specified in 202.03.03

The Department will not make payment for removal and disposal of unstable material disclosed in embankment sections of pavement structure during preparation of subgrade.

The Department will not make payment for backfill with suitable excavated material in unstable area disclosed in embankment sections of pavement structure during preparation of subgrade.

The Department will not make payment for constructing embankment and for preparing area on which embankments are placed.

The Department will make payment for SESC measures specified in 158.04.

THE FOLLOWING SECTION IS ADDED:

SECTION 204 – FISH COLLECTION AND TEMPORARY FLOW DIVERSION CHANNEL

204.01 DESCRIPTION

This work shall consist of the fish and wildlife scientific collection and relocation, the construction and maintenance of a temporary flow diversion channel, and freshwater fish stocking of the Headwaters, West Lake, and Central Lake of the Clark Reservoir as indicated in the Contract Documents.

204.02 MATERIALS

The Contractor shall employ such material, equipment, and labor as required to perform the fish collection relocation and stocking, as well as the construction and maintenance of a temporary flow diversion channel.

204.03 CONSTRUCTION

Fish salvaging and replenishment during dewatering and construction activities shall be in accordance with the New Jersey Division of Fish and Wildlife and in accordance with the lake lowering permit. The Contractor shall be responsible for all salvaging and replenishment operations.

The Contractor shall lower the lakes at a slow rate of release so as not to cause over-bank flow of the downstream channel and to prevent the stranding of fish in isolated pools.

The Contractor should note that it is unacceptable to simply "flush" the fish downstream. All carp (including goldfish) must be removed and disposed of by Contractor, as it is illegal to stock carp in the State of New Jersey.

All fish that are salvaged shall be transported to separate location as part of the Contractor's fish salvage plan which will be reviewed and approved by the engineer prior to lake lowering.

Once lowered, the Contractor shall be responsible to maintain a continuous release of water, which must be passed downstream to maintain aquatic biota in the watershed. The amount of outflow should be the approximate equivalent to the amount of inflow into the Reservoir (excluding storm flows).

The Contractor should take extreme caution when excavating in the area of the Featherbed Lane Bridge, Raritan Road Bridge, and Garden State Parkway Bridge, so as not to cause damage or undermining to the structure. The Contractor shall repair any damage occurring to the outfall structure at no additional cost to the County.

The Contractor is required to prevent sediment from traveling downstream and entering the East Lake (Garden State Parkway to Madison Hill Road) or a previously dredged portion of the Headwaters, West Lake, or Central Lake during dredging operations. If sediment enters the East Lake or a previously dredged portion of the other Lakes, the Contractor shall be responsible to remove the sediment at no additional cost to the County.

204.04 MEASUREMENT AND PAYMENT

Payment will be made under:

Pay Item	Pay Unit
FISH COLLECTION, RELOCATION, AND RESTOCKING	LUMP SUM
MAINTENANCE OF TEMPORARY FLOW DIVERSION CHANNEL	LUMP SUM

Measurement and payment for the fish collection, relocation, and restocking will be made on a lump sum basis at the price bid in the proposal, which price shall include all labor, equipment (including but not limited to nets,

seines, tank trucks, weirs), and materials necessary therefore and incidental thereto the complete collection, relocation and re-stocking of the fish. The price shall also include the removal and disposal of all carp and goldfish.

Separate measurement and payment will not be made for restoration to the existing bank of the lakes. All costs including labor, equipment, and materials are to be included in the bid items requiring same.

Measurement and payment for maintenance of temporary flow diversion channel will be made on a lump sum basis at the price bid in the proposal, which price shall include all labor, equipment, and materials necessary therefore and incidental thereto to construct temporary flow diversion channels as detailed in section 204.03.

THE FOLLOWING SECTION IS ADDED:

SECTION 205 – ALLOWANCE FOR LABORATORY TEST / MATERIAL TESTING

205.01 DESCRIPTION

This item shall be utilized for reimbursement to the Contractor for costs associated with laboratory test / material testing.

The Contractor shall allow for an allowance as contained in the bid form for laboratory test / material testing to determine the presence of any hazardous contaminants in the soil within the Project Limits.

All sampling procedures and analytical methods must conform to the most recent guidance in the Technical Requirements and the NJDEP Field Sampling Procedures Manual. Analyses shall also fulfill the requirements of the disposal facility.

Suspected contaminated soils shall be characterized by the Contractor according to the type and amount of contamination present in the soil: (1) soil that contains hazardous waste, and (2) soil that contains nonhazardous waste (ID 27 when disposed of).

Excavated soils are considered hazardous when the following criteria are met:

1) The soils test positive for a characteristic of a hazardous waste defined at Title 40 Code of Federal Regulations (CFR) Part 261 Subpart C (261.21-261.24), or,

2) Is a listed waste as per 40 CFR Part 261 Subpart D (261.31-261.33), or,

3) Is a mixture of a solid waste (non-hazardous) and one or more hazardous wastes listed in 40 CFR Part 261 Subpart D (261.31-261.33).

Appropriate analyses, where required by the disposal facility, will be performed by the Contractor as per the latest version of the Technical Requirements to determine if contaminant levels are above appropriate cleanup guidelines.

The Contractor will be paid from the allowance based on a mutually agreeable price between the Contractor and the owner's representative prior to commencing material testing as ordered by the owner's representative in writing.

The Contractor shall allow five hundred thousand dollars and zero cents ($500,000.00) for this item to cover the work. Nothing herein shall constitute a guarantee that the Contractor is entitled to payment of the full allowance or any portion of the allowance. If no work is done under this item, the full amount of five hundred thousand dollars and zero cents ($500,000.00) will not be paid by the Owner to the Contractor. To qualify for payment, work must be ordered by the Owner's Representative in writing.

205.02 MEASUREMENT AND PAYMENT

Item	*Pay Unit*
ALLOWANCE FOR LABORATORY TEST / MATERIAL TESTING	ALLOWANCE

Measurement and payment for ALLOWANCE FOR LABORATORY TEST / MATERIAL TESTING will be made based on the actual cost as evidenced by supporting records, itemized billing and a copy of test results. **An amount of five hundred thousand dollars and zero cents ($500,000.00) is established for this item and is included in the Proposal.** This item also does not include provisions for payment related to any paperwork or damages caused by delays related to this item.

THE FOLLOWING SECTION IS ADDED:

SECTION 206 – ALLOWANCE FOR DISPOSING OF HAZARDOUS AND REGULATED MATERIAL

206.01 GENERAL

The specifications outlined herein are for the disposal of hazardous and regulated soils that may be encountered during the excavation of the proposed trails, parking lots, access road, and dredging operations. Any materials that are suspected to contain contamination shall be tested, classified and disposed in accordance with the applicable local, State and Federal regulations. All necessary soil testing will be performed by the Contractor.

206.02 WORK INCLUDED

A. It is the Contractor's responsibility to furnish all labor, permits, supplies, tools and logistical coordination necessary to complete the removal of all contaminated materials, including material handling, loading, hauling, disposing, and all else incidental thereto. The Contractor shall also provide to the Owner a written plan for compliance with this section prior to construction and provide an accurate verification of material quantities at the Site.

B. At a minimum, all potentially contaminated soils must be staged by the Contractor on an impervious surface and covered with a waterproof material (i.e., tarpaulin or 10 mil plastic sheeting). The containment must be maintained for the duration of the staging period to prevent contaminant volatilization, runoff, leaching, or fugitive dust emissions.

The stockpiled soil shall be covered with similar plastic sheeting that shall be held securely in place. The plastic sheeting shall be maintained or replaced as needed for as long as the material remains stockpiled. Stockpiles shall be located where excavation equipment can place the material directly from the excavation onto a stockpile. Where stockpiling of soil is not possible at the site, soil from the excavation shall be stockpiled at a site provided by the Contractor and approved by the Engineer.

The ground surface on which the geomembrane is to be placed shall be free of rocks greater than 0.5 inches in diameter and any other object which could damage the membrane.

The Contractor shall periodically maintain the plastic covering during soil classification period.

Stockpiled materials shall also be encircled by staked haybales or silt fence.

Where excavations must be left opened and unattended until backfill due to associated testing requirements and where the same is approved by the Engineer, the excavations shall be suitably barricaded and other devices shall be employed as required to prevent unauthorized entry into the work area.

Contaminated soil shall be stored in such a manner that the soil is completely isolated from the environment and any hazardous materials in the soil are prevented from contact with or being released into the environment. Periodic inspections shall be made by the Contractor to ensure that the stockpiled soils are not released to the surrounding environment by erosion. Stockpiled soil shall not be stockpiled for more than 28 days.

C. Security and public access must be considered when selecting a location for stockpiling of any potentially contaminated soils. Excavation and staging of any potentially contaminated soil must be performed using methods that minimize the disturbance of the soil.

Hazardous Waste

D. The Contractor shall conduct testing as required by the disposal facility to determine if a waste is a hazardous waste pursuant to N.J.A.C. 7:26G-5.2(b) and if soil contains a hazardous waste.

E. Excavated soils are considered a hazardous waste when the following criteria are met:

1) The soils test positive for a characteristic of a hazardous waste defined at Title 40 Code of Federal Regulations (CFR) Part 261 Subpart C (261.21-261.24), or,

2) Is a listed waste as per 40 CFR Part 261 Subpart D (261.31-261.33), or,

3) Is a mixture of a solid waste (non-hazardous) and one or more hazardous wastes listed in 40 CFR Part 261 Subpart D (261.31-261.33).

F. All excavated soils designated as a hazardous waste (soils with contamination above the nonhazardous waste levels) must be properly staged and removed by the Contractor from the excavation site within 28 days after receipt of the soil classification from the State. When excavated soils are determined to contain a hazardous waste, they should be staged during the remaining 28-day period in a sealed rolloff container or sealed drums. Roll-off units used to temporarily store contaminated material shall be water tight. A cover shall be placed over the units to prevent precipitation from contacting the stored material.

If multiple storage units are required, each unit shall be clearly labeled with an identification number and a written log shall be kept to track the source of contaminated material in each temporary storage unit.

G. It is the responsibility of the Contractor that hazardous waste in soil going off-site for disposal shall be properly manifested, transported by a licensed, insured hauler and go to a facility authorized to accept same. The Contractor shall transport the contaminated soil to the recycling or disposal facility and shall obtain appropriate documentation that shall be provided to the Engineer, the NJDEP, and the county of origin.

Regulated Soil

H. Excavated soils are considered to be regulated, non-hazardous solid waste when the following criteria are met:

1) The soils contain a contaminant at a concentration which exceeds the NJDEP's Soil Remediation Standards, pursuant to NJAC 7:26D, or,

2) exceed a site-specific Alternative Remediation Standard, established pursuant to NJAC 7:26D-8, and

3) are not a hazardous waste as defined in (E) above

I. Appropriate analyses, where required by the disposal facility, will be performed by the Contractor as per the latest version of the Technical Requirements to determine if contaminant levels are above appropriate cleanup guidelines.

J. Contaminated soils that are designated as non-hazardous solid waste may not be stockpiled for more than six months pursuant to the Solid Waste Regulations, N.J.A.C.7:26-1.1;1.4.

206.03 PRODUCTS (Reserved)

206.04 EXECUTION

The Contractor shall notify the Engineer one (1) week prior to the start of excavation of contaminated material. The Contractor shall be responsible for contacting regulatory agencies in accordance with the applicable reporting requirements.

Surface water shall be diverted to prevent entry into the excavation.

206.05 WORK GUIDELINES

Personal protective equipment should be utilized at all times during the removal debris. The Contractor shall ensure that all work involving the above referenced materials are conducted in accordance with the applicable local, State and Federal regulations.

The Contractor shall prepare a health and safety program as mandated by the federal Occupational Safety and Health Administration, U.S. Department of Labor, 29 C.F.R. 1910.120, which must address, at a minimum, the Contractor's individual:

a. Organizational Structure;

b. Comprehensive Workplan;

c. Safety and Health Training Program;

d. Medical Surveillance Program (MSP);

e. Site-specific health and safety concerns and requirements dependent upon the site's characteristics and operations as well as period and duration of operation; and

f. Standard Operating Procedures for Health and Safety.

206.06 DISPOSAL

All materials, whether hazardous or regulated shall be disposed of in accordance with all laws and provisions and all Federal, State and local regulations. The Contractor shall ensure that all waste is properly characterized. The Contractor shall comply with the disposal requirements.

If the material being transported is classified as regulated, it is legally considered a solid waste, (ID 27), and, as such, the transporter hauling the waste must be a New Jersey registered solid waste transporter in accordance with N.J.A.C. 7:26-1 et. seq.

All hazardous waste must be shipped in accordance with the U.S. Department of Transportation guidelines as stated in 49 C.F.R. 171-179, N.J.A.C. 7:26-3.0 et seq., and contaminated soils material must be shipped in accordance with N.J. Solid Waste Regulations, applicable radioactive and medical waste regulations, and applicable local regulations.

Hazardous waste shipments must be properly containerized, labeled, and manifested prior to leaving the site.

All disposal transporters for regulated materials must be licensed by the appropriate regulatory agency or agencies to transport the type of waste being hauled. The transportation and maneuver of materials is expected to be completed in a safe and responsible fashion, in accordance with all local, State and Federal guidelines.

The Contractor shall provide manifests for all materials sent to each respective disposal facilities. The Contractor shall obtain required federal, state, and local permits for excavation and storage of contaminated material. Permits shall be obtained at no additional cost to the Owner.

The disposal of materials and debris is regulated under the Solid Waste Management Act (NJSA 13:1 E-1) and is governed by NJAC 7:26 et seq. The Contractor shall dispose of the material and debris according to the solid waste management plan developed by the solid waste management district of origin. Proper documentation from the disposal facility shall be submitted to the Engineer.

206.07 Method of Measurement

Disposing of hazardous material, will be paid under the Allowance provided in bid form for same. Payment shall not be made until the Contractor has furnished the Engineer with a certificate from an approved recycling facility or a tipping certificate from an approved landfill.

Disposing of regulated material, will be paid under the Allowance provided in bid form for same. Payment shall not be made until the Contractor has furnished the Engineer with a certificate from an approved recycling facility or a tipping certificate from an approved landfill.

206.08 Basis of Payment.

Payment will be made under:

Pay Item	*Pay Unit*
DISPOSING OF HAZARDOUS MATERIAL (IF AND WHERE DIRECTED)	ALLOWANCE

Pay Item *Pay Unit*

DISPOSING OF REGULATED MATERIAL
(IF AND WHERE DIRECTED) ALLOWANCE

Measurement and payment for DISPOSING OF HAZARDOUS MATERIAL will be made based on the actual cost as evidenced by supporting records, itemized billing and a copy of disposal fees. **An amount of seven hundred and fifty thousand dollars and zero cents ($750,000.00) is established for this item and is included in the Proposal.** This item also does not include provisions for payment related to any paperwork or damages caused by delays related to this item.

Measurement and payment for DISPOSING OF REGULATED MATERIAL will be made based on the actual cost as evidenced by supporting records, itemized billing and a copy of disposal fees. **An amount of five hundred thousand dollars and zero cents ($500,000.00) is established for this item and is included in the Proposal.** This item also does not include provisions for payment related to any paperwork or damages caused by delays related to this item.

Measurement and Payment for the disposal of regulated material associated with the dredging of the Headwaters, West Lake, and Central Lake shall be included in the unit price bid for LAKE EXCAVATION INCLUDING LAKE LOWERING, DEWATERING, TRANSPORTATION, AND DISPOSAL OF DREDGE SPOILS.

Payment under disposing of hazardous material shall include permits, fees, and handling associated with the disposal of hazardous material.

Payment under disposing of regulated material shall include permits, fees, and handling associated with the disposal of hazardous material.

No payment will be made under this item for disposal of materials covered in other sections of the Contract Documents.

No payment will be made for the disposal of the overlying hot mix asphalt.

No separate measurement and payment will be made for construction of stockpiles, on site or off site, of hazardous or regulated soil. Any costs associated with aspects of grading, preparation, handling, placement, maintenance, removal, treatment, and disposal of cover materials and liner materials and all other items incidental to construction of stockpiles of regulated and hazardous soil shall be included in the respecting allowances included for disposal.

TABLE OF CONTENTS

DIVISION 300 – SUBBASE AND BASE COURSES

SECTION	
301	SUBBASE
302	AGGREGATE BASE COURSE

SECTION 301 - SUBBASE

301.01 DESCRIPTION

301.02 MATERIALS
THE FOLLOWING IS ADDED:

Subbase shall be constructed using existing insitu granular soils or furnished and installed 2" to 2-1/2" clean stone, or aggregate, NJDOT type 57 if and where directed by the engineer.

Geotextile roadway stabilization, if and where ordered, shall conform to Subsection 919.01.

301.03 CONSTRUCTION

301.03.01 Subbase

A. Preparing Subgrade
The following is added:

Where directed by the Engineer, the Contractor shall install a geotextile soil support fabric prior to the placing of the proposed dense graded aggregate base course and/or clean stone subbase. The subgrade shall be cleared of all large stones and sharp objects that could puncture the fabric prior to placement. The fabric should then be rolled out into the sub-grade by at least two men, beginning on the firmest soil of the site perimeter to establish an anchor point. Lateral and longitudinal seams should be overlapped 3' or more or sewn. Aggregate may be used to hold down the fabric until the sub-base can be placed. Ground securing pins may also be used on the overlap sections.

Once the fabric is in place, the aggregate subbase can be backdumped onto the fabric beginning on firm soil at a point just in front of the fabric. The aggregate should be spread in lifts to allow proper compaction while not overstressing the fabric. Where extremely soft subgrades exist, care should be taken during aggregate placement to insure that the fabric is not moved out of position. Deformations or ruts that appear in the subbase shall be filled with additional aggregate until stabile. Areas of the fabric which are damaged or moved out of position during aggregate placement shall be exposed and covered with a fabric "patch" overlapping 3 to 4 feet onto unaffected areas.

B. Spreading and Grading

C. Compacting

301.04 MEASUREMENT AND PAYMENT
THIS SUBSECTION IS CHANGED TO:

The Department will measure and make payment for Items as follow:

Item	*Pay Unit*
2” TO 2-1/2” CLEAN STONE SUBBASE INCLUDING EXCAVATION, UNCLASSIFIED (IF AND WHERE DIRECTED) (MINIMUM UNIT PRICE BID $10.00/CY)	CUBIC YARD
GEOTEXTILE ROADWAY STABILIZATION (IF AND WHERE DIRECTED)	SQUARE YARD

Separate measurement and payment will not be made for subbase constructed of insitu soils or insitu aggregates.

Separate payment will not be made for overlap or patch areas of geotextile roadway stabilization.

SECTION 302 – AGGREGATE BASE COURSE

302.01 DESCRIPTION
THIS FOLLOWING IS ADDED:

The Contractor is herein advised that the use of imported recycled material as an alternate to dense graded aggregate is subject to the submission of gradation test results and acceptable TAL/TCL+30 test results indicating the material is acceptable for the intended use in accordance with NJDEP criteria and requirements. One set of test results per source shall be provided for every 1000 cubic yards of imported material provided that a minimum of one set of results is submitted per street. Further, any recycled material to be utilized must come from a State licensed recycling facility.

302.02 MATERIALS

302.03 CONSTRUCTION

302.03.01 Soil Aggregate Base Course and Dense-Graded Aggregate Base Course

A. Preparing Subgrade or Subbase.

B. Density Control Strip

C. Aggregate Base Course Placement.

D. Thickness Requirements
DELETE THE FIRST PARAGRAPH OF THIS ARTICLE AND SUBSTITUTE THE FOLLOWING:

The thickness will be measured at a frequency not exceeding 100 feet or as established by means of test holes or other methods. Test holes shall be refilled with the base course material and the material compacted in layers not more than 6 inches thick with a flat-face mechanical tamper.

E. Compaction Acceptance Testing

THE FOLLOWING SUBHEADINGS ARE ADDED:

F. Waiving standard Compaction Requirements

When the Special Provisions waive the requirements of Subheadings B and E above and no alternative method is specified, the base course shall be placed and compacted according to subsection 203.03.02.

The compaction requirements in subheadings B and E are waived.

G. Maintenance Under Traffic Control

Traffic shall not be permitted to ride on the compacted base course.

302.04 MEASUREMENT AND PAYMENT
THIS SUBSECTION IS CHANGED TO:

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
DENSE-GRADED AGGREGATE BASE COURSE (MINIMUM UNIT PRICE BID $10.00/CY)	CUBIC YARD
COARSE AGGREGATE , SIZE NO.57, BRIDGE “E”	CUBIC YARD

Item	*Pay Unit*
COARSE AGGREGATE , SIZE NO.57, BRIDGE “F”	CUBIC YARD

Measurement by the cubic yard shall be based on the compacted thickness as determined in accordance with 302.03.1D.

The cost for the test holes described in 302.03.1D shall be included in the unit cost of the various aggregate base courses.

Separate measurement and payment will not be made for Dense Graded Aggregate utilized under curbs, walkways, and driveways.

TABLE OF CONTENTS

DIVISION 400 – PAVEMENTS

SECTION	
401	HOT MIX ASPHALT (HMA) COURSES

SECTION 401 – HOT MIX ASPHALT (HMA) COURSES

401.01 DESCRIPTION

401.02 MATERIALS
THE LAST PARAGRAPH IS CHANGES TO:

When a Materials Transfer Vehicle (MTV)is used, install a paver hopper insert with a minimum capacity of 14 tons in the hopper of the HMA paver.

401.03 CONSTRUCTION

401.03.07 HMA Courses

D. Transportation and Delivery of HMA
THE FIRST PARAGRAPH IS CHANGED TO:

Deliver HMA using HMA trucks in sufficient quantities and at such intervals to allow continuous placement of the material. Do not allow trucks to leave the plant within 1 hour of sunset unless nighttime lighting is provided as specified in 108.06. The RE will reject HMA trucks do not meet the requirements specified in 1009.02. The RE will suspend construction operations if the Contractor fails to maintain a continuous paving operation. Before the truck leaves the plant, obtain a weight ticket from a fully automatic scale. Before unloading, submit for each truckload a legible weigh ticket that includes the following:

1. Name and location of the HMA plant.
2. Project title.
3. Load time and date.
4. Truck number.
5. Mix designation.
6. Plant lot number.
7. Tare, gross, and net weight.

E. Spreading and Grading
THE THIRD PARAGRAPH IS CHANGED TO:

Use a Materials Transfer Vehicle (MTV) for the construction of intermediate and surface course in the traveled way. Ensure that the MTV independently delivers HMA from the HMA trucks to the HMA paver. Operate the MTV to ensure that the axle loading does not damage structures, roadways, or other infrastructure.

Use an MTV for the construction of surface course in the traveled way. Ensure that the MTV independently delivers HMA from the HMA trucks to the HMA paver. Operate the MTV to ensure that the axle loading does not damage structures, roadway, or other infrastructure.

J. Ride Quality Requirements
THE FIRST PARAGRAPH IS CHANGED TO:

The Department will evaluate the HMA surface course using the International Roughness Index (IRI) according to ASTM E 1926. The Department will use the measured IRI to compute the appropriate pay adjustment (PA). The PA may be positive for superior quality work or negative for defective work.

SUBPART 3 OF SECOND PARAGRAPH IS CHANGED TO:

3. Preparation for IRI Testing. Provide the necessary traffic control when the Department performs IRI testing. Perform required mechanical sweeping of the surface course before IRI testing. To facilitate auto triggering on laser profilers, place a single line of

preformed traffic marking tape perpendicular to the roadway baseline 300 feet before the beginning of each lane, shoulder, and ramp to be tested. Submit the actual stationing for each traffic marking tape location to the RE.

401.04 MEASUREMENT AND PAYMENT
THIS SUBSECTION IS CHANGED TO:

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
TACK COAT	GALLON
PRIME COAT	GALLON
POLYMERIZED JOINT ADHESIVE	LINEAR FOOT
HOT MIX ASPHALT 9.5M64 SURFACE COURSE	TON
HOT MIX ASPHALT 19M64 BASE COURSE	TON
HMA MILLING, 3" OR LESS	SQUARE YARD

The specified depth of the milling is measured from the original surface to the top of the high spots of the textured surface.

The Department will measure Hot Mix Asphalt Pavement Repair before overlay by the square yard of area bounded by the sawcuts.

The Department will measure Tack Coat by volume delivered, converted to the number of gallons at 60□F as calculated by the temperature-volume correction factors specified in 902.01.

The Department will measure Hot Mix Asphalt 9.5 M 64 Surface Course and Hot Mix Asphalt 19 M 64 Base Course by the ton as indicated on the certified weigh tickets, excluding unused material. When nominal maximum aggregate size 3/8-inch HMA surface course is directed for use in transition (run out) areas, the Department will include this weight with the weight for Hot Mix Asphalt 9.5 M 64 Surface Course.

The Department will not make payment for MTV, Quality Control Cores or additional cores for reset and a thin-lift nuclear density gauge.

The Department will make a payment adjustment for HMA air void quality by the following formula:
Pay Adjustment = Q x BP x PPA

Where:
BP = Bid Price
Q = Air Void Lot Quantity
PPA = air void PPA as specified in 401.03.03H.

The Department will make a payment adjustment for HMA thickness quality by the following formula:
Pay Adjustment = Q x BP x PPA

Where:
BP = Bid Price
Q = Air Void Lot Quantity
PPA = air void PPA as specified in 401.03.03I

The Department will make a payment adjustment for HMA ride quality, as specified in 401.03.03J.

TABLE OF CONTENTS

DIVISION 500 – BRIDGES AND STRUCTURES

SECTION	
501	SHEETING AND COFFERDAMS
502	LOAD BEARING PILES
504	STRUCTURAL CONCRETE
509	BRIDGE COMBINATION RAILING, MISCELLANEOUS RAILINGS, AND FENCE
510	TIMBER STRUCTURES
513	RETAINING WALLS
515	PREFABRICATED PEDESTRIAN BRIDGES

DIVISION 500 – BRIDGES AND STRUCTURES

SECTION 501 – SHEETING AND COFFERDAMS

501.01 DESCRIPTION

This Section describes the requirements for constructing and removing cofferdams and sheeting.

This work shall also include maintenance of adequate drainage flow during all phases of construction. It shall also include the construction of cofferdams, dewatering and bypass pumping as necessary enabling the construction of bridge footings, abutment, wingwalls, etc. This work shall also include the clearing and restoring of the areas subjected to storm water runoff during construction.

501.02 MATERIALS

Provide materials as specified:

Concrete	903.03
Structural Steel	906.01
Steel Sheet Piles	906.02

501.03 CONSTRUCTION

501.03.01 Temporary Sheeting

A. Working Drawings. At least 30 days before beginning work, submit working drawings signed and sealed by a Professional Engineer for approval. Include the following:

1. Size, cross section, section modulus, and physical properties of the sheeting that will provide resistance to the maximum longitudinal bending moment for proper functioning.
2. Bracing design to protect workers, adjoining properties, and the public.
3. The combined stress calculations to determine the maximum effect of the principal stresses on the sheeting. Include a check for the principal stresses against the appropriate material yield point.
4. The effects of bending stresses in the longitudinal direction and the transverse direction.
5. The maximum forces that the sheeting is subjected to during construction operations.
6. The Contractor may use the Hencky-von Mises (Yield Distortion Energy) criterion to combine stresses and relate the principal stresses to a failure criterion (Material Yield Point).
7. Method for removing obstructions.
8. Method for addressing underground facilities and utilities that coincide with sheeting.
9. If required, dewatering plan, including method of dewatering and controlling sediment and contaminants from entering adjacent waterbodies, wetlands and environmentally sensitive areas. Do not use earthen berms as a method of dewatering.
10. Method for maintaining safe and adequate passage of stream and storm water flow at all times during construction.
11. Method for removal of debris, dirt and sediment generated by storm events and construction activities within and around the project limits.
12. Method for pumping to handle heavy stream flow due to high and unexpected flooding.

B. Construction. Excavate and remove materials that obstruct the installation as specified in 202.03. Do not install within 200 feet of concrete that is being placed or has been placed within the previous 24 hours unless approved by the RE. Ensure that the sheeting has no gaps and is continuous for its entire length.

Maintain safe and adequate passage of stream and storm flow to protect the foundation and the construction against damage and water. Remove dirt, debris and sediment generated by construction activities and storm events. The

Contractor is fully responsible for the losses that may arise due to failure to collect and consider flooding information during preparation of bid proposal.

Provide advance notice to all utility companies if utility needs to be supported or protected.

C. Dewatering. If required, dewater as specified in the approved dewatering plan. Continue dewatering operations until the temporary sheeting is removed or as directed by the RE.

D. Removal. Remove temporary sheeting when it is no longer required. Backfill voids left from temporary sheeting to provide uniform finish grades. Except for timber, the RE may approve leaving the temporary sheeting in place. When temporary sheeting is left in place, remove the upper portion to at least 3 feet below finish ground.

501.03.02 Permanent Sheeting

Construct permanent sheeting as shown on the Plans. Ensure that the sheeting has no gaps and is continuous for its entire length.

At least 15 days before constructing sheeting, submit to the RE for approval a dewatering plan including method of dewatering and controlling sediment and contaminants from entering adjacent waterbodies, wetlands, and environmentally sensitive areas. Dewater according to the approved dewatering plan. Continue dewatering operations until no longer required.

501.03.03 Temporary Cofferdam

A. Working Drawings. At least 30 days before beginning work, submit working drawings signed and sealed by a Professional Engineer for approval. Include the following:

1. Size, cross section, section modulus, and physical properties of the cofferdam that will provide the maximum longitudinal bending moment for proper functioning.
2. Bracing design to protect workers, adjoining properties, and the public.
3. The combined stress calculations to determine the maximum effect of the principal stresses on the cofferdam. Include a check for the principal stresses against the appropriate material yield point.
4. The effects of bending stresses in the longitudinal direction and the transverse direction.
5. The maximum forces that the cofferdam is subjected to during construction operations.
6. The Contractor may use the Hencky-Von Mises (Yield Distortion Energy) criterion to combine stresses and relate the principal stresses to a failure criterion (Material Yield Point).
7. A complete description of the proposed cofferdam.
8. Dewatering plan, including method of dewatering and controlling sediment and contaminants from entering adjacent waterbodies, wetlands, and environmentally sensitive areas. Do not use earthen berms as a method of dewatering.
9. Method for maintaining safe and adequate passage of stream and storm water flow at all times during construction.
10. Method for removal of debris, dirt and sediment generated by storm events and construction activities within and around the project limits.
11. Method for pumping to handle heavy stream flow due to high and unexpected flooding.

B. Construction. Construct cofferdam to ensure the stability of the excavation and to keep the excavation free of water. Construct the cofferdam with interior dimensions that allow clearance for the construction and inspection of forms and for the handling and pumping of water outside of the footing area. Extend the cofferdam below the bottom of the footings and brace cofferdams in all directions and ensure that they are maintained free of water until the subsequent work has been completed.

The Contractor may only extend timber or bracing of a cofferdam into or through the proposed substructure with RE approval. Ensure that vertical structural members supported on rock are toed-in to ensure stability.

Maintenance of adequate drainage flow shall be provided at all times during the course of construction. The Contractor shall phase his work in such a manner as to at no time block or impede stream flow.

The Contractor shall be responsible for the entire area damaged by dirt, debris or sediment resulting from his work regardless of the limits of construction. The Engineer's decision as to the extent of stream damage caused by the Contractor's work shall be final.

C. Dewatering. Continue dewatering operations until the temporary cofferdam is removed or as directed by the RE.

D. Removal. Remove temporary cofferdam when no longer required. Restore disturbed areas, including watercourse beds, to original conditions.

The Contractor may request that the temporary cofferdam be left in place. If approved, the RE will designate the limits of the cofferdam to be left in place.

501.03.04 Permanent Cofferdam

A. Construction. Construct cofferdam to protect the foundation and the construction against damage and water. Ensure that vertical structural members supported on rock are toed-in sufficiently to provide stability against movement.

B. Placing Concrete Seal. When concrete seals are shown, submit a plan of operation to the RE for approval at least 30 days before placing concrete. Include the following in the plan:

1. Method of placing concrete.
2. Methods of controlling water and sediment intrusion.
3. Equipment models and quantity. Include backup equipment within the Project Limits at all times.
4. Size and description of crew.
5. Corrective action plan for equipment breakdown or cofferdam failure.

Maintain still water at the point of deposit. Do not place concrete in running water. Ensure that plastic concrete does not come in contact with water outside of the confines of the cofferdam. Place concrete in a single continuous operation. To prevent segregation, place the concrete in a compact mass in its final position. Do not disturb the concrete after placement. Place concrete under water using one of the following methods:

1. Tremie Method. When using a tremie, ensure that the tube is at least 10 inches in diameter, and constructed in sections having flanged couplings fitted with gaskets. Support the tremie to allow free movement of the discharge end over the entire placement area and to allow its being lowered rapidly to choke off or retard the flow. Ensure that the discharge end is completely submerged in concrete at all times and the tremie tube contains sufficient concrete to prevent water entry.

2. Bottom-Dump Bucket Method. When using a bottom-dump bucket to place concrete, ensure that the bucket has a capacity of at least 1/2 cubic yard and loose fitting top covers. Gradually lower the bucket until it rests upon the prepared foundation or upon concrete already placed. Then gradually raise the bucket while discharging the concrete, to maintain as near still water as possible at the point at discharge.

Ensure that depressions in the top of the seal are less than 6 inches below the specified elevation and peaks are less than 6 inches above the specified elevation. The RE will take soundings during placement of the final lift of each seal, before initial set. Cut areas exceeding the 6 inch tolerance to within the permissible height above the theoretical top of the seal.

C. Dewatering. If required, submit a dewatering plan to the RE for approval. Include the method of dewatering and controlling sediment and contaminants from entering adjacent waterbodies, wetlands, and environmentally sensitive areas. Do not use earthen berms as a method of dewatering. Before placing the tremie seal, clear the bottom of excavation of objectionable material. Do not dewater while placing concrete and for at least 24 hours after completion of the tremie seal.

Do not begin dewatering a sealed cofferdam until the seal has cured to withstand the hydrostatic pressure. Dewater the cofferdam and clean the seal of laitance.

D. Removal. Remove the cofferdam to the limits shown on the Plans after completion of the substructure. Restore disturbed areas, including watercourse beds, to original conditions.

501.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Pay Item	*Pay Unit*
PERMANENT SHEETING, DPW WALL	SQUARE FOOT
TEMPORARY COFFERDAM, BRIDGE E	LUMP SUM
TEMPORARY COFFERDAM, BRIDGE F	LUMP SUM

The Department will measure the square footage of PERMANENT SHEETING by multiplying the average height and length of sheeting that is driven. The Department will determine the average height as the average of each full height sheeting section.

Separate measurement and payment will not be made to furnish, install, maintain, remove, and perform all associated work for the demolition and removal of existing drainage structures, excavation support, dewatering operations, temporary storm sewers, temporary storm sewer outfall, temporary pollution control to maintain water quality, and temporary soil erosion & sediment control measures. All costs thereof shall be included in the price bid for the TEMPORARY COFFERDAM items.

Separate measurement and payment will not be made for the cofferdams for Pedestrian Bridges A, B, and C. All costs thereof shall be included in the price bid for the lump sum pedestrian bridge items described in Sections 504 and 505.

SECTION 502 – LOAD BEARING PILES

502.01 DESCRIPTION

THE FOLLOWING IS ADDED:

The work in this section covers installation of steel W-sections for the Department of Public Works (DPW) wall, timber piles for the boardwalks and piers, and steel H-piles for the Bridge F piers.

THE FOLLOWING IS ADDED REGARDING THE TREATED TIMBER PILES:

A. General.

The work in this section covers installation of boardwalk and pier piles as indicated on the plans and specified herein.

B. Section Includes.

a. Preparation of pile layout drawings based on design plan layout for boardwalk and pier structural drawings.
b. Furnishing and delivering treated foundation piling for boardwalk and pier structure installations.
c. Coordination of pile installation with demolition, earthwork, and boardwalk and pier framing and installation.
d. Layout and installation of boardwalk and pier foundation piles in accordance with the design plans and specifications.
e. Resurvey and submittal of as-driven pile locations and replacement of mis-driven piles, if and where necessary.
f. Cutoff of foundation piles at the design cutoff elevation and application of preservative coatings to all pile cutoffs.

C. References.

a. Occupational Safety and Health Administration Standard No 1926. Subpart P, Subpart E, Subpart S, Subpart AA and Subpart CC Standards and Interpretations
b. ASTM Construction Standards.
    1) ASTM D25 – Standard Specification for Round Timber Piles
    2) ASTM D2899 – Standard Practice for Establishing Allowable Stresses for Round Timber Piles
c. ANSI/AWC NDS2024- – ASD/ LRFD National Design Specification for Wood Construction and Supplement.
d. U1-24 American Wood Protection Association standard – Use Category System: User Specification for Treated Wood
    1) AWPA Preserved Wood Use Category for Piles -UC5B for Marine Use, Central Waters (Salt or Brackish Water)

D. Quality Assurance.

a. Furnishing pile driving equipment suitable for pile installation from both on-shore and/or within the lake as required to complete the work.
b. Furnishing piles conforming to the ASTM material standards and treatment standards.
c. Providing templates for careful alignment of timber boardwalk and pier piles to close tolerances required for structural members.
d. Continuous inspection of pile installation and maintenance of records of pile dimensional characteristics, penetration resistance, final driven length and deviation from tolerances.
e. Driving of bearing piles to both the minimum depth and depth required to develop the formula bearing capacity of the piling, whichever is deeper.
f. Provision of equipment to penetrate obstructions in the upper layer, if required, and maintain piling close to the design alignment for support piling.
g. Cutting off of piles to the design elevation.
h. Application of field applied preservative coatings to pile cutoffs.

E. Submittals.

The following material submittals shall be made prior to performing the related items of work:

a. Pile Layout and Numbering Plans for each structure requiring piles.
b. Pile material and treatment certificates.
c. Description of driving equipment to be used for each class of pile listed in the pile schedule on the drawings and at each structure requiring piles.
d. Inspectors pile driving logs, summaries and certification of driving records.
e. Pile resurvey for pier and bearing piles.

F. Delivery, Storage and Handling.

a. Deliver piles to the project site in such quantities and at such times to maintain the project schedule.
b. Carefully handle piles by means of rope slings or other means which will not break the wood preservative seal. Store and handle materials to prevent physical damage.

G. Pile Inspection Service.

a. All members shall be subject to the inspection by the Engineer in order to confirm compliance with the drawings, specifications and specified standards.
b. The Owner shall retain the Design Engineer to inspect and log bearing pile installation and monitor the installation depth of other classes of piling indicated on the schedule. Summary records kept by the Design Engineer shall include:

    1) Date and time when driven
    2) Pile length, tip elevation, and cut-off elevation
    3) Type, weight and stroke of hammer, operating frequency
    4) Final penetration resistance
    5) Apparent deviation from location and plumb
    6) Pile heave and re-drive measurements

502.02 MATERIALS

THE FOLLOWING IS ADDED REGARDING THE TREATED TIMBER PILES:

a. Timber piles shall be round, clean peeled, in one piece from butt to tip, Marine Grade Southern Pine No.1 or better, complying with ASTM D25, with minimum tip diameter of 10 inches or as indicated on the contract drawings, and a minimum reference design values of 1250 psi (Table 3-1 NDS).and flexural stress of 1950 psi (Table 3-1 NDS). The values are given for piles treated with a preservative using a steam conditioning or Boultonizing processes. For piles that are air dried or kiln-dried prior to treating stresses may be increased by 11% to 18%.
b. All classes of piles shall be treated in accordance with the reference AWPA Standard for Use Category 5B for Marine piling and as listed in Table 915.05-2 of the Standard NJDOT Specifications. Minimum preservative retention level and treatment shall be 2.5 pcf CCA
c. Apply compatible preservative to cuts and abrasions that will be exposed above grade.

502.03 CONSTRUCTION

502.03.03 Driving Piles

C. Test Piles.

THE FIRST PARAGRAPH IS CHANGED TO:

Test piles of the specified materials, dimensions, and at the designated locations shall be furnished and driven with an impact hammer unless specifically stated otherwise in the Special Provisions or on the plans. In general, lengths of test piles will be greater than the estimated length of production piles to provide for variation in soil conditions. The driving equipment and procedure (criteria) used for driving test piles shall be identical to that which the Contractor proposes to use on the production piles. The Contractor shall excavate the ground at each footing location to the elevation of the

bottom of the footing before the pile is driven. Test piles shall be driven at the designated locations to the bearing capacity and tip elevation that is shown on the Plans. The RE shall be the sole judge in determining bearing capacity and the length of pile to be driven.

1. Static Pile Load Test.

THE FOLLOWING IS ADDED:

Empirical Pile Formula. If no other methods of determining pile capacity are stated in the Special Provisions or Plans, then the Engineering News-Record (ENR) formula shall be used.

Procedure A (Quick Test), in accordance with ASTM D1143, shall be the testing method used.

THE FOLLOWING IS ADDED REGARDING THE TREATED TIMBER PILES:

A. Coordination of the Work.

a. Coordinate with the Owner and the Township to zone areas for work and stockpiling.
b. Remove excess materials and scrap as quickly as possible.
c. Provide notice to the Owner if and when it is necessary to work in areas used for their operation.

B. Safety Procedures.

a. Perform all operations in accordance with OSHA procedures for job health and safety. Adhere to the precautions of material data safety sheets for preservative materials to be applied on the project.
b. Control dust, coating residues and waterborne debris in accordance with permit requirements and environmental regulations having jurisdiction.

C. Driving Equipment.

a. Furnish pile driving equipment of a type generally used in standard pile driving practice, operated at manufacturer's specified rate, to develop the required rated energy per blow. Boardwalk and pier foundation piles shall be driven by single or double acting stream or air or diesel hammers.
b. Use a hammer with rated driving energy of not less than 8,700 nor more than 15,000-foot pounds per blow. The hammer shall be equipped with a driving helmet capable of protecting the pile head and providing uniform distribution of hammer energy to the pile head.
c. Use fixed or swinging rigid leads to maintain close tolerances required for boardwalk and pier foundation piles. Driving with free hammers shall not be acceptable.

D. Survey Lines and Levels.

a. The Contractor shall establish framing lines and pile locations in each area and shall be responsible for accurate location of the piles. Precise driving will be required due to the framing requirements of the boardwalks and piers. Use templates and fixed rigid leads.
b. The Contractor shall provide the Engineer with a re-survey of piles within 48 hours of completion of driving in each bearing structure. The pile rig shall remain at the site until completion of the re-survey and evaluation as to whether replacement piles and/or additional piles will be required.

E. Pile Driving.

a. Mark each pile by painting a horizontal line at 1-foot intervals and the number of feet at intervals of 5 feet.
b. Pile design loads are indicated on the schedule for piles. Continuously drive each pile at the locations indicated to the net driving resistance established by the Engineering News Formula and/or to the minimum length indicated on the pile schedule, whichever is deeper. Bearing piles shall be driven to the required resistance over a distance of at least one foot.

c. Practical refusal shall be considered as a driving resistance of 3 blows per inch for the single acting hammer or an equivalent resistance for a hammer of less energy as determined by the Engineering News Formula.
d. Carefully plumb the leads and the pile before driving. Take care during driving to prevent and to correct any tendency of the pile to rotate.
e. Provide a spud, if required, to penetrate resistant fills in the upper layers prior where obstructions are encountered that may cause the piles to drift.

F. Driving Tolerances.

a. Boardwalk and pier foundation piles shall be driven to within 3 inches from the location of the center of gravity of the single support piles.
b. Maintain plumbness of the piles within 1 inch in 10 feet vertical.

G. Pile Heave.

a. Compile recorded instrument observations made during pile driving to determine whether a driven pile has lifted from its original seat during the driving of adjacent piles.
b. If a pile has heaved, re-drive the pile to at least its original depth and original driving resistance.

H. Damaged or Misdriven Piles.

a. Damaged piles and bearing piles driven beyond the tolerances will not be accepted.
b. Coordination of pile installation with demolition, earthwork, and boardwalk and pier framing installation.
c. Withdraw damaged piles or mis-driven piles where feasible to avoid the necessity of redesigning the structural framing wherever possible.
d. Replace damaged or mis-driven piles with new piles.
e. Piles mis-driven due to inadequate support during driving or damaged due to structural flaws or improper driving shall be replaced at no additional cost to the Owner.

I. Pile Cutoffs.

a. Precisely cutoff bearing piles horizontal and level at the elevations required to receive the boardwalk and pier cap girders. Piles shall not be notched vertically. Girder shims shall be used to compensate for differences between girder width and pile butt diameters and for minor pile deviation within the prescribed tolerance limits.
b. Coat the cutoff ends of the piling with preservative coating and plastic cap.

502.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Pay Item	*Pay Unit*
FURNISHING EQUIPMENT FOR DRIVING PILES, BRIDGE F	LUMP SUM
FURNISHING EQUIPMENT FOR DRIVING PILES, DPW WALL	LUMP SUM
FURNISHING EQUIPMENT FOR DRIVING PILES, KAYAK STORAGE PIER	LUMP SUM
TEST PILE, FURNISHED, STEEL PILE, W 30 X 211	LINEAR FOOT
TEST PILE, FURNISHED, TIMBER PILE, 12” DIAMETER	LINEAR FOOT
TEST PILE, FURNISHED, STEEL H-PILE, HP 10 X 42	LINEAR FOOT
TEST PILE, DRIVEN, STEEL PILE, W 30 X 211	LINEAR FOOT
TEST PILE, DRIVEN, TIMBER PILE, 12” DIAMETER	LINEAR FOOT
TEST PILE, DRIVEN,STEEL H-PILE, HP 10 X 42	LINEAR FOOT
DYNAMIC PILE LOAD TEST	UNIT
STEEL PILE, FURNISHED, W 30 X 211, DPW WALL	LINEAR FOOT
STEEL PILE, DRIVEN, W 30 X 211, DPW WALL	LINEAR FOOT
TIMBER PILE, FURNISHED, 12” DIAMETER, KAYAK STORAGE PIER	LINEAR FOOT
TIMBER PILE, DRIVEN, 12” DIAMETER, KAYAK STORAGE PIER	LINEAR FOOT
STEEL H-PILE, FURNISHED, HP 10 X 42, BRIDGE F	LINEAR FOOT

Pay Item	*Pay Unit*
STEEL H-PILE, DRIVEN, HP 10 X 42, BRIDGE F	LINEAR FOOT
STATIC PILE LOAD TEST (ONLY IF AND WHERE ORDERED)	UNIT

THE FOLLOWING IS ADDED:

The Department will pay 75 percent of the lump sum price bid for each FURNISHING EQUIPMENT FOR DRIVING PILES item when the equipment necessary for driving piles is furnished and driving of test piles has started on an individual structure basis. The Department will pay the remaining 25 percent when the work of driving piles is completed on an individual structure basis.

Separate measurement and payment will not be made for cutting off of the piles. All costs thereof shall be included in the price bid for the various pile items.

Pile driving test quantities shall be as follows:

- A minimum of one pile driving test shall be performed at each Bridge F pier (3)
- A minimum of two pile driving tests shall be performed at the DPW wall (2)
- A minimum of one pile driving test shall be performed at the kayak storage pier (1)
- Six (6) total tests are anticipated

Test piles shall be driven at designated production pile locations prior to commencing production pile driving. All material, equipment and labor required to perform the pile testing shall be included in the price bid for DYNAMIC PILE LOAD TEST. The Department will not make separate payment for dynamic pile load tests and CAPWAP analysis performed on piles that require restriking.

The unit price for the STATIC PILE LOAD TEST (ONLY IF AND WHERE ORDERED) item generally includes the furnishing of all labor, mobilization and demobilization, transportation, plant and equipment, materials, tools, consulting engineering services, and other essentials and incidentals necessary to perform static pile load testing for the steel H-piles and the timber piles in accordance with the Contract Documents and Drawings, per ASTM D1143. Static Pile Load Testing shall not be performed except, if and where directed by the Engineer, to measure the static bearing capacity of piles due to unanticipated conditions, if encountered, in the driving of piles and/or to compare with the results of the dynamic pile testing and resolve disagreements on the production pile driving criteria. Tests performed to further evaluate the bearing strata shall be paid for in accordance with the unit price bid. Testing performed to resolve issues related to improper performance of the Dynamic Load Testing Program shall be performed at no additional cost to the Owner.

The work associated with this item includes, but is not necessarily limited to: all mobilization and demobilization; submittals and review for support of the test reaction, test instrumentation, and test procedures; furnishing and setup of the pile reaction; furnishing of and set up of calibrated jack; preparation of the pile head; installation of test gage frames, wire gages and rulers; consulting engineering services, transportation, labor, materials and equipment necessary to perform the pile load test; performance of the pile load test by the qualified test agency; submittal of the test pile report; and, all associated work in accordance with the Contract Documents. No payment shall be made for static pile load tests if the testing indicates that the piles do not achieve the required bearing capacity due to deficient pile materials, or the inadequacy of the equipment used to drive the piles.

SECTION 504 – STRUCTURAL CONCRETE

504.01 DESCRIPTION
THE FOLLOWING IS ADDED:

This work shall also consist of the construction of a Portland cement thin veneer architectural finish simulating stone masonry which shall appear natural.

This work shall also include the furnishing of all materials and labor for:

(a) Installation of architectural form liners simulating the appearance of stone masonry on exposed concrete surfaces as shown on the contract documents for the abutments, wingwalls and pier walls for Bridge F only.
(b) Staining of form lined concrete surfaces to simulate the natural appearance of stone masonry construction for the abutments, wingwalls and pier walls for Bridge F only.

504.02 MATERIALS
THE FOLLOWING MATERIAL IS ADDED TO THE LIST

Concrete Stain 912.01.04

THE FOLLOWING IS ADDED:

Architectural Form Liners:

Form liner material	Plastic or elastomeric type for single or repetitive use applications
Relief	2 inch maximum, 1-1/4 inch average
Pattern	Stone pattern and colors to be submitted to Engineer and Owner for review and approval

Concrete stain for form lined surfaces:

100% Acrylic resin with inorganic pigmented stain forming a breathable film allowing trapped moisture vapor to safely migrate through the coating without blistering or peeling. The variation of stain colors in the concrete stone and concrete bands above the stone form liner patterns shall be as specified in section 504.03.04.

Stone formliners to be provided on exterior vertical faces at all Bridge "F" abutments, wingwalls, and piers. The stone formliners shall closely match a Stonemont Split Ledge pattern or approved equal. Contractor to submit samples of stone formliners and proposed stain color during the shop submittal process. All material selections are subject to the review and approval of the County and the Engineer prior to installation.

504.03 CONSTRUCTION

504.03.02 Concrete

G. Removal of Forms and Falsework.

Do not remove forms and false work before 14 days following pour or until the concrete obtains a compressive strength of 90% of the design value.

THE FOLLOWING SUBSECTION IS ADDED:

504.03.04 Architectural Form Liners:

The Contractor shall submit the manufacturer's technical data and installation requirements for the proposed form liners and concrete stains for approval by the Engineer. The application of an approved release agent to contact surfaces of the form line, the installation of form liners, and staining of the formed concrete surfaces shall be in accordance with the manufacturer's recommendations.

The concrete form liner system must be approved by the Engineer prior to start of the form work. The Contractor shall construct a separate 4' x 4' wide concrete sample panel using the approved form liner system with the approved simulated pattern and color of the faux masonry stone. The sample panel shall be stained in accordance with Manufacture's recommendations and construction methods approved by the Engineer. The approved test panel shall demonstrate the workmanship, texture and color of faux stone masonry. The sample panel shall be left in place at least one week prior to inspection for approval. The approved panel shall become the project standard for masonry materials, workmanship, and appearance. The test panel shall remain on site for comparison throughout construction of the faux stone masonry within the project limits and shall be removed only after the faux stone masonry on the project has been accepted by the Engineer. Any test panel(s) deemed unacceptable by the Engineer shall be re-done until an acceptable test panel has been constructed by the Contractor. Any unacceptable test panel(s) shall be removed from the project.

After the concrete forms are removed, the Contractor shall clean and prepare the form lined surfaces as required by the manufacturer prior to application of the stain. The color and appearance of the pigmented stains shall be consistent with native stones indigenous to the surrounding environment. The Contractor shall apply a minimum of two coats of stain to the concrete formed surfaces.

504.03.05 Concrete Staining

Prior to staining, examine the surfaces to be stained. Bring areas requiring patching or repair to the attention of the RE.

A. Submittals. Submit product information and manufacturer color chip sample for approval by the Owner.

B. Cleaning. After the concrete areas and any patching has cured for at least 28 days, power wash all surfaces for initial preparation at a minimum pressure of 2,500 psi using a 25 degree tip and a standoff distance of 2 feet. Verify that all foreign materials, such as dirt, dust and form oil, have been removed and surfaces are clean prior to application of primer and stain. If contaminants are still present after initial preparation, vary power washing parameters or use other suitable methods to clean surfaces.

C. Test Staining. Complete a test staining program for porosity, adhesion, and color acceptance before staining operations on approved textural mock-ups or in place according to contract plans. Test area(s) to include both smooth and textured concrete sections. Prepare test area for initial surface preparation as described in 504.03.04.B for inspection by the RE. If the staining mock-ups are approved, they may be included as part of the final construction.

After concrete has cured, test for porosity prior to testing for adhesion or color acceptance, on both the smooth concrete section and the textured concrete section by spraying water onto the surface to be stained. Notify the RE if the water does not absorb rapidly as per manufacturers recommendations.

If the concrete passed the porosity test, apply production stain to concrete as specified in 504.03.04.D. After the manufacturer’s recommended drying time of the stain, test for satisfactory adhesion of stain as described in Table 912.01.04-1.

The final stain color scheme will be approved by the Owner in the field after reviewing and approving the test stain program. Do not order final quantities of stain and primer until approved. When approved the sample area will serve as a standard of acceptance for all further work.

D. Stain and Primer. Apply one coat of primer and one coat of stain to smooth concrete surfaces. Apply one coat of stain, only to textured concrete surfaces.

E. Stain Colors. See the Special Provisions for stain colors.

504.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Pay Item	*Pay Unit*
REINFORCEMENT STEEL, GALVANIZED, BRIDGE E	POUNDS
REINFORCEMENT STEEL, GALVANIZED, BRIDGE F	POUNDS
CONCRETE FOOTING, BRIDGE E	CUBIC YARD
CONCRETE FOOTING, BRIDGE F	CUBIC YARD
CONCRETE WING WALL, BRIDGE E	CUBIC YARD
CONCRETE WING WALL WITH STONE FORMLINERS, BRIDGE F	CUBIC YARD

Pay Item	*Pay Unit*
CONCRETE PIER WALL WITH STONE FORMLINERS, BRIDGE F	CUBIC YARD
CONCRETE ABUTMENT WALL, BRIDGE E	CUBIC YARD
CONCRETE ABUTMENT WALL WITH STONE FORMLINERS, BRIDGE F	CUBIC YARD
CONSTRUCT REINFORCED CONCRETE BRIDGE FOUNDATION A, INCLUDING COFFERDAMS, EXCAVATION, STONE BASE, REINFORCEMENT STEEL, CONCRETE FOOTINGS, ABUTMENTS, WINGWALLS, BACKFILL AND RAILINGS	LUMP SUM
CONSTRUCT REINFORCED CONCRETE BRIDGE FOUNDATION B, INCLUDING COFFERDAMS, EXCAVATION, STONE BASE, REINFORCEMENT STEEL, CONCRETE FOOTINGS, ABUTMENTS, WINGWALLS, BACKFILL AND RAILINGS	LUMP SUM
CONSTRUCT REINFORCED CONCRETE BRIDGE FOUNDATION C, INCLUDING COFFERDAMS, EXCAVATION, STONE BASE, REINFORCEMENT STEEL, CONCRETE FOOTINGS, ABUTMENTS, WINGWALLS, BACKFILL AND RAILINGS	LUMP SUM
CONSTRUCT REINFORCED CONCRETE FOOTINGS, WALLS AND BEAMS FOR BOARDWALKS AT BOAT RAMPS, INCLUDING SUPPORT OF EXCAVATION, EXCAVATION, STONE BASE, REINFORCEMENT STEEL AND BACKFILL	CUBIC YARD

The Department will make payment for reinforcement steel for Bridges E and F in the CONCRETE FOOTING, CONCRETE WING WALL, CONCRETE PIER WALL and CONCRETE ABUTMENT WALL under the REINFORCEMENT STEEL, GALVANIZED items as specified in 504.04.

THE FOLLOWING IS ADDED AFTER THE LAST PARAGRAPH:

No separate payment will be made for architectural form liners and the staining of concrete surfaces. All costs for this work including faux stone masonry sample panel(s) shall be included in the price bid for the items requiring same.

The quantity of concrete for any seals in cofferdams will not be measured separately for payment. The cost thereof shall be included in the items requiring same.

Concrete structures shall be rejected and ordered repaired or replaced by the Engineer if any or all of the following should occur or exist:

a. Staining or discoloration of concrete.
b. Concrete is out of horizontal alignment in excess of 1”.
c. Concrete is out of vertical alignment in excess of 1”.
d. Joints and surface are improperly finished or aligned.
e. Expansion joints protrude from concrete.
f. Cracks, chips, or other damage occur in construction or maintenance period.
g. Settlement of concrete.
h. Inspection not requested of forms and reinforcing prior to pouring concrete.
i. Improper vibration of concrete.
j. Vandalism during initial setup of concrete.
k. Improper installation or placement of components

These deficiencies must be corrected prior to opening of structures to the satisfaction of the Engineer at no additional cost to the Owner.

.SECTION 509 – BRIDGE COMBINATION RAILING, MISCELLANEOUS RAILINGS, AND FENCE

509.01 DESCRIPTION

THE FOLLOWING IS ADDED:

This Sections describes the requirements for constructing timber railing and fence on and/or directly adjacent to the approach walls and wingwalls leading to each pedestrian bridge.. Metal railing includes metal railing components for combination traffic railing system, combination non-traffic railing system, non-traffic pedestrian or bicycle railing, ornamental railing and other railing not subject to vehicular impact.

The Contractor shall provide all labor, materials, equipment and incidentals necessary to furnish and install new pedestrian bridge approach timber railing, as shown on the construction drawings, as directed by the Engineer, and specified herein.

The timber railing shall be constructed at locations shown on the construction drawings and/or as directed by the Engineer.

All construction work and required materials including various sizes of timber railings and posts, galvanized steel hardware, anchorage assembly, concrete footings (if required), excavation and backfilling (if required), stain finish, final cleanup, coordination, and all associated work and appurtenances; shall be in accordance with the details and specifications as contained on the plans, as directed by the Engineer or as required to fulfill the intent of same. All work must be approved by the Engineer.

Contractor shall provide shop drawings to the Engineer for approval prior to construction.

The Contractor shall provide all work necessary to satisfactorily complete the improvements in a first-class manner acceptable to the Engineer.

The Contractor shall restore to original condition any area of materials, improvements, vegetation, etc. damaged or disturbed in any way during the performance of the work specified under this section.

Restoration of areas disturbed shall be performed to the satisfaction of the Engineer and in accordance with other applicable sections of these Specifications.

SUBMITTALS

A. General: Submit each item in this Article according to the General Conditions of the Contract .

B. Wood treatment data as follows, including chemical treatment Manufacturer's instructions for handling, storing, installing and finishing treated materials.

C. Payment for the work as outlined within this section including, but not limited to, all labor, equipment and materials required to satisfactorily complete the work, shall be included in the lump sum items for Bridges A Through C, and the wingwall items for Bridges E and F, as detailed in the Contract Drawings requiring wood and timber work, including, but not limited to, the following: new pressure treated timber railing and new pressure treated timber post.

a. For each type of preservative-treated wood product, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained and compliance with applicable standards.

b. For waterborne-treated products, include statement that moisture content of treated materials was reduced to levels indicated before shipment to Project site.

D. Warranty of chemical treatment Manufacturer for each type of treatment.

QUALITY ASSURANCE

A. Forest Certification: For the following wood products, provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, "Principles and Criteria".

a. Pressure Treated Timber Railing.

b. Pressure Treated Timber Post.

DELIVERY, STORAGE AND HANDLING

A. Keep materials under cover and dry. Protect them from weather and contact with damp or wet surfaces. Stack lumber, railings, posts, and other timber material. Provide for air circulation within and around stacks under temporary coverings.

a. For lumber and timber pressure treated material with waterborne chemicals, place spacers between each bundle to provide air circulation.

509.02 MATERIALS

THE FOLLOWING IS ADDED FOR THE TIMBER RAILINGS:

LUMBER - GENERAL

A. Lumber Standards: Comply with DOC PS 20, “American Softwood Lumber Standard,” and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee’s (ALSC) Board for review.

B. Inspection Agencies: Inspection agencies, and abbreviations used to reference them, include the following.

a. NELMA – Northeastern Lumber Manufacturers Association.

b. NLGA – National Lumber Grades Authority (Canadian).

c. SPIB – Southern Pine Inspection Bureau.

d. WCLIB – West Coast Lumber Inspection Bureau.

e. WWPA – Western Wood Products Association.

C. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing and mill.

WOOD – PRESERVATIVE / TREATED MATERIALS

A. General: Where lumber is indicated as preservative treated or is specified to be treated, comply with applicable requirements of AWPA C2 (lumber). Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.

a. Do not use chemicals containing chromium or arsenic for exposed wood.

b. CCA treatment may be used for wood covered by sheet metal flashing, roofing or untreated trim.

B. Pressure treat aboveground items with waterborne preservatives to a minimum retention of 0.25 lb./cu. ft. (4.0 kg/cu. m). After treatment, kiln-dry lumber to a maximum moisture content of 19. Treat indicated items and the following:

a. Pressure Treated Timber Railing.

b. Pressure Treated Timber Post.

RAILINGS

Timber for the railings shall be 2" x 12" No. 2 or better southern yellow pine or dense select structural lumber as shown on the drawings. All railings shall be pressure treated with waterborne preservatives or approved equal.

All lumber shall be new and in good condition with squared ends and edges, free of any warps, bends, rot, cracks, or other weaknesses and imperfections.

POSTS

All posts shall be 6" x 12" No. 2 or better southern yellow pine or dense select structural lumber as shown on drawings. All posts shall be in lengths as shown on the detail.

All posts to be chamfered one (1") inch at top, as shown on the plans.

All posts are to be shall be pressure treated with waterborne preservatives or approved equal.

All posts shall be new and in good condition with squared ends and edges, free of any warps, bends, rot, cracks, or other weaknesses and imperfections.

HARDWARE

Hardware for bolting posts and rails together shall consist of 5/8" diameter hot dipped galvanized steel lag bolts with corresponding hot-dipped galvanized steel washers.

Hardware for the connection of the posts to the top of the wingwalls shall consist of hot dipped galvanized bolts with corresponding hot-dipped galvanized steel washers as indicated on the Contract Plans.

STAINING AND PAINTING

Stain shall be an exterior penetrating oil-base wood stain as manufactured by Minwax Wood Finish or approved equal. All timber members shall be stained with "Jacobean 2750" color, or approved equal. Stain manufacturer and color samples shall be submitted to the Engineer and Owner for review and approval prior to furnishing and application.

Where applicable, paint shall be an exterior oil base enamel paint, suitable for use on metal, as selected by the Engineer, to match bridge approach timber rails. Color samples shall be provided for approval prior to ordering paint.

509.03 CONSTRUCTION

THE FOLLOWING SUBSECTION IS ADDED:

509.03.03 TIMBER RAILING

All workmanship and construction shall be of high quality and professionalism.

All work shall be done in a manner that minimizes disturbance to adjacent improvements. Should any damage to the surrounding improvements occur as a result of the methods and operations utilized by the Contractor, he will be

responsible to provide an acceptable repair or new material, if required, of the same type to replace that which is damaged at no additional cost to the Owner.

If applicable, holes for posts to be dug by hand or with a power auger to prescribed depths as shown on plans. Contractor has the responsibility to ascertain possible presence of underground utilities, etc., prior to construction.

Posts to be set plumb and perfectly vertical to the horizontal ground plane, and checked with carpenter's level. Anchorage assembly shall be detailed and fabricated to follow the top slope of each wingwall as indicated on the Contract Plans. Concrete footings, if required, shall be Class B (4,500 psi) concrete and constructed to the dimensions shown on the plans, for each post. All posts not mounted to top of wingwalls shall be securely set in concrete with holes extending four (4) inches below finished ground surface, unless otherwise indicated on the construction detail. Where applicable, tops of footings shall be crowned to allow water to runoff. All posts must be within one (1") inch plumb.

Location of all posts to be staked by the Contractor and approved by the Engineer prior to digging of holes, if required.

Location of all posts to be laid out by the Contractor and approved by the Engineer prior to pouring the wingwalls, so as to avoid potential conflicts between the post anchors and the wingwall reinforcement.

The rails shall be level and parallel to the top slope of the wingwalls or the plane of the ground, if applicable. Bottom of rail shall be at the prescribed height above the ground / top of wingwalls. Spacing of rails as per construction detail.

Holes for lag bolts shall be pre-drilled. All rails shall be securely bolted to the posts as shown on the details.

All cut surfaces shall be treated in accordance with the requirements of AWPA for brush or spray treatment of field cuts. A one (1") inch chamfer shall be constructed along the top edge of all timber posts and the timber rail at the end of the rail.

Lag bolts to be flush with railings.

Protruding ends of the exposed lag bolts shall be cut as approved by the Engineer. All cut bolt ends shall be free from sharp edges or burrs.

Stain / paint shall be applied evenly and uniformly via rag or brush, along all faces and edges of the timber / steel rail components. Spillage or discoloration is unacceptable and is cause for rejection of the timber rail.

Work area shall be kept neat, free from any debris whatsoever resulting from the construction of the timber railing, on a day-to-day basis.

ALL WORK SHALL BE GUARANTEED FOR ONE YEAR FROM THE DATE OF ACCEPTANCE AGAINST ALL DEFECTS IN MATERIAL AND WORKMANSHIP. REPAIRS IF NECESSARY SHALL BE DONE PROMPTLY AT NO COST TO THE OWNER.

509.04 MEASUREMENT AND PAYMENT

Payment for the furnishing and installation of bridge approach timber railings shall be included in the lump sum items for Pedestrian Bridges A Through C, and the wingwall items for Bridges E and F, described in Sections 504 and 505 and shall include all costs for materials, labor, equipment, excavation and backfill (if required); various sizes of timber railings and posts; galvanized steel hardware, anchorage assembly, concrete footings (if required), application of stain finish, shop drawings, final cleanup, restoration, coordination and all else necessary and incidental to the satisfactorily completion of the timber railings in accordance with the Plans, Specifications and the direction of the Engineer.

SECTION 510 –TIMBER STRUCTURES

510.01 DESCRIPTION

THE FOLLOWING IS ADDED:

A. General.

This Section describes the construction requirements for the timber boardwalks, piers at the boat ramp, and the kayak storage pier as indicated on the plans and specified herein.

B. Section Includes.

a. Fabrication of steel fittings, connecting plates, and galvanizing the fabrications in accordance with the approved shop drawings.
b. Furnishing and delivering of treated boardwalk and pier framing lumber.
c. Installing and anchoring the treated timber deck framing including joists, bridging, and supplementary connections for railing systems, and architectural deck fittings as indicated.
d. Furnishing and delivering decking in accordance with the approved shop drawing details.
e. Installing decking in accordance with the approved manufacturer's installation drawings.
f. Furnishing and delivering galvanized steel deck grating as indicated herein and in accordance with the approved shop drawing details.
g. Framing of boardwalk and pier beams and bracing for ramp area piers in accordance with the approved shop drawing details.
h. Framing of boardwalk and pier decks.
i. Installation of railings on the boardwalks and piers.

C. References (As Required).

a. Occupational Safety and Health Administration Construction Standards and Interpretations Construction Industry Standards Related excavation safety, heavy construction and waterfront work.
b. ASTM Construction Standards.
    1) ASTM A36 – Structural Steel
    2) ASTM A307 – Carbon Steel Externally Threaded Fasteners
    3) ASTM A325 – High Strength Bolts for Structural Steel
    4) ASTM A163 – Hot Dip Galvanizing
    5) ASTM D5456 – Standard Specification for Evaluation of Structural Composite Lumber Products
    6) ASTM D2559 – Standard Specification for Adhesives for Bonded Structural Wood Products for Use Under Exterior Exposure Conditions
c. Structural Steel Painting Council.
d. American Welding Society – AWS D1.1 Structural Welding Code.
e. National Forest Products Association – National Design Specification.
f. Timber grading rules for applicable species used in the construction.
g. American Wood Preservers Association treatment standards.
    1) AWPA Standard C2 – Lumber, Timbers, Bridge and Mine Ties and timbers

D. Quality Assurance.

a. Fabricating and galvanizing steel connection hardware and pile caps in accordance with approved shop drawings, codes and standards.
b. Furnishing treated structural PSL Composite lumber in accordance with the approved shop drawings.
c. Connecting and aligning girders and substructure frames in accordance with the approved shop drawing details.
d. Pre-boring of holes for large nails, and lag screws.
e. Application of field applied preservatives to drill holes, cut ends, etc.
f. Furnishing standard treated lumber conforming to grading rules for specified grades and species.
g. Framing and connecting deck systems in accordance with approved shop drawing details.

h. Installation of deck fixture anchorages in accordance with design and approved shop drawing details.
i. Installation of decking, rails and/or gates in accordance with approved shop drawing details.
j. Field applied coating and/or painting.

E. Submittals.

The following material submittals shall be made prior to performing the related items of work:

a. Fabricator's twist ties, connecting plates, clevis and tie rod connectors, bolts, special plate washers, and other materials indicated on the plans.
b. Submit galvanizer's certificates for steel fabrications and hardware as required.
c. Submit substructure framing shop drawings indicating member sizes and connection locations for timber framing, connectors, fender beams, etc. for the boardwalks and piers.
d. Submit treatment certificates for parallel strand framing and standard lumber.

F. Delivery and Storage.

a. Store and handle materials to prevent physical damage.

G. Inspection.

a. All members shall be subject to the initial inspection by the Engineer in order to confirm compliance with the drawings, specifications and specified standards.

510.02 MATERIALS

THE FOLLOWING IS ADDED:

A. Steel Connection Fabrications (If Required).

a. Steel connection and fabrications shall be constructed using steel plate and/or rolled sections fabricated from steel conforming to ASTM A36.
b. Shop drawings shall be prepared by a qualified steel detailer and shall be based on the design drawing details. Coordinate with as driven piling plans to confirm final angles for diagonal struts, if required.
c. Welding shall conform to AWS D1.1 Structural Welding Code by experienced welders.
d. Welds shall be performed using minimum E60 electrodes.
e. All fabrications shall be hot dip galvanized after fabrication.

B. Metal Specifications (If Required).

a. Plate washers, cap angles and plates – ASTM A36 – Fy = 36,000 psi minimum.
b. Bolts: ASTM A307, nuts shall be compatible and develop the strength of the bolt.
c. Tie rods: ASTM A36.
d. All of the bolts, tie rods, plates and nuts shall be hot dip galvanized in accordance with ASTM A153. The zinc coating shall be Class A, two ounces of zinc per square foot of hardware surface.
e. Galvanized tie rods shall be shop coated with coal tar epoxy bitumastic after treating the galvanized tie rods with passivator and primers.

C. Framing Lumber.

a. All timbers, dimension lumber and boards shall be graded and carry an identifiable grade mark in accordance with the Grading Rules of the Southern Pine Inspection Bureau. The in-place length of lumber shall be as shown on the drawings.
b. Lumber shall conform to the following specifications:
    1) Joists and railings: Marine Grade No 1 (Kiln Dried After Treatment to 19% max. moisture content) 2" to 4" thick and surfaced on all four sides with minimum reference design values as follows:

a) for 8" wide: F_b = 1250 psi, F_v = 175 psi, F_c = 1500 psi and F_t = 800 psi
b) for 10" wide: F_b = 1050 psi, F_v = 175 psi, F_c = 1450 psi and F_t = 700 psi
c) for 12" wide: F_b = 1000 psi, F_v = 175 psi, F_c = 1400 psi and F_t = 650 psi

2) Lumber above elevation 48.7 shall be treated with CCA in accordance with the AWPA standard requirements for Use Category 4B. Minimum retention of preservative shall be 0.6 pcf. Lumber below elevation 48.7 shall be treated in accordance with requirements for Use Category 5B to a minimum of 2.5 pcf. Materials shall be branded or tagged with lettering, the supplier's brand, plant designation, treatment date, species of lumber and the type of preservative.

D. Metal Railings.

a. Aluminum railings, if present, shall be 6061-T6 mill finished, clear anodized aluminum. All fasteners shall be Type 304 stainless steel.
b. Aluminum welding shall be 100% MIG with 5356 alloy filler.

510.03 CONSTRUCTION

THE FOLLOWING IS ADDED:

A. Coordination of the Work.

a. Coordinate with the Owner to zone areas for work and stockpiling.
b. Remove excess materials and scrap as quickly as possible.
c. Provide notice to the Owner if and when it is necessary to work in areas used for their operation.

B. Safety Procedures.

a. Perform all operations in accordance with OSHA procedures for job health and safety.
b. Control dust, coating residues and waterborne debris in accordance with permit requirements and environmental regulations having jurisdiction.

C. Boardwalk and Pier Substructure Framing.

a. Trim piling as required to install and align the timber split pile caps along the lines of the pile bents.
b. Install cross braces and diagonal struts, as required.
c. Whenever possible, precut and pre-bore lumber to size before assembly. Treat bore holes with field applied preservative.
d. Apply field preservative to all cuts prior to assembly.
e. Accurately set and assemble substructure framing in accordance with the approved shop drawings.
f. Bolt holes shall be of the minimum diameter so that bolts are installed using light tapping.
g. Pre-bore holes for nail, lag screw and drift pin holes as required to prevent splitting of the wood.

D. Boardwalk and Pier Deck Framing and Deck Installation.

a. Install joists at design spacing and lengths and anchor to the substructure in accordance with the plan and anchorage details.
b. Install continuous solid bridging over supports and at mid span and/or as indicated on the drawings.
c. Layout deck fixture locations and install anchors in accordance with the design drawings and approved shop drawing details.
d. Install railing system as indicated on the drawings.

E. Inspection.

The Owner shall retain the Design Engineer to review shop drawings and inspect the boardwalk and pier construction. The presence of the Engineer or his representative shall not relieve the Contractor of his responsibility to install the boardwalks and piers in accordance with plans, specifications and codes and standards having jurisdiction.

510.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Pay Item	*Pay Unit*
CONSTRUCT BOARDWALKS FOR BOAT RAMP	SQUARE FOOT
CONSTRUCT KAYAK STORAGE PIER	SQUARE FOOT

Each square foot pay item listed above shall include all materials and appurtenances required to furnish and construct each structure as shown on the contract plans and as described in the specifications. Each pay item shall include, but not be limited to, the framing, bracing, connections, steel connection fabrications, metal specifications, framing lumber, decking, railings, finishes and all other items required to construct a complete system.

SECTION 513 – RETAINING WALLS

513.01 DESCRIPTION

The following is added.

The Contractor shall provide all labor, materials and equipment necessary to construct retaining walls made of high-strength modular concrete decorative blocks at the locations indicated on the contract drawings and in accordance with the details provided.

513.01.01 General

Work includes furnishing and installing modular concrete block retaining wall units to the lines and grades designated on the construction drawings and as specified herein.

513.01.02 Reference Standards

A. ASTM C1372 - Standard Specification for Segmental Retaining Wall Units.
B. ASTM C1262 - Evaluating the Freeze thaw Durability of Manufactured CMU's and Related concrete Units.
C. ASTM D698 - Moisture Density Relationship for Soils, Standard Method.
D. ASTM D422 - Gradation of Soils.
E. ASTM C140 - Sample and Testing Concrete Masonry Units.

513.01.03 Delivery, Storage and Handling

A. Contractor shall check the materials upon delivery to assure proper material has been received.
B. Contractor shall prevent excessive mud, cementitious material, and like construction debris from coming in contact with the materials.
C. Contractor shall protect the materials from damage. Damaged material shall not be incorporated in the project (ASTM C1372).

513.01.04 Contractor Requirements

Contractors shall be trained and certified by local manufacturer or equivalent accredited organization.

A. Allan Block and NCMA have certification programs that are accredited. Identify when advanced certification levels are appropriate based on complexity and criticality of project application.
B. Contractors shall provide a list of projects they have completed.

513.02 MATERIALS

The following is added:

513.02.01 Modular Wall Units

A. Wall units shall be Allan Block Retaining Wall units as produced by a licensed manufacturer, or approved equal.
B. Wall units shall have minimum 28-day compressive strength of 3000 psi (20.7 MPa) in accordance with ASTM C1372. The concrete units shall have adequate freeze-thaw protection with an average absorption rate in accordance with ASTM C1372 or an average absorption rate of 7.5 lb./ft³ (120 kg/m³) for northern climates and 10 lb./ft³ (160 kg/m³) for southern climates.
C. Exterior dimensions shall be uniform and consistent. Maximum dimensional deviations on the height of any two units shall be 0.125 in. (3 mm).
D. Wall units shall provide a minimum of 110 lbs total weight per square foot of wall face area (555 kg/m²). Hollow cores to be filled with wall rock and compacted by using plate compactor on top of wall units (see section 3.4). Unit weight of wall rock in cores may be less than 100% depending on compaction levels.

E. Exterior face shall be textured. Color as specified by Owner. Contractor to submit intended color to Engineer and Owner for review.
F. Freeze Thaw Durability: Like all concrete products, dry-cast concrete SRW units are susceptible to freeze-thaw degradation with exposure to de-icing salts and cold temperature. This is a concern in northern tier states or countries that use deicing salts. Based on good performance experience by several agencies, ASTM C1372, or equivalent governing standard or public authority, Standard Specification for Segmental Retaining Wall Units should be used as a model, except that, to increase durability, the compressive strength for the units should be increased to a minimum of 4,000 – 5,800 psi (28 - 40 MPa) unless local requirements dictate higher levels. Also, maximum water absorption should be reduced and requirements for freeze-thaw testing increased.
    a. Require a current passing ASTM C1262 or equivalent governing standard or public authority, test report from material supplier in northern or cold weather climates.
    b. See the Best Practices for SRW Design document for detailed information on freeze thaw durability testing criteria and regional temperature and exposure severity figures and tables to define the appropriate zone and requirements for the project.

Geogrid Reinforcement Systems

Part 1: General

513.02.1.1.1 Scope

Work includes furnishings and installing geogrid reinforcement, wall block, and backfill to the lines and grades designated on the construction drawings and as specified herein.

513.02.1.1.2 Reference Standards

See specific geogrid manufacturer's reference standards. Additional standards:

A. ASTM D4595 - Tensile Properties of Geotextiles by the Wide-Width Strip Method.
B. ASTM D5262 - Test Method for Evaluating the Unconfined Creep Behavior of Geogrids.
C. ASTM D6638 - Grid Connection Strength (SRW-U1).
D. ASTM D6916 - SRW Block Shear Strength (SRW-U2).
E. GRI-GG4 - Grid Long Term Allowable Design Strength (LTADS).
F. ASTM D6706 - Grid Pullout of Soil.

513.02.1.1.3 Delivery, Storage, and Handling

A. Contractor shall check the geogrid upon delivery to assure that the proper material has been received.
B. Geogrid shall be stored above -10 F (-23 C).
C. Contractor shall prevent excessive mud, cementitious material, or other foreign materials from coming in contact with the geogrid material.

Part 2: Materials

513.02.1.2.1 Definitions

A. Geogrid products shall be of high-density polyethylene or polyester yarns encapsulated in a protective coating specifically fabricated for use as a soil reinforcement material.
B. Concrete retaining wall units are as detailed on the drawings and shall be Allan Block Retaining Wall Units, or approved equal.
C. Drainage material is free draining granular material as defined in Section 513.
D. Infill soil is the soil used as fill for the reinforced soil mass.
E. Foundation soil is the in-situ soil.

513.02.1.2.2 Products

Geogrid shall be the type as shown on the drawings having the property requirements as described within the manufacturer's specifications.

513.02.1.2.3 Acceptable Manufacturers

A manufacturer's product shall be approved by the wall design engineer.

Part 3: Wall Construction

513.02.1.3.1 Foundation Soil Preparation

A. Foundation soil shall be excavated to the lines and grades as shown on the construction drawings, or as directed by the on-site soils engineer.
B. Foundation soil shall be examined by the on-site soils engineer to assure that the actual foundation soil strength meets or exceeds assumed design strength.
C. Over-excavated areas shall be filled with compacted backfill material approved by on-site soils engineer.
D. Contractor shall verify locations of existing structures and utilities prior to excavation. Contractor shall ensure all surrounding structures are protected from the effects of wall excavation.

513.02.1.3.2 Wall Construction

Wall construction shall be as specified under Section 513.

513.02.1.3.3 Geogrid Installation

A. Install block wall to designated height of first geogrid layer. Backfill and compact the wall rock and infill soil in layers not to exceed 8 in. (200 mm) lifts behind wall to depth equal to designed grid length before grid is installed.
B. Cut geogrid to designed embedment length and place on top of the block units to back edge of the raised front lip or within 1 in. (25 mm) of the concrete retaining wall face. Extend away from wall approximately 3% above horizontal on compacted infill soils.
C. Lay geogrid at the proper elevation and orientations shown on the construction drawings or as directed by the wall design engineer.
D. Correct orientation of the geogrid shall be verified by the contractor and on-site soils engineer. Strength direction is typically perpendicular to wall face.
E. Follow manufacturer's guidelines for overlap requirements. In curves and corners, layout shall be as specified in the manufacturer's standard details.
F. Place next course of block on top of grid and fill block cores with wall rock to lock in place. Remove slack and folds in grid and stake to hold in place.
G. Adjacent sheets of geogrid shall be butted against each other at the wall face to achieve 100 percent coverage.
H. Geogrid lengths shall be continuous. Splicing parallel to the wall face is not allowed.

513.02.1.3.4 Fill Placement

A. Infill soil shall be placed in lifts and compacted as specified under Section 513.
B. Infill soil shall be placed, spread and compacted in such a manner that minimizes the development of slack or movement of the geogrid.
C. Only hand-operated compaction equipment shall be allowed within 3 ft. (0.9 m) behind the wall. This area shall be defined as the consolidation zone. Compaction in this zone shall begin by running the plate compactor directly on the block and then compacting in parallel paths from the wall face back, until the entire consolidation zone has been compacted. A minimum of two passes of the plate compactor are required with maximum lifts of 8 in. (200 mm).
D. When fill is placed and compaction cannot be defined in terms of Standard Proctor Density, then compaction shall be performed using ordinary compaction process and compacted so that no deformation is observed from the compaction equipment or to the satisfaction of the engineer of record or the site soils engineer.

E. Tracked construction equipment shall not be operated directly on the geogrid. A minimum fill thickness of 6 in. (150 mm) is required prior to operation of tracked vehicles over the geogrid. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.
F. Rubber-tired equipment may pass over the geogrid reinforcement at slow speeds, less than 10 mph (16 Km/h). Sudden braking and sharp turning shall be avoided.
G. The infill soil shall be compacted to achieve 95% Standard Proctor (ASTM D698). Soil tests of the infill soil shall be submitted to the on-site soils engineer for review and approval prior to the placement of any material. The contractor is responsible for achieving the specified compaction requirements. The on-site soils engineer may direct the contractor to remove, correct or amend any soil found not in compliance with these written specifications.
H. An independent testing firm should be hired by the Owner to provide services.
I. Independent firm to keep inspection log and provide written reports at predetermined intervals to the owner.
J. Testing frequency should be set to establish a proper compaction protocol to consistently achieve the minimum compaction requirements set by the design requirements. If full time inspection and testing at 8 inch (20 cm) lifts is not provided, then the following testing frequency should be followed.
    a. One test for every 8 inches (20 cm) of vertical fill placed and compacted, for every 25 lineal feet (7.6 m) of retaining wall length, starting on the first course of block.
    b. Vary compaction test locations to cover the entire area of reinforced zone; including the area compacted by the hand-operated compaction equipment.
    c. Once protocol is deemed acceptable, testing can be conducted randomly at locations and frequencies determined by the on-site soils engineer.
K. Slopes above the wall must be compacted and checked in a similar manner.

513.02.1.3.5 Special Considerations

A. Geogrid can be interrupted by periodic penetration of a column, pier or footing structure.
B. Fence post or railings should be positioned 3 ft. (0.9 m) behind the top course to allow proper overturning design. Fence posts within 3 ft. (0.9 m) need to consider the local overturning forces applied to the wall facing.
C. If site conditions will not allow geogrid embedment length, consider the following alternatives:
    a. Masonry reinforced walls.
    b. Increased wall batter.
    c. Double block wall.
    d. No-fines concrete.
    e. Soil nailing.
    f. Earth anchors.
    g. Rock bolts.
D. Block walls will accept vertical and horizontal reinforcing with rebar and grout. A grouted connection could be used with geogrid reinforcement if needed.
E. For masonry reinforced walls, block modification may be necessary to allow for rebar placement. Masonry wall and parapet design and construction requires site specific analysis for every wall case.

513.03 CONSTRUCTION

The following is added to this section of the Standard Specifications:

513.03.03 Concrete Modular Block Retaining Walls

Wall Rock

A. Material must be well-graded compactable aggregate, 0.25 in. to 1.5 in., (6 mm - 38 mm) with no more than 10% passing the #200 sieve. (ASTM D422).
B. Material behind and within the blocks may be the same material.

Infill Soil

A. Infill material shall be site excavated soils when approved by the on-site soils engineer unless otherwise specified in the drawings. Unsuitable soils for backfill (heavy clays or organic soils) shall not be used in the reinforced soil mass.

Fine grained cohesive soils (ϕ less than 31° (Ref)) may be used in wall construction, but additional backfilling, compaction and water management efforts are required. Poorly graded sands, expansive clays and/or soils with a plasticity index (PI) greater than 20 or a liquid limit (LL) greater than 40 should not be used in wall construction.

B. The infill soil used must meet or exceed the designed friction angle and description noted on the design cross sections and must be free of debris and consist of one of the following inorganic USCS soil types: GP, GW, SW, SP, GP-GM or SP-SM meeting the following gradation as determined in accordance with ASTM D422.

Sieve Size	Percent Passing
1 inch (25 mm)	100 – 75
No. 4 (4.75 mm)	100 – 20
No. 40 (0.425 mm)	0 - 60
No. 200 (0.075 mm)	0 - 35

C. Where additional fill is required, contractor shall submit sample and specifications to the wall design engineer, or the onsite soils engineer for approval and the approving engineer must certify that the soils proposed for use has properties meeting or exceeding original design standards.

513.03.03.1 Wall Construction

513.03.03.1.1 Excavation

A. Contractor shall excavate to the lines and grades shown on the construction drawings. Contractor shall use caution not to over-excavate beyond the lines shown, or to disturb the base elevations beyond those shown.
B. Contractor shall verify locations of existing structures and utilities prior to excavation. Contractor shall ensure all surrounding structures are protected from the effects of wall excavation.

513.03.03.1.2 Foundation Soil Preparation

A. Foundation soil shall be defined as any soils located beneath a wall.
B. Foundation soil shall be excavated as dimensioned on the plans and compacted to a minimum of 95% of Standard Proctor (ASTM D698) prior to placement of the base material.
C. Foundation soil shall be examined by the on-site soils engineer to ensure that the actual foundation soil strength meets or exceeds assumed design strength. Soil not meeting the required strength shall be removed and replaced with acceptable material.

513.03.03.1.3 Base

A. The base material shall be the same as the Wall Rock material or a low permeable granular material.
B. Base material shall be placed as shown on the construction drawing. Top of base shall be located to allow bottom wall units to be buried to proper depths as per wall heights and specifications.
C. Base material shall be installed on undisturbed native soils or suitable replacement fills compacted to a minimum of 95% Standard Proctor (ASTM D698).
D. Base shall be compacted at 95% Standard Proctor (ASTM D698) to provide a level hard surface on which to place the first course of blocks. The base shall be constructed to ensure proper wall embedment and the final elevation shown on the plans. Well-graded sand can be used to smooth the top 1/2 in. (13 mm) on the base material.
E. Base material shall be a 4 in. (100 mm) minimum depth for walls under 4 ft. (1.2 m) and a 6 in. (150 mm) minimum depth for walls over 4 ft. (1.2 m).
F. Base material should be installed to allow for a minimum of one buried block to be extended into the slope to prevent erosion.

513.03.03.1.4 Unit Installation

A. Install units in accordance with the manufacturer's instructions and recommendations for the specific concrete retaining wall unit, and as specified herein.
B. Ensure that units are in full contact with base. Proper care shall be taken to develop straight lines and smooth curves on base course as per wall layout.

C. Fill all cores and cavities and a minimum of 12 in. (300 mm) behind the base course with wall rock. Use infill soils behind the wall rock and approved soils in front of the base course to firmly lock in place. Check again for level and alignment. Use a plate compactor to consolidate the area behind the base course. All excess material shall be swept from top of units.
D. Install next course of wall units on top of base course. Position blocks to be offset from seams of blocks below. Perfect "running bond" is not essential, but a 3 in. (75 mm) minimum offset is recommended. Check each block for proper alignment and level. Fill all cavities in and around wall units and to a minimum of 12 in. (300 mm) depth behind block with wall rock. Block, wall rock and infill soil placed in uniform lifts not exceeding 8 in. (200 mm). Compaction requirements for all soils in areas in, around and behind the reinforced mass shall be compacted to 95% of maximum Standard Proctor dry density (ASTM D698) with a moisture content control of +1% to -3% of optimum.
E. For taller wall applications, structural fill should be specified for a minimum bottom 1/3 to 1/2 of the reinforced fill. If structural fill is not utilized in the reinforced mass, the depth of wall rock behind the block should be increased. See the Best Practices for SRW Design document for more information.
F. The consolidation zone shall be defined as 3 ft (0.9 m) behind the wall. Compaction within the consolidation zone shall be accomplished by using a hand operated plate compactor and shall begin by running the plate compactor directly on the block and then compacting in parallel paths from the wall face until the entire consolidation zone has been compacted. A minimum of two passes of the plate compactor are required with maximum lifts of 8 in. (200 mm). Expansive or fine-grained soils may require additional compaction passes and/or specific compaction equipment such as a sheepsfoot roller. Maximum lifts of 4 in. (100 mm) may be required to achieve adequate compaction within the consolidation zone. Employ methods using lightweight compaction equipment that will not disrupt the stability or batter of the wall. Final compaction requirements in the consolidation zone shall be established by the engineer of record.
G. Install each subsequent course in like manner. Repeat procedure to the extent of wall height. Individual course height may vary due to allowable block manufacturing tolerances per ATSM C1372. Contractor must verify wall height, if noted as being critical, prior to completion of construction to ensure the elevation of the top of the wall or the controlling elevation matches desired plan elevation, if noted as critical. Contractor must follow this method for single walls or walls that branch off into a terraced orientation.
H. As with any construction work, some deviation from construction drawing alignments will occur. Variability in construction of SRWs is approximately equal to that of cast-in-place concrete retaining walls. As opposed to cast-in-place concrete walls, alignment of SRWs can be simply corrected or modified during construction. Based upon examination of numerous completed SRWs, the following recommended minimum tolerances can be achieved with good construction techniques.
    a. Vertical Control - ±1.25 in. (32 mm) max over 10 ft. (3 m) distance.
    b. Horizontal Location Control - straight lines ±1.25 in. (32 mm) over a 10 ft. (3 m) distance.
    c. Rotation - from established plan wall batter: ±2.0°.

513.03.03.1.5 Additional Construction Notes

A. When one wall branches into two terraced walls, it is important to note that the soil behind the lower wall is also the foundation soil beneath the upper wall. This soil shall be compacted to a minimum of 95% of Standard Proctor (ASTM D698) prior to placement of the base material. Achieving proper compaction in the soil beneath an upper terrace prevents settlement and deformation of the upper wall. One way is to replace the soil with wall rock and compact in 8 in. (200 mm) lifts. When using on-site soils, compact in maximum lifts of 4 in. (100 mm) or as required to achieve specified compaction.
B. Vertical filter fabric use is not suggested for use with cohesive soils. Clogging of such fabric creates unacceptable hydrostatic pressures in soil reinforced structures. When filtration is deemed necessary in cohesive soils, use a three-dimensional filtration system of clean sand or filtration aggregate. Vertical filter fabric may be used to separate wall rock zone from fine grained, sandy infill soils if the design engineer deems it necessary based on potential water migration from above or below grade, through the reinforced zone into the wall rock on the project. Horizontal filter fabric should be placed above the wall rock column to prevent soils from above migrating into the wall rock column.
C. Embankment protection fabric is used to stabilize rip rap and foundation soils in water applications and to separate infill materials from the retained soils. This fabric should permit the passage of fines to preclude clogging of the material. Embankment protection fabric shall be a high strength polypropylene monofilament material designed to meet or exceed typical NTPEP specifications and stabilized against ultraviolet (UV) degradation.
D. Water management is of extreme concern during and after construction. Steps must be taken to ensure that drainpipes are properly installed and vented to daylight or connected to an underground drainage system and a grading plan has

been developed that routes water away from the retaining wall location. Site water management is required both during construction of the wall and after completion of construction.

513.04 MEASUREMENT AND PAYMENT

This article of the standard specifications is amended as follows:

Payment for the construction of the required concrete modular retaining walls as detailed on the contract drawings including all work as described above including geogrid reinforcement, base leveling pad, unit fill, backfill, excavation, foundation, soil preparation, modular block wall units, caps, filter fabric, toe drains, heel drains, any dewatering required to facilitate the construction of the retaining walls, and any other work required to satisfactorily complete same shall be made based on the unit price bid per square foot of exposed and buried wall face for the various retaining wall sections to be constructed as indicated in the bid form.

Measurement and payment will be made under:

Pay Item	*Pay Unit*
MODULAR BLOCK RETAINING WALL	SQUARE FOOT
MSE RETAINING WALL	SQUARE FOOT

Payment for the construction of the MSE retaining wall as detailed on the contract drawings including all work as described above including geogrid reinforcement, base leveling pad, unit fill, backfill, excavation, foundation, soil preparation, block wall units, caps, filter fabric, toe drains, heel drains, any dewatering required to facilitate the construction of the retaining wall, and any other work required to satisfactorily complete same shall be made based on the unit price bid per square foot of exposed and buried wall face for the various retaining wall sections to be constructed as indicated in the bid form.

THE FOLLOWING SUBSECTION IS ADDED:

SECTION 515 – PREFABRICATED PEDESTRIAN BRIDGES

1.0 GENERAL

1.1 Scope

These specifications are for fully engineered half through truss (no overhead bracing) bridges of corrosion resistant high-strength low-alloy (weathering) steel construction and shall be regarded as minimum standards for design and fabrication. The work included under this item shall consist of design, fabricating, finishing and transporting the steel truss bridge superstructure including bearings.

1.2 Definitions

- *Contractor*: Entity who will be installing, and/or purchasing, the bridge.
- *Foundation Engineer*. Engineering Entity or Firm who will be designing and detailing the foundation system.
- *Geotechnical Engineer*. Engineering Entity or Firm who will be responsible for providing the Geotechnical information necessary to design the foundation system.
- *Bridge Manufacturer*: Firm who will be designing and supplying the bridge in accordance with these Special Provisions.

1.3 Qualified Bridge Manufacturer

Qualified Bridge Manufacturers must have at least 5 years of experience fabricating these types of structures and shall have an up to date quality certification by AISC per Section 14.1 of these specifications. All suppliers shall fabricate their product utilizing a modern fabrication facility owned and operated by the Bridge Manufacturer that includes the use of CNC beam drilling machines, no brokers are allowed.

Bridge Manufacturers shall be Contech Engineered Solutions LLC or approved equal.

1.4 Bridge Manufacturer's Design Professional and Submittals

The Bridge Manufacturer shall have as a direct employee, an engineer who is experienced in bridge design to be in responsible charge of all engineering related task and design. The engineer shall have a minimum of 10 years of experience in bridge design and be a currently licensed civil or structural Professional Engineer in the State of New Jersey and shall be the engineer who will seal and sign the plans.

Engineering drawings, 11x17 format, shall be prepared and submitted to the Engineer for their review after receipt of the order. Submittal drawings shall be unique drawings, prepared to illustrate the specific portion of the bridge being fabricated. All relative design information such as member size, ASTM/AASHTO material specification, dimensions necessary to fabricate and required welding shall be clearly shown on the drawings. Drawings shall have referenced details and sheet numbers. All drawings shall be stamped, signed and dated by the Bridge Manufacturer's Design Professional.

Structural calculations for the design of the bridge superstructure shall be prepared by the Bridge Manufacturer and submitted for review by the Engineer after receipt of the order. Calculations shall include complete design, analysis and code checks for the controlling members, connectivity and support conditions, truss stability checks, deck design, deflection checks, bearings and all splices. All calculations shall be signed and sealed by a licensed Professional Engineer registered in the State of New Jersey.

Additional required submittals shall include all applicable product data, installation procedures, and lifting and access plans for review by the Engineer prior to fabrication and construction.

2.0 APPLICABLE CODES AND STANDARDS

2.1 Governing Specifications

Bridge shall be designed in compliance with the AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges, 2009 (*AASHTO Ped*). Calculations shall be in accordance with this document, and formulas shall reference the appropriate sections.

2.2 Other Reference Codes, Specifications and Standards

- AASHTO LRFD Bridge Design Specifications, 9th Edition, 2020 (*AASHTO LRFD*)
- AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, First Edition, 2005 (*AASHTO Signs*)
- AISC Steel Construction Manual, 15th Edition, 2017 (*AISC*)
- ANSI/AISC 360-16 Specification for Structural Steel Buildings, 2016 *(AISC 360)*
- American Welding Society, Structural Welding Code, D1.1, 2015 (*AWS D1.1*)
- ASCE/SEI 7-10 Minimum Design Loads for Buildings and Other Structures, 2010 (*ASCE 7*)
- Setra Technical Guide for Footbridges, 2006 (Setra)
- ANSI/AWC NDC-2015 National Design Specification for Wood Construction, 2015 (*NDS*)
- Tropical Timbers of the World, US Forest Products Laboratory

The AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges shall control if any conflicting requirements occur with the Other Reference Documents and/or other local Codes.

3.0 BRIDGE SYSTEM TYPE

3.1 Truss Style

The truss style shall be a Connector or approved equal. The vertical trusses shall be designed such that the top and bottom chord members are parallel for the entire length of bridge. The interior verticals of the trusses shall be perpendicular to the top face of the bottom chord and the end verticals of the trusses shall be plumb. Trusses shall be laid out such that diagonals shall be at an angle of 30-degrees or more with respect to the bottom chord.

3.2 Diagonal Style

The vertical truss shall use a single-diagonal, Pratt configuration, where all the diagonals are in tension for gravity loads.

3.3 Floor Beam Location

The bridges up to 100 feet in length shall utilize an underhung floor beam where the top face of the floor beam shall be welded to the bottom face of the bottom chord. The distance from the top of deck to the bottom of the floor beam shall be determined by the Bridge Manufacturer during final design. The bridges greater than 100 feet in length shall utilize an H-Section configuration where the ends of the floor beams are welded only to the interior face of the verticals. The distance from the top of deck to the bottom of the bottom chord shall be determined by the Bridge Manufacturer during final design.

4.0 BRIDGE GEOMETRY

4.1 Span Length

The bridge span lengths shall be as follows per bridge (horizontal straight line dimensions) and measured from end to end of the bridge truss, not including the end dam, any deck extension or bearing that extends beyond the end of the truss:

Bridge A: 45’-0” single span
Bridge B: 30’-0” single span
Bridge C: 30’-0” single span
Bridge E: 195’-0” single span
Bridge F: 634’-1” over four spans

4.2 Width

The bridge width shall provide a minimum clearance of 10'-0” between all interior railing elements.

4.3 Top of Truss Height Above Deck

The top of the top chord shall not be less than 48" above the deck (measured from the high point of the deck). Note that this dimension may be exceeded due to truss height requirements for structural, deflection and vibration requirements.

4.4 Lower Steel Clearance

The Bridge Manufacturer shall determine the distance from the top of the deck (measured from the highest point of the deck) to the bottom of any steel member.

For underhung configurations, top of deck to bottom of bottom chord shall not exceed 5”.
For H-section configurations, top of deck to low steel shall not exceed 2’-10”.

4.5 Truss Bay Spacing

The number of bays and the dimension of the panel points shall be determined by the Bridge Manufacturer.

4.6 Camber

A single simple-span bridge shall have a vertical camber dimension at the mid-span equal to 150% of the anticipated full dead load deflection.

4.7 Elevation Difference

The top of the decks shall be at the same elevation at each end of the bridge.

5.0 STRUCTURAL DESIGN LOADS

5.1 Dead Load

The bridge structure shall be designed for the total bridge weight including the final deck system.

5.2 Pedestrian Loading (PL)

The bridge structure shall be designed for a uniform pedestrian loading of 90 psf. This loading shall be

patterned to produce the maximum load effects. Consideration of dynamic load allowance is not required with this loading.

5.3 Vehicle Load (VL)

The superstructure and deck system for all pedestrian bridges shall be designed for each of the following concentrated/vehicular loads:

- A concentrated load of 1,000 pounds placed on any area 2.5' by 2.5' square.
- A single truck shall be placed to produce the maximum load effects and shall not be placed in combination with the pedestrian load. The dynamic load allowance need not be considered for this loading. The truck shall be the following:
    - H5 vehicle (10,000 pound two-axle vehicle with 80% to rear axle).

5.4 Wind Load (WS)

Pedestrian bridges shall be designed for wind loads as specified in *AASHTO Signs*, Articles 3.8 and 3.9. The loading shall be applied over the exposed area in front elevations of both trusses including all enclosures. Minimum wind load shall be 35 pounds per square foot on the full vertical projected area of the bridge as if enclosed.

In addition to the wind load specified above, a vertical uplift line load as specified in *AASHTO LRFD* Article 3.8.2 and determined as the force caused by a pressure of 20 psf over the full deck width, shall be applied concurrently. This loading shall be applied at the windward quarter point of the deck width.

5.5 Seismic (EQ)

The bridge structure shall be designed for seismic loading as specified in Section 3.10 of *AASHTO LRFD*. The transverse loads shall be calculated considering the transverse period of the bridge and longitudinal loads shall be calculated using a period of zero. A response modification factor of 0.8 shall be used for the calculation of forces applied to the bridge anchorage. A response modification factor of 1.0 shall be used for the calculation of bearing reactions. The transverse seismic load shall be applied to all the bearings and the longitudinal seismic load shall be applied to the fixed bearings only. The vertical bearing reactions shall be calculated using an overturning force on the bridge based on the center of gravity of the bridge times the transverse seismic load.

5.6 Fatigue Load (FL)

The fatigue loading shall be as specified in Section 11 of *AASHTO Signs*. The Natural Wind Gust specified in Article 11.7.1.2 and the Truck-Induced Gust specified in Article 11.7.1.3 of *AASHTO Signs* only need only be considered, as appropriate.

5.7 Snow Load

The bridge structure shall be designed for a snow loading of 25 psf over the deck area. The snow load shall not be combined with the pedestrian load.

5.8 Utility Load

In order to accommodate potential future lighting on the bridge, the bridge structure for Bridge F only shall be designed for a utility loading of 5 minimum to 10 maximum *plf along the truss.*

5.9 Combination of Loads

The load combinations and load factors to be used shall be as specified in *AASHTO LRFD* Table 3.4.1-1, with the following exceptions:

- Load combinations Strength II, Strength IV, and Strength V need not be considered.
- The load factor for Fatigue I load combination shall be taken as 1.0, and Fatigue II load combination need not be considered.

6.0 STRUCTURAL DESIGN CRITERIA

6.1 Modeling

The bridge shall be modeled and analyzed utilizing a three-dimensional computer software which shall account for moments induced in members due to joint fixity where applicable. Moments due to both truss deflection and joint eccentricity must be considered. All loads listed in Section 5 of these specifications shall be applied to the model and analyzed appropriately.

6.2 Lateral Frame and Member Design

The bridge shall be designed and proportioned such that appropriate lateral stiffness is provided locally and globally, to ensure that the structure is stable.

For bridges without any overhead members (Half-Through Trusses), the vertical truss members, the floor beams and their connections shall be proportioned to resist a lateral force applied at the top of the truss verticals at the center of the top chord. This lateral force shall be applied as an additional load to the top of the vertical at the center of the top chord, creating a cantilever moment, which is then added to the forces obtained from the three-dimensional model. The magnitude of this lateral force shall not be less than 0.01/K times the average factored design compressive force in the two adjacent top chord members increased by a factor of safety of 1.33.

The top chord shall be analyzed as a column with elastic lateral supports at the panel points, considering all moments due to in-plane and out-of-plane bending, along with moments due to eccentricities of the members.

The U-Frame Stiffness of the verticals and floor beams shall be as specified in *AASHTO Ped* Article 7.1.2, assuming that the vertical and floor beam connection is rigid. This means that the following must be met:

- On H-Section floor beam connections, the floor beam width shall be at least 80% of the vertical face width in order to prevent any deformation due to tube wall plastification of the vertical member faces under service loads. The connection design will be checked at Strength I & Strength III load combinations.
- On Underhung floor beam connections, the vertical width shall match the bottom chord width in order to transfer vertical moments through the walls of the bottom chord to the verticals with no deformation of the chord side walls due to sidewall yielding or crippling under service loads. The connection design will be checked at Strength I & Strength III load combinations.
- The vertical and floor beam members shall not be connected to faces of the bottom chord at a 90-degrees to one another.
- All fixed end moments in the floor beams and verticals due to floor beam rotations, in addition to the loads derived from a U-Frame analysis have been accounted for in the strength design of the connections.

The vertical and floor beam members shall be proportioned such that the effective length factor, K, used in the design of the top chord shall not be greater than 2.0.

The end verticals shall be designed as a simple cantilever to carry the loads obtained from the three-dimensional model, plus the cantilever moment due to a lateral load of 0.01 times the axial force in the end vertical, applied laterally at the top end of the end vertical at the center of the top chord.

The floor beams shall be sized for the forces obtained from a simple span, pinned end analysis, or from the forces obtained from the three-dimensional model, whichever controls.

The diagonals and brace diagonals shall be analyzed as pinned-end connection members.

Interior verticals shall be analyzed as pinned-end connections unless longitudinal forces are applied to the verticals such as when the brace diagonals are connected to floor beams on an H-Section floor beam configuration. When longitudinal forces are applied to the verticals they shall be analyzed as fixed-end connections.

All other members shall be analyzed as fixed-end connections.

HSS member connections shall be evaluated per the requirements of *AISC 360* Chapters J & K.

6.3 Deflections

The vertical deflection of the bridge due to the unfactored pedestrian live loading shall not exceed 1/360 of the span length.

The horizontal deflection of the bridge under unfactored wind loading shall not exceed 1/360 of the span length.

6.4 Fracture

The fracture toughness requirements and designation of Fracture Critical Member and Main Member designation are hereby waived for these structures.

6.5 Vibrations

Vibration of the structure shall not cause discomfort or concern to the users of the bridges. To assure this, the fundamental frequency (f) of the pedestrian bridge in the vertical direction, without live load, shall be greater than 3.0 hertz (Hz) to avoid the first harmonic. The fundamental frequency of the pedestrian bridge in the lateral direction, shall be greater than 1.3 Hz. If the fundamental frequency cannot satisfy these limitations, then the bridge should be proportioned such that either of the following criteria are satisfied:

$$f \geq 2.86 * \ln(180/W)$$

or

$$W \geq 180 * e^{(-0.35 * f)}$$

Where W is the weight of the bridge in kips and f is the fundamental frequency in the vertical direction in Hz.

For bridges longer than 85 ft and shorter than 125 ft the vertical and horizontal vibration must also meet the requirements for Bridge Class III with a Mean comfort level in accordance with *Setra*.

7.0 DECK SYSTEM

7.1 Deck System

Deck to be comprised of transverse wood planks attached to longitudinal steel stringers that are attached to the floor beams.

The wood deck timber planks shall be Ipe wood (Tabebuia spp. -lapacho group), FEQ grade, all heartwood (no sapwood), clear (no knots), straight grained, with no worm holes, surfaced 4 sides (S4S) and eased at four edges (E4E), and be air dried to no more than 20% moisture content prior to installation. Planks shall be untreated, except ends of planks shall be sealed with "Anchorseal" as manufactured by Mobil CER-M or an equal aqueous wax log sealer. Based on the Forest Products Laboratory value of 27,270 psi for Modulus of Rupture, Modulus of Elasticity of 3,030,000 psi and Maximum Crush Strength of 13,720 psi the following allowable stresses shall apply. Allowable bending stress without modification factors of 3,700 psi; allowable shear without modification factors of 320 psi.

Deck planks shall be secured utilizing 5/16" flat head self-tapping screws. Each plank shall have enough screws to adequately secure the plank to the stringers and prevent cupping and twisting of the board. Screws shall have adequate edge distance to prevent splitting and cracking. The end edges of the deck planks shall include a cover plate or angle to hide the plank ends from the bridge user or be precision end cut such that the ends are all within 1/16" from plank to plank. Deck planks shall be placed tight together with no gaps.

Deck planks shall be sized to support the loads specified in Section 5.0 of these specifications.

Each deck plank shall be designed to support the maximum wheel load from the design vehicle. Distribution to other planks will only be allowed if those planks are doweled together or if the tire contact wheel length is longer than the width of the plank. The Tire Contact Area will be calculated as 0.01 times the wheel load. The wheel width transverse to the direction of traffic, is 2.5 times the wheel length. The wheel width is calculated as follows:

- The Wheel Width (in inches) is $2.5 * \sqrt{(\frac{0.01*P}{2.5})}$, where P is the wheel load in pounds.

Plank shall be checked for both shear and moment, and meet all allowable stresses as per *Tropical Timbers of the World*.

8.0 MATERIALS OF CONSTRUCTION

8.1 Structural Steel

All members of the truss and deck support system shall be fabricated from square or rectangular hollow structural shapes (HSS), with the exception that floor beams may be wide flange shapes. All open ends of end posts and floor support beams shall be capped. Drain holes shall be provided for all sections at the low point of the member that may become filled with water.

All bridges shall be fabricated using A847 for HSS sections and A588 for structural shapes and plates.

Minimum nominal thickness of primary hollow structural shapes shall be 1/4". Rolled shapes shall have a minimum thickness of 1/4".

8.2 Fasteners

Structural bolts used to field splice or connect all main members shall be ASTM F3125 Grade A325. The nuts for these structural bolts shall be ASTM A563. The Bridge Manufacturer shall determine the finish of the structural bolts. They will be either Type 3 (Weathering) or Type 1 (Hot-Dipped or Mechanically Galvanized) as specified by the Bridge Manufacturer.

Bolts used for the connection of a wood rub rail shall be 18-8 or 316 Stainless Steel, ¼" diameter carriage bolts.

Screws for the attachment of wood deck shall be steel, 5/16” diameter, six lobe drive, self-tapping screws. The screws shall have flat heads for the screws in the wood and round heads for the screws on the edge cover. The screws shall have a protective coating that will prevent corrosion due to contact with treated wood and environmental exposure.

Self-drilling fasteners for attachment of the form decking shall be #14 x 1” zinc plated hex washer head Tek screws.

Power Actuated fasteners shall be Hilti sheet metal nail X-ENP-19 fastener.

Other miscellaneous fasteners shall be ASTM A307 zinc plated or galvanized, as determined by the Bridge Manufacturer.

9.0 FINISH

For corrosion resistant high-strength low-alloy (weathering) steel no surface finish treatment is necessary. All exposed surfaces of structural steel to be cleaned in accordance with Steel Structures Painting Council Surface Preparation Specifications No. 7, SSPC -SP7 brush-off blast cleaning. Exposed surfaces of steel shall be defined as those surfaces seen from the deck or from the outside and bottom of the structure. All other surfaces to have standard mill finish. The steel will be allowed to form a protective weathering patina over time.

10.0 ATTACHMENTS

10.1 Safety Rails

Safety rail system shall be placed on the inside of the structure, spaced so as to prevent a 4" sphere from passing through the side truss for the full height of the side truss, or 48", whichever is less. The top of the top chord may be considered the top of the rail system.

Bridges A Through C and E shall have a rail system that consists of horizontal rails. Rails shall be HSS 1 x 1 x 1/8 welded directly to the truss verticals with a maximum unsupported length of 6’-0” if placed on the inside of the structure and 7’-0” if placed on the outside of the structure. If the truss vertical spacing is greater than the maximum unsupported length, mid-bay supports will be required. When safety rails are placed on the inside of the structure and not covered by the end vertical, the ends of the rails near the end of the bridge shall be capped and ground smooth. No solid plate covering all rails as a unit will be allowed.

Bridge F shall have a rail system that consists of vertical pickets in between horizontal top and bottom rails. The top and bottom horizontal rail shall be HSS 1 x 1 x 1/8 welded directly to the truss verticals. In between these rails, vertical pickets shall be ½” round bar welded to the top and bottom rail. The maximum unsupported length shall be 7’-0” if placed on the inside of the structure and 8’-0” if placed on the outside of the structure. If the vertical spacing is greater than the maximum unsupported length, mid-bay supports will be required. When the rail system is placed on the inside of the structure and not covered by the end vertical, the ends of the horizontal rails near the end of the bridge shall be capped and ground smooth. If a toe plate is also specified, then the bottom horizontal rail may be modified to be used as a steel toe plate as specified. If a rub rail is also specified, then the top horizontal rail may be modified to be used as a steel rub rail as specified.

Each element of the pedestrian rail system shall be designed to support a uniformly applied load of 50 pounds per lineal foot, both transversely and vertically, acting simultaneously. In addition, each longitudinal element shall be designed to support a concentrated load of 200 pounds, which will act simultaneously with the above uniform loads at any point and in any direction at the top of the longitudinal element.

The posts of the pedestrian rail system shall be designed for a concentrated load applied at either the

center of gravity of the upper longitudinal element or 60" above the top of the walkway, whichever is less. This concentrated load shall be equal to 200 pounds plus 0.05 times the post spacing in feet.

10.2 Toe Plate

Toe Plates shall be steel channel shape section, 4” high by 1” wide minimum with the end of the channel legs welded directly to the inside face of the truss verticals. The maximum unsupported length shall be 7’-0”. If the vertical spacing is greater than the maximum unsupported length, mid-bay supports will be required. When the ends of the toe plates near the end of the bridge are not covered by the end verticals, they shall be capped and ground smooth. The bottom of the toe plate shall be placed 2” above the finished height of the deck. All seams of the toe plates shall be fully welded to give the appearance of a continuous member (welding should be located at a support member). If toe plates are incorporated into a safety rail system, they may be modified as needed but shall be a minimum of 4” high.

10.3 Rub Rail

Rub Rails shall be provided at a height of 3’-6” from top of the deck to the top of rub rail. Rub Rails shall be nominal 5/4x6 Ipe hardwood. If the vertical spacing exceeds 7'-0" then mid-bay supports will be required. Rub rails shall be supplied S4S, E4E. All exposed surfaces shall be smooth with no exposed sharp edges. Rub rails shall be attached using two ¼” diameter carriage bolts with lock nuts at each attachment. Attachment shall be to a structural angle welded directly to the side of the vertical. Where a seam occurs between two adjacent pieces of rub rail, two structural angles shall be used, one on each side of the truss vertical.

10.4 Expansion Joint

The gap between the end of the bridge deck and the back wall of the foundation system be sized to accommodate bridge movements due to thermal expansion of the bridge over the design temperature range. The gaps shall be covered with a steel cover which attaches to the bridge and extends over the gap and onto the top of the foundation system back wall. The steel cover shall have its edges rounded or beveled at a 45-degree angle. A compression seal sized for movement and rated for pedestrian traffic may be used in place of the steel cover.

11.0 BEARINGS

11.1 Bearing Type

Bearing type and size shall be designed by the Bridge Manufacturer based on anticipated loads and movements.

11.2 Design Temperature Range

The Design Temperature Range will be site specific and will be determined per *AASHTO LRFD* Article 3.12.2.

11.3 Non-Shrink Grouting

The bridge will be supplied with a lower setting plate. This setting plate shall be leveled and shimmed to the proper elevation. The space between the lower surface of the setting plate and the foundation surface shall be filled with a non-shrink grout capable of achieving a minimum compressive strength equal to or greater than the strength of the foundation concrete. The cost of the leveling, shimming, and non-shrink grout shall be the responsibility of the Contractor.

12.0 FOUNDATIONS

12.1 Foundation System

Foundation system for Bridges A Through C and E shall utilize abutments and footings designed by the Foundation Engineer in conjunction with the bridge bearing requirements and dimensions provided by the Bridge Manufacturer and the site-specific geotechnical information provided by the Geotechnical Engineer. All abutment dimensions and materials shall be shown on the final contract plans.

The foundation system for Bridge F shall utilize abutments, piers, footings, pile caps, and piles, and shall be designed by a licensed Professional Engineer registered in the State of New Jersey, retained by the Contractor. The design shall be in conjunction with the bridge bearing requirements and dimensions provided by the Bridge Manufacturer. The design shall consider the site-specific geotechnical information provided by the Geotechnical Engineer at each abutment. However, a subsurface exploration program shall be performed by the Contractor for their use in performing the foundation design. The subsurface exploration program shall consist of a minimum of one boring at each of the proposed Bridge F substructure elements (one at each abutment and one at each pier, totaling a minimum of five borings). Subsurface exploration results and all foundation design information shall be submitted to the Owner's Engineer for review and approval. Minimum abutment, pier, and footing dimensions shall be as shown on the final contract plans. Minimum size and quantity of piles shall be as shown on the final contract plans. The subsurface exploration program and the complete design of the foundation system shall not be measured separately for payment and shall be included in the cost of the various Bridge F items.

The Contractor will be responsible to provide the necessary coordination between the bridge structure drawings and the fabrication drawings detailing the construction of cast-in-place concrete foundations.

12.2 Anchor Bolts

Bridge Manufacturer shall design the diameter and grade of anchor bolts, based on the shear and tensile strength of the anchor bolt material only. All design considerations regarding concrete breakout strength in shear and tension, pullout strength, concrete side-face blowout strength, concrete pry out strength, embedment depth, type of anchorage or any other concrete failure modes shall be the responsibility of a licensed Professional Engineer registered in the State of New Jersey, retained by the Contractor and shall be submitted to the Owner's Engineer for review and approval. The design of the anchorage system shall not be measured separately for payment and shall be included in the cost of the various Bridge F items. All anchor bolts shall be galvanized. The Foundation Engineer shall determine if the anchor bolts shall be cast-in-place, drilled/epoxy, or expansion anchors. Anchor bolts shall be provided and installed by the Contractor.

13.0 FABRICATION

13.1 Welding

Welding procedures and weld qualification test procedures shall conform to the provisions of *AWS D1.1*. Filler metal shall be in accordance with the applicable AWS Filler Metal Specification and shall match the corrosion properties of the base metal.

13.2 Welders

Welders shall be qualified for each process and position used while fabricating the bridge. Qualification tests shall be in accordance with AWS D1.1. All weld qualifications and records shall be

kept in accordance with the Fabricator's Quality Assurance Manual which has been approved and audited by AISC as the basis for certification.

13.3 Shop Splices

Shop splices for main truss members shall be full penetration welds all around the perimeter of the member. These shop splices shall be performed using a full perimeter backing plate. After welding of the shop splices, the weld shall be ground smooth to match the perimeter of the member. Grinding these welds smooth is required and will be grounds for rejection of the bridge upon delivery if not completed.

Shop splices for all horizontal rail components to be located at the centerline of the truss verticals, each end welded to the truss vertical and seal welded together. Exposed surface of the seal welds as seen from the deck shall be ground smooth.

Shop spliced for all horizontal stringers to be located at the centerline of the floor beams, each end welded to the floor beam and seal welded together.

13.4 Bolted Splices

For shipping purposes, the bridge may be fabricated in sections. Sections shall be field assembled using bolted connections. No field welding of members shall be allowed.

The chord members of the bridge shall be bolted such that at least two faces of the member are bolted. This is to provide reasonable force distribution around the perimeter of the member. Bolted splices shall be designed and fabricated such that the head of the bolt and washer are the only item exposed. No through-bolting of the member is allowed. The nuts of the fastener cannot be welded to the internal splice plate and shall be held in plate with a nut capture system per Patent US 10,267,345 B2 or equal.

The diagonals and brace diagonals shall be bolted utilizing a through-bolt system with plates on the exterior faces of the members. An internal stiffening plate is required to keep the member from crushing during the bolt tightening process.

All bolted connections are considered to be pretensioned or slip-critical connections. All bolts are to be pretensioned per the requirements of section 8.2 of the Specification for Structural Joints Using High-Strength Bolts. Recommended tightening method of all structural bolts shall be Turn-of-the-Nut Pretensioning.

14.0 QUALITY CONTROL

14.1 AISC Certification

The bridge shall be fabricated in a shop owned by the Bridge Manufacturer. This facility shall have up to date quality certification by AISC as Certified Bridge Fabricator - Advanced (Major) with Fracture Critical Endorsement and Complex Coating Endorsement (P1-Enclosed or P2-Covered).

14.2 Certified Weld Inspector

The Bridge Manufacturer shall employ at least two Certified Weld Inspectors (CWI), with endorsement by AWS QC1. At least one CWI shall be present during the complete fabrication of the bridge. The CWI shall provide written documentation that the bridge has been fabricated in accordance with these specifications and the approved design drawings.

14.3 Documentation

Material Certifications shall be available for review for all materials within the bridge. Traceability of heat numbers is required for all structural steel.

Documentation showing the performance of all critical quality checks shall also be made available for review by the Engineer or Owner.

14.4 Non-Destructive Testing

All welds within the structure, shall be visually inspected for conformance to size, under cut, profile and finish.

All shop splices of main truss members shall be magnetic particle tested.

15.0 DELIVERY AND ERECTION

15.1 Delivery

Delivery shall be made via truck to a location nearest the site which is accessible to normal over-the-road equipment. All trucks delivering bridge materials will need to be unloaded at the time of arrival. If the erection Contractor needs special delivery or delivery is restricted, they shall notify the Bridge Manufacturer prior to bid date. This includes site issues which may prevent over-the-road equipment from accessing the site. Steerable dollies are not used in the cost provided by the Bridge Manufacturer. Determining the length of bridge section which can be delivered is the responsibility of the Contractor and shall be communicated to the Bridge Manufacturer prior to the bid date. When necessary to store units at the project site, Contractor to store units in a way as to ensure against damage.

15.2 Installation & Lifting Procedures.

The Bridge Manufacturer will provide standard typical written procedures for lifting and splicing the bridge. All actual means, methods, equipment and sequence of erection used are the responsibility of the Contractor and shall be reported to the Engineer prior to construction.

A representative of the Bridge Manufacturer shall be present when the bridge is delivered and installation commences to ensure proper installation.

The Bridge Manufacturer shall provide written inspection and maintenance procedures to be followed by the Bridge Owner.

Prior to submission of bids and to be completely informed, the Bidder shall be required to review / investigate the various available access points to the immediate work areas and be prepared to provide necessary provisions including all labor, equipment, material and methods to perform the site improvements proposed in this Contract. Any costs associated with the furnishing and installation of necessary site access provisions required to perform the work including maintenance / protection of existing site access restrictions, maintenance / protection of existing drainage flows and/or restoration of disturbed areas shall be included in the bid items that warrant site access provisions.

Restoration of areas disturbed shall be performed to the satisfaction of the Engineer and in accordance with other applicable sections of the Specifications.

16.0 WARRANTY

The Bridge Manufacturer shall warrant, at the time of delivery, that it has conveyed good title to its steel structure, free of liens and encumbrances created by the Bridge Manufacturer, and that its steel structure is free

of defects in design, material and workmanship. This warranty shall be valid for a period of one (1) year from the date of delivery. Durable tropical hardwood decking and hardwood attachments shall carry a one (1) year warranty against rot, termite damage, or fungal decay. This warranty shall specifically exclude all softwood and decking material such as Treated Southern Yellow Pine, Douglas Fir and Wood thermoplastic composite lumber (e.g. Trex). Paint, galvanizing and other special coatings, if warranted, shall be warranted by the coating manufacturer in accordance with their warranty provisions and are not covered under the Bridge Manufacturer's warranty.

This warranty shall not cover defects in the steel structure caused by abuse, misuse, overloading, accident, improper installation, maintenance, alteration, or any other cause not expressly warranted. This warranty shall not cover damage resulting from or relating to the use of any kind of de-icing material. This warranty shall be void unless owner's records are supplied that show compliance with the minimum guidelines specified in the in the Bridge Manufacturer's inspection and maintenance procedures.

Repair, replacement, or adjustment, in Bridge Manufacturer's sole discretion, shall be the exclusive remedy for any defects under this warranty. This warranty shall exclude liability for any indirect, consequential, or incidental damages.

17.0 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Pay Item	*Pay Unit*
FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE A	LUMP SUM
FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE B	LUMP SUM
FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE C	LUMP SUM
FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE E	LUMP SUM
FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE F	LUMP SUM

The costs associated with retaining the licensed Professional Engineer registered in the State of New Jersey, retained by the Contractor, who will be responsible for performing the subsurface exploration program and foundation design at Bridge F, and the performance of the subsurface exploration program, including the costs to provide the required design calculations, shop drawings, specifications and/or catalog cuts, shall be included in the prices bid for the design-build items requiring said services.

TABLE OF CONTENTS

DIVISION 600 – MISCELLANEOUS CONSTRUCTION

SECTION	
601	PIPE
602	DRAINAGE STRUCTURES
603	SLOPE AND CHANNEL PROTECTION
604	GABION WALLS
605	FENCE
606	SIDEWALKS, DRIVEWAYS, AND ISLANDS
607	CURB
609	BEAM GUIDERAIL
610	TRAFFIC STRIPES, TRAFFIC MARKINGS, AND RUMBLE STRIPS
612	SIGNS
631	ROADWAY TRENCH REPAIR
634	MISCELLANEOUS CONCRETE
636	REMOVEABLE BOLLARDS
637	WASTE AND RECYCLING CONTAINERS
638	PARK BENCHES
639	ALUMINUM GANGWAYS
640	FLOATING DOCKS
641	WATERFRONT ARTICULATED BLOCK RAMP
642	KAYAK STORAGE UNIT
643	TRAIL MARKERS
644	GRASS PAVERS
645	WATERWAY BOAT BARRIER SYSTEM
646	STONE VENEER PILLARS

DIVISION 600 – MISCELLANEOUS CONSTRUCTION

SECTION 601 – PIPE

601.01 DESCRIPTION

601.02 MATERIALS

This Article of the Standard Specifications is amended as follows:

The following is added:

Dense Graded Aggregate 901.10
High Density Polypropylene (PP) Pipe 909.02.02

601.03 CONSTRUCTION

This Article of the Standard Specifications is amended as follows:

The following is added:

Trench openings shall not remain open overnight under any circumstances: Backfill in roadways shall be made with dense graded aggregate. Backfill in other areas shall be with suitable previously excavated materials unless otherwise shown on the plans.

The Contractor shall maintain the roadways where storm drains are installed in good serviceable condition, and all abrupt depressions shall be immediately repaired to the satisfaction of the Engineer.

The Contractor shall construct any necessary ditches or trenches to keep the site and the work sufficiently drained at all times during progress of the work.

Leader drain outlets in curbing shall be installed such that the invert shall be above the proposed roadway overlay or reconstruction.

Subbase outlet drains and pipe bedding drains will be installed where indicated on the plans, or where directed by the Engineer, and connected to existing or proposed storm sewer structures.

601.03.01 Pipe

A. Storing and Handling.

B. Excavating.

C. Bedding.

This Article of the Standard Specifications is amended as follows:

The following is added:

Coarse Aggregate (Type 57) Bedding shall be provided for all kinds, classes and sizes of storm drains in accordance with Section 201 and the construction details.

D. Installing Pipe.

This Article of the Standard Specifications is amended as follows:

The following is added to the end of Section D:

All pipes shall be installed at the line, elevation and grades shown on the plans using offset stakes, string lines, or lasers, subject to the approval of the Engineer. Prior to the laying of pipe, the method to control alignment and grade shall be submitted for approval. The method shall be a laser system or grade board set up to establish a reference grade and alignment control directly above or in the pipe. In addition, cut sheets shall be prepared and shall include cuts at 100' intervals and at all drainage structures.

Use of damaged pipes shall not be permitted, and shall be removed from the job site, unless a portion of intact pipe is to be used.

E. Joining Pipe.

This Article of the Standard Specifications is amended as follows:

The following is added:

Pipe joints and lift holes shall be grouted after the installation of gaskets.

Flexible watertight gaskets shall be used in concrete pipe and shall be installed in accordance with the recommendations of the manufacturer.

Couplings for connecting newly constructed leader drains to existing leader drains shall be Fernco couplings or equal and shall be completely encased in 2000 psi concrete.

Concrete collars shall be constructed when connecting a proposed pipe with an existing pipe.

F. Backfilling.

Delete the first paragraph and substitute the following:

Delete the first paragraph and substitute the following:

Backfill around and over (P.P.T.) underdrains shall be coarse aggregate Type 57.

Backfill around and over storm sewer pipes shall be dense graded aggregate.

The Contractor shall cut, trim, etc. the filter fabric to meet the required dimensions with sufficient size to provide for an overlap of the filter fabric as shown on the plans.601.03.02 Pipe Using Alternate Methods.

601.03.03 End Section

601.03.04 Underdrain

601.03.05 Subbase Outlet Drain

601.03.06 Video Inspection of Pipe

601.03.07 Deflection Inspection of HDPE Pipe

601.03.08 Cleaning Existing Pipe

601.04 MEASUREMENT AND PAYMENT

This Article of the Standard Specifications is amended as follows:

Delete the entire text of this Article and substitute the following:

Measurement and payment will be made under:

Item	*Pay Unit*
6" HIGH DENSITY POLYETHYLENE PIPE	LINEAR FOOT
8" HIGH DENSITY POLYETHYLENE PIPE	LINEAR FOOT
15" HIGH DENSITY POLYETHYLENE PIPE	LINEAR FOOT
18" HIGH DENSITY POLYETHYLENE PIPE	LINEAR FOOT
24" HIGH DENSITY POLYETHYLENE PIPE	LINEAR FOOT
15" REINFORCED CONCRETE PIPE, CLASS V	LINEAR FOOT
18" REINFORCED CONCRETE PIPE, CLASS V	LINEAR FOOT
24" REINFORCED CONCRETE PIPE, CLASS V	LINEAR FOOT
36" REINFORCED CONCRETE PIPE, CLASS V	LINEAR FOOT
FURNISH AND INSTALL 10" DIA. HIGH DENSITY POLYETHYLENE PIPE (HDPE) CROSSINGS WITH FIELD MITERED FLARED ENDS	LINEAR FOOT
DENSE GRADED AGGREGATE FOR PIPE TRENCH (IF AND WHERE DIRECTED)	CUBIC YARD

The unit prices bid in the Proposal for the various items of underdrains and storm drains shall also include all costs of materials and labor necessary to connect the pipes to existing and proposed drainage structures. This shall be done in a manner satisfactory to the Engineer.

Separate payment will not be made for pipe stone bedding, gaskets, excavation, type 57 stone backfill to the spring line of the pipe, end caps, elbows, tees, couplings, clean outs and adapters or for ¾" clean stone and filter fabric. The cost thereof shall be included in the linear foot prices submitted for various sizes of underdrains and pipe listed in the proposal.

The unit prices bid for subbase outlet drains and pipe bedding drains shall include costs for all necessary fittings, end caps and connections to existing or proposed storm drainage structures.

Separate measurement and payment will not be made for disposal of excavated, unusable, and unsuitable material from pipe trenches. Same shall be included in the unit price bid for items requiring same.

SECTION 602 – DRAINAGE STRUCTURES

602.01 DESCRIPTION

This Article of the Standard Specifications is amended as follows:

The following is added:

The work may also include the construction of concrete block handholes and storm drainage diversion manholes.

602.02 MATERIALS

This Article of the Standard Specifications is amended as follows:

The following is added:

Select fill, K5 permeable coarse sand

602.03 CONSTRUCTION

602.03.01 Culvert and Headwall

602.03.02 Inlet and Manhole

This Article of the Standard Specifications is amended as follows:

Delete subtitles **1** and **2** of this Article and the entire text and substitute the following:

1. Precast.

When precast concrete inlets and manholes are specifically permitted, shop drawings signed and sealed by a licensed New Jersey Professional Engineer including certification that the precast concrete inlets and manholes are able to withstand AASHTO HL-93 live loading in accordance with the latest edition of the AASHTO LRFD bridge design manual and are suitable for the intended use shall be submitted for approval prior to construction.

Precast bases may be supplied for inlets and manholes to facilitate construction; inverts must be poured in place.

All precast bases for inlets and manholes shall be set on a six (6") inch thick bed of coarse aggregate size No. 57.

2. Concrete Block Construction.

Concrete block shall be laid with staggered joints. All horizontal joints and all keyways of vertical joints shall be filled with mortar. No horizontal joints shall be more than 3/8 inch wide. The inside and outside walls shall be plastered with a minimum of 1/2 inch thickness of mortar troweled to a smooth finish.

Inlet and outlet pipes shall extend through the walls of manholes and inlets for a sufficient distance beyond the outside surface to allow for connections, but shall be cut off flush with the wall on the inside surface.

The concrete block and mortar shall be so constructed around the pipes as to prevent leakage and form a neat connection.

Concrete block manholes and inlets shall be constructed on an 8" thick 4,500psi concrete mat in accordance with the construction details.

602.03.03 Set Casting, Reset Casting, and Reconstructed Inlet and Manhole

This Article of the Standard Specifications is amended as follows:

the following is added to the end of section 602.03.03:

Existing inlet and manhole castings which are no longer required, due to replacement or reconstruction, shall become the property of the Owner unless otherwise directed by the Engineer.

The work associated with the reconstruction of existing inlets and manholes shall include, but is not necessarily limited to, the removal and replacement of existing deteriorated ladder rungs, the replacement of missing bolts, the removal and reconstruction of deteriorated walls or portions of walls and walls constructed of materials other than concrete or concrete block and concrete brick, the disposal of deteriorated masonry, the grouting of all open joints and plastering of block walls, the filling of all block cells with concrete, the reconstruction of deteriorated channels and inverts, the trimming of pipes

flush with walls, the resetting and regrouting of existing castings and backplates, the replacement of damaged castings, grates or covers where damaged or ordered, the removal of all sedimentation and debris and all else necessary to make the inlet water tight and structurally sound.

602.03.04 Inlet Converted to Manhole

602.03.05 Extension Frame and Extension Ring

602.03.06 Manhole Cover and Bicycle Safe Grate

602.03.07 Curb Piece

602.03.08 Cleaning Drainage Structure

The following articles 602.03.09, 602.03.10, 602.03.11, 602.03.12, 602.03.13, and 602.03.14 are added to standard specifications as follows:

602.03.09 Filterra Bioretention System Standard Specification (Or Approved Equal)

1.0 General

1.1 This item shall govern the furnishing and installation of the filterra bioretention system or approved equal by Contech Engineered Solutions LLC or approved equal complete and operable as shown and as specified herein, in accordance with the requirements of the plans and contract documents.

1.2 Contractor shall furnish all labor, materials, equipment and incidentals necessary to install the bioretention system, appurtenances and incidentals in accordance with the drawings and as specified herein.

1.3 Bioretention system shall utilize the physical, chemical and biological mechanisms of an engineered biofiltration media, plant and microbe complex to remove pollutants typically found in urban stormwater runoff. The treatment system shall be a fully equipped, preconstructed, drop-in-place unit designed for applications in the urban landscape to treat contaminated runoff from impervious surfaces.

1.4 Bioretention system shall be capable of stand-alone stormwater treatment.

1.5 Bioretention plants shall be incorporated into the system with plant material extending into the treatment zone of the engineered media at time of activation.

1.6 The bioretention system shall be of a type that has been installed and in use for a minimum of five (5) consecutive years preceding the date of installation of the system. The manufacturer shall have been, during the same consecutive five (5) year period, engaged in the engineering design and production of systems deployed for the treatment of stormwater runoff and which have a history of successful production, acceptable to the engineer of record and/or the approving jurisdiction. The manufacturer of the filterra bioretention system or approved equal should be Contech Engineered Solutions LLC or approved equal.

1.7 Applicable provisions of any division shall govern work in this section.

1.8 American society for testing and materials (ASTM) reference specifications

A. ASTM C857: standard practice for minimum structural design loading for underground precast concrete utility structures

B. ASTM C858: standard specification of underground precast concrete utility structures

C. ASTM C990: standard specification for joints for precast box sections using preformed flexible joint sealants

D. ASTM C109: standard test method for compressive strength of hydraulic cement mortars

1.9 Manufacturer or authorized supplier to submit shop drawings for bioretention system (or approved equal) with the vault, engineered biofiltration media and accessory equipment. Drawings shall include principal dimensions, engineered biofiltration media placement, location of piping and unit foundation.

A. Manufacturer or authorized supplier shall submit installation instructions to the Contractor

B. Manufacturer or authorized supplier shall submit operations and maintenance manual to the Contractor

C. Before installation of the bioretention system, Contractor shall obtain the written approval of the engineer of record for the system drawings

2.0 Materials

2.1 All internal components including engineered biofiltration media, underdrain stone, pvc underdrain piping, mulch, and vegetation must be included as part of the bioretention system and shall be provided by contech engineered solutions llc or approved equal.

A. Engineered biofiltration media shall consist of both organic and inorganic components. Stormwater shall be directed to flow vertically through the media profile, saturating the full media profile without downstream flow control.

B. Underdrain stone shall be of size and shape to provide adequate bridging between the media and stone for the prevention of migration of fine particles. Underdrain stone must also be able to convey the design flow rate of the system without restriction and be approved for use in the filterra bioretention system or approved equal.

C. PVC underdrain piping shall be sdr35 with perforation pattern designed to convey system design flow rate without restriction.

D. Mulch shall be double shredded wood or bark mulch approved for use with the filterra bioretention system or approved equal.

E. Vegetation shall comply with the type and size required by the approved drawings and shall be alive and free of obvious signs of disease

2.2 Precast concrete vault shall be provided by manufacturer or authorized supplier according to astm c857 and c858.

A. Vault joint sealant shall be conseal cs-101 or approved equal. Joints shall be sealed with preformed joint sealing compound conforming to astm c 990.

B. If interior concrete baffle walls are provided, baffle walls shall be cast-in or sealed to the interior vault walls and floor with a polyurethane construction sealant rated for use below the waterline, sikaflex 1a or equal. Contractor to provide sealant material and installation unless completed prior to shipment.

2.3 Tree grates and access covers shall be cast iron. Tree grate frames shall be galvanized steel.

2.4 Curb nosing (where applicable) shall be galvanized steel and where specified shall be cast into a top slab designed to support aashto hs-20 loading at the curb.

2.5 All Contractor-provided components shall meet the requirements of this section, the plans specifications and contract documents. In the case of conflict, the more stringent specification shall apply.

A. Crushed rock base material shall be six-inch minimum layer of ¾-inch minus rock. Compact undisturbed sub-grade materials to 95% of maximum density at +/-2% of optimum moisture content. Unsuitable material below sub-grade shall be replaced to engineer's approval.

B. Concrete shall have an unconfined compressive strength at 28 days of at least 3000 psi, with ¾-inch round rock, a 4-inch slump maximum, and shall be placed within 90 minutes of initial mixing.

C. Silicone sealant shall be pure rtv silicone or approved equal conforming to federal specification number tt s001543a or tt s00230c or engineer approved.

D. Grout shall be non-shrink grout meeting the requirements of corps of engineers crd-c588. Specimens molded, cured and tested in accordance with ASTM C109 shall have minimum compressive strength of 6,200 psi. Grout shall not exhibit visible bleeding.

E. Backfill material shall be ¾-inch minus crushed rock, or approved equal.

3.0 Performance

3.1 Treatment capabilities shall be verified via third-party report following either tape or tarp protocols.

A. Engineered biofiltration media minimum treatment flow rate shall be 140"/hr. The system shall be designed to ensure that high flow events shall bypass the engineered biofiltration media preventing erosion and resuspension of pollutants.

B. The system shall remove a minimum of 85% total suspended solids (tss).

C. The system shall remove a minimum of 62% total phosphorus (tp).

D. The system shall remove a minimum of 34% total nitrogen (tn).

3.2 The system shall have general use level designation from washington department of ecology for basic (tss), phosphorus, enhanced (metals), and oil/grease and have certification by new jersey department of environment.

3.3 Quality assurance and quality control procedures shall be followed for all batches of engineered biofiltration media produced. Engineered biofiltration media shall be certified by the manufacturer for performance and composition.

A. Media particle size distribution and composition shall be verified as per relevant astm standards.

B. Media pollutant removal performance shall be verified as per relevant astm standards as well as a minimum of one scientific method approved by the usepa.

C. Media hydraulic performance shall be verified as per relevant astm standards.

D. Media fertility shall be verified as per a minimum of one published scientific method.

3.4 The manufacturer shall ensure through third party full scale field testing of installed units that the design flow rate of the system is not reduced over time. Studies shall be performed on a minimum of 10 systems of various ages, maintenance frequencies, and land uses. At least 80% of the tested systems shall have been installed 2.5 or more years. At least 50% of the systems shall have previous maintenance intervals greater than 2 times the manufacturer's recommendation.

4.0 Execution

4.1 Set precast vault on crushed rock base material that has been placed in maximum 6-inch lifts, loose thickness, and compacted to at least 95-percent of the maximum dry density as determined by the standard proctor compaction test, astm d698, at moisture content of +/- 2% of optimum water content.

4.2 Inlet and outlet pipes shall be attached to provided couplers or grouted in and connected to precast concrete vault according to engineer's requirements and specifications.

4.3 All throat and grate protection covers shall remain in place until the system is activated.

4.4 Contractor to cast-in-place throat inlet to convey stormwater into the bioretention system according to engineer's requirements and specifications.

4.5 Engineered biofiltration media shall be delivered installed in the vault, unless otherwise agreed upon with the manufacturer. Contractor shall take appropriate action to protect the media from sediment and other debris during construction. The method ultimately selected shall be at Contractor's discretion and Contractor's risk.

A. If media is shipped separately from vault, manufacturer or a manufacturer's certified representative shall install media into the vault or be present to supervise installation in order to ensure proper installation.

4.6 The bioretention system shall not be placed in operation (activated) until the project site is clean and stabilized (construction erosion control measures no longer required). The project site includes any surface that contributes storm drainage to the system. All impermeable surfaces shall be clean and free of dirt and debris. All catch basins, manholes and pipes shall be free of dirt and sediment. Activation shall be provided by manufacturer or authorized supplier.

4.7 Each correctly installed system shall be maintained by manufacturer or authorized supplier for a minimum period of one year. The cost of this service shall be included in the price of the system.

A. Annual maintenance consists of a maximum of two [2] scheduled visits.

B. Each routine maintenance visit shall consist of only the following items: system inspection; removal of foreign debris, silt, loose plant material and trash; mulch removal; engineered biofiltration media evaluation; plant health evaluation and pruning; replacement of mulch; disposal of all maintenance refuse items; and updating of maintenance records.

4.8 To ensure long term performance of the bioretention system, continuing annual maintenance programs should be performed or purchased by the owner per the latest filterra bioretention system or approved equal operation and maintenance manual.

602.03.10 Modular Subsurface Flow Wetland System (Or Approved Equal)

1.0 General

1.1 The purpose of this specification is to establish generally acceptable criteria for Modular Subsurface Flow Wetland Systems or approved equal used for biofiltration of stormwater runoff including dry weather flows and other contaminated water sources. It is intended to serve as a guide to producers, distributors, architects, engineers, contractors, plumbers, installers, inspectors, agencies and users; to promote understanding regarding materials, manufacture and installation; and to provide for identification of devices complying with this specification.

1.2 Modular Subsurface Flow Wetland Systems (MSFWS) or approved equal are used for filtration of stormwater runoff including dry weather flows. The MSFWS is a pre-engineered biofiltration system composed of a pretreatment chamber containing filtration cartridges, a horizontal flow biofiltration chamber with a peripheral void area and a centralized and vertically extending underdrain, the biofiltration chamber containing a sorptive media mix which does not contain any organic material and a layer of plant establishment media, and a discharge chamber containing an orifice control structure. Treated water flows horizontally in series through the pretreatment chamber cartridges, biofiltration chamber and orifice control structure.

1.3 The manufacturer of the MSFWS or approved equal shall be one that is regularly engaged in the engineering design and production of systems developed for the treatment of storm water runoff for at least (10) years, and which have a history of successful production, acceptable to the engineer of work.

1.4. Submittals

1.4.1. Submittal drawings are to be provided with each order to the contractor and consulting engineer.

1.4.2. Submittal drawings are to detail the MSFWS and all components required and the sequence for installation, including:
- System configuration with primary dimensions
- Interior components
- Any accessory equipment called out on shop drawings

1.4.3 Inspection and maintenance documentation submitted upon request.

1.5. Work Included

1.5.1. Specification requirements for installation of MSFWS.

1.5.2. Manufacturer to supply components of the MSFWS(s) Modules:
- Pretreatment chamber components (pre-assembled)
- Concrete Structure(s)
- Biofiltration chamber components (pre-assembled)
- Flow control discharge structure (pre-assembled)

1.6. Reference Standards
- ASTM C 29 Standard Test Method for Unit Weight and Voids in Aggregate
- ASTM C 88 C 88 Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
- ASTM C131 C 131 Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregates by Abrasion and Impact in the Los Angeles Machine
- ASTM C 136 C 136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
- ASTM C 330 C 330 Standard Specification for Lightweight Aggregate for Structural Concrete
- ASTM D 698 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft.-lbf/ft3 (600 kN-m/m3)
- ASTM D 1621 10 Standard Test Method for Compressive Properties Of Rigid Cellular Plastics
- ASTM D 1777 ASTM D1777 - 96(2007) Standard Test Method for Thickness of Textile Materials
- ASTM D 4716 Standard Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
- ASTM A 615 Standard Specifications for Deformed and Plan Carbon-Steel Bars for Concrete Reinforcement
- ASTM A 706 Standard Specifications for Deformed and Plan Low-Alloy Steel Bars for Concrete Reinforcement
- AASHTO T 99-01 Standard Method of Test for Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in) Drop
- AASHTO T 104 Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
- AASHTO T 260 Standard Method of Test for Sampling and Testing for Chloride Ion in Concrete and Concrete Raw Materials.
- AASHTO T 288 Standard Method of Test for Determining Minimum Laboratory Soil Resistivity
- AASHTO T 289 Standard Method of Test for Determining ph of Soil for Use in Corrosion Testing
- AASHTO T 291 Standard Method of Test for Determining Water Soluble Chloride Ion Content in Soil
- AASHTO T 290 T 290 Standard Method of Test for Determining Water Soluble Sulfate Ion Content in Soil

2.0 Materials

2.1. The Modular Subsurface Flow Wetland Systems (MSFWS) or approved equal and all of its components shall be self-contained within a concrete structure constructed of concrete

with a minimum 28-day compressive strength of 5,000 psi, with reinforcing per ASTM A 615 or ASTM A 706, Grade 60, and supports and H20 loading as indicated by AASHTO. Each Chamber shall have appropriate access hatches for easy maintenance and sized to allow removal of all internal components without disassembly. All water transfer system components shall conform with the following:

- Filter netting shall be 100% Polyester with a number 16 sieve size, and strength tested per ASTM D 3787.
- Drainage cells shall be manufactured of lightweight injection-molded plastic and have a minimum compressive strength test of 6,000 psi and a void area along the surface making contact with the filter media of 75% or greater. The cells shall be at least 2" in thickness and allow water to freely flow in all four directions.

2.2. Pretreatment Chamber Components

2.2.1. Filter Cartridges shall operate at a loading rate not to exceed 3 gallons per minute per square foot surface area.

2.2.2 Drain Down System shall include a pervious floor that allows water to drain into the underdrain pipe that is connected to the discharge chamber.

2.3. Biofiltration Chamber Components

2.3.1. Media shall consist of ceramic material produced by expanding and vitrifying select material in a rotary kiln. Media must be produced to meet the requirements of ASTM C330, ASTM C331, and AASHTO M195. Aggregates must have a minimum 24-hour water absorption of 10.5% mass. Media shall not contain any organic material. Flow through media shall be horizontal from the outer perimeter of the chamber toward the centralized and vertically extending underdrain. The retention time in the media shall be at least 3 minutes. Downward flow filters are not acceptable alternatives. The thickness of the media shall be at least 19" from influent end to effluent end. The loading rate on the media shall not exceed 1.1 gallons per minute per square foot surface area. Media must be contained within structure that spaces the surface of the media at least 2" from all vertically extending walls of the concrete structure.

2.3.2. Planting shall be native; drought tolerant species recommend by manufacturer and/or landscape architect.

2.3.2. Plant Support Media shall be made of a 3" thick moisture retention cell that is inert and contains no chemicals or fertilizers, is not made of organic material and has an internal void percentage of 80%.

2.4. Discharge Chamber

2.4.1. The discharge device shall house a flow control orifice plate that restricts flows greater than designed treatment flow rate. All piping components shall be made of a high-density polyethylene. The discharge chamber shall also contain a drain down filter if specified on the drawing.

3.0 Performance

3.1. Function - The MSFWS has no moving internal components and functions based on gravity flow, unless otherwise specified. The MSFWS is composed of a pretreatment chamber, a biofiltration chamber and a discharge chamber. The pretreatment device houses cartridge

media filters, which consist of filter media housed in a perforated enclosure. The untreated runoff flows into the system via subsurface piping and or surface inlet. Water entering the system is forced through the filter cartridge enclosures by gravity flow. Then the flow contacts the filter media. The flow through the media is horizontal toward the center of each individual media filter. In the center of the media shall be a round slotted PVC pipe of no greater than 1.5" in diameter. The slotted PVC pipe shall extend downward into the water transfer cavity of the cartridge. The slotted PVC pipe shall be threaded on the bottom to connect to the water transfer cavity. After pollutants have been removed by the filter media the water discharges the pretreatment chamber and flows into the water transfer system and is conveyed to the biofiltration chamber. Once runoff has been filtered by the biofiltration chamber it is collected by the vertical underdrain and conveyed to a discharge chamber equipped with a flow control orifice plate. Finally, the treated flow exits the system.

3.2. Pollutants - The MSFWS will remove and retain debris, sediments, TSS, dissolved and particulate metals and nutrients including nitrogen and phosphorus species, bacteria, BOD, oxygen demanding substances, organic compounds and hydrocarbons entering the filter during frequent storm events and continuous dry weather flows.

3.3. Treatment Flow Rate and Bypass - The MSFWS operates in-line. The MSFWS will treat 100% of the required water quality treatment flow based on a minimum filtration capacities listed in section 3.4. The size of the system must match those provided on the drawing to ensure proper performance and hydraulic residence time.

3.4. System must be capable of treating flows to the specified treatment flow rate on the drawings. The flow rate shall be controlled by an orifice.

4.0 Execution

4.1. The installation of the MSFWS shall conform to all applicable national, state, state highway, municipal and local specifications.

4.2. Installation

The Contractor shall furnish all labor, equipment, materials and incidentals required to install the MSFWS modules and appurtenances in accordance with the drawings and these specifications.

4.2.1. Grading and Excavation site shall be properly surveyed by a registered professional surveyor, and clearly marked with excavation limits and elevations. After site is marked it is the responsibility of the contractor to contact local utility companies and/or DigAlert to check for underground utilities. All grading permits shall be approved by governing agencies before commencement of grading and excavation. Soil conditions shall be tested in accordance with the governing agencies requirements. All earth removed shall be transported, disposed, stored, and handled per governing agencies standards. It is the responsibility of the contractor to install and maintain proper erosion control measures during grading and excavation operations.

4.2.2. Compaction – All soil shall be compacted per registered professional soils engineer's recommendations prior to installation of MSFWS components. Compaction shall be to 95% of Standard Proctor or 90% of Modified Proctor.

4.2.3. Backfill shall be placed according to a registered professional soils engineer's recommendations, and with a minimum of 6" of gravel under all concrete structures.

4.2.4. Concrete Structures – After backfill has been inspected by the governing agency and approved the concrete structures shall be lifted and placed in proper position per plans.

4.2.5. Subsurface Flow Wetland Media shall be carefully loaded into area so not to damage the Wetland Liner or Water Transfer Systems. The entire wetland area shall be filled to a level 9 inches below finished surface.

4.2.6. Planting layer shall be installed per manufacturer's drawings and consist of a minimum 3" grow enhancement media that ensures greater than 95% plant survival rate, and 6" of wetland media. Planting shall consist of native plants recommended by manufacturer and/or landscape architect. Planting shall be drip irrigated for at least the first 3 months to insure long term plant growth. No chemical herbicides, pesticides, or fertilizers shall be used in the planting or care and maintenance of the planted area.

4.3. Shipping, Storage and Handling

4.3.1. Shipping – MSFWS shall be shipped to the contractor's address or job site, and is the responsibility of the contractor to offload the unit(s) and place in the exact site of installation.

4.3.2. Storage and Handling– The contractor shall exercise care in the storage and handling of the MSFWS and all components prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted and unloading has commenced shall be born by the contractor. The MSFWS(s) and all components shall always be stored indoors and transported inside the original shipping container until the unit(s) are ready to be installed. The MSFWS shall always be handled with care and lifted according to OSHA and NIOSA lifting recommendations and/or contractor's workplace safety professional recommendations.

5.0 Inspection and Maintenance

5.1. Inspection – After installation, the contractor shall demonstrate that the MSFWS has been properly installed at the correct location(s), elevations, and with appropriate components. All components associated with the MSFWS and its installation shall be subject to inspection by the engineer at the place of installation. In addition, the contractor shall demonstrate that the MSFWS has been installed per the manufacturer's specifications and recommendations. All components shall be inspected by a qualified person once a year and results of inspection shall be kept in an inspection log.

5.2. Maintenance – The manufacturer recommends cleaning and debris removal maintenance of once a year and replacement of the Cartridge Filters as needed. The maintenance shall be performed by someone qualified. A Maintenance Manual is available upon request from the manufacturer. The manual has detailed information regarding the maintenance of the MSFWS. A Maintenance/Inspection record shall be kept by the maintenance operator. The record shall include any maintenance activities preformed, amount and description of debris collected, and the condition of the filter.

5.3. Material Disposal - All debris, trash, organics, and sediments captured by the MSFWS shall be transported and disposed of at an approved facility for disposal in accordance with local and state requirements. Please refer to state and local regulations for the proper disposal of toxic and non-toxic material.

602.03.11 High Capacity Kraken Membrane Filtration System (Or Approved Equal)

1.0 General

1.1 The Contractor shall furnish and install the High Capacity (HC) Kraken or approved equal, complete and operable as shown and as specified herein, in accordance with the requirements of the plans and contract documents.

1.2. The manufacturer of the HC Kraken or approved equal shall be one that is regularly engaged in the engineering design and production of systems developed for the treatment of stormwater runoff for at least (10) years, and which have a history of successful production, acceptable to the engineer of record and/or approving Jurisdiction.

1.3. Submittals: Shop drawings for the structure and performance are to be submitted with each order to the Contractor. Contractor shall forward shop drawing submittal to the Engineer of Record for approval. Shop drawings are to detail the precast concrete structure and call out or note the internals/components.

1.5. American Society for Testing and Materials (ASTM) Reference Specifications:

1.5.1. ASTM C891: Standard Specification for Installation of Underground Precast Concrete Utility Structures

1.5.2. ASTM C478: Standard Specification for Precast Reinforced Concrete Manhole Sections

1.5.3. ASTM C990: Standard Specification for Joints for Concrete Manholes Using Preformed Flexible Joint Sealants 2

1.5.4. ASTM D4101: Standard Specification for Polypropylene Injection and Extrusion Materials

1.5.5. ASTM C858: Standard Specification of Underground Precast Concrete Utility Structures

1.5.6. ASTM C857: Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures

1.5.7. ASTMA615/A615M: Standard Specification for Deformed or Plain Carbon-Steel Bars for Concrete Reinforcement 1.5.8. ASTM D698: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort

2.0 Materials

2.1. Precast Concrete Structure: The device shall be an all concrete structure (including risers), constructed from precast concrete riser and slab components or monolithic precast structure(s). Precast concrete vault shall be provided according to ASTM C857 and C858 and manholes shall be provided according to ASTM C478. Both structure types shall be installed to conform to ASTM C891 and to any required state highway, municipal or local specifications; whichever is more stringent. All precast

concrete components shall be manufactured to a minimum live load of HS-20 truck loading or greater based on local regulatory specifications, unless otherwise modified or specified by the design engineer.

2.2. Gaskets: Gaskets and/or sealants shall be used to seal between concrete joints. Joints shall be sealed with preformed joint sealing compound conforming to ASTM C990.

2.3. Internal Components:

2.3.1. Separation and weir walls shall be constructed of plastic. Plastic walls shall be constructed of copolymer polypropylene and shall be a minimum of 1/2" thick with 3" wide reinforcement.

2.3.2. Filter cartridges shall be comprised of cylindrical, pleated paper membrane material. The diameter of each cartridge is approximately 8", consisting of a 3" perforated core tubing surrounded by 2.5" pleated membranes to maximize surface area. One in every four cartridges will include a drain down orifice at the bottom of the perforated core tubing. Each filter cartridge shall also contain an integrated top handle and quarter turn bottom coupler. The length of each filter element shall be a minimum of 10" with a maximum length of 30". The maximum flux rate determined by the maximum treatment flow rate per unit of filtration membrane surface area shall be 0.101 gpm/ft2. The filter cartridges shall be located in the filtration treatment chamber containing at grade frames and covers and/or hatches to allow access for maintenance. The filter cartridges shall be removable and installed by hand.

Cartridge Length (in)	Pleated Media Area (ft^2)	Design Treatment Flow Rate (gpm) (1 filter)
10	49	4.9
20	104.5	10.6
30	168.2	17

2.3.3. Underdrain assembly will be a copolymer polypropylene false floor with quarter turn connectors secured to it for the cartridges. The underdrain assembly shall convey flow to the outlet bay of the structure.

2.3.4. Steps shall be constructed of copolymer polypropylene conforming to ASTM D4101. Steps shall be driven into preformed or drilled holes once concrete is cured. Steps shall meet the requirements of ASTM C478 and AASHTO M199. The ½" Grade 60 deformed reinforcing bar shall meet ASTM A615, where required.

2.4. Frame and Cover: Frame and covers must be manufactured from cast-iron or other composite material tested to withstand H-20 or greater design loads, and as approved by the local regulatory body.

2.5. Doors and Hatches: If provided shall meet designated loading requirements or at a minimum for incidental vehicular traffic.

3.0 Performance

3.1. Treatment Flux Rate (Surface Loading Rate): The HC Kraken or approved equal filter shall treat 100% of the required water quality treatment flow based on a maximum treatment flux rate (surface loading rate) across the membrane filter cartridges not to exceed 0.101 gpm/ft^2 .

3.2. Lab Testing: At a minimum, the HC Kraken or approved equal filter must meet all of these testing performance standards:

3.2.1. The HC Kraken or approved equal filter must be tested under a nationally recognized lab protocol and verified independently by a third-party public agency:

• Must be capable of removing greater than 80% TSS • Verified by NJCAT and certified by NJDEP

• Must use a particle size distribution with d50 of 65 microns

• Approval must be current and not expired.

3.2.2. The HC Kraken or approved equal filter shall be certified for online use by NJDEP, able to internally bypass higher flows without scouring.

3.3. Suspended Solids Removal: The HC Kraken or approved equal filter shall have demonstrated a minimum median TSS removal efficiency of greater than 80%.

3.4. Fine Particle Removal: The HC Kraken or approved equal filter must be proven to have the ability to load 19 lbs./cartridge, while still maintaining an overall 80% removal efficiency.

4.0 Execution

4.1. Precast Concrete Structure: Set precast structure on crushed rock base material that has been placed in maximum 6-inch lifts, loose thickness, and compacted to at least 95- percent of the maximum dry density as determined by the standard Proctor compaction test, ASTM D698, at moisture content of +/- 2% of optimum water content.

4.2. Structure floor shall slope 1/4 inch maximum across the width and slope downstream 1 inch per 12 feet of length. For manholes "Length" is defined by a line running from the invert of the outlet through the center of the manhole and "width" is the perpendicular to the "length". Structure top finish grade shall be even with surrounding finish grade surface unless otherwise noted on plans.

4.3. Inlet and outlet pipes shall be stubbed in and connected to precast concrete structure according to Engineer's requirements and specifications. All connections to be sealed to minimize water intrusion. If grout is used, Contractor to grout all inlet and outlet pipes flush with or protruding up to 2 inches into interior of structure.

4.4. When required, ballast shall be placed to the dimensions specified by the engineer and noted on the data block. Ballast shall not encase the inlet and/or outlet piping. Provide 12" clearance from outside diameter of pipes.

4.5. Backfill shall be placed according to a registered professional soils engineer's recommendations and per governing agencies standards.

4.6. Clean Up:

4.6.1. Remove all excess materials, rocks, roots, or foreign material, leaving the site in a clean, complete condition approved by the engineer. The project site shall be clean and free of dirt and debris and the inlet/outlet chamber(s) and filter chamber(s) shall be free of construction debris and sediment before the allowing runoff to enter and place the system in operation. All filter components shall be free of any foreign materials including concrete and excess sealant.

4.6.2. Where applicable, Contractor shall remove the temporary filter fabric around the inlet grate to place the system in operation.

4.7. Filter Cartridges:

4.7.1. Filter cartridges shall be delivered installed in the structure, unless otherwise agreed upon with Contech or approved equal. Contractor shall take appropriate action to protect the cartridges from sediment and other debris during construction. The method ultimately selected shall be at Contractor's discretion and Contractor's risk. Some methods for protecting the cartridges include, but are not limited to:

4.7.1.1. Remove cartridges from the structure and store in a clean, dry location. Cartridges shall be reinstalled to operate according to 4.7.2. (see below).

4.7.1.2. Leave cartridges in the structure and plug inlet and outlet pipe to prevent stormwater from entering the vault and provide means for stormwater to bypass the filtration treatment bay.

4.7.2. Filter cartridges shall not be placed in operation until the structure is clean and the project site is clean and stabilized (construction erosion control measures no longer required). The project site includes any surface that contributes storm drainage to the HC Kraken or approved equal filter. All impermeable surfaces shall be clean and free of dirt and debris. All catch basins,

manholes and pipes shall be free of dirt and sediments. Refer to instructions on the transfer cover opening to activate the system.

4.7.3. Filter Cartridges with ¼-Turn Connector Fittings: ¼-turn connectors shall be secured into HC Kraken or approved equal false floor openings to be equipped with a filter cartridge. Filter cartridges shall be turned onto the connector until they reach the hard stop on the connector – approximately ¼ revolution, with care to not "over turn" the cartridge, or turn with such force to damage the hard stop mechanism. Plugs shall be secured over the ¼ turn connectors for connectors not equipped with a filter cartridge.

4.8. Shipping, Storage and Handling

4.8.1. Shipping – The HC Kraken or approved equal filter shall be shipped to the Contractor's address or job site and it is the responsibility of the Contractor to offload the unit(s) and place in the exact site of installation.

4.8.2. Storage and Handling – The Contractor shall exercise care in the storage and handling of the HC Kraken or approved equal filter and all components prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted, and unloading has commenced, shall be borne by the Contractor. The HC Kraken or approved equal filter shall always be handled with care and lifted according to OSHA and NIOSA lifting recommendations and/or contractor's workplace safety professional recommendations.

5. Inspection and Maintenance

5.1. Maintenance and Inspection shall be in performed in accordance with Contech's or approved equal recommendations for maintenance and inspection.

5.2. Maintenance and inspection intervals shall be per Contech's or approved equal recommendations, or per the approving/local jurisdiction/agency requirements; whichever is more frequent.

5.3. Surface access for personnel and equipment for inspection and maintenance activities shall be provided.

602.03.12 ADS Aquabox Modular System (Or Approved Equal)

1.0 General

1.1 This item shall be similar in all respects to the Aquabox System or approved eqaul as manufactured by Advanced Drainage Systems (ADS), Inc. or approved equal as indicated on the drainage plans.

1.2 Contractor shall furnish all labor, materials, equipment and incidentals necessary to install the detention system, appurtenances and incidentals in accordance with the Drawings and as specified herein.

1.3 The infiltration system shall be of a type that has been installed and in use for a minimum of five (5) consecutive years preceding the date of installation of the system. The Manufacturer shall have been, during the same consecutive five (5) year period, engaged in the engineering design and production of systems deployed for the treatment of stormwater runoff and which have a history of successful production, acceptable to the Engineer of Record and/or the approving Jurisdiction.

1.4 Applicable provisions of any Division shall govern work in this section.

1.5 Reference Specifications:

A. AASHTO: Standard Specifications for Highway Bridges – Seventh (7th) Edition

B. ACI 318: Building Code Requirements for Structural Concrete

C. ASTM A615/A615M – Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

D. ASTM C857: Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures

E. ASTM C858: Standard Specification of Underground Precast Concrete Utility Structures

F. ASTM C891: Standard Practice for Installation of Underground Precast Concrete Utility Structures

G. ASTM C990: Standard Specification for Joints for Precast Box Sections Using Preformed Flexible Joint Sealants

H. ASTM A1064: Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete

1.6 Manufacturer or authorized supplier to submit shop drawings for detention system and accessory equipment. Drawings shall include plans, elevation, sections, and details indicating layout, dimensions, foundation, cover and joints. Shop drawings shall also indicate the size and location of roof openings and inlet and outlet pipe openings as well as the sealing of joints.

A. Manufacturer or authorized supplier shall submit installation instructions to the Contractor

B. Manufacturer or authorized supplier shall submit Operations and Maintenance Manual to the Contractor

C. Before installation of the detention system, Contractor shall obtain the written approval of the Engineer of Record for the system drawings

2.0 Materials

2.1 All components of the infiltration system must be included and shall be provided by ADS, Inc. or approved equal unless stated otherwise. The concrete pad will be provided separately by the Contractor.

2.2 Concrete pad to be provided by the Contractor. The foundation shall have a 1-foot overhang. Concrete shall have a minimum compressive strength of 4000 psi at 28 days.

2.3 All Contractor-provided components shall meet the requirements of this section, the plans specifications and contract documents. In the case of conflict, the more stringent specification shall apply.

A. Joint tape shall be 7/8" diameter, preformed butyl mastic joint sealer conforming to ASTM C990.

B. Joint wrap shall be 8" wide self-adhesive elastomeric resin bonded woven puncture resistant polymer wrap.

3.0 Execution

3.1 Install modules plumb, on line, and to proper elevation with a maximum space of ¾" between adjacent modules. If the space exceeds ¾", the modules shall be reset with appropriate adjustment made to line and grade to bring the space into compliance.

3.2 Place modules on level, cast-in-place concrete foundation with 1' overhang.

3.3 Prepare surfaces and seal perimeter horizontal joint between modules with joint tape in accordance with ASTM C891, 8.8 and 8.12 and in accordance with manufacturer's instructions.

3.4 Prepare surfaces and seal exterior joints between adjacent modules with joint wrap in accordance with ASTM C891 and in accordance with manufacturer's instructions.

602.03.13 Outlet Control Structure

This work shall consist of the construction of the required Outlet Control Structures. The structures shall be constructed as specified in 602.03.02 and as shown in the details in the contract documents. The structures shall include all control plates, weir walls, and orifice configurations depicted in the contract documents.

602.03.14 Inlet Trench Drain

This work shall consist of the construction of the required ACO Flowdrain FG200 or approved equal trench drain. The structures shall be constructed as specified in 602.03.02 and as shown in the details in the contract documents. The structures shall include all grates, fittings, slabs, connections and all appurtenances depicted in the contract documents.

602.03.15 Stormwater Management Facility – Subsurface Infiltration Basins

This work shall consist of the construction of the required Stormwater Management Facilities. The facilities shall be constructed to the limits and configuration as depicted in the Contract Drawings. The work shall include all excavation, the furnishing and installation of the Aquabox or approved equal system, the installation of No. 57 stone aggregate, the installation of K5 sand, and temporary sediment control measures. The work also includes any required temporary excavation support, dewatering, and necessary bypass pumping.

602.04 MEASUREMENT AND PAYMENT

This Article of the Standard Specifications is amended as follows:

Delete the entire text of this Article and substitute the following:

Measurement and payment will be made under:

Item	*Pay Unit*
MANHOLE, 4' SQUARE, STORM SEWER	UNIT

MANHOLE, 4’ SQUARE, STORM SEWER, SHALLOW CASTING	UNIT
REINFORCED CONCRETE HEADWALL	CUBIC YARD
OUTLET CONTROL STRUCTURE	UNIT
HIGH CAPACITY KRAKEN OR APPROVED EQUAL FILTER, 72” MANHOLE	UNIT
CONTECH FILTERRA HC PEAK DIVERSION 6’ X 6’ MEDIA BAY, OR APPROVED EQUAL	UNIT
CONTECH FILTERRA HC PEAK DIVERSION 6’ X 8’ MEDIA BAY, OR APPROVED EQUAL	UNIT
CONTECH FILTERRA HC PEAK DIVERSION 6’ X 10’ MEDIA BAY, OR APPROVED EQUAL	UNIT
CONTECH FILTERRA HC PEAK DIVERSION 7’ X 10’ MEDIA BAY, OR APPROVED EQUAL	UNIT
CONTECH FILTERRA HC PEAK DIVERSION 8’ X 10.5’ MEDIA BAY, OR APPROVED EQUAL	UNIT
CONTECH MODULAR WETLAND 8’ X 16’, OR APPROVED EQUAL	UNIT
LAWN INLET	UNIT
INLET, TYPE D, 6” HEAD	UNIT
INLET, TYPE E	UNIT
INLET TRENCH DRAIN	LINEAR FOOT
RESET EXISTING CASTING	UNIT
HIGH CAPACITY KRAKEN FILTER PEAK DIVERSION 4’X6’ VAULT OR APPROVED EQUAL	UNIT
SUBSURFACE INFILTRATION BASIN #1, FURNISH AND INSTALL COMPLETE SUBSURFACE INFILTRATION BASIN, INCLUDING EXCAVATION AND BACKFILL, GEOTEXTILES, DEWATERING, NO. 57 STONE AGGREGATE, I-9 SOIL, PIPING, STRUCTURES, AND ALL ASSOCIATED WORK AND ALL MATERIALS	LUMP SUM
SUBSURFACE INFILTRATION BASIN #2, FURNISH AND INSTALL COMPLETE SUBSURFACE INFILTRATION BASIN, INCLUDING EXCAVATION AND BACKFILL, GEOTEXTILES, DEWATERING, NO. 57 STONE AGGREGATE, I-9 SOIL, PIPING, STRUCTURES, AND ALL ASSOCIATED WORK AND ALL MATERIALS	LUMP SUM

Separate payment will not be made for coarse aggregate bedding under precast bases for inlets, manholes and all water quality treatment structures and devices.

All inlets to be constructed and reconstructed will be with new casting and curb piece, and new bicycle safe grate. The curb piece will be “ECO” type with height as indicated on the plan. Payment for curb piece, bicycle safe grate and all else necessary will be included in the price bid for constructing and reconstructing the inlets.

All manholes to be constructed will be with new manhole casting and cover and in accordance with the details. Payment for manhole casting and cover and all else necessary will be included in the price bid for constructing the manholes.

Separate payment will not be made for new casting and new cover for the manholes to be reset or reconstruct using new casting and cover. Payment for manhole casting, cover and all else necessary will be included in the price bid for resetting or reconstructing manhole using new casting and cover.

All manholes, inlets and handholes to be reset will be paid under pay item “Reset existing casting”.

Separate measurement and payment will not be made for lowering manholes for the manholes to be reset or reconstruct using new casting and cover. Payment for manhole casting, cover and all else necessary will be included in the price bid for resetting or reconstructing manhole using new casting and cover.

SECTION 603 – SLOPE AND CHANNEL PROTECTION

603.01 DESCRIPTION

603.02 MATERIALS

603.03 CONSTRUCTION

603.04 MEASUREMENT AND PAYMENT

This Article of the Standard Specifications is amended as follows:

Delete the entire text of this Article and substitute the following:

Measurement and payment will be made under:

Item	*Pay Unit*
RIPRAP STONE SLOPE PROTECTION, 12" THICK (D50=6")	SQUARE YARD
RIPRAP STONE CHANNEL PROTECTION, 36" THICK (D50=6")	SQUARE YARD
RIPRAP STONE SLOPE PROTECTION, 30" THICK (D50=15")	SQUARE YARD
RIPRAP STONE CHANNEL PROTECTION, 36" THICK (D50=15")	SQUARE YARD
RIPRAP STONE CHANNEL PROTECTION, 36" THICK (D50=24")	SQUARE YARD
RIPRAP STONE SLOPE PROTECTION, 48" THICK (D50=24")	SQUARE YARD

SECTION 604 – GABION WALLS

604.01 DESCRIPTION

604.02 MATERIALS

PVC COATED STONE FILLED GABIONS AND MATTRESSES

1. GENERAL DESCRIPTION

The polyvinyl chloride (PVC) coated gabions/reno mattress shall be flexible zinc coated gabion/mattress of the type and sizes specified below. It is made of wire mesh of the type, size and selvedges as specified in the following paragraphs. Each gabion/mattress may be divided by diaphragms into cells whose length shall not be greater than one and half times the width of the gabion/mattress.

Standard GABIONS/MATTRESSES shall be fabricated so as to be of a single unit construction-base, lids and sides shall be woven into a single unit and the ends connected to the base section in such a manner that strength and flexibility of the point of connection is at least equal to that of the mesh.

PVC coated gabions/mattresses shall be as manufactured by Maccaferri Gabions, Inc. or approved equal.

2. MESH

The mesh shall be hexagonal woven mesh with the joints formed by twisting each pair of wires through three half turns. Because of their appearance, the joints are often termed triple twisted. The size of the mesh shall be of 8x10 type mesh. Nominal mesh size is 3-1/4 by 4-1/2 inches.

3. WIRE

All wire used in the fabrication of the gabions/mattresses and in the wiring operations during construction for the Zinc Coating and Tensile Strength, shall be in accordance with the requirements of ASTM A 641-97 or latest edition, Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire, for galvanized wire, Class 3, soft temper, as measured before extrusion of the PVC coating and fabrication of the netting. The **nominal** diameter of the wire used in the fabrication of the netting shall be 0.1063 inches.

The **nominal** diameter of the steel wire core, used in the fabrication of the netting, shall be 0.1063 inches with a PVC coating, extruded onto the wire core, having a **nominal** thickness of 0.02165 inches, with a minimum thickness of 0.015 inches. An overall **nominal** diameter of 0.1496 inches is obtained.

4. ELONGATION OF WIRE

Tests shall be made on the wire before coating with PVC and fabrication of the gabions/mattresses on a sample ten inches long. Elongation shall not be less than 12%, in accordance with the requirements of ASTM A 370-92 or latest edition.

5. ZINC COATING (GALVANIZING)

All wire used in the fabrication on the gabions/mattresses and in the wiring operations during construction shall be coated to ASTM A641-97 or latest edition for Zinc Coated (galvanized) carbon steel wire.

The minimum weight of the zinc coating shall be according to the figures shown in the table below when tested in accordance with ASTM A 90-81 or latest edition.

Nominal Diameter of Wire	Minimum weight of coating
0.0866 inches.....lacing wire.....	0.70 ozs./sq.ft.
0.1063 inches.....mesh.....	0.80 ozs./sq.ft.
0.1338 inches.....selvage.....	0.85 ozs./sq.ft.

The adhesion of the zinc coating to the wire should be such that, when wrapped around a mandrel in accordance with ASTM A 641-97 or latest edition, the zinc coating will not crack or flake to such an event that any zinc can be removed by rubbing with the bare fingers.

6. SELVEDGES

All edges of the PVC coated gabions/mattresses including end-panels and the diaphragms, if any, shall be mechanically selvedged in such a way as to prevent unraveling of the mesh and to develop the full strength of the mesh. The wire used for the selvedge shall have a diameter greater than that of the wire used to form the mesh, namely:

For the 8x10 type mesh, made of wire having a **nominal** core diameter of 0.1063 inches, the selvedge shall be of wire having a **nominal** diameter of 0.1338 inches or greater.

7. DIMENSIONS OF PVC COATED GABIONS/MATTRESSES

Standard PVC coated gabions shall have the following dimensions:

Nominal Length = 6 feet, 9 feet or 12 feet
Nominal Width = 3 feet
Nominal Height = 1 foot, 1 foot 6 inches or 3 feet

Standard PVC coated mattresses shall have the following dimensions:

Nominal Length = 9 feet or 12 feet
Nominal Width = 6 feet
Nominal Height = 6 inches, 9 inches or 12 inches

8. LACING WIRE

Sufficient lacing and connecting PVC coated wire shall be supplied with the gabions/mattresses for all wiring operations carried out in the construction of the gabion/mattress work.

The **nominal** diameter of lacing wire shall be 0.0866 inches and shall comply to the same specification as the wire used in the mesh.

a. FASTENERS

Rings can be used in lieu of lacing wire for assembly and installation operations of the Gabions/Mattresses. Rings supplied shall be stainless steel. The wire diameter of the rings shall be the same as the mesh. The wire used for the rings shall be in accordance with ASTM A 313 type 302, class I. Load tests shall conform to ASTM A 370-92 or latest edition. Tensile strength to be determined as per ASTM E 8/MTP 2004 or latest edition.

9. PVC COATING

All wire used in the fabrication of the gabions/mattresses and in the wiring operations during construction shall, after zinc coating have extruded onto it a coating of polyvinyl chloride, otherwise referred to as "PVC" The coating shall be grey in color of **nominal** thickness 0.02165 inches and shall nowhere be less than 0.015 inches in thickness. It shall be capable of resisting deleterious effects of natural weather exposure, immersion in salt water and shall not show any material difference in its initial characteristics which are:

a. INITIAL PROPERTIES OF PVC USED IN COATING

SPECIFIC GRAVITY

Shall be 1.30 to 1.35 kg/Dm3, in accordance with ASTM D 2287-92 or latest edition, Table 1 when tested as specified in ASTM D 792-91 or latest edition.

DUROMETER HARDNESS

Shall be 50 to 60 Shore D, in accordance with ASTM D 2287-92 or latest edition, Table 1 when tested as specified in ASTM D 2240-91 or latest edition (ISO 868 1985 or latest edition).

VOLATILE LOSS

At 105 degree C for 24 hours shall not be higher than 2%

At 105 degree C for 240 hours shall not be higher than 6% in accordance with ASTM D2287-92 or latest edition when tested as specified in ASTM D 1203-89 or latest edition (ISO 176-1976 or latest edition).

TENSILE STRENGTH

Shall not be less than 210 kg/cm2 in accordance with ASTM D 412-92 or latest edition.

ELONGATION

Shall not be less than 200% nor higher than 280% in accordance with ASTM D 2287-92, when tested as specified in ASTM D 412-92 or latest edition.

MODULUS OF ELASTICITY AT 100% OF ELONGATION

Shall not be less than 190 kg/cm2 when tested as specified in ASTM D 412-92 or latest edition.

RESISTANCE TO ABRASION

The loss of weight shall not be more than 0.19g in accordance with ASTM D 1242-92 or latest edition.

BRITTLENESS TEMPERATURE

Cold bend temperature shall not be higher than -30 degrees C in accordance with BSS 2782-151A(84)

Cold flex temperature shall not be higher than +15 degree C in accordance with BSS 2782-153A.

CREEPING CORROSION

Maximum penetration of corrosion of the wire core from a square cut end shall be 25mm when the specimen has been immersed for 2000 hours in a 50% SOLUTION HCI (hydrochloric acid 12 Be).

b. Variation of the initial properties will be allowed, as specified hereunder, when the specimen is submitted to the following accelerate aging tests:

SALT SPRAY TEST

According to ASTM B 117-94 or latest edition
Period of test - 3000 hours

EXPOSURE TO ULTRAVIOLET RAYS

According to ASTM D 1499-92a or latest edition and ASTM G 23-93 or latest edition using apparatus type E or as otherwise approved.

Period of test: 3000 hrs. at 63 degrees C or as otherwise agreed.

EXPOSURE AT HIGH TEMPERATURE

According to ASTM D 1203-89 or latest edition, (ISO 176-1976 or latest edition), and ASTM D 2287-92 or latest edition
Period of test = 240 hours at 105 degree C

After the above tests have been performed the P.V.C. compound shall show the following properties.

c. PROPERTIES AFTER AGING TESTS

APPEARANCE OF COATED MESH

The vinyl coating shall not crack, blister or split and shall not show any remarkable change in color.

SPECIFIC GRAVITY

Shall not show change higher than 6% of its initial value.

DUROMETER HARDNESS

Shall not show change higher than 10% of its initial value.

TENSILE STRENGTH

Shall not show change higher than 25% of its initial value.

ELONGATION

Shall not show change higher than 25% of its initial value.

MODULUS OF ELASTICITY

Shall not show change higher than 25% of its initial value.

RESISTANCE TO ABRASION

Shall not show change of more than 10% of its initial value.

BRITTLENESS TEMPERATURE

Cold Bend Temperature Shall not be higher than -20 degree C
Cold Flex Temperature Shall not be higher than +18 degree C

10. DIAPHRAGMS

According to engineering requirements the gabions/mattresses incorporate diaphragms to form cells having a length not greater than one and half the width of the gabion/mattress.

11. TOLERANCES

a. WIRE

Tolerances on the diameter of all wire in the above clauses shall be permitted in accordance with ASTM A641-89 or latest edition Table 3 or latest edition.

b. GABIONS/MATTRESSES

Tolerances of (+/-) 5% on the width, height and length of the gabions/mattresses shall be permitted.

604.03 CONSTRUCTION

604.04 MEASUREMENT AND PAYMENT

This Article of the Standard Specifications is amended as follows:

Delete the entire text of this Article and substitute the following:

Measurement and payment will be made under:

Item	*Pay Unit*
GABION MATTRESS	CUBIC YARD

SECTION 605 - FENCE

605.01 DESCRIPTION
THE FOLLOWING IS ADDED:

This work shall also consist of necessary excavation, backfill, clearing site and removal of debris where required along the fence alignment.

605.02 MATERIALS
THIS SUBSECTION IS CHANGED TO:

CHAIN LINK FENCE:

1. Fabric

   Vinyl-Coated-Fused-to-Galvanized Steel chain link fabric shall be as manufactured by ANCHOR FENCE, INC. of Baltimore, Maryland or approved equal in accordance with ASTM #F668-Type 2B. The steel core wire shall conform to the following table:

Core Wire Gage	Diameter of Core Wire	Break Test (Lbs.)	Galvanizing (Oz per square foot of surface)
9	0.148 inch	1290#	0.30

CORE WIRE SHALL BE 9 GAGE PRIOR TO COATING WITH PVC.

The core wire shall be given a coating of zinc in accordance with ASTM A-641.

A polyvinyl chloride (PVC) compound of virgin PVC resins, plasticizers and stabilizers shall be fused and bonded to the zinc coated core wire in accordance with ASTM A-641.

The (PVC) coating shall be 7 mills (0.006 to 0.10 inches) thick, the finished wire with a fused-on (PVC) coating shall be smooth, uniform, free of pin holes and blisters. The (PVC) coating shall not peel, crack or shrink.

Mesh Size shall be 1-3/4 inches as measured between the wires with permissible variation of plus or minus 0.250 inches.

Fabric Gage shall be 9 gage.

Fabric shall be knuckled selvage top, knuckled selvage bottom and shall be the height specified in the proposal and on the plans.

The fabric shall be connected securely to all terminal posts by ¼" x ¾" tension bar with fasteners as detailed on the plans. Fabric connections to line posts and rails shall be made using 9 gauge tie wires and placed at locations shown on the plan.

Proposed fencing fabric shall be weaved into existing where proposed meets existing to avoid seems in the fencing as directed by the engineer.

2. Color

All fabric color shall be black.

3. Framework

All framework shall be PVC coated as required for fence fabric.

A. Posts and Rails

Post and rail framework shall be as manufactured by ALLIED TUBE AND CONDUIT FENCE DIVISION OF HARVEY ILLINOIS or CENTURY TUBE OF PINE BLUFF, ARKANSAS or approved equal.

Pipe for posts and rails shall be manufactured from steel conforming to ASTM A 569, cold-formed, high frequency welded and having a minimum yield strength of 50,000 PSI. External surface triple coated with 1.0 ounce + 0.1 ounce of zinc per square foot, 30 + 15 micrograms of chromate per square inch and 0.5 + 0.2 mils of clear, cross linked polyurethane. Internal surface coated, after welding, with a zinc-rich based organic coating having an 87% zinc powder loading capable of providing galvanic protection.

Pipe shall be straight and true to section.

B. End, Corner, Gate, Line Posts

End, corner, line posts; gate framework and gate posts shall be Schedule 40 galvanized steel pipe conforming to ASTM A120.

The sizes of the various component members shall be as follows:

1) Line Posts: Line posts shall be 2.375" O.D. pipe weighing 3.117 pounds per foot with a sufficient length to allow installation to approximately 3'-6" below ground level, and shall be spaced on 10'-0" centers, unless otherwise shown on the plans.

2) End, Corner Posts: End, corner posts shall be 4.000" O.D. pipe weighing 9.1 pounds per foot with a sufficient length to allow installation to a depth approximately 3'-6" feet below ground level. (Schedule 40 ASTM A120 pipe only will be allowed, no substitutions).

3) Brace Rail: Brace Rail shall be 1.66" O.D. pipe weighing 1.836 pounds per foot.

A truss rod and turnbuckle arrangement shall be installed between each terminal, corner, or gate post and each adjacent line post above and below the brace rail.

4) Top, Bottom Rails: Top and bottom rails shall be 1.66" O.D. pipe weighing 1.836 pounds per foot. Top rail shall be in continuous lengths of 21 feet joined by 6" long sleeves and shall pass through openings provided in the post tops.

5) Tension Bars, Bands, Post Tops: Tension Bars, Bands and post tops shall be aluminum alloy, galvanized pressed steel, cast or malleable steel as shown on the plans.

6) Pedestrian Gate: Where specified, pedestrian gates shall have nominal clear opening as indicated on the plan, and shall be the same height as the surrounding fence. Fence fabric for pedestrian gate shall be the same as herein before specified. Gate posts shall be 4.000" O.D. pipe weighing 9.1 pounds per foot. Gate frame shall be fabricated from 2.000" O.D. pipe weighing 2.72 pounds per foot welded together to a rigid frame, matching the gate frame. Hinges, latches, fittings, etc. shall

be provided as per manufacturer's recommendations and as approved by the Engineer. Galvanizing shall be replaced at all frames.

7) Double Gates: Double Gates shall be provided where specified on the plans. Overall dimensions of each gate opening shall be as shown on the plans.

   Fabric shall be the same as specified for the fence, stretcher bars, clips, tie rod and turnbuckle arrangements shall be as here in before specified, fabric shall be secured on all four sides. Frames for gates shall be 2.00" O.D. pipe weighing 2.71 pounds per foot welded together as shown on the plans. Vertical and horizontal intermediate members shall be provided and welded into the gate framework.

   Gate posts for each gate leaf on the 10'-0" overall width double gates shall be 6.000" O.D. Schedule 40 pipes set as shown on the plans to support the gate frame as shown.

   Double gates shall be provided with a positive locking latch of a type satisfactory to the Engineer.

8) Tie Wires: Tie wires for fastening the fence fabric to the fence framework shall be 9 gauge galvanized steel wire, placed at the intervals and locations shown on the plans.

9) Fittings: Fittings and other appurtenances shall be aluminum alloy, galvanized pressed steel, malleable or cast steel.

10) Footings: No matter what is recommended by the fence manufacturer, footings shall be constructed of Class B 4,500 psi concrete as outlined in Section 903 and shall be constructed to the dimensions shown on the plans, for each type and size of post.

All posts shall be securely set in concrete with holes extending six (6) inches below finished ground surface. Tops of footings shall be crowned to allow water to runoff. All posts must be within one (1) inch plumb.

TIMBER ACCESS GATE:

Contractor to furnish and install double swing timber access gates as indicated on the construction plans and details. Swing gate installation shall be in accordance with any applicable codes. The double swing gates shall be constructed from a combination of galvanized steel hardware and wood. The gates are to be constructed to ensure 180-degree swinglines are achieved where necessary to prevent gate arm from impeding traffic flow. Double swing gates shall be set in a concrete foundation as depicted on the plans.

All lumber/timbers utilized for the construction of the required timber access road gate shall be arsenic-free and chromium-free southern yellow pine No. 2 grade or dense select structural and consist of 4" x 8" boards of proper length. The required tie back posts shall be 6" x 6" southern yellow pine No. 2 grade or better, a minimum of 7' long. All lumber shall be pressure treated with a preservative to a minimum of 0.40 pcf retention. The top of the tie back posts shall be chamfered as per the detail contained on the contract drawings. All posts and rails shall be sized in accordance with the detail drawing(s) and shall be free of any warps, bends, rot, cracks, other weaknesses and imperfections.

All fastening hardware shall meet the requirements of ASTM A307, hot dipped galvanized steel in accordance with ASTM A53 or as recommended by the lumber producer and sized as approved by the Engineer.

All welding shall be conducted with a working knowledge of the "Structural Welding Code" of the American Welding Society and ASTM Specifications A-139, latest revision. All welds shall develop the full strength of the material being welded. All components shall be solidly and completely welded to one another.

Concrete shall be NJDOT Mix Class B, air-entrained 4500 PSI.

Chain shall be high strength galvanized steel, 1" link, to be approved by the engineer. The length of the chain shall be in accordance with the contract drawings. Contractor shall provide a galvanized steel chain for each tie back post constructed.

Padlock shall be heavy duty, weather resistant, vandal-proof type to be approved by the engineer. The lock shall be as per Master, or approved equal. The contractor shall provide a padlock for each tie back post constructed. The padlocks shall be keyed-alike and five (5) sets of keys shall be provided to the engineer after installation.

Paint shall be an exterior oil base enamel paint, suitable for use on metal and shall be brown in color or as selected by the Engineer.

Stain shall be exterior oil base solid color stain, brown in color or as selected by the Engineer.

Color samples shall be provided for approval prior to ordering paint and stain.

A "Stop" sign (R1-1) shall be provided for the access road gate near the site entrance. The sign shall be mounted on the right hand gate in the location shown on the contract drawings. The dimension and color of the sign shall be as described in the "Manual on Uniform Traffic Control Devices".

605.03 CONSTRUCTION

THE FOLLOWING IS ADDED TO THIS SUBSECTION:

1) Clearing

Clearing of the proposed fence alignment shall be as specified in Section 201 of the specifications and shall be kept to the minimum area necessary for fence construction.

Access routes to all fence construction areas shall be discussed with and approved by the Engineer prior to the start of construction. The Contractor shall strictly adhere to the routes.

2) Shop Drawings for Fence and Gates

Prior to construction of any portion of the fencing, and gates, the Contractor shall submit shop drawings on fencing and gates to be constructed.

3) Excavation

All footing holes shall be excavated prior to any pouring of concrete and shall be approved by the Engineer prior to setting of any terminal, line, or gate posts. Undersized holes shall be enlarged by the Contractor to the proper dimensions.

Prior to any excavation for fence and gate footings, the Contractor shall carefully check and review with the Engineer the proposed fence and gate alignment in the field and the location of any underground utilities or installations.

4) Cleanup

The Contractor shall remove all excess fence materials and debris caused by his operations upon completion of the fence installation.

5) Damage

The Contractor shall repair all areas damaged, disturbed, rutted, etc. due to his operations at no additional expense to the Owner. Whether an area has or has not been damaged, disturbed, rutted, etc. shall be determined solely by the Engineer.

605.03.01 Chain-link Fence
THE FOLLOWING IS ADDED TO THIS SUBSECTION

1) Posts

   Line posts, corner posts, terminal posts, gate posts, and pull posts shall be spaced as shown on the Plans or ten feet (10'-0") on center, if not shown on the Plans, with their tops properly aligned and all shall be plumb. The Engineer reserves the right to direct the removal and replacement of any post, not aligned properly, out of plumb, incorrectly spaced, or whose footing is of insufficient size, at no additional cost to the Owner.

2) Fabric

   Rolls of vinyl coated chain line fabric shall be joined by weaving a single, diamond shaped strand into the ends of the roll to form a continuous mesh pattern, the location of the joint shall not be discernible after joining. The fabric shall be stretched taut and securely fastened to all terminal posts, pull posts, and gate posts. Fabric shall be placed on the side of the framework, facing away from the area to be enclosed, unless otherwise directed by the Engineer.

   Steel wire ties shall be placed at 12" centers vertically on each post, and 24” centers horizontally on the top, bottom and brace rails.

605.03.02 Gates

Gates shall be the same height as the fence to which the gates are attached.

New fencing shall be hot dipped galvanized steel wire (chain link) No. 9 gauge woven in a 2” diamond mesh and shall be vinyl coated where indicated on the plans.

Where vinyl coated fencing is indicated on the plans, it shall include vinyl coating of all fabric, framework, posts, rails fittings and hardware.

Minimum sizes of post and rails shall be as follows:

4’ to 6’ High Chain Line Fence	**Diameter (inches)**	**Nominal Weight (lbs/ft)**
Corner, Angle, End, and Pull Posts	3	5.79
Gate Posts	2-7/8	5.79
Line Posts	2-1/2	3.65
Gate Framing Members	2	2.27
Top Rails and Braces	1-5/8	2.27

8’ to 10’ High Chain Line Fence	**Diameter (inches)**	**Nominal Weight (lbs/ft)**
Corner, Angle, End, and Pull Posts	4	9.1
Gate Posts	4	9.1
Line Posts	3	5.79
Gate Framing Members	2	2.27
Top Rails and Braces	1-5/8	2.27
Mid Rails and Bottom Rails	1-5/8	2.27

605.03.03 Repair Chain-Link Fence
THIS SUBSECTION IS CHANGED TO:

605.03.03 Remove, Refurbish and Reset Existing Chain-Link Fence

Where directed by the Engineer, the Contractor shall reset existing fence as shown on the drawings or as directed by the Engineer. The Contractor shall utilize existing fence parts and straighten same where required and replace parts beyond repair with new materials. Fence posts shall be set in concrete as required.

605.03.04 Temporary Chain-Link Fence

The Contractor shall furnish, install and maintain temporary chain link fence if and where ordered by the engineer as necessary to confine construction activities and limit access during the duration of the Project.

THE FOLLOWING SUBSECTION IS ADDED:

605.03.05 TIMBER ACCESS GATE

All workmanship and construction shall be of a high quality and professionalism. All work shall be done in a manner that minimizes disturbance to adjacent improvements. Should any damage to the surrounding improvements occur as a result of the methods and operations utilized by the Contractor, he will be responsible to provide an acceptable repair or new material, if required, of the same type to replace that which is damaged at no additional cost to the Owner.

Location of all posts shall be staked by the contractor and approved by the engineer prior to digging of holes.

Contractor has the responsibility to ascertain possible presence of underground utilities, etc., prior to construction.

Holes for steel W8x21 and wood tie back posts and gate supports shall be dug by power auger to the prescribed depths as shown on the plans and backfilled accordingly.

Steel and wood posts shall be set plumb and perfectly vertical to the horizontal ground plans and checked with carpenter's level. Soil/sand mix to be backfilled and firmly tamped to prevent any lateral movement whatsoever.

Shop drawings of all plates to be fabricated shall be submitted to the engineer for approval.

Chain plate shall be located after posts have been installed to assure proper alignment with gate and tieback post.

All construction shall be in accordance with the approved shop drawings, detailed plans, specifications, and the direction of the engineer.

All wood members shall be stained prior to assembly of gate. Stain shall be applied evenly and uniformly via rag or brush, along all faces and edges. Spillage or discoloration is unacceptable and is cause for rejection of the gate.

All work shall be guaranteed for one year from the date of acceptance against all defects in material and workmanship. Repairs if necessary shall be done promptly at no cost to the Owner.

605.04 MEASUREMENT AND PAYMENT
THIS SUBSECTION IS CHANGED TO:

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
TEMPORARY CHAIN-LINK FENCE, 10’ HIGH (IF AND WHERE DIRECTED)	LINEAR FOOT
TEMPORARY 10’ HIGH BY 24’ WIDE CHAIN-LINK FENCE TWO-SECTION GATE (IF AND WHERE DIRECTED)	UNIT

Item	*Pay Unit*
FURNISH AND INSTALL 6’ HIGH BLACK VINYL COATED CHAIN-LINK FENCE	LINEAR FOOT
FURNISH AND INSTALL POST AND RAIL FENCE	LINEAR FOOT
FURNISH AND INSTALL TIMBER ACCESS GATE, DOUBLE LEAF, 20’ WIDE	UNIT
FURNISH AND INSTALL TIMBER ACCESS GATE, DOUBLE LEAF, 26’ WIDE	UNIT
4’ WIDE DECORATIVE STEEL DOCK GATE INCLUDING CONCRETE FOUNDATION	UNIT
WOODEN SNOW FENCE	LINEAR FOOT

Payment for the furnishing and installation of fences, including all labor, equipment and materials as described above and required to satisfactorily complete same, shall be included in the linear foot price bid for the fence items as listed in the bid form. Gates shall be measured by the unit.

SECTION 606 – SIDEWALKS, DRIVEWAY, AND ISLANDS

606.01 DESCRIPTION
THIS SUBSECTION IS CHANGED TO:

General - The Contractor is hereby notified that all concrete sidewalks and driveways shall be cured in accordance with Sections 606 and 504.

This work shall also include the construction of aggregate driveways.

This work shall also consist of the application of a color contrast and a slip resistant surface on existing or proposed concrete sidewalks.

606.02 MATERIALS
THE FOLLOWING IS ADDED TO THIS SUBSECTION:

Coarse aggregate shall conform to Section 901.03.

Class A concrete aprons and driveways shall attain a strength of not less than 3000 psi in 48 hours.

Materials for the application of a color contrast and a slip resistant surface on existing or proposed concrete sidewalks shall be a moisture cured polyurethane coating with self contained white rubber grit. The materials shall be capable of adhering to existing or new Portland cement concrete sidewalk.

The moisture cured polyurethane shall be an abrasion, chemical and UV resistant formula. When cured, the coating shall produce a slip resistant non-porous surface. The surface of the moisture cured polyurethane shall be adequately slip resistant with the following minimum values when tested in accordance with ASTM D 1894.

STATIC CO-EFFICIENT OF FRICTION (N/KG)	KINETIC CO-EFFICIENT OF FRICTION (N/KG)
35.0	32.0

The minimum final dry coat thickness for two coats of roller applied polyurethane shall be 1 mm. The moisture cured polyethylene coating shall be durback as manufactured by Cote-L or equal.

606.03 CONSTRUCTION

606.03.01 HMA Sidewalks, Driveways, and Islands
THE FOLLOWING IS ADDED TO THIS SUBSECTION:

HMA driveway restoration, 2" thick shall consist of 2" of HMA 9.5M64, over 4" of DGA base course.

606.03.02 Concrete Sidewalks, Driveways, and Islands

A. Underlayer Preparation
THE FOLLOWING GIS ADDED TO THIS SUBSECTION:

Four inches (4") of dense graded aggregate base course shall be provided under all sidewalks and driveway aprons.

B. Forms

C. Sleeves

D. Welded Wire Mesh

E. Expansion Joints
THE FOLLOWING IS ADDED TO THIS SUBSECTION:

Pre-formed expansion joints shall be provided where proposed concrete walks and driveways are to abut existing concrete walks and/or driveways.

Four inch (4") PVC sleeves shall be provided for all sign posts within proposed concrete sidewalks.

F. Placing Concrete

G. Finishing Concrete

H. Protection and Curing
THE FOLLOWING IS ADDED AFTER THE FIRST PARAGRAPH:

Ambient temperature below 40°F shall be considered cold weather

I. Backfilling

606.03.03 Detectable Warning Surfaces
THE FOLLOWING IS ADDED TO THIS SUBSECTION:

Immediately before installing Detectable Warning Surfaces, the designated areas shall be thoroughly cleaned and dried according to the manufacturer's recommendations. The installation of Detectable Warning Surfaces shall be according to the corresponding construction details and the manufacturer's recommendations.

THE FOLLOWING IS ADDED TO THIS SECTION:
606.03.04 Paint Concrete Sidewalk

Immediately prior to applying the paint material to the concrete surface, all dirt, oil, grease, and other foreign material shall be removed and the surface completely cleaned with a solvent in accordance with the manufacturer's recommendations. The paint material shall be applied on thoroughly dry surfaces within the manufacturer's recommended ambient conditions for application. Color shall match existing adjacent sidewalk paint and must be approved by the owner prior to application.

The moisture-cured polyurethane coating shall be applied by roller method, in two coats. Immediately after the application of the second coat, 60 grit silicon carbide shall be broadcast evenly over the moist surface coat at a rate of 38 grams per square meter. The drying time between coats and drying time to fully cure the coating shall be the times recommended by the manufacturer of the moisture-cured polyurethane. The coating shall not be subjected to loading or chemical exposure until fully cured.

606.04 MEASUREMENT AND PAYMENT
THIS SUBSECTION IS CHANGED TO:

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
FURNISH AND INSTALL 8' WIDE AGGREGATE WALKING TRAIL INCLUDING 2" THICK QUARRY PROCESS CRUSHED CLEAN STONE NJDOT NO. 10 SCREENINGS, 4" THICK QUARRY PROCESS COARSE CLEAN AGGREGATE NJDOT TYPE 57, SUBSURFACE GEOTEXTILE FABRIC, METAL EDGING AND ALL ASSOCIATED WORK	SQUARE YARD
CONCRETE SIDEWALK, 4" THICK	SQUARE FOOT
HOT MIX ASPHALT SIDEWALK, 6" THICK	SQUARE YARD
HOT MIX ASPHALT DRIVEWAY, 6" THICK, COMMERCIAL	SQUARE YARD
CONCRETE DRIVEWAY, REINFORCED, 10" THICK, COMMERCIAL	SQUARE FOOT
DETECTABLE WARNING SURFACE	SQUARE YARD
GRADE, COMPACT AND TOP DRESS WITH NJDOT NO. 57 TYPE STONE, UP TO 4" THICK	SQUARE YARD

Separate measurement and payment shall not be made for metal edging along the perimeter of the aggregate walking trail. Same shall be included in the unit price bid for furnish and install 8' wide aggregate walking trail. Metal edging shall be manufactured by Vodaland or approved equal and shall be installed per manufacturer's recommendations.

Payment for sidewalks shall also include all grading of adjacent turf areas necessary to provide a minimum slope of 2% and a maximum slope of 3:1.

<u>Causes for Rejection of Concrete Walks and Driveways</u>

Concrete walks and driveways shall be rejected and ordered replaced by the Engineer if any or all of the following should occur or exist:

A. Staining or discoloration of concrete sidewalk.
B. Walk or driveway is out of alignment.
C. Walk or driveway is out of grade.
D. Joints and surfaces are improperly finished.
E. Expansion joints protrude from concrete.
F. Cracks, chips, or other damages occur during
G. Construction or maintenance period.
H. Settlement of walk or driveway.
I. Inspection not asked for prior to pouring of concrete.
J. Improper vibration of concrete.
K. Vandalism during initial setup of concrete.

Separate payment will not be made for removal, disposal, and replacement of walks and driveways rejected due to the causes of rejection listed above.

No separate payment shall be made for Contractor prepared plans and certification. The cost of the Contractor retained Engineer, plans and certification shall be included in the unit prices of Stamped Concrete Driveway, Reinforced 10" thick as appropriate.

No separate payment will be made for knee walls or similar. The cost thereof shall be included in the unit prices of Stamped Concrete Driveway, Reinforced 10" thick.

No payment will be made for any Concrete Sidewalk, Reinforced or Detectable Warning Surface which is part of an ADA ramp until the as-built plan and engineer's certification is submitted to the engineer and the ramp has been inspected and found to be in accordance with the approved as-built plan submitted by the NJ professional engineer retained by the Contractor.

SECTION 607 – CURB

607.01 DESCRIPTION
THE FIRST SENTENCE IS CHANGED TO:

The work shall consist of the construction of portland cement concrete curbs, portland cement concrete curbs with coloring additives, granite curbs, and granite block curbs and the resetting of granite curbs and granite block curbs and the installation of steel plate curb treatment at conflicts of trees and proposed curbs.

The Contractor is hereby notified that all concrete curbs shall be cured in accordance with Sections 607 and 504.

All slab lengths shall conform to Subsection 607.03.

607.02 MATERIALS
THE FOLLOWING IS ADDED OT THIS SUBSECTION:

Class A concrete curbs shall attain a strength of 3000 psi in 48 hours.

Steel plates shall be constructed of Cor-Ten weathering steel or approved equal.

607.03 CONSTRUCTION

607.03.02 Concrete Vertical Curb and Concrete Sloping Curb

A. Underlayer Preparation.
THE FOLLOWING IS ADDED:

Six inches (6") of compacted dense graded aggregate shall be provided under all proposed concrete curb, curb and gutter, granite and granite block curb, unless otherwise directed by the Engineer.

C. Installing Joints.
THE FOLLOWING IS ADDED:

Expansion joints shall be provided at uniform intervals of 20'.

D. Placing Concrete.
THE FOLLOWING IS ADDED:

Concrete curb shall not be constructed from November 1 to March 15 except as permitted by the Engineer.

Concrete curbs shall have a uniform slab length of 10'.

F. Protecting and Curing Concrete.
THE FOLLOWING IS ADDED:

Ambient temperatures below 40° F shall be considered cold weather.

607.03.05 Granite Curb

THIS SUBSECTION IS REPLACED WITH:

Granite block curb shall be constructed to the size shown on the Plan, the locations and to the prescribed lines and grades as indicated on the drawings or as ordered by the Engineer. The subgrade shall be smooth and even and compacted. Concrete for curbs shall have a minimum compressive strength of 4500 psi after twenty-eight (28) days and shall be manufactured in accordance with the latest revisions of ASTMC-94 "Specifications for Ready-Mixed Concrete" and shall originate in a ready-mixed plant that has been certified and approved by the National Ready-Mixed Concrete Association. The Contractor shall submit to the Engineer a copy of the certification prior to the delivery and placing of any concrete on the project. Coarse aggregate proportions shall conform to the latest revisions of ASTMC 33 "Concrete Aggregates Size No. 57 or 67". Concrete will be air-entrained and the amount of air shall be 5% plus or minus 1%. Granite blocks approved for use under this item shall be of uniform quality, structure and texture with percentage of wear not more than 5%. Blocks shall be dressed so that all faces are approximately rectangular, and shall be not less than 10" or more than 16" in length, not less than 5" or more than 7" in width and not less than 4" or more than 6" in depth. All blocks shall be from one quarry and the same color and texture. All edges shall be approximately parallel and at right angles to each other. Blocks shall be set in concrete with the greatest dimensions vertical and the least dimension perpendicular to the line of the curb.

The concrete foundation shall be suitably formed on both sides with approved form materials set true to line and grade and properly braced and supported so as to prevent displacement during pouring or setting. Block joint spacing shall not exceed 2" and all joints shall be "pointed up" with a 1:2 cement/sand mixture in an approved manner, after setting. All curbing shall be set accurately to line and grade and shall present an even and unbroken line for the entire length of the work. All blocks shall be set with the axis of each block perpendicular to the profile, and through vertical curve sections the axis of the block shall be set along radial lines.

Where shown on the plans or directed by the Engineer, the curb shall be lowered to within 2" of the proposed gutter to provide for driveway entrances. When set in final positions, the curb shall have a uniform batter, away from the gutter, of 1" per foot.

Where the work consists of the removal and replacement of existing block curbing, the Contractor shall restore the curbing utilizing blocks of a size and type equivalent to those which are existing and the work may require the salvaging and reuse of the existing blocks, if so directed by the engineer.

THE FOLLOWING SUBSECTION IS ADDED TO THE SPECIFICATIONS:

607.03.08 Cleaning and Sealing Existing Joints in Concrete Curb and Gutter

Clean existing transverse joints to a depth of 2 inches. After cleaning, immediately remove debris from the joint cavity and surrounding surface. Clean joints with a 150-pounds-per-square-inch water blast to remove remaining debris in the joint cavity, and then blow joints with a hot-air lance to provide a dry surface. Seal joints immediately after blowing.

Seal joints when the ambient temperature is between 50 and 80 °F. Pour joint sealer in the joints, ensuring that joint sealer is not spilled on the surface of the concrete or surrounding surface. If spillage occurs, immediately remove spilled joint sealer. Fill joints to ensure that the joint sealer is 1/8 to 1/4 inch below the adjacent surface. Do not allow traffic over the poured joints until the joint sealer has hardened to resist pickup.

607.04 MEASUREMENT AND PAYMENT
THIS SUBSECTION IS CHANGED TO:

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
9” X 20” CONCRETE VERTICAL CURB	LINEAR FOOT

Item	*Pay Unit*
GRANITE BLOCK CURB	LINEAR FOOT
SLOPED GRANITE BLOCK CURB	LINEAR FOOT

Separate measurement and payment will not be made for steel plate curb treatment or for grinding roots where necessary in order to install curb whether or not steel plate curb treatment is ordered. The same shall be measured as concrete curb.

Separate measurement and payment will not be made for expansion joints nor for dense graded aggregate base course provided under concrete curb and gutter sections.

Causes for Rejection of Curb

Concrete curb or curb and gutter shall be rejected and ordered replaced by the Engineer if any or all of the following should occur or exist:

A. Staining or discoloration of concrete sidewalk.
B. Walk or driveway is out of alignment.
C. Walk or driveway is out of grade.
D. Joints and surfaces are improperly finished.
E. Expansion joints protrude from concrete.
F. Cracks, chips, or other damages occur during
G. Construction or maintenance period.
H. Settlement of walk or driveway.
I. Inspection not asked for prior to pouring of concrete.
J. Improper vibration of concrete.
K. Vandalism during initial setup of concrete.
L. Excessive laitance or efflorescence

Payment for asphalt impregnated expansion joints in concrete curbing and along the face of concrete curbing abutting portland cement concrete pavement shall be included in the unit price bid for concrete curb as listed in the bid form.

Separate payment will not be made for dense graded aggregate under proposed curb and/or curb and gutter sections.

SECTION 609 – BEAM GUIDE RAIL

806.01 DESCRIPTION

806.02 MATERIALS

806.03 CONSTRUCTION

806.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follow:

Item	*Pay Unit*
RESET BEAM GUIDE RAIL WITH EXISTING POSTS	LINEAR FOOT

SECTION 610 – TRAFFIC STRIPES, TRAFFIC MARKINGS AND RUMBLE STRIPS

610.01 DESCRIPTION

610.02 MATERIALS

610.03 CONSTRUCTION

610.03.01 Traffic Stripes

Add the following to sub section 610.03.01.E:

All retroreflectance measurements taken with a LTL2000Retrometer will be made on a clean, dry surface.

610.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follow:

Item	*Pay Unit*
TRAFFIC STRIPES, LONG LIFE, "THERMOPLASTIC, 4" WIDE, WITH GLASS BEADS	LINEAR FOOT
TRAFFIC STRIPES, LONG LIFE, "THERMOPLASTIC, 8" WIDE, WITH GLASS BEADS	LINEAR FOOT
TRAFFIC STRIPES, LONG LIFE, "THERMOPLASTIC, 12" WIDE, WITH GLASS BEADS	LINEAR FOOT
TRAFFIC STRIPES, LONG LIFE, "THERMOPLASTIC, 24" WIDE, WITH GLASS BEADS	LINEAR FOOT
TRAFFIC MARKINGS, SYMBOLS, LONG LIFE "THERMOPLASTIC	SQUARE FOOT

SECTION 612 – SIGNS

612.01 DESCRIPTION

Add the following to this subsection

This work shall consist of fabricating, furnishing, assembling and erecting signs, accessory panels and delineators. 612.02 MATERIALS

612.03 CONSTRUCTION

612.03.02 Guide Signs, Type GA Breakaway Supports

612.03.03 Guide Sign Panel, Type GO and Guide Sign Pantel, Type GOX

631.04 MEASUREMENT AND PAYMENT

This article of the standard specifications is amended as follows:

The Department will measure and make payment for Items as follow:

Item	*Pay Unit*
FURNISH AND INSTALL REGULATORY AND WARNING SIGNS	SQUARE FOOT
HANDICAPPED PARKING SIGN ASSEMBLY INCLUDING SECONDARY SIGNS, POSTS, AND ALL APPURTENANCES	UNIT

Only one face of double-sided signs will be measured for payment.

Payment for the handicapped parking sign assembly including concrete foundations, all equipment, materials, labor, secondary signs, posts and all associated appurtenances and work will be made at the unit bid price for said items as listed in the bid form.

THE FOLLOWING SUBSECTION IS ADDED:

SECTION 631 – ROADWAY TRENCH REPAIR

631.01 DESCRIPTION

The Contractor shall provide all necessary labor, materials, and equipment to construct the trench repair as shown on the drawings or as directed by the Engineer, and as specified below and in other applicable sections of this specification.

The Contractor is herein advised that the use of imported recycled material as an alternate to dense graded aggregate is subject to the submission of gradation test results and Target Compound List/Target Analyte List plus thirty (TCL/TAL+30) test results indicating the material is acceptable for the intended use in accordance with NJDEP criteria and requirements. One set of test results per source shall be provided for every 1000 cubic yards of imported material provided that a minimum of one set of results is submitted per street. Further, any recycled material to be utilized must come from a State licensed recycling facility.

631.02 MATERIALS

631.03 CONSTRUCTION

Do not leave trench openings open overnight under any circumstances. Use dense graded aggregate for backfill in roadways. Use suitable previously excavated materials for backfill in other areas unless otherwise shown on the plans.

Maintain the roadways where storm drains are installed in good serviceable condition, and immediately repair all abrupt depressions to the satisfaction of the Engineer.

Construct any necessary ditches or trenches to keep the site and the work sufficiently drained at all times during progress of the work.

Mechanically compact the trench to the material's optimum density as shown on the construction detail drawings.

The Contractor is herein advised that the Owner intends to utilize as much of the existing in situ granular soils as possible and accordingly, the work shall consist of the segregation of portions of the excavated material to optimize the reuse of these granular soils. The Contractor is specifically directed not to backfill with clayey or silty soils. Where these soils are encountered, segregate these soils from the granular material and dispose of these soils at approved locations.

The Contractor is further advised that the work also includes the drying of the excavated saturated granular soils, if necessary, and that compensation for this work should be included in the prices bid for the various items included in the bid form and requiring the same.

Where unsuitable soils are encountered, furnish and install backfill materials as specified in other applicable sections of these specifications and on the construction details.

The maximum payment width for the imported backfill materials utilized for trench backfill shall be as indicated on the construction details. Should additional select fill beyond the maximum payment width be required due to the Contractor's methods or operations, the cost for this material will be borne by the Contractor and no compensation for same will be made.

The work under this section also requires the Contractor to protect all existing structures adjacent to the proposed construction areas. He shall also be required to monitor the stability of potentially affected structures and to implement any corrective measures necessary if stability of said structures are affected. The Contractor is also encouraged to make indoor inspections, where deemed necessary, and to take preconstruction photos of these structures prior to the commencement of work.

The Contractor is specifically advised that no separate payment for dewatering shall be made and that dewatering may include in trench dewatering, well points, deep wells and/or whatever methods are necessary to adequately maintain the groundwater level at a minimum of 2' below the prevailing excavation bottom during the pipe installation and backfill. Payment for dewatering shall be included in the prices bid for the various items included in the bid form and requiring same.

631.03.01 Temporary Trench Repair

In areas of the roadway that will be subject to full excavation, construct temporary trench repair prior to the end of each working day following the installation of the proposed storm sewer mains and laterals. Temporary trench repair shall consist of the construction of 2" of hot mix asphalt 9.5M64 surface course on top of the compacted trench backfill. Construct the temporary trench repair such that the finished surface matches the existing elevation of the adjacent pavement.

Continuously maintain the trench area as directed by the Owner or Engineer at no additional cost until such time as the roadway is to be excavated in accordance with the plans. At that time, excavate the roadway, re-compact the trench area, and install the roadway pavement section.

631.03.02 Roadway Trench Repair

Construct roadway trench repair at the end of each work day and shall consist of the construction of dense graded aggregate base course and hot mix asphalt 19 M 64 base course, at the thicknesses indicated on the construction plans and details. The roadway trench repair shall be constructed on top of the compacted trench backfill, and the finished surface shall match the existing elevation of the adjacent pavement.

631.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follow:

Item	*Pay Unit*
TEMPORARY TRENCH REPAIR	SQUARE YARD
ROADWAY TRENCH REPAIR	SQUARE YARD

Payment for roadway trench repair and temporary trench repair in accordance with the contract drawings shall include all work as outlined above and required to satisfactorily complete same.

Payment for trench repair shall be based on a maximum payment width of six (6) feet.

Bidders are advised that prior to the end of each working day, all open trenches must be backfilled and repaired. If permanent or temporary pavement is unavailable, then 6" of NJDOT Type 57 stone shall be installed in the trench until the asphalt is available subject to the approval of the Engineer; however, in no case shall the trench be left unrepaired, without asphalt, for more than 48 hours. Compensation for the 6" Type 57 stone, if required, shall be included under the prices bid for temporary trench repair.

Measurement and payment for imported backfill shall be made based on the in-place cubic yardage actually installed, compacted, and measured in place by the Engineer or his authorized representative.

The maximum payment width for the imported backfill materials utilized for trench backfill shall be 6 feet. Should additional select fill beyond the 6 feet payment width be required due to the Contractor's operations or methods, the cost for this material will be borne by the Contractor and no compensation for same will be made.

Payment for HMA pavement milling shall be made in accordance with Section 401.

Separate payment will not be made for segregating, drying, installing and compacting excavated materials from the site that are utilized for backfill.

Payment for hot mix asphalt surface course with the exception of trench repair shall be made in accordance with Section 401.

THE FOLLOWING SUBSECTION IS ADDED:

SECTION 634 – MISCELLANEOUS CONCRETE

634.01 DESCRIPTION

This work shall consist of the construction of miscellaneous portland cement concrete items such as steps, saddles, valley gutters, support blocks and encasements.

This work shall also consist of the excavation, sawcutting, plugging, filling with Controlled Low Strength Material (CLSM) and backfilling of storm sewer pipe and water mains to be abandoned.

Reinforced concrete steps, at a minimum, shall conform to the detail provided in the plans.

Contractor shall submit working drawings signed and sealed by a licensed New Jersey Professional Engineer including plans, sections and elevations with dimensions for all steps indicated on the plans to be reconstructed. Steps shall be reconstructed to match the existing style, as directed by the engineer. Where existing steps contain cheek walls and/or brick treads or risers, they shall be reconstructed in kind

634.02 MATERIALS

Concrete	903.03
Curing Materials	903.10
Preformed Joint Filler	914.01
Reinforcement Steel	905.01

The following is added:
All concrete shall be Class B, 4500 psi air entrained concrete.

The following is also added:
A. REINFORCED CONCRETE LOW FLOW CHANNEL

The reinforced concrete low flow channel shall be constructed of 4" thick 4500 psi concrete with 6 x 6, 10 gage welded wire mesh reinforcement. Details for the required concrete and reinforcement shall be as described in other applicable sections of these specifications.

The required low flow channel shall be constructed above 8" thick base course of Quarry Type 57 crushed stone.

Pre-formed bituminous fiber expansion joints ½" thick shall be provided at 12' intervals.
Construction of the reinforced concrete low flow channel shall be in accordance with the detail as contained on the contract drawings.

634.03 EXCAVATION AND BACKFILLING

Excavation and backfilling shall be according to Section 202, 302, or 601

634.04 MIXING, PLACING, FINISHING, AND CURING

Mixing, placing, finishing, and curing of concrete including placing of reinforcement steel shall be according to Section 504.

634.05 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
MISCELLANEOUS CONCRETE, CLASS B (IF AND WHERE DIRECTED)	CUBIC YARD

THE FOLLOWING SECTION IS ADDED:

SECTION 636 – REMOVABLE BOLLARDS

636.01 DESCRIPTION

Bollards shall include the furnishing of materials, labor and equipment for the construction of Bollards as scheduled in the Plans and Specifications, as directed by the Engineer and as required to fulfill the intent of same.

636.02 MATERIALS

Steel Bollards shall be Model BOLLARD straight removable as manufactured by Keystone Ridge Designs or approved equal.

Bollard shall be 36" high with 4 ½" O.D. pipe with cast aluminum cap.

Prime coat to be rust proof with color to be determined by owner.

Finished color of removable bollard shall be Safety Yellow or as selected by the Owner.

The steel bollard shall be finished with a colored polyester powder coating applied to a 7-15 mil thickness. Substrate preparation shall consist of removing impurities such as heavy mill oils and rust inhibitors, ensuring that all surface contaminants are removed. The substrate is sandblasted to a white finish. The raw product then receives a corrosion inhibiting iron phosphate coating per TT-C-490 Method II, prior to application of the powder coating. The powder coating is electrostatically applied and oven cured according to powder coating manufacturing specifications to create a smooth, satin-like finish.

The concrete footing shall be Class "B" (4500 psi) concrete as per New Jersey Department of Transportation Standard Specifications.

All hardware shall be as supplied by the Bollard Manufacturer.

The Contractor shall submit shop drawings showing installation procedures and anchoring details.

636.03 CONSTRUCTION

Location for the Bollards shall be as shown on the Plans or as designated in the field by the Engineer.

The Bollards shall be installed as per the Manufacturer's instructions or as directed by the Engineer.

The construction requirements for adjacent areas shall be as described in other applicable sections of these Specifications.

All workmanship and construction shall be of high quality and professionalism.

636.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Item	Pay Unit
REMOVEABLE BOLLARD (IF AND WHERE DIRECTED)	UNIT

Payment for Removable Bollards shall be made on a unit price bid, which price shall include furnishing all materials, excavation, backfill, concrete, labor, and equipment, and all else necessary therefore and incidental thereto.

THE FOLLOWING SECTION IS ADDED:

SECTION 637 – WASTE AND RECYCLING CONTAINERS

637.01 DESCRIPTION

The Contractor shall provide all labor, materials and equipment necessary to furnish and install the required waste and recycling containers including reinforced concrete pad at the locations directed by the Engineer.

All construction work and required materials shall be as directed by the Engineer or as required to fulfill the intent of same.

The Contractor shall provide all work necessary to satisfactorily complete the improvements in a first class manner acceptable to the Engineer.

637.02 MATERIALS

The waste and recycling containers shall be Model CFTR-011 with liner as manufactured by Custom Fabrication Inc. or approved equal..

The concrete pads shall be Class "B" concrete as per New Jersey Department of Transportation Standard Specifications Section 903.

637.03 CONSTRUCTION

The waste and recycling containers and concrete pad shall be installed at the locations as directed by the County and Engineer. Permanent installation shall be in accordance with the detail drawing. Contractor shall submit shop drawings for approval prior to ordering.

All workmanship and construction shall be of a high quality and professionalism. All work shall be done in a manner that minimizes disturbance to adjacent improvements. Should any damage to the surrounding improvements occur as a result of the methods and operations utilized by the Contractor, he will be responsible to provide an acceptable repair or new material, if required, of the same type to replace that which is damaged at no additional cost to the owner.

637.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
FURNISH AND INSTALL WASTE AND RECYCLING CONTAINERS INCLUDING LINER, CONCRETE PAD AND ALL APPURTENANCES (IF AND WHERE DIRECTED)	UNIT

Payment for the installation of waste and recycling containers including all work as detailed above and required to satisfactorily complete same shall be based on the unit price bid for this item as listed in the bid form. The unit price shall include the costs of concrete foundations, reinforcement, ¾" crushed stone, one waste container with liner, one recycling container with liner and all labor, materials and equipment necessary for the construction and installation of the above-described work.

THE FOLLOWING SECTION IS ADDED:

SECTION 638 – PARK BENCHES

638.01 DESCRIPTION

The Contractor shall provide all labor, materials and equipment necessary to install park benches at locations as determined in the field, including furnishing and installation of concrete pads, inspecting, transporting, assembling and securing the same in accordance with the Contract Documents, as directed by the County or the Engineer and in order to fulfill the intent of same.

638.02 MATERIALS

The decorative park benches shall be Model 63-771-6PL, 6' Long Black Powder Coat Finish with recycled cedar plastic slats as manufactured by Dumor, Inc. and provided by General Recreation, Inc. or approved equal. The benches shall be powder coated, black in color. Permanent installation shall be in accordance with the detail drawing. Contractor shall submit shop drawings for approval prior to ordering.

The Contractor shall be required to review all documents and inspect all parts and hardware for park benches s prior to transporting the same to the project site. The Contractor shall immediately notify the Engineer of any material that was found to be missing or defective as a result of this inspection.

The park benches shall be secured as per manufacturer's recommendations.

638.03 CONSTRUCTION

The park benches shall be assembled and installed as per manufacturer's instructions and at the locations shown on the plans or as designated in the field, and as directed by the engineer.

When fully installed, park benches shall be secure and free of any play whatsoever. All connectors shall be firmly tightened. Park benches shall be free of any marks, dents, holes, etc. As a result of transportation to the site and actual on-site construction.

Footings shall be designed and constructed as per the design-build notes shown on the contract drawings.

638.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
FURNISH AND INSTALL BENCH, 6' LONG, INCLUDING CONCRETE PAD AND ALL APPURTENANCES (IF AND WHERE DIRECTED)	UNIT

The quantity of park benches for which payment will be made will be the number of park benches actually installed in accordance with the plans, or as directed by the County or the Engineer.

Payment for the installation of park benches shall include all labor, excavation, concrete pads and foundations, anchoring, subgrade preparation, quarry dense graded aggregate base course, inspecting, transporting, assembling, securing and all labor, materials and equipment necessary for or incidental to the completion of the work described herein and as directed by the County or the Engineer, shall be included in the unit price bid for park benches as listed in the Bid Form.

THE FOLLOWING SECTION IS ADDED:

SECTION 639 – ALUMINUM GANGWAYS

639.01 DESCRIPTION

Measurement and payment for the furnishing and installation of gangways, including all labor, equipment and materials as required to satisfactorily complete same, shall be included in the unit price bid for the gangway items listed in the bid form.

639.02 MATERIALS

Aluminum gangway system shall be Warren Gangway manufactured by Mantle Industries or approved equal.

Aluminum extrusions for gangway structures shall be aluminum alloy 6061-T6, 6063-T5 and 6063-T6 and shall be extruded in accordance with the requirements of applicable sections of Federal Specification QQ-A-200.

Stainless steel fasteners shall be grade 304

Rollers used at the end of the gangway shall be ultra-high molecular weight polyethylene (UHMW).

639.03 CONSTRUCTION

Part I GENERAL

639.03.01 References

A. Occupational Safety and Health Administration construction Industry Standards and Interpretations related to construction safety.

B. All construction is to be in accordance with the minimum provisions of the 2009 International Building Corde (IBC)

C. Design of the aluminum members shall conform to the Current Edition of The Aluminum Design Manual

D. Analysis of gangway truss shall utilize Holt's method for determining top chord bucking as outlined in 'Guide to Stability Design Criteria for Metal Structures', 4th Edition, by Theodore B. Galambos.

639.03.02 Design Loading Criteria

A. Gangway deck and structural components shall be designed to support the deadload of the gangway plus Utilities and a Uniform Live Load of 100 pounds per square foot for Public/Commercial use and 40 pounds per square foot for Private/Residential use. Maximum deflection of structure shall be calculated using L/180 where "L" is the length of the gangway in inches.

B. The deck and structural components shall be designed to support a concentrated vertical load of 400 pounds applied over a one square foot area

C. The mounting and components of the handrails shall be capable of withstanding a load of 50 pounds per lineal foot, Lateral.

D. Intermediate rails and supports shall be capable of withstanding a load of 25 pounds per square foot applied horizontally to the rails.

639.03.03 Submittals

The following material submittals shall be made prior to performing the related items of work:

A. Shop drawings of all components and details shall be submitted for written approval prior to any fabrication.

B. Product Data: Manufacturer's specifications and installation instructions for all components of each product type specified.

C. Sealed support calculations provided by a Professional Engineer experienced in the design of aluminum structures showing analysis and design review shall be submitted with the shop drawings.

D. Catalog cuts and loading charts shall be provided for decking information

639.03.04 Handrails

A. The gangway shall have a continuous "Mantle" handrail along both sides of the walking surface and shall extend a minimum of one food beyond the primary walking surface at each end.

B. The top of the handrails shall not be less than 34 inches nor more than 38 inches above the walking surface.

C. The ends shall be returned into the truss body or terminate with no sharp or catching edges.

C. The handrail portion of the handrails shall not be less than 1-1/4 inches nor more than 2 inches in cross-sectional dimension, or the shall shall provide an equivalent surface. A minimum of 1-1/2 inches clearance shall be provided between the gangway truss and the backside of the handgrip portion.

639.03.05 Guardrails

A. The top chord of the truss serves as the guardrail provided that its not less than 42 inches above the walking surface of the guardrail.

B. Continuous full-length intermediate rails shall be provided to prevent passage of a 4-inch sphere, anywhere below the handrails, on both sides of the walking surface.

639.03.06 Utility Attachments

A. Utility Attachments shall be per manufacturer's recommendation or approved equal.

639.03.07 Rollers and Roller Guide Tracks.

A. The gangway shall be supplied with solid UHMW rollers or UHMW skid shoes. In addition, all rollers, axles and skid shoes shall be designed to accommodate all loads to ramps and any job specific requirements.

B. Roller/skid shoe tracks shall be provided ready to install to the float surface and shall be installed per manufacturer's recommendation.

C. Guide tracks shall be long enough to allow for full longitudinal movement through all water election changes and shall restrict any lateral movement of the gangway at the landing.

639.03.08 Transition Plates

A. Full width, hinged transition plates shall be provided at both ends of the ramps. The length of both shall be long enough to provide a slope which does not exceed the maximum slope of the gangway.

B. The leading edge of each transition plate shall be UHMW that has been profiled to create no more than a quarter inch rise.

639.03.09 Shore Mount

A. The hinged connection at the shore end of the gangway shall be per manufacturer's recommendation or approved equal.

B. There shall not be a gap between the ramp deck and the shore mount.

C. This shore mount shall be designed to be site specific, and its design is to be included in the engineer's support calculations.

Part II PRODUCTS

639.03.01 General

All structural aluminum, including tubes, plates, angles, and pipes shall be per manufacturer's recommendation or approved equal.

639.03.02 Decking

A. Gangway decking shall be per manufacturer's recommendation or approved equal.

B. Samples and/or catalog cut sheets shall be provided for approval prior to fabrication.

C. Method of securing the decking product to the ramp frame shall be described and approved prior to fabrication.

Part II EXECUTION

639.03.01 General

Design, fabrication, delivery, handling, and installation of the aluminum gangway shall be per manufacturer's recommendation and in accordance with the latest Aluminum construction manual and all applicable standards and data as described by the Aluminum Association.

Edges shall be cut true, smooth and free from burrs, Corner edges shall be ground smooth. All exposed surfaces shall be smooth and free of sharp or jagged edges. Welds splatters, burrs, and weld flash shall be removed from all exposed surfaces.

Completed gangways shall be stored on dunnage or by other appropriate means to prevent direct contract with the ground and unnecessary damage. Completed gangways shall bear an identification decal showing the date of manufacture, live load capacity, and the identifying serial number. Every gangway ramp shall be directly traceable to the manufacturer.

The gangway manufacturer shall show proof of having successfully completed a minimum of twenty similar projects within the last two years. Additionally, the manufacturer shall show proof of having liability insurance for the manufacture of these structures. All gangway design, engineering and manufacturing process shall be performed by American tradesman. No out of country design, engineering or manufacturing shall be allowed.

Aluminum welding shall be in accordance with the ANSI/AWS D1.2-97 GMAW/GTAW process and shall be performed by experienced operators. Each shall demonstrate satisfactory evidence of experience and ability to perform the type and quality of welding required. Welder's proof of certification shall be provided upon request.

639.03.02 Installation

The gangway, gangway shore mount, roller guide tracks, and any other associated components shall be installed per manufacturer's recommendations.

639.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
FURNISH AND INSTALL 60' ALUMINUM GANGWAY, INCLUDING DECKING, CONNECTION HARDWARE, HANDRAIL, TRANSITION PLATE, UTILITY CONNECTION HARDWARE, AND ALL APPURTENANCES	UNIT

Measurement and payment for the furnishing and installation of gangways, including all labor, equipment and materials as required to satisfactorily complete same, shall be included in the unit price bid for the gangway items listed in the bid form.

THE FOLLOWING SECTION IS ADDED:

SECTION 640 – FLOATING DOCKS

640.01 DESCRIPTION

Measurement and payment for the furnishing and installation of the floating dock systems, including all labor, equipment and materials as required to satisfactorily complete same, shall be included in the unit price bid for the floating dock items as listed in the bid form.

640.02 MATERIALS

640.02.01 Aluminum

Metal for aluminum structures shall be 6061-T6 aluminum alloy. Metal for decking and handrails shall be 6063-T6 aluminum alloy. Both alloys shall be extruded in accordance with the requirements of applicable sections of Federal Specifications QQ-A-200.

640.02.02 Floatation Systems

Float shell shall be fabricated with linear low-density polyethylene (LLDPE) that is UV ray and slip resistant manufactured by EZ Dock, Inc. or approved equal.

Flotation units shall be designed to maintain the desired buoyancy and freeboard even if punctured or cracked. Flotation attachment to structural frame shall be positively attached, as indicated on the approved shop drawing details. Flotation unit and frame shall act as one integral section.

Each dock section shall consist of a number of interior air filled pylons, determined by manufacturer, to provide for flotation in the event of a break of an exterior wall of the dock section. Each pylon shall support a design load of 55 pounds and have a volume no less than 1540 cubic inches.

640.02.03 Light/Power Pedestal

Measurement and payment for the furnishing and installation of the floating dock systems shall include Light/Power Pedestals manufactured by Eaton Corp. – Marina Power and Lighting, Inc. or approved equal. Light/Power pedestals shall include ¾" hose fittings, and corrosion resistant electrical receptacles rated for marine use.

640.03 CONSTRUCTION

640.03.01 Design Loading and Floatation Criteria

A. Dead Loadings shall consist of the entire weight of the floating structure including utilities, ramps, dock boxes, and other accessories and appurtenances.

B. Dock shall be designed to a minimum load of 62.5 psf, including the deadload

C. Gangways shall be designed to support a load of 90 lb/ft, and deck and structural components shall be designed to support a concentrated load of 400 psf applied to any 12in x 12in square.

640.03.02 Floating Dock System

The layout of the floating dock system shall be comprised of 60"x10' dock sections, 80"x10' dock sections, corner gusset sections, kayak launch sections, utility channels, light/power pedestals, security curbing, timber piles, piling brackets, ladders, gangway connection kits, and all other connections and hardware necessary to construct a fully functioning floating dock system.

Floating dock materials and hardware required shall be manufactured and provided by EZ Dock, Inc. or approved equal.

Each dock section shall provide a freeboard of approximately 12.75 in under dead load and have a freeboard of 7" under an additional live load of 30 psf.

Each dock section should have a surface running slope of no more than 0.50% and a cross slope of no more than 0.44%.

640.03.03 Anchorage

Anchorage shall consist of timber piles driven butt down. Working/Design drawings shall be submitted to the Engineer for review and approval for the depth of timber piles prior to construction. Provide design loads based on manufacturer's anchor pile layout for review of pile embedment requirements with the County and Engineer.

The piling brackets shall be provided by the manufacturer to be installed on the floating dock systems.

640.03.04 Gangway Connection

Furnishing and installation of the floating dock systems shall include the connection of the aluminum gangways to the proposed floating docks and indicated on the contract drawings. All connection hardware shall be supplied by Manufacturer.

640.03.05 Submittals

The following material submittals shall be made prior to performing the related items of work:

A. Fabricating drawings and calculations indicating conformance to the design loadings indicated in section.

B. Submit shop drawings containing finished dimensional layout of the float system.

640.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
FURNISH AND INSTALL FLOATING DOCK SYSTEM (A), INCLUDING CONNECTIONS, HARDWARE, CLEATS, SECURITY CURBING, LADDER, TIMBER PILES, TIMBER PILE CAPS, AND ALL APPURTENANCES	LUMP SUM
FURNISH AND INSTALL FLOATING DOCK SYSTEM (B), INCLUDING CONNECTIONS, HARDWARE, UTILITY CHANNELS, LIGHT/POWER PEDESTALS, CLEATS, SECURITY CURBING, LADDER, TIMBER PILES, TIMBER PILE CAPS, KAYAK LAUNCH, DRIVE THROUGH ADA KAYAK LAUNCH, AND ALL APPURTENANCES	LUMP SUM

Payment for the furnishing and installation of floating docks as detailed on the contract drawings and as directed by the County and Engineer including all labor, material, equipment and work as outlined above or required by the plans and specifications or necessary to satisfactorily complete same shall be included in the lump sum bid for the floating docks as listed in the bid form.

The Contractor is advised that the layouts of the floating dock systems on the contract drawings are only for bidding purposes only. The Contractor is responsible for the production and submittal of working drawings for the final design and layout of the floating dock systems and shall be included in the lump sum bid for items requiring same.

THE FOLLOWING SECTION IS ADDED:

SECTION 641 – WATERFRONT ARTICULATED BLOCK RAMP

641.01 DESCRIPTION

The Contractor shall provide all labor, materials, and equipment necessary to construct the Waterfront Articulated Block Ramp. The Waterfront Articulated Block Ramp shall include but is not limited to: preparation of sub-grade, the furnishing and installation of geo-textile fabric, and the furnishing and installation of the articulating concrete block revetment systems. The Waterfront Articulated Block Ramp installations shall be manufactured by Contech Engineered Solutions or approved equal and in accordance with the plans and specifications and as depicted on the contract documents, in compliance with the applicable construction codes.

All fabrication and layout shall meet and/or exceed industry standards and comply with applicable ASTM criteria, latest edition. The Waterfront Articulated Block Ramp shall be installed as depicted on the contract drawings and as per manufacturer’s specifications.

641.02 MATERIALS

641.02.01 Geotextile Filter Fabric

Geotextile Filter Fabric shall be per manufacturer's recommendation.

641.02.02 Revetment Cables and Fittings

Revetment Cables and fittings shall be per manufacturer's recommendation.

641.02.03 Articulating Concrete Blocks

Manufacturing shall conform to the current version of ASTM D-6684, *Standard Specification for Materials and Manufacture of Articulating Concrete Block (ACB) Revetment Systems*.

Articulating Concrete Block Systems are to be manufactured by Contech Engineered Solutions or approved equal.

641.03 CONSTRUCTION

The work in the section covers constructing the ramp sub-base, steel sheeting, rip-rap toe stabilization and the furnishing, delivering and installing and anchoring of the articulated (cable connected) pre-cast concrete block revetment system for the Boat Launching Ramp.

Part I GENERAL

641.03.01 Section Includes

A. Furnishing and delivering articulated per-cast concrete block paving system.

B. Furnishing and delivering loose concrete block units for edges as required/directed.

C. Coordination of test pit work to locate utilities in the area of the work.

D. Placement of secondary geotextile and geogrid separation fabrics on the graded sub-base/base for the block mattress.

E. Furnishing, delivering and installing helical soil anchors for the ramp paving panels.

F. Installing articulated block mattresses on the prepared sub-grade to the limits indicated on the plans.

G. Hand placement of loose block pavers between the edges of the ramp pavement and the adjacent bulkhead.

H. Installing steel sheeting at the toe of the concrete block ramp for the entire width of the ramp.

E. Installing rip-rap toe stabilization

641.03.02 References

A. Occupational Safety and Health Administration construction Industry Standards and Interpretations related to construction safety.

B. New Jersey Department of Transportation Standard Specifications for Road and Bridge Construction (Current Edition)

C. ASTM Construction Standards Section 4, Volume 4.08 – Soil and Rock

641.03.03 Quality Assurance

A. Prequalification of articulated block manufacturer and fabricator.

B. Acceptance of the properly prepared ramp sub-grade both above and below the mean tide level.

C. Furnishing block of the strength and durability specified.

D. Fabrication of assembled panels of the maximum size indicated on the drawing to minimize jointing of the mattress.

E. Installation of the helical soil anchors on the upper side of panels to hold the mat to the grade under heavy traction form trailer launching vehicles.

F. Placement of secondary geotextile separation fabric over the top of stone to minimize the potential for migration of stone base materials through the face.

G. Installation of mats in a tightly connected configuration as indicated on the drawing.

H. Hand placement of individual armor units between the ramp edge and bulkhead as required for the ramp.

I. Coordination of the work with the Union County involved in the waterfront development.

641.03.04 Submittals

The following material submittals shall be made prior to preforming the related items of work:

A. Submit qualification of armor system manufacturer,

B. Product Data: Manufacturer's specifications and installation instructions for all components of each product type specified.

C. Show complete layout, plan views, elevations, connections, details for fabrication and attachment to other elements, and other installation details.

D. Submit concrete test results for armor nits indicating concrete strength, provisions for sulfate resistance and freeze thaw resistance.

Part 2 PRODUCTS

641.03.01 Geotextile

A. Provide geotextile conforming per manufacturer's recommendation or approved equal:

641.03.02 Geogrid Reinforcement

A. Provide geogrid reinforcement conforming per manufacturer's recommendation or approved equal:

641.03.03 Concrete Armor

A. Provide armor units conforming per manufacturer's recommendation or approved equal:

641.03.04 Helical Soil Anchor

A. Provide galvanized helical soil anchors conforming per manufacturer's recommendation or approved equal:

Part 3 EXECUTION

641.03.01 Coordination Of The Work

A. Coordinate with the Owner zone areas for work and stockpiling.

B. Coordinate mark-out and test pit exploration to locate existing utilities in the area of anchor installation work.

C. Provide notice to the Owner, if, and when it Is necessary to work in areas used for their operation.

641.03.02 Safety Procedures

A. Perform all operations in accordance with OSHA procedures for job healthy and safety.

B. Control dust, and waterborne debris in accordance with permit requirements and environmental regulations having jurisdiction.

641.03.03 Acceptance of Subgrade

A. Sub-grade shall consist of stone bedding layer shaped and compacted. The Contractor shall verify grades on and offshore just prior to placing articulated armor mats to verify even grading of the ramp. Install geotextiles immediately prior to setting mats.

641.03.04 Installation of Anchors

A. Use manufacturers recommended torque device to install he anchors to the design depth in accordance with the approved shop drawing for mat anchorage.

B. Connect anchor to mat directly after placement and alignment of the matt to preclude slippage on newly laid mat.

641.03.05 Installation of Armor Mats

A. Fabricate the mats at an approved manufacturers facility and deliver fully assembled to the site.

B. Provide mats of the sizes indicated on the approved layout shop drawing. Provide crane and spreader capable of unloading the mats safely.

C. Place geotextile on finished and maintained sub-grade. Place mats on geotextile aligning for a tight fit with adjacent mats.

D. Flush ¾ inch bedding stone or manufacturer's recommended stone into the open spaces.

641.03.06 Hand Placed Pavers (If and Where Required)

A. Shape and grade sub-grade in the area to be covered with hand placed interlocking armor units.

B. Place secondary geotextile over gravel base.

C. Trim block neatly at irregular edges.

D. Set blocks in interlocking pattern in accordance with manufacturer's recommendations.

E. Fill open spaces between edges to be joined with concrete

641.03.07 Installation of Steel Sheeting

Sheeting installation shall conform to the 2019 NJDOT Standard Specification Section 501.

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
FURNISH AND INSTALL WATERFRONT ARTICULATED PRE-CAST CONCRETE BLOCK RAMP AT CENTRAL LAKE WITH STONE SUB-BASE, GEOTEXTILE FABRIC, GEOGRID, ANCHORS, SHEETING, STABILIZATION, AND ALL APPURTENANCES	LUMP SUM

Payment for the furnishing and installation of the waterfront articulated pre-cast concrete block ramp system and areas as detailed above including all but not limited to protection, coordination with the Owner, fabrication of block system assemblies and furnishing and delivering the system to the site, equipment required to lift and place the block system, placement of secondary geotextile layer, installation of anchors, installation of steel sheeting and interconnected mat pavement systems and all labor, materials and equipment necessary for or incidental to the completion of the work described herein and as directed by the Engineer, shall be included in the lump sum price bid for same as listed in the Bid Form.

Separate measurement and payment will not be made for sheeting, or any other work associated with the furnishing or installation of steel sheet piling, including but not inclusive to cutting, connectors, corner connectors, caps, and coatings. Measurement and payment for same shall be included in the lump sum price for Furnish and Install Waterfront Articulated Pre-Cast Concrete Block Ramp System.

THE FOLLOWING SUBSECTION IS ADDED:

SECTION 642 – KAYAK STORAGE UNIT

642.01 DESCRIPTION

The Contractor shall provide all labor, materials, and equipment necessary for the furnishing and installation of a kayak storage unit as indicated on the plans. Installation shall be in accordance with the details provided and per manufacturer's recommendation.

642.02 MATERIALS

Kayak Storage Units shall be manufactured by Hitch Exclusives LLC or approved equal.

The wood used in the Kayak Storage Unit structures shall be Northern White Cedar and have weather resistant finishes.

Kayak Storage Unit shall have a design weight capacity of 100 lbs. for each kayak intended to store.

Kayak Storage Unit shall store approximately 24 kayaks.

642.03 CONSTRUCTION

Kayak Storage Unit shall be constructed using 4-5/8" wooden posts for the posts and feet of the storage system, and 3" posts for the rails of the system. Joinery shall be constructed using 2-inch mortice and tenon connections reinforced.

642.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
KAYAK STORAGE UNIT	UNIT

Measurement and payment for the furnishing and installation of kayak storage unit, including all labor, equipment and materials as required to satisfactory complete same.

THE FOLLOWING SECTION IS ADDED:

SECTION 643 – TRAIL MARKERS

643.01 DESCRIPTION

The Contractor shall provide all labor, materials, and equipment necessary to furnish and install trail markers throughout the trail system in accordance with the contract documents.

The trail markers shall be constructed at locations shown on the construction drawings and/or as directed by the County and Engineer.

All construction work and required materials shall be in accordance with the details and specifications as contained on the plans, as directed by the Engineer or as required to fulfill the intent of same. All work must be approved by the Engineer.

The trail markers shall be constructed of lumber, concrete and steel to the dimensions as detailed on the construction drawings.

For the following items described in this section, the Contractor shall provide shop submittals detailing layout, concrete footings, reinforcement and execution for review and approval prior to construction. The Contractor is responsible for the preparation of plans and details by a N.J. Licensed Engineer for submittal to the construction department for all permitting. All construction shall comply with applicable codes. Any additional required soil testing for bearing capacity determination is the responsibility of the Contractor.

The Contractor shall provide all work necessary to satisfactorily complete the improvements in a first class manner acceptable to the Engineer. Installation of all components shall be in strict conformance with the detail drawings and/or with the manufacturer's instructions and recommendations as directed by the Engineer.

The Contractor shall restore to original condition any area of materials, vegetation, etc., damaged or disturbed in any way during the performance of the work specified under this section.

643.02 MATERIALS

Contractor to furnish and install trail markers as indicated on the construction plans and details. Trail markers installation shall be in accordance with any applicable codes. The trail marker shall be wood set in a concrete foundation as depicted on the plans.

All lumber/timbers utilized for the construction of the required trail marker timber shall be arsenic-free and chromium-free southern yellow pine No. 2 grade or dense select structural and posts shall be 6" x 6", a minimum of 7' long. All lumber shall be pressure treated with a preservative to a minimum of 0.40 pcf retention. The trail marker posts shall be chamfered as per the detail contained on the contract drawings. All posts shall be sized in accordance with the detail drawing(s) and shall be free of any warps, bends, rot, cracks, other weaknesses and imperfections.

The numeric mileage indications, for example 0.0, 0.1, 0.2, etc., shall be recessed into the wood surface with the recessed numeral painted in white to with the color of the post to achieve a high level of visibility for pathway users. The mileage marker locations shall be laid out in accordance with the plans by a NJ Licensed Land Surveyor for accurate distance and spacing.

Concrete shall be NJDOT Mix Class B, air-entrained 4500 PSI.

Paint shall be an exterior oil base enamel paint, suitable for use on wood and shall be white in color or as selected by the Engineer.

Stain shall be exterior oil base solid color stain, brown in color or as selected by the Engineer.

Color samples shall be provided for approval prior to ordering paint and stain.

643.03 CONSTRUCTION

All workmanship and construction shall be of a high quality and professionalism. All work shall be done in a manner that minimizes disturbance to adjacent improvements. Should any damage to the surrounding improvements occur as a result of the methods and operations utilized by the Contractor, he will be responsible to provide an acceptable repair or new material, if required, of the same type to replace that which is damaged at no additional cost to the Owner.

Location of all posts shall be staked by the Contractor’s land surveyor and approved by the engineer prior to digging of holes.

Contractor has the responsibility to ascertain possible presence of underground utilities, etc., prior to construction.

Holes for wood trail markers shall be dug by power auger to the prescribed depths as shown on the plans and backfilled accordingly.

Wood posts shall be set plumb and perfectly vertical to the horizontal ground plans and checked with carpenter's level. Soil/sand mix to be backfilled and firmly tamped to prevent any lateral movement whatsoever.

Shop drawings of shall be submitted to the engineer for approval.

All construction shall be in accordance with the approved shop drawings, detailed plans, specifications, and the direction of the engineer.

All wood members shall be stained prior to assembly trail markers. Stain shall be applied evenly and uniformly via rag or brush, along all faces and edges. Spillage or discoloration is unacceptable and is cause for rejection of the gate.

All work shall be guaranteed for one year from the date of acceptance against all defects in material and workmanship. Repairs if necessary shall be done promptly at no cost to the Owner.

643.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
TRAIL MARKER (IF AND WHERE DIRECTED)	UNIT

Payment for furnishing and installing trail markers along the trail as shown on the plans and with direction of the County and Engineer, including all work as outlined above and required to satisfactorily complete the same, all labor, materials, equipment, excavation and backfill material, concrete foundations, lumber all appurtenance shall be included in the unit price bid for each trail marker as listed in the bid form.

Separate payment for the all items requiring footings will not be made. Compensation for these items shall be included in the bid price for said items.

Separate payment for all items requiring construction permits will not be made. Compensation for these items shall be included in the price bid for said items.

THE FOLLOWING SECTION IS ADDED:

SECTION 644 – GRASS PAVERS

644.01 DESCRIPTION

The Contractor shall provide all labor, materials, and equipment necessary for the furnishing and installation of grass pavers at locations indicated on the plans. Installation shall be in accordance with the details provided. The work includes grading, excavation, compaction, stone subbase, grass paver grids with bedding sand, restoration of disturbed areas and all else necessary to satisfactorily complete the work.

The final dimension and layout of the access road to be further reviewed in the field with the Engineer prior to construction.

All work and material shall be guaranteed for one year from the date of acceptance against all defects in material and workmanship. Repairs, if necessary, shall be done promptly at no cost to the Owner.

The Contractor shall provide all work necessary to satisfactorily complete the improvements in a first class manner acceptable to the Engineer.

644.02 MATERIALS

The grass pavers shall be capable of resisting salt, oil, frost, and tropical heat, and shall have a minimum compressive strength of 4000 psi.

The grass pavers shall be capable of withstanding the vehicle weight of standard maintenance vehicles while avoiding frost upthrust.

The grass pavers shall be turfstone type as manufactured by Anchor Concrete Products, Inc., or approved equal.

Bedding sand shall be clean, non-plastic, free of lumps, clay, vegetation, soft particles, sulphates and other deleterious or foreign matter. The sand shall be natural or manufactured from crushed rock. Limestone screenings or stone dust that do no conform to the grading requirements in Table 1 shall not be used. Grading of sand for the bedding course shall be done according to ASTM C 136. The bedding sand shall conform to grading requirements of ASTM C 33 as shown in Table 1.

TABLE 1 Grading Requirements for Bedding Sand ASTM C 33	
Sieve size	Percent Passing
3/8 in.	100%
No. 4	95 to 100
No. 8	85 to 100
No. 16	50 to 100
No. 30	25 to 60
No. 50	10 to 30
No. 100	2 to 10

644.03 CONSTRUCTION

The Contractor shall grade the area of the grass pavers to the proposed grades indicated on the plans.

The required stone subbase and bedding sand shall then be compacted and leveled off.

Upon completion of this work, the grass pavers shall be arranged in the selected pattern with a joint spacing not to exceed 1/8". The grass pavers shall then be compacted into place until they are to the required grade.

The joints between the pavers shall then be filled with topsoil and planted with grass as detailed in other applicable sections of these specifications.

644.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
GRASS PAVER WALKING TRAIL, 6" THICK	SQUARE FOOT

THE FOLLOWING SECTION IS ADDED:

SECTION 645 – WATERWAY BOAT BARRIER SYSTEM

645.01 DESCRIPTION

The Contractor shall provide all labor, materials, and equipment necessary to construct the Waterway Barrier System. The installation of the Waterway Barrier System shall be in accordance with the plans and specifications and as depicted in the contract documents, and in compliance with the applicable construction codes. All fabrication and layout shall meet and/or exceed industry standards and comply with applicable ASTM criteria, latest edition. The Waterway Barrier System shall be installed as depicted on the contract drawings and as per the manufacturer's specifications.

All construction work and required materials shall be in accordance with the details and specifications as contained on the plans, as directed by the engineer or as required to fulfill the intent of same. All work must be approved by the Engineer.

645.02 MATERIALS

645.02.01 Waterway Barrier Module

The Waterway Barrier System shall TUFFBOOM Floating Barrier System or approved equal.

The Waterway Barrier System and components are to be manufactured by Worthington Products, Inc or approved equal.

645.02.02 Waterway Barrier Connectors

The Waterway Barrier System connectors and components shall be per manufacturer's recommendation.

The Waterway Barrier System connectors and components are to be manufactured by Worthington Products, Inc. or approved equal.

645.03 CONSTRUCTION

645.03.01 Section Includes

A. Furnishing, delivering and installing the Waterway Barrier System and all components.

B. Furnishing, delivering and installing the Waterway Barrier anchorage system and all components.

C. Coordination of test pit work to locate utilities in the area of the work.

Part I GENERAL

645.03.01 Design Loading and Floatation Criteria.

A. Waterway Barrier System shall be designed such that the minimum tensile strength in the connecting hardware is 120,000 lbs (54,434 kgs).

B. Waterway Barrier System shall be designed to include a solid foam core to maintain their original freeboard even if punctured. Foam core shall meet the requirements of ASTM C-578 with a minimum in-place density of 0.9 pounds per cubic foot. Water absorption of foam core shall not exceed 3% by volume per ASTM C-272. Foam core must take up a minimum of 95% of the interior volume of the waterway barrier.

645.03.02 Quality Assurance

A. Products, materials and articles incorporated in work shall be new, not damaged of defective, and of best quality purposes intended.

645.03.03 Submittals

The following material submittals shall be made prior to preforming the related items of work:

A. Submit qualification of water barrier system manufacturer.

B. Fabrication drawings and calculations conformance to the design loading indicated in section.

C. Product Data: Manufacturer's specifications and installation instructions for all components of each product type specified.

D. Show complete layout, plan views, connections, details for fabrication and attachment to other elements, and other installation details.

E. Sealed support calculations provided by a Professional Engineer experienced in the design of anchorage support systems showing analysis and design review shall be submitted with the shop drawings.

645.03.04 Coordination Of The Work

A. Coordinate with the Owner zone areas for work and stockpiling.

B. Coordinate mark-out and test put exploration to locate existing utilities in the area of anchor installation

C. Provide notice to the Owner, if, and when it Is necessary to work in areas used for their operation.

Part 2 PRODUCTS

645.03.01 Waterway Barrier System Floatation Unit

A. The length of each flotation unit is to be approximately 10 ft.

B. The floatation units shall be colored Yellow per U.S. Federal Standard 595B color #FS-13655 such that they are visible in low-light conditions and to individuals who suffer from color blindness.

C. Provide Waterway Barrier System Flotation Unit per manufacturer's recommendation or approved equal

645.03.02 Waterway Barrier System Connection Hardware

A. Provide Waterway Barrier System Connection Hardware per manufacturer's recommendation or approved equal

Part 3 EXECUTION

645.03.01 Waterway Barrier System

A. The Waterway Barrier System float line shall be supplied in sufficient length to span from anchor point to anchor point, as indicated on drawings

B. The Waterway Barrier System and its floatation units shall be installed per manufacturers' recommendations.

645.03.02 Waterway Barrier System Connectors

A. Connections between floatation units shall be installed per manufacturers' recommendation.

639.03.09 Shore Anchorage System

A. The connection at the shore end of the Waterway Barrier System shall be per manufacturer's recommendation or approved equal.

B. This anchorage system shall be designed to be site specific, and its design is to be included in the engineer's support calculations.

645.04 MEASUREMENT AND PAYMENT

THE DEPARTMENT WILL MEASURE AND MAKE PAYMENT FOR ITEMS AS FOLLOWS:

Item	*Pay Unit*
WATERWAY BOAT BARRIER	LINEAR FOOT

Measurement and payment for the waterway barrier system as detailed above includescoordination with the Owner, assembly of waterway barrier system, design of appropriate capacity onshore anchor point by professional engineer

services, installation and connection to onshore anchor point, and all labor, materials and equipment necessary for or incidental to the completion of the work described herein and as directed by the Engineer.

THE FOLLOWING SECTION IS ADDED:

SECTION 646 – STONE VENEER PILLARS

646.01 DESCRIPTION

The Contractor shall provide all labor, materials, and equipment necessary to construct the stone veneer pillars. The stone veneer pillars shall be in accordance with the plans and specifications as depicted on the contract documents, in compliance with the applicable construction codes.

All fabrication and layout shall meet and/or exceed industry standards and comply with applicable ASTM criteria, latest edition.

646.02 MATERIALS

646.02.01 Stone Veneer Pillars

The 48" high, 30" wide stone veneer pillars shall be constructed in accordance with the contract drawings, with good construction practice and with all applicable building codes. Working/design drawings, signed and sealed by a Professional Engineer licensed in New Jersey shall be submitted to the Engineer for review and approval. Specifications, samples and color selection materials for the stone veneer (various colors & styles) shall be provided by the Contractor for selections to be made by the Owner. Contractor to submit samples of cultured stone during the shop submittal process. Pattern of stone veneer used shall be stonemont split ledge or approved. All material selections are subject to review and approval of the County and the Engineer prior to installation.

646.03 CONSTRUCTION

646.03.01 Performance Requirements

A. Structural Performance: Engineer, fabricate, and install stone veneer pillar structures to withstand the structural loading required by applicable loads.

B. Thermal and Corrosion Control:

1. Allow for thermal action resulting from the maximum range (change) in ambient temperature in the design, fabrication, and installation of rail systems, to prevent opening of joints, buckling, and other detrimental effects, including overstressing of connections and components.

2. Prevent galvanic action and other forms of corrosion by isolating dissimilar metals, preventing direct contact with each other.

646.03.02 Submittals

A. Product Data: Manufacturer's specifications and installation instructions for all components of each product type specified.

B. Shop Drawings: Prepared specifically for this project.

1. Show complete layout; plan views, elevations, connections, details for fabrication and attachment to other elements, and other installation details.

C. Working/Design Drawings:

1. The Contractor is herein advised that the design drawings contain a preliminary design layout for the construction of the reinforced concrete footings and piers for the masonry posts that will be required for this project. These details provide for minimum dimensions and minimum requirements for the structures and structural elements to be designed and built. As a part of the bid for this project, the Contractor will be required to retain the services of a licensed professional engineer registered in the state of new jersey to design all of these structural elements for the footings and piers specified and to finalize all dimensions.

2. The Contractor's engineer will be required to review the preliminary design layout for structural design loads, code compliance (ibc, nj latest edition and asce 7-2016) and constructability.

3. Contractor to perform a geotechnical subsurface investigation program to obtain soil design properties for the design of the structures and structural elements. This program is to be performed by a licensed professional engineer registered in the state of New Jersey retained by the Contractor.

4. The Contractor's engineer will be required to submit detailed design calculations, shop drawings and/or catalog cuts to the owner's engineer for review and approval for the specified reinforced concrete footings and piers prior to any fabrication or construction. The Contractor's engineer's layout shall be based on the preliminary layout shown on these drawings.

5. Upon approval by the Owner's Engineer, the Contractor's licensed professional engineer registered in the state of New Jersey shall provide six (6) sets of signed and sealed detailed documents to the Owner's Engineer for use by the Contractor during construction. The costs associated with retaining a licensed professional engineer, including providing the required documents shall not be measured separately for payment. These costs shall be included in the price bid for the new structures, including all appurtenances, as described herein.

646.03.03 Quality Assurance

A. Manufacturer/Installer Qualifications: stone veneer pillars signs from one source, produced by a manufacturer and craftsmen having resources to provide consistent quality in appearance and physical properties, without delaying the work.

646.03.04 Delivery, Storage, and Handling

A. Store components to avoid damage from moisture, abrasion, and other construction activities.

646.03.05 Materials

A. General: Provide material free from surface blemishes where exposed to view in the finished installation. Materials used to stone veneer pillars shall be in accordance with the contract drawings and with the standard and supplementary specifications. Shop drawings shall be submitted to the Engineer for approval prior to fabrication.

B. Base Flanges, Anchors, and Inserts:

1. Anchors and inserts as required to support work specified, in accord with approved shop drawings.

C. Fittings and Fasteners: Same basic material and alloy as parts being joined, unless otherwise indicated. Do not use metals that will be corrosive or incompatible with materials being fastened; do not utilize pop-rivets, sheet metal screws, adhesives, or cast fittings.

1. Fasteners: Galvanized Steel

2. Component Fittings: Galvanized Steel

646.03.06 Examination

A. Examine system components, substrate, and conditions where railing systems are to be installed.

B. Notify Engineer in writing of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected.

646.03.07 Installation

A. Field welding shall not be permitted.

B. No improvements shall be installed prior to written acceptance of shop drawings.

C. Final location shall be approved by the Owner.

646.03.08 Protection

A. Provide adequate protection for all surfaces of completed installations to prevent damage during remainder of construction activities.

646.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
48” HIGH, 30” WIDE STONE VENEER PILLAR(INCLUDING FOOTINGS)	UNIT

Measurement and payment for furnish and install 48” high 30” wide stone veneer pillar shall include the footings/foundations and all labor and material.

Separate measurement and payment will not be made for the preparation and submission of working/design drawings for the stone veneer seatwall and stone veneer pillars but shall be included in the unit price bid for items requiring same.

TABLE OF CONTENTS

DIVISION 650 – UTILITIES

SECTION	
651	WATER
652	SANITARY SEWERS
654	METAL WORKS
655	PROCESS PIPING AND VALVES

SECTION 651 - WATER

651.01 DESCRIPTION

THE FOLLOWING IS ADDED:

The Contractor shall provide all labor, all pipe, fittings, valves, gaskets, bolts, nuts, and other materials, equipment, special services and all else necessary to furnish, install, flush, test, and disinfect all buried water lines on the site as required by the plans and Specifications to fulfill the intent of same. Excavation, bedding, backfill, and disposal of excess material shall conform to Section 202.

The Contractor shall provide all labor, materials, and equipment necessary to construct new water services or relocate existing water services at the locations indicated on the plan or as directed by the engineer and as detailed in the applicable sections of these specifications. The Contractor shall furnish all necessary adapters, connections, and fittings to connect new or relocated services to the existing building services.

The Contractor shall furnish and install new fire hydrant assemblies at the locations shown on the contract plans and in accordance with construction plan details. Each hydrant shall be provided with a 6 inch buried isolation gate valve as specified elsewhere. The work may also include the relocation of existing hydrant assemblies.

This work shall consist of resetting or raising existing water valve boxes and water service boxes to the finished grade only if and where ordered.

651.02 MATERIALS

THE FOLLOWING IS ADDED:

Roadway trench repair materials shall conform to the following:

Dense Graded Aggregate Base Course	901.10
Hot Mix Asphalt	902.02

Pipe materials shall conform to the following:

DUCTILE IRON PIPE

Ductile iron pipe shall be centrifugally cast cement-lined, shall be suitable for water service, and shall conform with the ANSI A21.51 (AWWA C-151) Ductile Iron Pipe. Cement linings shall conform with ANSI A21.4-1964 and shall also receive a bituminous seal coat. The pipe exterior shall receive a standard foundry coal tar dip coating. All ductile iron pipe shall be minimum pressure Class 200 psi and pipe thickness shall be minimum Class 56 for sizes 4" through 20" with depth of cover from 4' to 10' except for flanged pipe which shall be Class 54 and grooved pipe and pipe within railroad right-of-way which shall be Class 56. Pipe thickness classes for larger sizes or greater depths shall be as required by the Engineer. All pipe shall be furnished in 18 to 20 feet nominal lengths.

PVC PIPE

Polyvinyl Chloride pressure pipe shall be of a manufacturer who can demonstrate at least 5-years of experience in the manufacture of polyvinyl chloride pipe for use in potable water systems. The pipe shall be “Blue Brute” C900 Pipe as manufactured by JM Eagle or equal.

Polyvinyl Chloride pressure pipe shall be of the size indicated on the plans and shall conform to the requirements of the AWWA C900 Standards for PVC900 Pressure Pipe for Water Distribution with cast iron pipe equivalent outside diameters and ASTM D1784 specifications. Joints shall use elastomeric gaskets and be in accordance with ASTM D1784. Gaskets shall conform to ASTM F477.

The standard laying length shall not exceed 20 feet. The minimum “pipe stiffness” (load divided by change in inside diameter in direction of load application) at 5% deflection shall be at least 46 psi for pipe tested in accordance with ASTM Specifications D2412.

Bends shall be constructed of ductile iron in accordance with AWWA A21.10 with mechanical joint ends.

Pipe shall be clearly marked on the outside indicating the name of the manufacturer, nominal diameter, and the ASTM or AWWA designation or both for the Polyvinyl Chloride Pressure Pipe.

HIGH DENSITY POLYETHYLENE PIPE

High density polyethylene piping system shall be developed specifically for potable water systems and in accordance with all standards and testing requirements. The polyethylene pipe shall be lightweight, flexible and chemical/abrasion resistant, pressure class as indicated on the Contract Drawings. The pipe shall be resistant to acids, salts, hot soils, rust, rot and corrosion. The pipe shall not promote or support algae or bacterial growth.

The high-density polyethylene pipe shall be as manufactured by Phillips Driscopipe Series 4000/4100 DR-11 or approved equal.

The pipe specified shall be in accordance with ASTM D3350 cell classification and ASTM F-714 pipe standards. The pipe shall by the color blue, and shall meet the Utility Location and Coordination Council, "Uniform Color Code," per APWA/ULCC Standards Committee.

JOINTS

All main pipe joints shall be the "Push-on" type with rubber gasket conforming to ANSI A21.11 (AWWA C-111) or of the mechanical joint type. Mechanical joints will be required when connecting to existing mains. Pipe plain ends shall be suitably beveled to permit easy entry into the bell. EACH JOINT SHALL BE PROVIDED WITH TWO BRONZE WEDGES SECURELY DRIVEN BETWEEN THE OUTSIDE OF PIPE AND INSIDE OF BELL IN ACCORDANCE WITH MANUFACTURER`S RECOMMENDATIONS IN ORDER TO PROVIDE ELECTRICAL CONTINUITY.

All jointing shall be in strict accordance with the manufacturers recommendations.

FITTINGS (UNDERGROUND)

All water main fittings shall be cast iron or ductile iron fittings with cement lining, interior bituminous seal coat and standard exterior coal tar dip coating. Cast and ductile iron fittings shall conform to ANSI 21.10. Mechanical joints and push-on joints shall conform with ANSI 21.11. Hardware shall be stainless steel.

All mechanical joint fittings and push-on joint fittings shall be installed strictly in accordance with both the pipe and fitting manufacturer's recommendations specifically with regard to permissible torque of bolts and the effective sealing of the joint. If effective sealing is not attained at the maximum recommended torque the joint shall be disassembled and reassembled after thorough cleaning and if necessary with a new gasket. Overstressing the torque of bolts to compensate for poor installation procedures will not be permitted.

GATE VALVES (UNDERGROUND)

Gate valves shall conform with all applicable provisions of standard Specification AWWA C-509 (as amended) for Resilient Seated Gate Valves. Buried gate valves shall be externally epoxy coated iron body, inside manganese bronze mounted iron wedge, symmetrical and fully encapsulated with molded rubber, parallel seat and "O" ring seals. The interior of the valve shall be coated with an epoxy compound to provide a durable gate seating surface and protection against abrasion, tuberculation, scale, etc. The valve shall have a fullbore, unobstructed flow path for full flow capacity. All valves shall open counter clockwise, shall be set plumb, and shall be furnished with a 2 inch square operating nut. Valves shall be of the non-rising stem type and shall be Mueller 4-2360 as manufactured by Mueller Co. or approved equal. Bonnet and stuffing box nuts and bolts shall be 316 stainless steel fasteners.

All valves up to 12" diameter shall be supplied with mechanical joint ends with retainer glands, shall be suitable for working pressures to 350 PSI and shall be installed in the vertical position. Valves larger than 12" diameter shall be suitable for working pressures to 150 psi, shall be installed in the horizontal position and shall be provided with bevel gear operator and enclosed grease case. All valves larger than 12" diameter shall also be provided with a 3 inch bypass valve (with separate valve box) and rollers, horizontal tracks and scrapers. Lubrication instructions and parts lists shall be furnished in triplicate for each type of valve provided. No valves shall be ordered without first obtaining the approval of the manufacturers and style from the Engineer.

VALVE BOXES

All buried valve boxes shall be 2 piece sliding type cast iron valve boxes. Where valves are deeper than 4'-0" extension stems shall be provided to within 2'-0" of the ground. All extension stems shall be of heavy duty construction, shall be coated with 2 coats of asphaltum varnish, and shall be provided with a self-centering ring to maintain the stem in the center of the valve box. Each valve box shall be Bingham and Taylor #5564S with cover or approved equal.

All valves boxes and extension stems shall be set plumb. All valve box covers shall have the word "water" and an arrow indicating the direction of valve opening cast on. Concrete block shall be poured around all valve boxes not set in paved area as shown on the detail sheet.

After completion of the project, the Contractor shall furnish the owner with two (2) adjustable valve wrenches suitable for operating all valves.

INSERTION VALVES

Insertion valves shall be installed with equipment capable of installation without a shutdown in the range of 4 inch diameter through 12 inch diameter. Method of pipe entry shall be made using a carbide tipped cutter and a pilot drill with retaining wire to retain the coupon. Reaming or milling of the pipe will not be accepted.

The valve sleeve shall be capable of pressure-tight assembly to exterior of the pipe in which flow is to be stopped at a working pressure of 250 psi. The sleeve shall be constructed of a two (2) piece, ductile iron casting (top and bottom) to be bolted together using stainless steel bolts. The valve shall meet the AWWA C509 requirements for resilient seal valves suitable for potable water use. The ductile iron gate shall have a resilient rubber seal 360 degrees around the gate and is expandable to the inside diameter of the pipe. Valve stem shall be made of stainless steel with a tensile strength of 60,000 psi. The valve body shall be provided with an epoxy coating of a minimum of 8 mils. All valve hardware and fasteners shall be provided as stainless steel.

Valves shall open counter clockwise, shall be set plumb, and shall be furnished with a 2 inch square operating nut. Insertion valve assemblies shall be as manufactured by EZ Valve or approved equal.

FIRE HYDRANT ASSEMBLIES

The hydrant shall be a three-way hydrant with Municipality's Standard threads. The operating nut shall be a 1-1/2 inch pentagon. The hydrant main internal valve opening shall be 5-1/4 inches open left. The hydrant shall be a traffic model with hydrant barrel made up of two sections with a break-feature flange. Each hydrant shall be Mueller Company, No. A-423 or approved equal.

Nozzles:	Pumper – 4-1/2"; Gauge = 4-1/4" – 4 - 494 Two Hose – 2-1/2"; 4 – 297 National Standard Thread
Inlet Connection:	6" mechanical joint shoe with 6" M.J. auxiliary valve installed with a 2' stub between the hydrant and the auxiliary street valve
Bury:	4'-6"
Color Code:	-All barrels shall be safety red. -All tops shall be safety yellow. -Caps on a hydrant off a main smaller than 6" diameter shall be red. -Caps on a hydrant off a main 6" to 8" in diameter shall be yellow. -Caps on a hydrant off a main 10" or larger shall be green.

The hydrant shall be suitably restrained-rodded to the isolation valve and the valve shall be restraint-rodded to the water main tee.

The hydrant shall have a 150 psi working pressure and a 300 psi test pressure rating. The hydrant shall meet the requirements of AWWA C-502, latest revision.

WATER SERVICE CONNECTIONS AND RELOCATIONS

Pipe:		Copper piping for underground service shall be Type "K" soft annealed seamless copper water tube, ASTM B88, with approved brass flared joint fittings.
Service Fittings:	All service fittings shall be forged of waterworks bronze alloy and be as manufactured by the Mueller Company or approved equal.	
	Corporation Stops:	Mueller 25000 or equal
	Curb Stop:	Mueller No. 15204 or equal
	Curb Box:	Mueller No. H10314 (1" or H-10310 (1-1/2"-2" cast iron extension type with arch pattern base and stainless steel rods and pins or equal
	Connectors:	Mueller 110 flared type or equal
	Service Saddle:	Mueller H-13000 bronze 2-piece with "O" ring seal or equal for PVC pipe
Meter Pit:	2" Meter Pit	Mueller Vault Single Meter Pit (550VS3630FFBN) or equal
	Meter Pit Cover:	VESTAL Manufacturing Enterprises, INC. Part Code 32-259 Model # RMRC-20L W/SN W/TR Locking R&C, Touch Read with opening for SENSUS Smart Point 520M or equal
	Meter Yoke:	Mueller Co. H-1424-2N (2-inch meter) or equal
	Insulation:	Ford Meter Box Company, Inc Insulating Disc CCID or equal

REDUCE PRESSURE ZONE BACKFLOW ASSEMBLY

The Reduced Pressure Principle Backflow Prevention Assembly shall be certified to NSF/ANSI 372, ASSE® Listed 1013, and supplied with full port gate valves. The main body and access cover shall be epoxy coated ductile iron (ASTM A 536 Grade 4), the seat ring and check valve shall be NORYL™ or equal, the stem shall be stainless steel (ASTM A 276) and the seat disc elastomers shall be EPDM. The checks and the relief valve shall be accessible for maintenance

without removing the device from the line. The Reduced Pressure Principle Backflow Prevention Assembly shall be a ZURN WILKINS Model 375 or equal.

METER VAULTS

A. Meter vaults may be constructed of precast concrete or cast-in-place concrete unless a specific type of construction is required by Drawings.

B. Concrete for meter vaults: Conform to requirements of Section - Cast-In-Place Concrete.

C. Reinforcing steel for meter vaults: Conform to requirements of Section – Cast In Place Concrete.

D. Meter vaults shall be designed to include anti-floatation provisions.

E. Grates and Covers: Use castings for frames, grates, rings and covers conforming to ASTM A48, Class 35B. Provide locking covers if indicated on Project Drawings.

1. Use clean castings capable of withstanding application of AASHTO M306 - 40,000 pound proof loading without detrimental permanent deformation.
2. Fabricate castings to conform to shapes, dimensions, and with wording or logos shown on Project Drawings. Standard dimension for manhole cover opening is 32-inches in diameter
3. Use clean castings, free from blowholes and other surface imperfections. Use clean and symmetrical cast holes in covers, free of plugs.

F. Provide safety grate option and keyed locks for all access hatches. Provide master access keys in accordance with Owner's requirements. Two of each key shall be provided and keys shall be tagged for lock location.

ALUMINUM HEATED ENCLOSURE

DESCRIPTION

The Contractor shall provide labor, materials, equipment and plumbing supplies necessary to furnish and install the required heated enclosure including foundations, water service connections and all appurtenances in accordance with contract documents.

The backflow prevention assembly enclosure manufacturer shall be a company specializing in the manufacture of backflow prevention assembly enclosures. Enclosure shall be as manufactured by SAFE-T-COVER or approved equal.

RELATED WORK

Additional requirements and information necessary to complete the work of this section may be found in other documents including, but not limited to, the following related specification sections.

Section 654 – Metal Works

Section 655 – Process Piping and Valves

MATERIALS

Sectionalized Aluminum Enclosures

A. Sectionalized enclosures shall be factory assembled with tongue and grooved sections that glide together and then secured to the concrete pad with manufacture supplied anchor pads and wedge anchors.

B. Access panels shall have a four point locking system with pad lockable handle.

C. Drain ports shall be sized for full port backflow discharge and designed for a one way operation allowing backflow discharge but not allowing wind, debris and small animals to enter the enclosure.

D. Enclosures shall be designed to support a minimum vertical load of 100 lb/sf.

Materials of Fabrication

A. Aluminum sheeting shall be 5052-H32 marine grade aluminum (0.05/18 gauge), mill finish or 1/8" polyester resin reinforced with fiberglass strand and shall meet ASTM B209. Stucco embossed finish shall reduce glare.

B. Bracing shall be 6063-T52 aluminum and shall meet ASTM B221.

C. No wood or particle board shall be used for the construction.

D. Anchor pads shall be galvanized steel.

E. Insulation shall be 1.5: unicellular, non-wicking, polyisocyante foam sprayed in place that forms a monolithic bond between the aluminum bracing and aluminum sheeting.

F. Insulation shall have the following properties:

a.	R-Value	10
b.	Dimension Stability	less than 2% linear change
c.	Compressive Strength	51 psi
d.	Flame Point	325 degrees F
e.	Water Absorption	0.037 psf
f.	Porosity	91%

Heating Equipment

A. Heating equipment shall protect the piping and equipment from exterior temperatures to (-)30 degrees F. ETL listed thermostatically controlled wall mounted air forced heaters shall be furnish and designed by the manufacturer of the enclosure to maintain the equipment at (+)40 degrees F at all times.

B. Heating equipment shall be wall mounted to the supplied heater plates and a minimum of 8" from the bottom of the receptacle to the top of the slab.

C. The heaters shall be ETL listed for wet/damp locations.

Concrete Slab

A concrete slab to support the enclosure shall be designed by a New Jersey Licensed Professional Engineer obtained by the Contractor and submitted for review.

651.03 CONSTRUCTION

651.03.01 WATER PIPE

The following is added to this sub section:

CONNECT PROPOSED MAIN TO EXISTING MAIN

At the locations shown on the Contract Drawings where the water line tie-ins are to be made, the Contractor shall excavate a test pit in order to determine the exact location and size of the existing water mains and to verify that the existing water mains and valves are adequately restrained.

The size of the existing water mains shall be confirmed prior to the ordering of any materials. Any discrepancies between actual conditions and the Construction Drawings shall be brought to the immediate attention of the Engineer.

At the locations shown on the Contract Drawings where the proposed water mains are to be connected to the existing water mains, the Contractor shall utilize the appropriate size bends, fittings, reducers/increasers, offset type bends, restrained joints and/or couplings necessary to complete the required connections.

For connections between different types or outside diameter pipes, the existing main shall be connected to the proposed pipe by means of a transition coupling manufactured by Dresser Style 62/162 or approved equal. For connections between same type and outside diameter pipes, couplings shall be Dresser Style 38/138 or approved equal. Said coupling shall be installed in accordance with the manufacturer's recommendations.

The flexible couplings shall be of a gasketed, sleeve-type, with diameter to properly fit the pipe. Each coupling shall consist of one (1) steel middle ring, two (2) steel followers, two (2) Grade 27 rubber-compounded wedge section gaskets and sufficient stainless steel track-head steel bolts to properly compress the gaskets.

The middle ring followers of the coupling shall be factory prime and top epoxy coated of true circular sections free from irregularities, flat spots, or surface defects. They shall be formed from mill sections with the follower-ring section of such design as to provide confinement of the gasket. After welding, they shall be tested by cold expanding a minimum of 1% beyond the yield point.

The coupling bolts shall be stainless steel of the elliptic-neck, track-head design with rolled threads. The manufacturer shall supply information as to the recommended torque to which the bolts shall be tightened. All bolt holes in the followers shall be oval for greater strength.

The gaskets of the coupling shall be Grade 27 rubber composed of a crude or synthetic rubber base compounded with other products to produce a material which will not deteriorate from age, from heat, or exposure to air under normal storage conditions. It shall also possess the quality of resilience and ability to resist cold flow of the material so that the joint will remain sealed and tight indefinitely when subjected to shock, vibration, pulsation and temperature or other adjustments of the pipe line.

The couplings shall be assembled on the job in a manner to insure permanently tight joints under all reasonable conditions of expansion, contraction, shifting and settlement, unavoidable variations in trench gradient, etc.

Pipe cutting methods that produce a smooth, square cut end without damage to the pipe cutters, rotating blades, or other approved equipment when properly used, are acceptable. Abrasive disks are not recommended unless special precautions are taken. The ends of the cut pipe to remain shall be machined by utilizing field lathes designed for this purpose to insure that the diameter profile, and roundness meet the pipe manufacturer's specifications. Joint restraint shall be installed in accordance with the direction of the Engineer.

The Contractor shall coordinate any shut-down of the existing water mains with the Owner prior to making any connections.

All fittings used to connect the existing and proposed water mains shall be as approved by the Engineer and in accordance with the requirements of the Specifications.

A. Scheduling of Work and Interruption to Water Service

B. Existing Utilities and Structures

C. Excavating

D. Handling of Pipe and Accessories

This sub section is amended as follow:

Pipe and other accessories shall be handled with care to avoid damage. The interior of all pipe and accessories shall be kept free of dirt and other foreign material at all times.

Pipe will be lowered into the trench by means of ropes, slings or other suitable means. In no case shall pipe or accessories be dumped or dropped into the trench. Pipe and accessories will be inspected for damage or defects prior to installation. Ends of the pipe and flanges will be wiped clean prior to joining the pipes.

E. Installing Water Pipe

This subsection is amended as follow:

1. WET TAP INSTALLATION

Where shown on the drawings or as required by the specifications, the Contractor shall connect to existing water mains under system pressure utilizing tapping sleeves, valves and a water main drilling machine. Prior to ordering the sleeves, the Contractor shall be responsible for determining the size and material of the water main to be connected to.

The tapping sleeves shall be of the split sleeve bolt-on type with mechanical joint end connections. The mechanical joint connections shall be provided with totally confined end duck tipped gaskets to resist cold flow and creep. The sleeves shall be rated for working pressure of 200 psi. Prior to placing the sleeve onto the main to be drilled, the main shall be thoroughly cleaned down to the original pipe material in order to insure the water and pressure tight fit of the sleeve. The tapping sleeve shall be Mueller Company Model H-615 for sleeve less than 10" diameter and H-616 for sleeves 10" and larger, Kennedy Square Seal, U.S. Pipe, Smith Dual Compression Seal, or approved equal.

Where shown on the drawings, tapping sleeves shall be compatible for use with the material of the existing water mains.

All valve and tapping sleeve hardware shall be stainless steel.

The tapping valve shall be a non-rising stem gate valve, as described in a previous section of the Specification. The tapping valve shall have flanged to mechanical joint end connections. Valves shall comply with AWWA C509-87 (as amended) for resilient seal wedge gate valves. The water main tapping shall be made by a drilling machine specifically designed for water main connections under pressure. Upon the attachment of the tapping sleeve and valve and drilling machine to the main, the entire assembly shall be pressure tested in accordance with Subsection 651.03.01.F prior to making the cut. The drilling machine shall be air or gasoline motor operated. The use of manually operated machines will not be permitted. The drilling machine shall be equipped with a tungsten-carbide tipped shell cutter and pilot drill.

The Contractor shall provide competent and qualified personnel, completely familiar with the operation of the drilling machine, and thoroughly familiar with the operation of tapping water mains under pressure.

A concrete slab shall be poured under the body of the tapping valve AFTER the completion of the tapping operation in such a manner that will not affect any future work on the joints or of valve parts.

All equipment and materials shall be sterilized before installation.

2. PIPE INSTALLATION

A. OPEN TRENCH METHOD

Pipe laying shall start at the low end unless otherwise approved by the Engineer. Excavation for the pipeline will conform to the lines and grades shown on the drawing. The width of the trench at the point six inches above the top of the pipe will be no more than two feet plus the diameter of the pipe. The width of the trench at the ground surface may vary depending on the depth of the excavation and character of material, but shall be kept to a minimum.

The pipe shall be bedded and covered with suitable granular material as shown on the construction detail drawings.

Each section of pipe will be laid so that it is in contact with the bedding material for its full length. Recesses will be excavated for couplings. Pipe will not be supported by couplings, blocks, bricks, or similar devices.

Cutting of pipe sections shall be done only by experienced men using methods recommended by the manufacturer in a manner that will result in a smooth end normal to the axis of the pipe.

Prior to connecting pipe sections all plain ends shall be beveled in accordance with the manufacturer's recommendations.

Pipe shall be laid to the grade shown on the contract drawings and shall have a minimum cover of 4.0 feet. The Contractor shall take all necessary precautions to insure that the pipeline is laid at a continuous grade upward

from low points to high points in order to insure that intermittent high points are not created which would require the installation of additional means of air release.

TRAFFIC SAFETY PRECAUTIONS

The Contractor shall be responsible for installing all necessary traffic safety devices including, but not limited to, breakaway barricades, drums, flashers, warning signs and the like, to maintain an unobstructed flow of traffic throughout the time limit of the Contract. All traffic safety devices shall be in accordance with applicable local and state traffic standards, as detailed in other applicable sections of these specifications and in accordance with section 110 of the New Jersey Department of Transportation Standard Specifications, latest revision.

The Contractor is herein advised that permitted hours of construction activities must be coordinated with the Local Police Department. Please be advised that construction operations may be limited to within certain hours of the day.

The Local Police Department shall be notified of all scheduled construction related activities which may affect traffic flow patterns.

3. JOINT RESTRAINT

All joints along the pipeline shall be installed to prevent damage to the integrity of the pipeline and its joints from internal test and working water pressures. All fittings shall be securely blocked with cast-in-place concrete thrust blocks to the size and dimension shown on the contract drawings or as directed by the Engineer.

Joint restraint between cast iron, asbestos cement, poly vinyl chloride, or polyethylene pipe shall be by threaded stainless steel rods of minimum 3/4 inch diameter with drawbolts and pipe strapping as indicated on the contract drawings or as directed by the Engineer. Four (4) restraint rods in a symmetrical pattern shall be utilized at each joint requiring restraint.

Joint restraint between ductile iron pipes or PVC Pipes shall be by the use of mechanical joint retainer gland as indicated on the contract drawings or as directed by the Engineer. The retainer gland shall be cast of high strength ductile iron fitted with cup point, square head, heat treated steel set screws. The screws shall be torqued down in accordance with manufacturer's recommendations to bite into the surface of the pipe to prevent joint separation and provide electrical continuity. The retainer gland shall be Model F-1058 by Clow Corporation, EBAA Iron, Inc., or approval equal.

The engineer has the option to order the type of joint restraint he deems best suited for each particular application with no additional compensation to the Contractor.

F. Hydrostatic Pressure Testing and Leakage Testing

Delete the entire article and substitute the following:

TEST REQUIREMENTS

The entire pipeline will be tested for water tightness by exfiltration test in conformance to AWWA C600/C605 except as modified herein. Length of pipe sections to be tested will be determined in advance in conjunction with the engineer or his inspector.

The Contractor shall provide all labor and equipment necessary to perform the testing of the pipeline including the installation of corporation cocks where necessary for testing or for bleeding air from the test section. The pipe shall be tested in the presence of the engineer and representatives of the New Jersey Department of Environmental Protection if required as stipulated in Division 1 of the specifications.

The Contractor shall fill the line completely with water; all air shall be expelled and an exfiltration test made. The pipeline will be tested under a minimum hydrostatic pressure of 150 psi based on the lowest elevation of the pipeline. Test pressure shall not be less than 100 psi at the highest point along the test section when allowed by the Engineer. The maximum leakage permitted will be 11.65 gallons per inch diameter per mile per day while maintaining the test pressure with an allowable tolerance of 5 psi maximum. The duration of the test shall be 2 hours.

Should the test indicate a leakage rate greater than that permitted, the Contractor shall at his own expense locate and repair or rebuild the defective portion of the main responsible for the leak.

The test shall then be repeated until it is found that the leakage is within the allowable limit. The Contractor shall furnish all water, hose, pumps, test plugs, measuring devices and all other items that may be required for test purposes.

All tests must be witnessed by the engineer or his representative before the pipeline will be accepted. THE CONTRACTOR IS CAUTIONED THAT A WATER TIGHT PIPELINE IS OF PRIME IMPORTANCE.

G. Backfilling

H. Disinfection/Bacteriological Testing

The following is added to this article **:**

FLUSH MAINS

All mains shall be flushed thoroughly with water after backfilling is complete. All dirt, rubbish and debris shall be removed from the mains. The Contractor shall furnish and install all temporary piping and hose which may be necessary to properly flush the pipeline.

The Contractor shall be responsible to make his own arrangements for water and if necessary obtain permission from the water department in the event he wishes to obtain flushing water from the municipal water system. No hydrants shall be opened without prior approval of the water department. Standard hydrant wrenches shall be used to open and close hydrants.

STERILIZATION

All piping shall be thoroughly cleaned, flushed, and sterilized in accordance with the requirements of AWWA C651-05 (as amended) "Standard for Disinfecting Water Mains" latest edition. After the pipeline has been sterilized in accordance with the aforementioned specifications, all chlorinated water shall be completely flushed from the new pipeline and appurtenances specifically from all reaches of the line, until the water throughout the line is equal in chemical and bacteriological quality with the water in the existing mains, or as requested by the Engineer.

The Contractor is responsible to provide all materials, equipment and labor to perform the flushing and sterilization of the new water lines as many times as necessary if the initial treatment is not adequate and until tests show the waterline meet the aforementioned requirements.

Following the completion of the flushing and sterilization procedures, samples, shall be taken and analyzed by a recognized testing laboratory and a certified report shall be submitted to the Engineer for approval.

ALL WATER LINES AND APPURTENANCES SHALL BE THOROUGHLY FLUSHED AND STERILIZED IN ACCORDANCE WITH THESE SPECIFICATIONS AND NO LINES SHALL BE PUT INTO SERVICE WITHOUT THE APPROVAL OF THE ENGINEER.

I. Thrust Blocks

J. Roadway Trench Repair

Temporary and permanent roadway trench repair, if and where ordered by the Engineer shall be constructed in accordance with Section 631 of the specifications.

Bituminous concrete materials shall conform to Sections 902 and 401 of this specification.

Dense graded aggregate, if and where ordered by the Engineer, shall be installed and compensated for in accordance with Section 302 and 901.

K. Abandoning Existing Water Mains and Services

Upon completion of testing of the proposed water main and submission of satisfactory bacteriological test results to the engineer, the Contractor shall provide a mechanical joint cap, concrete thrust block and concrete pipe plug at the locations directed by the Engineer and indicated on the Contract Drawings to cap the portion of the water main that will remain active and to completely seal the existing water main to be abandoned.

Said cap shall be acceptable to the Engineer and shall be of a size equal to that of the existing water main.

Thrust blocks shall be in accordance with the requirements of other applicable sections of these Specifications.

The existing water valves shall be abandoned as directed by the Engineer. The Contractor shall close all existing valves located on the existing water main to be abandoned. The existing valve boxes and covers shall be removed upon completion of the proposed improvements and cap and thrust block installation.

Roadway trench repair shall be required as detailed in other applicable sections of these Specifications.

Upon completion and testing of the proposed water service connections, the existing water service connections shall be abandoned as directed by the Engineer.

REPLACE DAMAGED WATER MAIN (ONLY WHERE ORDERED)

The Contractor shall provide all labor, materials, and equipment necessary to remove and replace any damaged sections of the existing water main at the locations directed by the Engineer. All work shall be performed as detailed below and in other applicable sections of these Specifications.

651.03.02 WATER PIPE, BRIDGE

651.03.03 WATER SERVICE CONNECTION

The following is added to this sub section:

WATER SERVICE INSTALLATION

The Contractor shall install building water services in the location shown on the contract drawings or as directed by the engineer. Materials required for said installation will be as described in other applicable sections of this specification. Water services shall be installed by method of open cutting the existing roadway and shall be performed in accordance with the approval of the engineer. Upon completion of said crossing, the Contractor will proceed to install the service fittings as previously described and shown in detail on the contract drawings. The water main and service fittings shall be thoroughly tested as described in other applicable sections of these specifications prior to connection to existing building or dwelling water services.

Where existing services to be relocated are behind existing sidewalks or curbs, or embedded in existing sidewalks or driveway aprons, the Contractor shall relocate such existing water services, where directed and restore any disturbed area to its original condition in a manner approved by the engineer.

651.03.04 FIRE HYDRANT

The following is added to this sub section:

HYDRANT INSTALLATION

The fire hydrant shall be installed complete with auxiliary isolation gate valve, adjustable cast iron valve box, 6 inch tee off distribution main, restraining rods, thrust blocks, clean 1-1/2 inch crushed stone, polyethylene sheeting or filter fabric, granular backfill and all other material and labor needed to install the hydrant assembly as detailed on the contract plans. The hydrant, valve stem and valve box shall be set plumb. The valve box shall be centered and installed so that the auxiliary valve can easily be operated from street level by use of proper valve wrench. Cover of valve box shall be one (1) inch above surrounding ground level.

Before installing the fire hydrant, all foreign matter shall be removed from the interior of the barrel.

The hydrants shall be placed so that the center line of the hydrant is 2'-0" to 2'-6" behind the top of face of curb. The steamer hose nozzle shall face street and the hydrant elbow shall be placed on a solid block or concrete slab foundation not less than four (4) inches thick and fifteen (15) inches square. The back side of the hydrant opposite the pipe connection shall be firmly braced against the vertical face of the trench by means of a poured concrete thrust block or other means approved by the engineer and the Municipality to prevent the fittings from blowing off the line. Bracing shall be installed so as not to interfere with hydrant drains. The bottom of the ditch and lower part of the hydrant barrel shall be surrounded with coarse gravel so that water released from the standpipe by the drain valve may escape quickly.

The hydrants must be firmly supported underground all around the standpipe since the proper working of the safety breakable section depends on the unyielding support of the ground standpipe. Solid ground support shall be at the ground level line mark on the hydrant barrel, resulting in center line of hose and steamer nozzles being sixteen (16) to eighteen (18) inches above ground level. The preceding requires thorough and careful compacting of backfill after correct positioning of hydrant.

When the hydrant is ready for service, it shall be opened and closed to see that all parts are in working condition. After closing hydrant, the standpipe interior shall be inspected to make sure of proper drainage.

651.03.05 RELOCATE FIRE HYDRANT

651.03.06 RESET FIRE HYDRANT

651.03.07 RESET WATER VALVE BOX

Excavation and backfill shall be in accordance with Section 202.
Methods of construction shall be such that, when reset, the water valve boxes shall conform to the grade of the resurfaced or regraded area.

Care shall be exercised in resetting the valve boxes. After resetting, the valve boxes shall be protected until the final resurfacing course has been laid. Castings which are damaged because of construction operations or vehicular traffic shall be replaced in kind and in a manner satisfactory to the Owner without additional compensation.

During the time between the adjustment of the valve box and the resurfacing, the Contractor shall place pavement around the extended frame and to a suitable distance around the frame so as not to cause a traffic nuisance or be the cause of an accident. The Contractor shall remove this pavement prior to installation of permanent overlay.

Adjustment rings for valve boxes, are required on concrete roads, as directed and required by the Engineer.

651.03.08 WATER AS-BUILT PLAN

651.03.09 METER VAULT

A. Construct concrete meter vaults to dimensions shown on Project Drawings. Do not cast in presence of water. Make bottom uniform. Verify lines and grades are correct and compacted subgrade will support loads imposed by vaults.

B. Precast Meter Vaults:

1. Install precast vaults in accordance with manufacturer's recommendations. Set level on a minimum 3-inch-thick bed of sand conforming to requirements of Utility Backfill Materials Section.
2. Seal lifting holes with cement-sand mortar or non-shrink grout.

C. Meter Vault Floor Slab:

1. Construct floor slabs of 6-inch-thick reinforced concrete. Slope floor 1/4-inch per foot toward sump. Make sump 12-inches in diameter, or 12-inches square, and 4-inches deep, unless other dimensions are required by Project Drawings. Install dowels at maximum of 18-inches, center-to-center for keying walls to floor slab.

2. Precast floor slab elements may be used for precast vault construction.

D. Cast-in-Place Meter Vault Walls:

1. Key walls to floor slab and form to dimensions shown on Project Drawings. Minimum wall thickness shall be 6-inches.
2. Cast walls monolithically. One construction joint will be allowed when vault depth exceeds 12-feet.
3. Set frame for cover in concrete.

651.03.10 FRAME AND COVER FOR METER VAULTS

A. Set cast iron frame in a mortar bed and adjust elevation of cover as follows:

1. In unpaved areas, set top of meter box or meter vault cover 4 to 6-inches above natural grade.
2. In paved areas, set top of meter box or meter vault cover flush with adjacent concrete.

651.04 MEASUREMENT AND PAYMENT

This article of the standard specifications is amended as follows:

The Department will measure and make payment for Items as follows:

Pay Item	*Pay Unit*
RESET WATER VALVE BOX TO GRADE (IF AND WHERE DIRECTED)	UNIT
FURNISH AND INSTALL 4” DIA. CEMENT LINED DIP CLASS 56 WATER MAIN (MINIMUM 4’-0” BELOW GRADE) INCLUDING EXCAVATION, BACKFILL, NJDOT NO. 57 STONE BEDDING TO 1" OVER TOP OF THE PIPE, GEOTEXTILE FILTER FABRIC, FITTINGS, CONCRETE ENCASEMENT, THRUST BLOCKS, RESTRAINING RODS AND COLLARS, TESTING, DISINFECTING, APPURTENANCES AND ALL ASSOCIATED WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS	LINEAR FOOT
FURNISH AND INSTALL 8” DIA. CEMENT LINED DIP CLASS 56 WATER MAIN (MINIMUM 4’-0” BELOW GRADE) INCLUDING EXCAVATION, BACKFILL, NJDOT NO. 57 STONE BEDDING TO 1" OVER TOP OF THE PIPE, GEOTEXTILE FILTER FABRIC, FITTINGS, CONCRETE ENCASEMENT, THRUST BLOCKS, RESTRAINING RODS AND COLLARS, TESTING, DISINFECTING, APPURTENANCES AND ALL ASSOCIATED WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS	LINEAR FOOT
FURNISH AND INSTALL 4” BURIED M.J. GATE VALVE AND VALVE BOX WITHIN A PROPOSED WATER MAIN, INCLUDING BEDDING, FITTINGS, SPOOL PIECES, EXCAVATION, BACKFILL, APPURTENANCES, AND ALL ASSOCIATED WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS	UNIT
FURNISH AND INSTALL 8” BURIED M.J. GATE VALVE AND VALVE BOX WITHIN A PROPOSED WATER MAIN, INCLUDING BEDDING, FITTINGS, SPOOL PIECES, EXCAVATION, BACKFILL, APPURTENANCES, AND ALL ASSOCIATED WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS	UNIT

Pay Item	*Pay Unit*
FURNISH AND INSTALL NEW FIRE HYDRANT ASSEMBLY ON NEW WATER MAIN WITH 6" ISOLATION GATE VALVE AND BOX, 6" CEMENT LINED DIP, EXCAVATION, BEDDING, RESTRAIN RODDING, THRUST BLOCKS, POLYETHYLENE FABRIC, GRANULAR BACKFILL, AND ALL OTHER ASSOCIATED WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS	UNIT
FURNISH AND INSTALL 2" HIGH DENSITY POLYETHYLENE PIPE DR-11 WATER SERVICE FROM ALUMINUM HEATED ENCLOSURE TO CURB BOX, INCLUDING EXCAVATION, BACKFILL AND CONNECTION TO PROPOSED WATER MAIN, FITTINGS AND APPURTENANCES	LINEAR FOOT
INSTALL ALUMINUM HEATED ENCLOSURE WITH INSULATED WALLS (20'L X 8'W X 6.5'H) INCLUDING 4" DUCTILE IRON PIPE, 8" DUCTILE IRON PIPE, DIP FITTINGS, 4" RPZ BACKFLOW PREVENTION ASSEMBLY, 8" BACKFLOW PREVENTION ASSEMBLY, 4" GATE VALVES, 8" GATE VALVES, PIPE PAINTING, METER INSTALLATION, CONCRETE SLAB, EXCAVATION, BACKFILLING AND STONE BEDDING IN ACCORDANCE WITH THE NEW JERSEY AMERICAN WATER DETAILS, INCLUDING ALL WORK, LABOR, MATERIALS AND ALL ELSE NECESSARY AND INCIDENTAL THERETO	LUMP SUM

The Contractor is advised that payment for the removal of existing water service connections shall not be included in the price bid for remove existing water distribution piping, but all costs for same shall be included in the price bid for remove and replace existing water service connections.

The Contractor is advised that a percentage of the payment for all water mains will be withheld until such time that the mains are satisfactorily pressure tested and acceptable bacteriological test results are submitted to the Engineer.

Buried water lines of the various types, sizes, and classes shall be measured and paid by the linear foot including the lengths of tees, bends, reducers/increasers, offset type bends, sleeves and couplings. Separate measurement and payment shall not be made for tees, bends, reducers/increasers, offset type bends, sleeves, friction clamps and couplings.

Gate valves, wet taps with valves, and water main utility crossings of the various sizes shall be measured and paid by the number of units.

The connections to the existing water mains shall be measured on a unit basis and shall include all materials, labor, and work and all else of whatever nature incidental thereto for which payment is not provided for in the items listed in the bid form, to construct the connections as indicated on the contract plans and in accordance with these specifications.

Separate measurement and payment will <u>not</u> be made for excavation, backfill with existing materials from the site, concrete encasements, thrust blocks, thrust collars, filter fabric, pipe bedding, fittings, connections, flushing, testing, caps and all work and appurtenances required, but not specifically paid for by other items in the bid form.

Separate payment will not be made for cutting of existing pipe, MJ cap, thrust block, concrete encasement, thrust collar or pipe plugs.

Water service connections shall be measured and paid on a unit basis, by size and type as shown on the plans, and shall include connection to the water main, corporations, curb stops, curb boxes, fittings, adapters, materials, labor, and work and all else of whatever nature incidental thereto for which payment is not provided for in the items listed in the bid form, to construct the connections as indicated on the contract plans and in accordance with these specifications. Separate measurement and payment will be not be made for pavement removal and restoration, excavation, backfill, flushing, and testing.

Copper water services installed shall be measured and paid on a linear foot basis, by size and type as shown on the plans, and shall include installation of copper pipe all materials, labor, and work and all else of whatever nature incidental thereto for which payment is not provided for in the items listed in the bid form, to construct the connections as indicated on the contract plans and in accordance with these specifications. Separate measurement and payment will be not be made for pavement removal and restoration, excavation, backfill, flushing, and testing.

Payment for furnishing and installing the fire hydrant assembly as shown on the plan, including all work as outlined above and required to satisfactorily complete the same shall be included in the unit price bid for each hydrant assembly as listed in the bid form.

Separate measurement and payment will not be made for 6" water main between hydrant assembly valves and hydrants.

SECTION 652 – SANITARY SEWERS

652.01 DESCRIPTION

The following is added:

Sanitary Sewer

The Contractor shall provide all labor, all pipe, fittings, gaskets, manholes, castings, special connections and other materials, equipment, special services, and all else necessary to furnish, install, flush, and test all sanitary sewer lines as required by the plans and specifications, or as required in order to fulfill the intent of the same. Requirements for excavation and backfill shall be in accordance with Sections 202 and 601.

The Contractor is advised that by-pass pumping may be required to maintain sewage flows in the existing system, and he shall supply all labor, material, and equipment necessary to maintain the flows without causing surcharging in the sanitary sewer system.

If pumping and by-passing is required, the Contractor shall supply the pumps, conduits, and other equipment to divert the flow of sewage around the section of pipe under construction. The by-pass system shall be of sufficient capacity to handle existing flow plus additional flow that may occur during a rainstorm. The Contractor will be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and by-passing system. Pump engines shall be equipped in a manner to keep noise to a minimum.

When flow in a sewer line is plugged, blocked, or by-passed, sufficient precautions must be taken to protect the sewer lines from damage that might result from sewer surcharging. Further, precautions must be taken to ensure that sewer flow control operations do not cause flooding or damage to public or private property being served by the sewers involved.

The Contractor is advised that the existing utilities shown on the plans are approximate and work under this section shall include the location of same by the Contractor, including existing service connections.

Connection of existing active laterals shall be in accordance with Subsection 652.03.04. The Contractor shall attempt to contact each homeowner and/or business which may be affected by the sanitary sewer construction at least 48 hours prior to the start of same. The Contractor at that time, shall attempt to arrange access into the home or business during the sewer main installation in order to perform a dye test to determine which laterals are active. The dye used for this test shall be yellow/green liquid powder tracing dye as manufactured by Norlad, or equal. In lieu of a dye test, televising or other means to determine the location of active laterals as may be approved by the Engineer shall be acceptable.

Each active lateral shall be connected to the new main as work progresses in accordance with Subsection 652.03.04. Any existing laterals which tie directly into a manhole shall be connected to the new sewer main with a standard wye connection. The Contractor shall verify, prior to the end of each working day, that all homes and/or businesses located along the new sanitary main installation have been connected. If it is determined that an active lateral has not been connected, the Contractor shall immediately provide all labor, material, equipment

and all else necessary to connect same in accordance with Subsection 652.03 and all other applicable sections of these specifications.

All existing laterals determined to be inactive shall be cut at the edge of the trench wall and plugged in accordance with Section 201.

Precast Concrete Sanitary Sewer Manholes

The Contractor shall provide all labor, materials, and equipment necessary to construct the precast concrete sanitary sewer manholes as required by the plans and specifications or as required in order to fulfill the intent of same. Requirements for excavation and backfill are detailed under Sections 202 and 601 and in other applicable sections of these specifications, but are included in the prices bid under this section.

Sanitary Sewer House Service Connections

The Contractor shall provide all labor, pipe, fittings, and other materials, equipment, special services, and all else necessary to furnish, install, flush, and test all 4" and 6" sanitary sewer house service connections as required by the plans and specifications or as required in order to fulfill the intent of the same. The work shall also include the connection of the proposed lateral to the existing lateral as indicated on the construction details. Requirements for excavation and backfill are included under Sections 202 and 301 of these specifications, but are included in the prices bid under this section.

Pipe installation and bedding shall be in accordance with Subsection 652.03.01, and trench backfill shall be in accordance with Section 301.

The work may also include the relocation of existing sanitary sewer laterals and cleanouts where directed by the Engineer.

652.02 MATERIALS

POLYVINYL CHLORIDE PIPE (GRAVITY SEWER)

A. Pipe Material

All pipe shall be best quality unplasticized polyvinyl chloride sewer pipe, adequate for the external loading conditions shown on the plans, with joints providing flexibility and watertightness under service conditions. Smooth internal surfaces, producing high carrying capacity obtainable with best standard practice and best workmanship, will be required. SDR 35 rated pipe shall be in accordance with ASTM Specification D3034 (latest edition) and shall meet the structural requirements of 115 psi for pipe stiffness. PS115 rated pipe shall be in accordance with ASTM Specification F679 (latest edition) and shall meet the requirements for extra strength minimum of the PS115 section of the above noted ASTM Specification.

The pipe shall be accurate and of uniform dimensions. All pipe shall be straight and true to form without bulges, dents, cracks, tears, or other defects which will affect strength, and shall have no bulges or dents on interior surfaces which will result in a noticeable variation in diameter from that obtained on adjacent unaffected portions of the surface. Each pipe shall not vary in length more than 1.0 inch in a length of 12-1/2 feet measured as mid-ordinate. Materials' properties shall meet the test requirements of ASTM D1784 (latest edition).

B. Joints

Joints shall be of the bell and spigot type with rubber ring. The bell shall consist of an integral wall section with a solid cross section rubber ring factory assembled. The ring groove shall be so designed as to prevent ring displacement. Sizes shall be as shown on the contract drawings or as required by field conditions. Jointing shall be in strict accordance with the recommendations of the pipe manufacturer.

C. Fittings

All fittings shall be PVC sewer pipe fittings with a rubber ring in each bell and ring groove so designed as to prevent ring displacement. All connections shall be made as shown on the drawings

or herein specified. Branch connections and service connections for PVC sewer pipe shall be such as to meet ASTM Standards as specified in ASTM D3034-73 SDR-35 (2008 Editions) or ASTM F679 (2008 Editions) PS115 as applicable. All associated pipe shall be PVC gravity sewer pipe as specified in the pipe material specification herein.

HIGH DENSITY POLYETHYLENE PIPE

High density polyethylene piping system shall be developed specifically for sanitary sewerage systems and in accordance with all standards and testing requirements. The polyethylene pipe shall be lightweight, flexible and chemical/abrasion resistant, DR9, Class 250. The pipe shall be resistant to acids, salts, hot soils, rust, rot and corrosion. The pipe shall not promote or support algae or bacterial growth.

The high density polyethylene pipe shall be as manufactured by Phillips Driscopipe Series 4000/4100 or approved equal. The HDPE pipe and fittings shall be for use in directional drilling applications.

The pipe specified shall be in accordance with ASTM D3350 cell classification and ASTM F-714 pipe standards. The pipe shall be the color green and shall meet the Utility Location and Coordination Council, "Uniform Color Code," per APWA/ULCC Standards Committee.

The piping system shall have a working pressure of a minimum of 250 psi.

CENTRIFUGALLY CAST FIBERGLASS REINFORCED POLYMER MORTAR PIPE (CCFRPM)

A. Pipe Material

Pipes: Manufacture pipe by the centrifugal casting process to result in a dense, nonporous, corrosion-resistant, consistent composite structure. The interior surface of the pipes exposed to sewer flow shall be manufactured using a resin which shall provide crack resistance and abrasion resistance. The exterior surface of the pipes shall be comprised of a sand and resin layer which provides UV protection to the exterior. Pipes shall be Type 1, Liner 2, Grade 3 per ASTM D3262. Pipes shall be manufactured by HOBAS Pipe USA or approved equal and shall have a stiffness rating of 72 psi and a pressure rating of 25 psi.

Resin Systems: The manufacturer shall use only polyester resin systems with a proven history of performance in this particular application. The historical data shall have been acquired from a composite material of similar construction and composition as the proposed product.

Glass Reinforcements: The reinforcing glass fibers used to manufacture the components shall be of highest quality commercial grade E-glass filaments with binder and sizing compatible with impregnating resins.

Silica Sand: Sand shall be minimum 98% silica with a maximum moisture content of 0.2%.

Additives: Resin additives, such as curing agents, pigments, dyes, fillers, thixotropic agents, etc., when used, shall not detrimentally effect the performance of the product.

Elastomeric Gaskets shall meet ASTM F477 and be supplied by qualified gasket manufacturers and be suitable for the service intended.

The extrapolated 50-year strain corrosion value shall not be less than 0.9% as determined in accordance with ASTM D3262 Section 8.2.1; the pipe shall be capable of being deflected, without failure, at a 50 year extrapolated strain level of 0.9% minimum when using test fluid of 1N sulfuric acid. This test must have been conducted on pipe made at the supplying factory and a report must be submitted demonstrating compliance.

ASTM References and Standards and Test Methods for FRP Pipe

A. ASTM D3262 – Standard Specifications for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe.

B. ASTM D4161 – Standard Specifications for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals.

C. ASTM D2412 – Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.

D. ASTM D3681 – Standard Test Method for Chemical Resistance of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe in a Deflected Condition.

E. ASTM D638 - Test Method for Tensile Properties of Plastics.

F. ASTM F477 – Standard Specification for Elastomeric Seals (Gaskets) Joining Plastic Pipe.

Acceptance of the installed pipe shall be based on a videotaped TV inspection to assure all joints are properly assembled, no damage exists and that any leakage or deformation is within the allowable limits. Each joint/ coupling is to be air tested with air pressure (max 5 psi). The joint passes the test if there is no pressure drop through the pipe or pipe joints for four minutes. Maximum allowable long-term deflection is normally 5% of the initial diameter.

Provide complete testing results for all of the ASTM standards for FRP Pipe. All testing results shall be signed and sealed by Licensed Professional Engineer and be in full compliance with the Standards. Quality Assurance Manual showing the existence and structure of an internal quality assurance program operating independently of the production management, with checkpoints and procedures to identify materials received and products manufactured as conforming to the specifications.

Provide certification that the proposed USA Pipe manufacturing site has the equipment capacity to perform the required pipe production.

B. Joints

Unless otherwise specified, the pipe shall be field connected with FWC couplings. Either joint shall utilize elastomeric sealing gaskets as the sole means to maintain joint water tightness and shall meet the performance requirements of ASTM D4161. Joints at tie-ins, when needed, may utilize gasket-sealed closure couplings.

C. Fittings

Flanges, elbows, reducers, tees, wyes, laterals and other fittings shall be capable of withstanding all operating conditions when installed. They may be contact molded or manufactured from mitered sections of pipe joined by glass-fiber-reinforced overlays.

DUCTILE IRON PIPE

A. Pipe Material

Ductile iron pipe shall be centrifugally cast with polyurethane or calcium aluminate lining and shall conform to the ANSI A21.51 (AWWA C-151) Ductile Iron Pipe. The pipe exterior shall receive a standard foundry coat tar dip coating. All ductile iron pipe shall be minimum thickness Class 52. All pipe shall be furnished in 18 to 20 foot nominal lengths.

B. Joints

All main pipe joint shall be the "Push-on" type with rubber gasket conforming to ANSI A21.11 (AWWA C-111). Pipe plain ends shall be suitably beveled to permit easy entry into the bell.

All jointing shall be in strict accordance with the manufacturer's recommendations.

C. Fittings

All fittings shall be cast iron or ductile iron fittings with polyurethane or calcium aluminate lining and standard exterior coal tar dip coating. Cast and ductile iron fittings shall conform to ANSI 21.10 or latest revision. Mechanical joints and push-on joints shall conform to ANSI 21.11 or latest revision.

All mechanical joint fittings and push-on joint fitting shall be installed strictly in accordance with both the pipe and fitting manufacturer's recommendations specifically with regard to permissible torque of bolts and the effective sealing of the joint. If effective sealing is not attained at the maximum recommended torque, the joint shall be disassembled and reassembled after thorough

cleaning and, if necessary, with a new gasket. Overstressing of the torque of bolts to compensate for poor installation procedures will not be permitted.

D. INTERIOR LINING

Due to the potential for septic sewage and aggressive wastes, cement lining on the ductile iron pipe will not be permitted. In order to help protect the proposed force main, the ductile iron pipe will be required to contain a ceramic epoxy lining.

A ceramic epoxy coating system will be required to be utilized for internal lining for the ductile iron pipe and fittings.

The lining material shall be Protecto 401 ceramic epoxy or equal. The material shall be an amine cured novalac epoxy containing at least 20% by volume of ceramic quartz pigment.

All surfaces to be lined shall be cleaned to near white metal finish (SSPC-SP 10) as applied to ductile iron pipe and fittings. All surfaces shall be completely dry, free of moisture, dust, grease, or any other deleterious substances, at the time the lining is applied.

The dry film thickness (DFT) on internal linings shall be 40 mils (0.40 inch) nominal. Thickness determinations using a Type 1 magnetic thickness gauge shall be conducted in accordance with the Steel Structures Painting Council SSPC-PA2 Specification as applied to ductile iron pipe and fittings.

In order to minimize potential dimensional and assembly problems, the thickness on sealing areas in the bell socket interior and on the spigot end of the pipe exterior shall be 6 mils (0.006 inch) nominal with a maximum of 10 mils (0.010 inch). Thicker coatings in these areas are acceptable if it is demonstrated that joint dimensions are within allowable tolerances after coating.

Depending on the application process and intended usage, the joint material shall be Protecto Joint Compound or equal.

Repair and touch-up materials shall be Protecto Joint Compound or equal. Repairs and touch-up shall be performed in accordance with the manufacturer's recommended repair and touch-up procedures. All field cut ends shall be repaired and sealed prior to installation.

Holiday inspection shall be conducted using test equipment described in American Water Works Association Standard, AWWA C210-84, Section 5.3.3.1. In accordance with coating manufacturer's recommendation, holiday testing may be conducted any time after the coating has reached sufficient cure.

The Contractor shall be required to provide the Engineer with a copy of the pipe manufacturer's certification as to the installation and testing of the required pipe lining material.

The use of ductile iron pipe with a calcium aluminate type of interior lining will be considered as approved equal on this project. This alternate type of lining shall be Sewper Coat as manufactured by Lafarge Calcium Aluminates, or approved equal.

REINFORCED CONCRETE PIPE

A. Pipe Material

Reinforced concrete piping system shall be developed specifically for sanitary sewerage systems and in accordance with all standards and testing requirements. The pipe shall be resistant to acids, salts, hot soils, rust, rot and corrosion. The pipe shall not promote or support algae or bacterial growth.

The pipe specified shall be in accordance with AASHTO M 170, Class III, Wall B, pipe standards.

Manufacture reinforced concrete culvert pipe, storm drain, and sewer pipe to conform to AASHTO M 170, Class III, Wall B, unless otherwise designated.

For jacked pipe, use reinforced concrete culvert pipe conforming to AASHTO M 170, Class V, Wall B. Manufacture reinforced concrete elliptical culvert, storm drain, and sewer pipe to conform to AASHTO M 207, Class HE-III, unless otherwise designated. If required for watertight flexible joints, use preformed flexible joint sealants conforming to AASHTO M 19
The piping system shall have a working pressure of a minimum of 250 psi.

B. Interior Lining

Due to the potential for septic sewage and aggressive wastes, epoxy lining on the concrete reinforced pipe will be required. In order to help protect the proposed sanitary sewer, the reinforced concrete pipe will be required to contain a ceramic epoxy lining.

A ceramic epoxy coating system will be required to be utilized for internal lining for the reinforced concrete pipe.

All surfaces to be lined shall be cleaned. All surfaces shall be completely dry, free of moisture, dust, grease, or any other deleterious substances, at the time the lining is applied.

Repairs and touch-up shall be performed in accordance with the manufacturer's recommended repair and touch-up procedures. All field cut ends shall be repaired and sealed prior to installation.

Holiday inspection shall be conducted using test equipment described in American Water Works Association Standard. In accordance with coating manufacturer's recommendation, holiday testing may be conducted any time after the coating has reached sufficient cure.

The Contractor shall be required to provide the Engineer with a copy of the pipe manufacturer's certification as to the installation and testing of the required pipe lining material.

HIGH BUILD EPOXY COATING

The Contractor shall furnish all high build epoxy coating, labor, materials, appliances and equipment necessary to mobilize and complete the surface preparation and installation of corrosion protection for all reinforced concrete sanitary sewer in the project area or as directed by the engineer. The lining shall be as manufactured by raven lining systems, inc. Raven 405; sauereisen, sewergard 210 rs; or equivalent products as manufactured by neopoxy international, haywood, ca; swerp, lafayette hill, pa; or equal, high-build epoxy coating, applied in the field after construction of structures.

Coating product shall be capable of being installed and curing properly within the specified environment. Coating product shall be resistant to all forms of chemical or bacteriological attack found in municipal sanitary sewer systems and capable of adhering to the substrates. Coating product shall be Raven 405, Sauereisen, Sewergard 210 rs or equal – 100% solids, solvent-free ultra high-build epoxy system exhibiting the following characteristics:

1. Product type: amine cured epoxy
2. Voc content (astm d2584): 0%
3. Compressive strength, psi (astm d695): 18,000 (minimum)
4. Tensile strength, psi (astm d638): 7,500 (minimum)
5. Flexural modulus, psi (astm d790): 600,000 (minimum)
6. Adhesion to concrete, mode of failure (astm d4541): substrate (concrete) failure
7. Chemical resistance (astm d543/g20) all types of service for:
8. Municipal sanitary sewer environment
9. Sulfuric acid, 30%
10. Sodium hydroxide, 5%
11. Successful pass: sanitation district of l.a. county coating evaulation study or sspwc 210.2.3.3 (greenbook “pickle jar” chemical resistance test)

The application method must be in accordance with the coating manufacturer’s recommendations and approved by the engineer prior to application. Contractor to supply manufacturer approved heated plural component spray equipment. Hard to reach areas, primer application and touch-up may be performed using hand tools. Temperature of the surface to be coated shall be maintained between 40 and 120 deg F. Specified surfaces shall

be shielded to avoid exposure of direct sunlight or other intense heat source. Where varying surface temperatures do exist, coating installation shall be scheduled when the temperature is falling versus rising.

Prior to commencing surface preparation, Contractor shall inspect all surfaces specified to receive the coating and notify owner, in writing, of any noticeable disparity in the site, structure or surfaces which may interfere with the work, use of materials or procedures as specified herein.

B. Surface preparation

1. Oils, grease, incompatible existing coatings, waxes, form release, curing compounds, efflorescence, sealers, salts, or other contaminants which may affect the performance and adhesion of the coating to the substrate shall be removed.

2. Concrete and/or mortar damaged by corrosion, chemical attack or other means of degradation shall be removed so that sound substrate remains.

3. Choice of surface preparation method shall be based upon the condition of the structure and concrete or masonry surface, potential contaminants present, access to perform work, and required cleanliness and profile of the prepared surface to receive the coating product.

4. Surface preparation method, or combination of methods, that may be used include high pressure water cleaning, water jetting, abrasive blasting, shotblasting, grinding, scarifying, detergent water cleaning, hot water blasting and others as referenced in nace no. 6/sspc sp-13. Whichever method is used, they shall be performed in a manner that provides a uniform, sound clean neutralized surface suitable for the specified coating product.

5. Infiltration shall be stopped by using a material which is compatible with the repair products and is suitable for topcoating with the coating product.

C. Application of repair/resurfacing products

1. Areas where rebar has been exposed shall be repaired in accordance with the engineer's recommendations. Areas where rebar has been exposed and is corroded shall be first prepared as specified previously. The exposed rebar shall then be abrasive blasted and coated with coating product specified.
2. Repair products shall be used to fill voids, bugholes, and other surface defects which may affect the performance or adhesion of the coating product.
3. Resurfacing products shall be used to repair, smooth or rebuild surfaces with rough profiles to provide a concrete or masonry substrate suitable for the coating product to be applied. These products shall be installed to minimum thickness as recommended within manufacturer's published guidelines.

4. Repair and resurfacing products shall be handled, mixed, installed and cured in accordance with manufacturer guidelines.

5. All repaired or resurfaced surfaces shall be inspected for cleanliness and suitability to receive the coating product. Additional surface preparation may be required prior to coating application.

D. Application of coating products

Application procedures shall conform to the recommendations of the coating product manufacturer, including environmental controls, product handling, mixing, application equipment and methods.

Spray equipment shall be specifically designed to accurately ratio and apply the coating product and shall be in proper working order.

Contractors qualified as previously specified shall perform all aspects of coating product installation.

Prepared surfaces shall be coated by spray application of the coating product described herein to a minimum wet film thickness of 125 mils.

Subsequent top coating or additional coats of the coating product shall occur within the product's recoat window. Additional surface preparation procedures will be required if this recoat window is exceeded.

Coating product shall interface with adjoining construction materials throughout the structure to effectively seal and protect concrete or masonry substrates from infiltration and attack by corrosive elements. Procedures and materials necessary to effect this interface shall be as recommended by the coating product manufacturer.

Sewage flow shall be stopped, bypassed or diverted for application of the coating product to the invert and interface with pipe materials.

Testing and inspection

During application a wet film thickness gauge, meeting astm d4414 - standard practice for measurement of wet film thickness of organic coatings by notched gages, shall be used. Measurements shall be taken, documented and attested to by Contractor for submission to owner.

After the coating product has set in accordance with manufacturer instructions, all surfaces shall be inspected for holidays with high-voltage holiday detection equipment. In accordance with nace rpo 188-99 for performing holiday detection. All detected holidays shall be marked and repaired by abrading the coating surface with grit disk paper or other hand tooling method. After abrading and cleaning, additional coating shall be hand applied to the repair area. All touch-up/repair procedures shall follow the coating manufacturer's recommendations. Documentation on areas tested, results and repairs made shall be provided to owner by Contractor.

Visual inspection shall be made by the owner's representative. Any deficiencies in the finished coating shall be marked and repaired according to the procedures set forth herein by Contractor.

SANITARY SEWER HOUSE SERVICE CONNECTIONS

PVC pipe shall be in accordance with ASTM D3034 (1985) and shall be Class SDR-35. Ductile iron pipe for laterals shall be Class 52, and cast-iron cleanout assemblies shall be service weight.

PRECAST CONCRETE SANITARY SEWER MANHOLES

A. Concrete and Joints

All manholes shall be precast manholes consisting of precast reinforced concrete sections manufactured in accordance with ASTM Designation C478. Top section shall be conical and all sections shall have a minimum concrete compressive strength of 4,000 psi. The circumferential reinforcement in the walls of all sections shall be a minimum of 0.12 sq. in. per linear ft. for inside diameters up to and including 54 in., and 0.17 sq. in. per linear ft. for the larger sizes. Reinforcing in the bottom of bases shall be a minimum of 0.12 inches per lineal foot in both directions. Joints of all manhole sections shall be formed entirely of concrete employing a round rubber gasket and when assembled, shall be self-centering and make a uniform watertight joint. Gasket spaces between the bell and spigot shall be so shaped as to provide grooves that will prevent the gasket from disengaging from its compression surface or being blown out by hydrostatic pressures.

Precast base sections shall be supplied by the manufacturer. The inverts may be cast in the field by the Contractor. All inverts shall be smooth and accurately shaped to a semi-circular bottom conforming to the inside of the adjacent sewer sections.

The base section of each manhole shall include precast flexible mechanical connections for all incoming pipes. The connection shall be installed during the construction of the section. The connection shall be of such design so as to be self-adjusting such that a constant equal compression is maintained regardless of variations in pipe thickness and shape. The flexible mechanical connection shall provide "zero" infiltration. Shop drawings of manholes and flexible mechanical connections shall be submitted for approval prior to construction.

Manholes and drop manholes shall be constructed as shown on the drawings in accordance with all applicable requirements previously specified.

B. Castings

The Contractor shall furnish and set level and to the proper grade, cast iron manhole frames and covers of the form and dimensions shown on the plans. All castings for manholes frames and covers shall be of tough gray iron, free from cracks, holes, and other defects.

All manhole castings shall be a circular flared type frame with round flange as indicated on the construction details.

All castings shall be accurately manufactured to the required dimensions and shall be machined to provide even bearing surfaces. Covers must fit the frames in any position, and if found to rattle under traffic, shall be replaced. Filling to obtain tight covers will not be permitted. The frame shall be thoroughly bedded in mortar.

Castings shall be carefully coated inside and out with coaltar pitch varnish.

All manhole covers shall have cast into the cover the words indicated on the construction details.

C. Ladder Rungs

During the construction of each manhole, ladder rungs, shall be set in place on the inside of the manhole, beginning two feet above the bottom, and spaced twelve inches (12") center to center, as shown on the plans and details. Steps shall be constructed to the dimensions shown on the contract drawings and shall be properly embedded in the wall.

VALVES

A. Gate Valves

Gate valves for finished water service shall conform to all applicable provisions of Standard Specification AWWA C509-87 "AWWA Standard for Resilient-Seated Gate Valves, 3 through 12 NPS, for Water Systems".

Resilient seat gate valves shall be iron body, inside screw, epoxy-coated inside and out, resilient seat with flanged ends except for buried valves which shall have mechanical joint ends. All valves shall open counter clock-wise and shall be furnished with hand wheel or chain wheel except for buried valves which shall have valve boxes and lids marked for water as described in Division 2.

All valves shall be suitable for working pressures to 200 psi with a bubble-tight shutdown and shall be installed as shown on the drawings. Lubrication and O & M Instructions and Parts List shall be furnished in quadruplicate for each type of valve provided. Resilient seat gate valves shall be Mueller, or equal.

B. Plug Valves

Plug valves shall be furnished and installed where shown on the Contract Drawings.

Valves shall be of non-lubricated eccentric type with hycar resilient faced plugs, suitable for the intended service, and shall be furnished with end connections as shown on the plans. Plug valve shall rotate 90º from full open to fully closed positions. Port areas of valves shall be at least 80% of full port area. Valves shall provide dead-tight shut-off. Flanged valves shall be faced and drilled to the ANSI 125/150 lb. standard. Mechanical joint ends shall be to the AWWA Standard C111-64, grooved ends per AWWA C-606-87. Screwed ends shall be to the NPT standard.

Valve bodies shall be of ASTM A126 Class B cast iron. Bodies in 3" and larger valves shall be furnished with a 1/8" welded overlay seat of not less than 90% pure nickel. Seat area shall be raised, with raised surface completely covered with weld to ensure that the plug face contacts only nickel. Screwed-in seats shall be not acceptable.

Plugs shall be of ASTM A126 Class B cast iron. The plug shall have a cylindrical seating surface eccentrically offset from the center of the plug shaft. The interference between the plug face and body seat, with the plug in the closed position, shall be externally adjustable in the field with the valve in the line under pressure.

Valves shall have sleeve type metal bearings and shall be of sintered, oil impregnated permanently lubricated type 316 stainless steel, ASTM A743 Grade CF-8M in 1/2"-36" sizes. In valves larger than 36", the upper and lower plug journals shall be fitted with ASTM A-240 type 316 stainless sleeves with bearings of ASTM B30, Alloy C95400 aluminum bronze. Non-metallic bearings shall not be acceptable.

Valve shaft seals shall comply with AWWA C504, be of the multiple V-ring type and shall be externally adjustable and repackable without removing the bonnet or actuator from the valve under pressure. Valves utilizing O-ring seals or non-adjustable packing shall not be acceptable. Packing shall be nitrile butadiene.

Valve pressure ratings shall be 100 psi. Each valve shall be given a hydrostatic and seat test with test results being certified when required by the specifications.
Manual valves shall have lever or gear actuators, handwheels or chainwheels, as indicated on the plans, specified or required per the installation. All valves 6" and larger, or valves in gas service, shall be equipped with gear actuators. All gearing shall be enclosed in a semi-steel housing and be suitable for running in a lubricant with seals provided on all shafts to prevent entry of dirt and water into the actuator. The actuator shaft and the quadrant shall be supported on permanently lubricated bronze bearings. Actuators shall clearly indicate valve position and adjustable stops shall be provided to set closing torque and to provide seat adjustment to compensate for change in pressure differential or flow direction change. All exposed nuts, bolts and washers shall be zinc plated.

Valves and gear actuators for buried or submerged service shall have seals on all shafts and gaskets on the valve and actuator covers to prevent the entry of water. Actuator mounting brackets for buried or submerged service shall be totally enclosed and shall have gasket seals. All exposed nuts, bolts, springs and washers shall be stainless steel.

All valves and actuators shall be as manufactured by DeZurik or equal. Valves 2" and smaller shall be Series 130 stainless steel with flanged or screwed connections. Valves larger than 2" shall be cast iron, Series 118, with flanged connections.

652.03 CONSTRUCTION

652.03.01 Sewer Pipe

A. Scheduling of Work

B. Existing Utilities and Structures

C. Excavating

D. Handling of Pipe and Accessories

The following is added to this article:

Pipe and other accessories shall be handled with care to avoid damage. The interior of all pipe and accessories shall be kept free of dirt and other foreign material at all times. All pipe shall be examined for defects or damage prior to installation.

Joint surfaces shall be protected from damage and shall be carefully examined before jointing. No damaged joints shall be used in the work.

Pipe will be lowered into the trench by means of ropes or other suitable means. In no case shall pipe or accessories be dumped or dropped into the trench. Pipe and accessories will be inspected for damage or defects prior to installation. Ends of the pipe and flanges will be wiped clean prior to joining the pipes.

E. Installing Sanitary Sewer Gravity and Force Mains

The following is added to this article:

Pipe laying shall start at the low end unless otherwise approved by the Engineer and shall be carefully laid to true alignment and grade and installed in accordance with ASTM D2321 (latest revision). Excavation for the pipeline will conform to the lines and grades shown on the drawing. The width of the trench at the point six inches above the top of the pipe will be no more than two feet plus the diameter of the pipe. The width of the trench at the ground surface may vary depending on the depth of the excavation and character of material, but shall be kept to a minimum.

All trenches shall be dewatered prior to laying pipe. Dewatering methods shall comply with Section 202.

Pipe bedding shall consist of a 6" minimum layer of NJDOT No., 57 crushed stone installed over suitable bedding soil.

Each section of pipe will be laid so that it is in contact with the bedding material for its full length. Recesses will be excavated for couplings. Pipe shall not be supported by couplings, blocks or bricks or similar devices.

NJDOT No. 57 crushed stone shall be extended to 1" over the top of the pipe. Existing soils from the excavation which have been segregated, as required in Section 202 shall be used as backfill material. The backfill for existing paved streets shall be compacted to 90% of its modified proctor density established in accordance with ASTM Specification D- 1557, from the top of the pipe embedment to within three feet of the pavement subgrade. The remaining portion of the backfill shall be compacted to 95% of its modified proctor density. Backfill at easements shall be compacted to 90% of its modified proctor density.

All materials and methods utilized shall be as approved by the Engineer and in accordance with the pipe bedding detail located on the plans.

Care shall be taken not to excavate below grade. Material excavated below adopted grade shall be replaced by material which meets with the approval of the Engineer, and then compacted without any further payment. All pipe shall be accurately centered prior to jointing and then thoroughly driven home. Immediately after the pipe is brought to final position, it shall be thoroughly secured and properly bedded, and ample support shall be provided to prevent settlement or disturbances. Pipe shall be protected during construction against possible flotation due to pouring of concrete cradles or in case the trench becomes flooded prior to placing the backfill.

The pipe end shall be thoroughly lubricated in accordance with the recommendations of the manufacturer.

Cutting of pipe sections shall be done only by experienced workers using methods recommended by the manufacturer in a manner that will result in a smooth end normal to the axis of the pipe.

Prior to connecting pipe sections, all plain ends shall be beveled in accordance with the manufacturer's recommendations.

Pipe shall be laid to the grade shown on the contract drawings. All pipe shall be thoroughly compacted by mechanical tamping as detailed above. The Contractor shall take all necessary precautions to ensure that the haunches of the pipe are compacted in order to eliminate possible deflections which will not be permitted.

When, in the opinion of the Engineer, the material at the bottom of the trench or other excavation is soft or unsuitable, it shall be removed to such depth as the Engineer may require and backfilled with NJDOT No. 57 crushed stone.

<u>BORE AND JACK CROSSING METHOD</u>

This method consists of pushing the casing pipe into the earth with a boring auger rotating within the pipe to remove the spoil.

The boring operation shall be progressed on a 24-hour basis without stoppage (except for adding lengths of pipe) until the leading edge of the casing pipe has reached the receiving pit.

The front of the casing pipe shall be provided with mechanical arrangements or devices that will positively prevent the auger from leading the pipe so that there will be no unsupported excavation ahead of the pipe.

The auger and cutting head arrangement shall be removable from within the casing pipe in the event an obstruction is encountered.

The over-cut by the cutting head shall not exceed the outside diameter of the casing pipe by more than one half inch. If voids should develop or if the bored hole diameter is greater than the outside diameter of pipe (plus coating) by more than approximately 1 inch, grouting or other methods approved by the engineer, shall be employed to fill such voids.

The face of the cutting head shall be arranged to provide a reasonable obstruction to free flow of soft or poor material.

Plans and descriptions of the arrangement to be used shall be submitted to the Engineer for approval and no work shall proceed until such approval is obtained.

At each location shown on the Plans where a crossing operation is required and prior to the installation of any pipe, the Contractor shall submit to the Engineer, the following:

a. Construction operations schedule
b. Proposed crossing method
c. Drilling pit plans and calculations
d. Auger – Stop Detail
e. Method of ground water control (dewatering)
f. Insurance documents
g. Details of boring arrangement at head of casing
h. Method of soil stabilization

Same shall be signed and sealed by a Professional Engineer licensed in the State of New Jersey.

It is the intent of these Specifications that by adhering to a properly engineered crossing procedure and design that it will be possible to achieve a pipe installation at the locations and to the lines and grades indicated on the Plans, and to maintain the crossing against any and all subsidence. The Contractor shall also include with the submitted procedure, a schedule of when the crossing operations are to commence and the proposed time to complete same. The Contractor shall notify the Engineer a minimum of 14 working days prior to the desired start of construction.

The Contractor shall familiarize himself with all soils information, available borings, and other similar crossing operations and problems which are peculiar to this area, prior to construction. If necessary, the Contractor shall perform additional subsurface investigations, excavate test pits as previously specified. The Contractor shall customize his crossing procedure accordingly and design for the most undesirable condition

Generally, the information required to be submitted for each crossing shall include in detail, but not be limited to, the following items while acknowledging all limitations, criteria, and recommendations listed:

1. TOLERANCES
   A steel casing pipe which deviates, prorated for the installation length as shown on the Plans, from line and grade greater than three (3) inches in one hundred feet of crossing is not acceptable. All expenses incurred for redesign, re-crossing and relocation of the pipe, except in the event of an unforeseeable major obstacle during the crossing operation, shall be borne by the Contractor.

   Bored installations shall have a bore hole essentially the same as the outside diameter of the casing pipe plus the thickness of the protective coating.

2. SCHEDULE
   The crossing operation, once commenced, shall be continuous and to operate around the clock including holidays and weekends using multiple shifts and all necessary overtime until the entire casing pipe is completely installed.

3. DEWATERING
   Electric motor driven dewatering pumps shall be installed on either side of the crossing and be ready to operate continuously if required. The quantity and size of pumps shall be sufficient to lower the groundwater, if encountered, to a depth of two (2) feet below the invert grade of the pipe in

accordance with applicable safety regulations. The crossing operation shall not commence until after the groundwater has been lowered. The Contractor shall have at his disposal, a generator capable of continuously operating the dewatering pumps. Proposed methods of dewatering and methods of monitoring for loss of fines must be submitted to the Engineer, for approval prior to implementation.

4. DRILLING PIT

Complete details of the approach pit shall be provided to the Engineer. These details should include the method of sheeting or bracing used to maintain the crossing embankment and to protect against sloughing if required. The drilling pit should be maintained dry by the use of crushed stone bottom and adequately sized sump pump as previously specified.

Steel sheeting shall be designed to support all lateral forces caused by the earth and other surcharge loads.

All excavated areas are to be illuminated (flashing warning lights not permitted), fenced and otherwise protected as directed by the Engineer, or their designated representatives.

5. DIRECTION OF CROSSING

The crossing should generally proceed upstream to preserve the pipe and end rings in normal laying direction and for groundwater to drain to the drilling pit.

6. DRILLING SHIELD

Complete dimensions and details of the cutting shield employed at each crossing will be required. This shield shall be designed cognizant of the prevailing solid condition and to absolutely minimize any possibility of overburden subsidence while maintaining the prescribed tolerances of line and grade. The outside diameter of the shield shall be equal to the outside diameter of the casing pipe. An over cut band or friction breaker will not be allowed.

7. CASING PIPE END SEALS

The casing for carrier pipe shall have both ends of the casing blocked up in such a way as to prevent the entrance of foreign material, but allowing leakage to pass in the event of a carrier break. The materials and installation method of end seals shall be reviewed by the Engineer.

8. SAFETY REQUIREMENTS

All operations shall be conducted so as not to interfere with, interrupt, or endanger the operation of traffic; nor damage, destroy, or endanger the integrity of the roadway. The Contractor shall secure and comply with the NJDOT safety rules and shall give written acknowledgement to NJDOT that they have been received, read, and understood by the Contractor and his employees. Operations will be subject to NJDOT inspection at any and all times.

At all times when the work is being progressed, a field supervisor for the work with no less than twelve (12) months experience in the operation of the equipment being used shall be present. If boring equipment or similar machines are being used, the machine operator also shall have no less than twelve (12) months experience in the operation of the equipment being used.

9. TRAFFIC SAFETY PRECAUTIONS

The Contractor shall be responsible for installing all necessary traffic safety devices including, but not limited to, breakaway barricades, drums, flashers, warning signs and the like, to maintain an unobstructed flow of traffic throughout the time limit of the Contract. All traffic safety devices shall be in accordance with applicable local and state traffic standards, as detailed in other applicable sections of these specifications and in accordance with section 110 of the New Jersey Department of Transportation Standard Specifications, latest revision.

The Contractor is herein advised that permitted hours of construction activities must be coordinated with the Local Police Department. Please be advised that construction operations may be limited to within certain hours of the day.

The Local Police Department shall be notified of all scheduled construction related activities which may affect traffic flow patterns.

END OF BORE AND JACK CROSSING METHOD SECTION

CLEANING AND FLUSHING

All manholes and pipes shall be thoroughly cleaned and ample precautions shall be taken to prevent entrance of dirt and debris into the structures and lines after laying. Exposed ends of sewers shall be provided with temporary plugs or covers. All manholes and lines shall be cleaned of dirt and debris, prior to inspection for acceptance.

The Contractor shall be required to perform a TV inspection of the installed pipe using a radial view camera (360-degree optical lens). This camera provides the operator the ability to view into the laterals. The radial view camera must have remote control of the 360-degree rotational lens. The camera is capable of viewing the complete circumference of the pipe. Cameras incorporating mirrors for viewing sides or camera using exposed rotating heads are not acceptable. The camera lens is an auto-iris type with remote controlled manual override. The camera light-head includes a high-intensity side viewing lighting system to allow illumination of internal sections of lateral sewer connections in order to determine if it has been installed properly. A DVD format video record including viewing of the connected laterals, shall be provided for review by the owner prior to acceptance. This work shall be performed at no extra cost.

TEMPORARY BYPASS PUMPING SYSTEM

Under this item the Contractor is required to furnish all materials, labor, equipment, power, maintenance, etc. to implement a temporary pumping system for the purpose of diverting the existing flow around the work area as required.

The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility. The Contractor shall employ the services of a vendor who can demonstrate to the engineer that he specializes in the design and operation of temporary bypass pumping systems. The vendor shall provide at least five (5) references of projects of a similar size and complexity as this project performed by his firm within the past three years. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.

Submittals

The Contractor shall submit to the Engineer detailed plans and descriptions, prior to construction, outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing wastewater flows. This plan must be specific and complete, including such items as schedules, locations, elevations, capacities of equipment, materials and all other incidental items necessary and/or required to ensure proper protection of the facilities, including protection of the access and bypass pumping locations from damage due to the discharge flows, and compliance with the requirements and permit conditions specified in these Contract Documents. No construction shall begin until all provisions and requirements have been reviewed by the Engineer.

The plan shall include but not limited to details of the following:

- Staging areas for pumps;
- Sewer plugging method and types of plugs;
- Number, size, material, location and method of installation of suction piping;
- Number, size, material, method of installation and location of installation of discharge piping;
- Bypass pump sizes, capacity, number of each size to be on site and power requirements;
- Calculations of static lift, friction losses, and flow velocity (pump curves showing pump operating range shall be submitted);
- Standby power generator size, location;
- Downstream discharge plan;
- Method of protecting discharge manholes or structures from erosion and damage;
- Thrust and restraint block sizes and locations;
- Sections showing suction and discharge pipe depth, embedment, select fill and special backfill;
- Method of noise control for each pump and/or generator;
- Any temporary pipe supports and anchoring required;
- Design plans and computation for access to bypass pumping locations indicated on the drawings;
- Calculations for selection of bypass pumping pipe size;
- Schedule for installation of and maintenance of bypass pumping lines;
- Plan indicating selection location of bypass pumping line locations.
- Alarm system and auto dialer.

Equipment

All pumps used shall be fully automatic self-priming units that do not require the use of foot-valves or vacuum pumps in the priming system. The pumps may be electric or diesel powered. All pumps used must be constructed to allow dry running for long periods of time to accommodate the cyclical nature of flows.

All pumps shall be Godwin "Dri-Prime" automatic self-priming pumps (CD, DPC, or HL series) as manufactured by Godwin Pumps of America, Inc., (609) 467-3636, (301) 390-3806, or equal.

The Contractor shall provide the necessary stop/start controls for each pump.

The Contractor shall include one stand-by pump of each size to be maintained on site.

Back-up pumps shall be on-line, isolated from the primary system by a valve.

Discharge Piping - In order to prevent the accidental spillage of flows all discharge systems shall be temporarily constructed of rigid pipe with positive, restrained joints. Under no circumstances will aluminum "irrigation" type piping or glued PVC pipe be allowed. Discharge hose will only be allowed in short sections and by specific permission from the Engineer.

Allowable piping materials will be Steel Pipe (Godwin Pumps of America, Inc.) or fused, high-density polyethylene pipe as manufactured by Phillips Driscopipe, Inc. or equal.

System Description

Design Requirements

Bypass pumping systems shall have sufficient capacity to pump all flows. The Contractor shall provide all pipeline plugs, pumps of adequate size to handle peak flow, and temporary discharge piping to ensure that the total flow of the main can be safely diverted around the section to be repaired. Bypass pumping system shall be capable of continuous operation as required.

The Contractor shall have adequate standby equipment available and ready for immediate operation and use in the event of an emergency or breakdown. One standby pump for each size pump utilized shall be installed at the mainline flow bypassing locations, ready for use in the event of primary pump failure.

Bypass pumping system shall be capable of bypassing the flow around the work area and discharging any amount of flow up to full available flow downstream into the existing sewer system as necessary for satisfactory performances of work.

The Contractor shall make all arrangements for bypass pumping during the time when the main is shut down for any reason. System must overcome any existing force main pressure on discharge.

Performance Requirements

It is essential to the operation of the existing sewerage system that there be no interruption in the flow of sewage throughout the duration of the project. To this end, the Contractor shall provide, maintain and operate all temporary facilities such as dams, plugs, pumping equipment (both primary and back-up units as required), conduits, all necessary power, and all other labor and equipment necessary to intercept the sewage flow before it reaches the point where it would interfere with his work, carry it past his work and return it to the existing sewer downstream of his work.

The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.

The Contractor shall provide all necessary means to safely convey the sewage past the work area. The Contractor will not be permitted to stop or impede the main flows under any circumstances.

The Contractor shall maintain sewer flow around the work area in a manner that will not cause surcharging of sewers, damage to sewers and that will protect public and private property from damage and flooding.

The Contractor shall protect water resources wetlands and other natural resources.

The Contractor shall provide a stand-by emergency back-up generator system capable of continuous operation to maintain operation during a power failure if the Contractor elects to use electric pumps.

The Contractor shall provide an auto dialer system programmed to transmit all system alarms required by the Owner. The Contractor shall be responsible to respond to all alarms.

Field Quality Control and Maintenance

Test: The Contractor shall perform leakage and pressure tests of the bypass pumping discharge piping using clean water prior to actual operation. The Engineer will be given 24 hours notice prior to testing.

Inspection: Contractor shall inspect bypass pumping system every two hours to ensure that the system is working correctly.

Maintenance Service: The Contractor shall ensure that the temporary pumping system is properly maintained and a responsible operator shall be on hand at all times when pumps are operating.

Extra Materials: Spare parts for pumps and piping shall be kept on site as required. Adequate hoisting equipment for each pump and accessories shall be maintained on the site.

Preparation

Precautions: Contractor is responsible for locating any existing utilities in the area the Contractor selects to locate the bypass pipelines. The Contractor shall locate his bypass pipelines to minimize any disturbance to existing utilities and shall obtain approval of the pipeline locations from the owner and the Engineer. All costs associated with relocating utilities and obtaining all approvals shall be paid by the Contractor.

During all bypass pumping operation, the Contractor shall protect the main and all local sewer lines from damage inflicted by any equipment. The Contractor shall be responsible for all physical damage to the main and all local sewer lines caused by human or mechanical failure.

Installation and Removal

The Contractor shall remove manhole sections or make connections to the existing sewer and construct temporary bypass pumping structures only at the access location indicated on the Drawings and as may be required to prove adequate suction conduit.

Plugging or blocking of sewage flows shall incorporate a primary and secondary plugging device. When plugging or blocking is no longer needed for performance and acceptance or work, it is to be removed in a manner that permits the sewage flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.

When working inside manhole or force main, the Contractor shall exercise caution and comply with OSHA requirements when working in the presence of sewer gases, combustible or oxygen-deficient atmospheres, and confined spaces.

The installation of the Bypass pipelines is prohibited in all saltmarsh/wetland areas. The pipeline must be located off streets and sidewalks and on shoulders of the roads. When the bypass pipeline crosses local streets and private driveways, the Contractor must place the bypass pipelines in trenches and cover with temporary pavement. Upon completion of the bypass pumping operations, and after the receipt of written permission from the Engineer, the Contractor shall remove all the piping, restore all property to pre-construction condition and restore all pavement. The Contractor is responsible for obtaining any approvals for placement of the temporary pipeline within public ways from the owner.

G. Sewer Pipe Testing

The following is added to this article:

GRAVITY SEWER TEST REQUIREMENTS

The entire pipeline will be tested for vertical deflections and for water tightness by infiltration and exfiltration test methods.

The length of pipe sections to be tested will be determined in advance in conjunction with the Engineer or his Inspector.

The Contractor shall provide all labor and equipment necessary to perform the testing of the pipeline. The pipe shall be tested in the presence of the Engineer and representatives of the New Jersey Department of Environmental Protection and Energy, if required, as stipulated in Division 1 of the Specifications.

A. Infiltration Test

The Contractor shall flush clean all sewers and appurtenances after the completion of the installation and prior to testing of the completed sewer. All debris shall be removed at each downstream manhole. After flushing the line, the Contractor shall perform an infiltration test. The entire work of constructing manholes must be carried on in a manner to ensure watertight construction and any leaks in manholes shall be caulked, repaired or the entire work shall be removed and re-built. Manhole frames and covers shall be of watertight design. An inspection of the completed work or any part thereof will be conducted and any signs of infiltration within manholes, pipes, or joints shall be corrected prior to final acceptance. After flushing the line, the Contractor shall perform an infiltration test. The allowable leakage rate shall be 25 gallons per inch of internal pipe diameter per mile per day. The Contractor shall provide calibrated V-notch Weirs at locations approved by the Engineer in order to determine the rates of infiltration. The weirs shall be installed by the Contractor in a manner that will not allow any infiltration water to by-pass the V-notched weir.

If the infiltration rate exceeds the allowable rate, the Contractor shall determine at his own expense, the source or sources of infiltration and he shall repair or replace all defective materials or workmanship. The entire pipe installation shall meet the requirements of this test.

B. Exfiltration Test

The Contractor shall first clean and flush all lines. All debris flushed out shall be removed at each downstream manhole. All test plugs, test gauges, an air compressor, and personnel for conducting the acceptance test shall be furnished by the Contractor. The test shall only be performed under the supervision of the Engineer.

The test shall be conducted on all main line sewers after the new sewer laterals and cleanouts have been installed as directed, and the laterals have been plugged utilizing blow-up plugs installed through the cleanout or other methods as may be approved by the Engineer.

The section of line being tested shall be securely plugged at each manhole and all stoppers or plugs shall be securely braced.

During the exfiltration test, low pressure air shall be slowly and steadily supplied to the plugged section of pipe to be tested until the internal air pressure reaches 4.0 psi greater than the average back pressure of any groundwater that may submerge the pipe. At least two minutes shall be allowed for temperature stabilization before proceeding further. The back pressure of any groundwater caused by the water head above the centerline of the pipe must be determined by a method approved by the Engineer. This back pressure must be added to the standard test pressures to compensate for the groundwater effect on the air test.

The rate of air loss shall then be determined by measuring the time interval required for the internal pressure to decrease from 3.5 psi to 2.5 psi greater than the average back pressure of any groundwater that may submerge the pipe.

MINIMUM DURATION FOR AIR TEST PRESSURE DROP

Pipe Size (Inches)	Time (Minutes)
4	2.5
6	4
8	5
10	6.5

Pipe Size (Inches)	Time (Minutes)
12	7.5
15	9.5
18	12
21	15
54	30

The pipeline shall be considered to have an acceptable exfiltration rate when tested at an average pressure of 3.0 psi greater than the average back pressure of any groundwater that may submerge the pipe, when the duration for air test pressure drop exceeds the time indicated in the previously listed table.

If the pipe installation fails to meet the exfiltration requirements, the Contractor shall determine at his own expense the source or sources of exfiltration, and he shall repair or replace all defective materials or workmanship. The entire pipe installation shall meet the requirements of this test.

C. Vertical Deflection Limitations Test

The Contractor shall also furnish all equipment and personnel to conduct deflection testing on all PVC pipe installed. The total vertical wall deflection of the PVC sewer pipe shall not exceed five (5) percent of the inside pipe diameter. Deflection testing shall not be conducted earlier than seven (7) days after placement and compaction of the backfill.

The vertical deflection shall be checked by manually pulling a go, no-go deflection testing mandrel through the pipe. The mandrel shall be specifically designed for this purpose, and the Contractor shall submit shop drawings to the engineer detailing the type of mandrel to be used. The mandrel shall be as manufactured by Armco, Inc. or equal and shall have the specified accuracy in all positions of rotations.

The Contractor shall conduct all deflection testing in the presence of the Engineer. Should any pipe section exceed the maximum deflection specified, the Contractor shall undertake any remedial action as required to reduce the deflection to within that limit.

I. Pipe Abandonment

The following is added:

Pipe Abandonment

The Contractor shall drain, clean, demolish, fill in, and restore, as applicable, all existing facilities or structures which are to be removed, abandoned or converted as shown on the Contract Drawings. Any items which the Owner elects to retain shall be carefully removed and delivered by the Contractor to the Owner.

The Contractor shall be required to clean and abandon the existing gravity lines in accordance with the requirements as detailed below or as required in order to fulfill the intent of same.

The existing sanitary pipes which are to be abandoned shall be jetted with high pressure water and cleaned of all sediment and debris prior to being plugged. The existing sanitary pipes which are to be abandoned shall be video inspected for lateral locations prior to being plugged. Concrete mortar shall be utilized to plug the end of the existing line to be abandoned. The plug shall be a uniform, watertight seal. When required to be filled, flowable fill shall be installed in order to fill the pipe in its entirety. The portion of the utility line which is to be filled and plugged shall be as directed by the Engineer.

Cleaning of Sewers

The Contractor shall furnish all material, labor and equipment required to clean the existing sewers as shown on the Contract Drawings complete with all appurtenances and accessories, as shown or specified.

The cleaning work required includes, but is not limited to, the following:

1. Field locating the manholes along the sewer reaches to be cleaned;
2. Maintaining and protecting of traffic, and meeting all requirements of the Municipality and all other governmental agencies having jurisdiction;
3. Cleaning of existing sewers, as hereinafter specified, to permit adherence of grout to the sewer joints or lining of the mains;
4. Disposal of waste and sediment in accordance with the specifications and all Federal, State and local agencies.
5. Recommending whether reaches should be deleted from subsequent work items;
6. Cleaning up as the work progresses and after the completion of the work; and
7. All other work required for the complete and satisfactory cleaning of the sewers.

Control of flow in sewers to permit the work to be accomplished, by use of plugs, flow restrictors, pumped bypasses or other reviewed means shall be in accordance with the Temporary Bypass Pumping System specifications

REQUIREMENTS

The Contractor shall be aware that this Contract requires work in live sewer manholes and shall follow all Federal, State and local requirements for safety when in confined spaces. The Contractor is specifically referred to recommendations in the National Institute for Occupational Safety and Health Publication No. 80-106, "Working in Confined Spaces".

Contractor shall have experience in the cleaning of sewers. Documentation of experience shall be furnished to the Engineer upon request.

SUBMITTALS

Submit the following to Engineer for review:

A. Plan for disposal of debris and sediment removed from the sewer lines;
B. Specifications of the sewer cleaning equipment to be used on the job; and
C. Specifications on the equipment to be used to remove sediment and debris at the downstream manhole of each reach to be cleaned.

EQUIPMENT

CLEANING

All sewers shall be cleaned with truck-mounted high velocity hydro-cleaning equipment. The equipment shall be provided with a minimum of 500 ft of one in. ID high pressure hose with a selection of high velocity nozzles, as required for the cleaning operation. The sewer cleaner shall have a minimum usable water capacity of 600 gal. The pumps shall be capable of delivering a minimum 60 GPM at 1,200 psi at the nozzle head. Pressure to the nozzle shall be regulated by a relief valve, adjustable from 0 to 1,500 psi minimum. The nozzles shall produce a scouring action from 15 to 44 deg in all size sewers to be cleaned. The equipment shall carry its own 1,000 gal water tank capable of holding corrosive or caustic cleaning or sanitizing chemicals, auxiliary engines and pumps, and an hydraulically-driven hose reel. All controls shall be located so that the equipment can be operated above ground. During hydro-cleaning, the Contractor shall restrict the flow level in the pipe to a maximum of 50 percent of the pipe diameter. Particular care should be taken to avoid flooding house connections during hydro-cleaning operations.

The Contractor shall provide equipment capable of removing all sand, dirt, rocks and other debris from the sewer reach to allow unobstructed internal inspection of all internal surfaces and subsequent pressure testing of all sewer joints.

All cleaning equipment, including machines, devices, tools, etc., required for the entire cleaning operation shall be owned or leased and operated by the Contractor. The Contractor shall certify that backup cleaning equipment is available and can be delivered to the site within 24 hours.

Any stoppages of lateral building connections resulting from the cleaning or other items of work shall be removed by cleaning of the building connection by the Contractor, at his own expense. Any damage caused by flooding of lateral building connections shall be corrected by the Contractor, at his own expense.

EXECUTION

CLEANING

After determining the preliminary requirements and the feasibility of effective video inspection, the Contractor shall thoroughly clean all manholes sewer reaches indicated on the Contract Drawings.

Water required for the cleaning of sewers shall be provided by the Contractor.

The Contractor shall remove all bricks, rocks, debris, sludge, dirt, sand, grease, roots and other materials from the sewers and collect and remove the resulting debris from the downstream manholes of the sewer section being cleaned. Passing waste material between manholes will not be permitted. A dam, weir and/or screen shall be temporarily installed in the downstream manhole in such manner that debris and solids shall be trapped and retained.

Waste and debris cleaned from the sewers shall be removed at the downstream manhole by pumps or other means. The discharge and drainage stream shall be returned to the sewer and discharged downstream for disposal. Under no circumstances shall sewage or solids be dumped onto the ground surface, street, or into ditches, catch basins or storm drains. All solids and semi-solids shall be transported to and temporarily stored by the Contractor at a site provided by the Contractor in accordance with the SEDIMENT DISPOSAL specifications. Trucks used for hauling solids or semi-solids to the storage site shall be watertight so that no spillage or leakage will occur and covered to minimize odors.

Where access to manholes in easements and rights-of-way is required, the Owner will obtain permission of access for the Contractor and his equipment.

Barricades and warning signs shall be used in work areas and around open manholes. The Contractor shall furnish and maintain traffic controls and safety devices as required.

The Contractor shall conform to the following requirements:

A. Cleaning of upstream reaches of sewers shall be completed before the downstream reaches are cleaned;
B. Hydro-cleaning equipment shall be inserted in the downstream manhole of the reach, and the work shall proceed upstream; and
C. Winching equipment used shall not damage the existing sewers.

Sediment Disposal

The Contractor shall furnish all labor, materials, equipment, tools and appurtenances required to complete the work of properly transporting, storing, draining, testing and disposing of all materials removed from the sewers as a result of his cleaning operations under this Contract, as specified or required.

REQUIREMENTS

The Contractor shall provide a certified industrial hygienist to act as the Health and Safety Officer (HSO) for this Contract. The HSO shall monitor all sediment transporting, storing, draining and testing operations.

TESTING

The Contractor shall provide testing laboratory services to test all sediment material removed during sewer cleaning operation. Testing shall comply with all current applicable Federal and State regulations concerning waste disposal.

Listed below are the references for analytical methods to be used by the laboratory:

Method Nos. 100-499Method for Chemical Analysis of Water and Wastes
EPA-600/4-79-020, Revised March 1983 or latest revision.

Method Nos. 500-599Methods for the Determination of Organic Compounds in Drinking Water
EPA-600/4-99-039, December 1988 or latest revision.

Method Nos. 600-699Methods for Organic Chemical Analysis of Municipal & Industrial Wastewater
EPA-600/4-82-057, July 1982 or latest revision.

Methods Nos. 1000-9999Test Methods for Evaluating Solid Waste
EPA SW-846, Third Edition, November 1986 or latest revision.

Methods with SM prefix Standard Methods for the Examination of Water & Wastewater

APHA/AWWA/WPCF, 16th Edition, 1985 or latest revision.

ASTM Annual Book of ASTM Standards

EXECUTION

Storage, Testing and Disposal

The Contractor shall provide a suitable site with a dumpster within the Township for temporary storage, draining and testing of sediment material.

All sediment material removed during sewer cleaning operation shall be delivered to this site and transferred into the dumpster. Dumpster shall have provision to drain liquid from sediment material into pipes connected to the sanitary sewer system. Sediment shall be drained until no gravity-bound water remains. Dumpsters shall be covered, at all times, with suitable covers. As soon as each dumpster is full and drained, the Contractor shall arrange for sediment material testing by NJDEP.

A minimum of five random sediment samples shall be obtained from each dumpster and tested in order to determine suitability of sediment for disposal in an approved landfill.

Immediately after successful laboratory testing, the Contractor shall transport each dumpster with successfully tested sediment material to an approved landfill.

In the event laboratory testing indicates one or more of the tested samples from a dumpster is hazardous or of such nature so as to prevent disposal of that sediment in a landfill, the Contractor shall dispose of each dumpster of such sediment in accordance with all Federal, State and local regulations.

652.03.02 Sanitary Sewer Pipe, Bridge

652.03.04 Sanitary Sewer Service Connections

The following is added:

Said house service connections shall be installed in accordance with the details set forth on the contract drawings. The minimum size of each individual service shall be 4".

A wye connection will be required to connect the proposed service connection to the proposed sewer main. The depth of the sewer lateral shall be as directed by the Engineer and in accordance with the contract drawings and applicable detail. A cleanout shall also be installed at the location directed by the Engineer and in accordance with the contract drawings. The cleanout shall be surrounded with a one (1) foot by one (1) foot concrete marker and topped with a brass cap in accordance with the contract drawings.

Service connections in any given street shall be laid coincidentally with the main sewer installation so that street repairs and cleanup are rapidly completed. All laterals and cleanouts shall be PVC pipe, except DIP laterals and cast iron cleanouts shall be used when connecting to a DIP sewer main.

The house service connection shall be connected to the existing lateral by means of a coupling as manufactured by Fernco, or approved equal, as directed by the Engineer.

The pipe shall be laid on a continuous upgrade of not less than 1/4" per foot and located where ordered by the Engineer.

The proposed house service connection shall be tested to the terminus of the connection by means of an exfiltration test as detailed in other applicable sections of these specifications.

The Contractor shall utilize blow-up plugs or other methods as may be approved by the Engineer, in order to isolate the new service connection from the existing house lateral such that the tests can accurately be performed.

STRAP-ON SADDLE ASSEMBLY

In the event that a sanitary main installation has been completed, and it is determined that an active lateral has not been connected, the Contractor shall immediately make said connection utilizing a 90° strap-on saddle assembly. The saddle body shall be gray cast iron and coated with rust- proofing primer and shall include a

water-tight rubber ring seal at the lateral connection and a mastic gasket seal "sandwiched" between the existing sewer and saddle body. All hardware and straps shall be stainless steel.

Prior to installation of the saddle assembly, the existing main shall be cut and the edges dressed with a coarse wood rasp or other approved method. Upon completion of the installation of the saddle, the entire assembly shall be encased with 3000 psi concrete, 6" all around. Strap-on saddles shall be as manufactured by "Pioneer" or approved equal.

652.03.05 Sanitary Sewer Manhole

The following is added:

WATERTIGHT SANITARY SEWERS AND MANHOLES

The Contractor is advised that all construction of sanitary sewerage facilities shall be of watertight construction. The sanitary sewers must pass the infiltration and/or exfiltration test and any sections found to be leaking shall be reconstructed. No noticeable leaks or streams of water will be permitted in the sewer or manhole construction.

MANHOLE INSTALLATION

Precast concrete base sections shall be installed on a 2000 psi concrete foundation mat as indicated on the drawings. The bell of the manhole base shall be cleaned free of all dirt and grit, and liberally soaped in preparation for receiving the riser, cone, or slab top section. Prior to installing the gasket onto the spigot groove of the next section, the gasket should be wiped clean and well soaped. Soaping the gasket groove will also make joining of the manhole sections easier, providing the gasket is properly seated. The next section with gasket in place should then be lowered into the bell of the manhole base, taking care that no dirt gets into the joint or on the gasket. Additional sections should be joined in a similar manner. After all sections are set plumb and level, the interior and exterior of all joints shall be mortared. No backfill shall be placed until mortar has thoroughly hardened.

MANHOLE TO PIPE SEAL

Each manhole shall be supplied with flexible mechanical manhole connection integrally cast with the manhole sections. Sleeves are to have stainless steel tightening clamps, unless otherwise approved by the Engineer. The Contractor must submit shop prints for flexible mechanical manhole connections. Each manhole connection shall be set to the correct alignment and elevation.

MANHOLE BEDDING

All manhole excavations shall be dewatered prior to the setting in place of the base section.

The bedding for the manhole shall consist of a 6" minimum layer of NJDOT No. 57 crushed stone installed over suitable bedding soil.

When, in the opinion of the Engineer, the material at the bottom of the excavation is soft or unsuitable, it shall be removed to such depth as the Engineer may require and backfilled with NJDOT No. 57 crushed stone.

All materials and methods utilized shall be as approved by the Engineer and in accordance with the details as located on the plan.

WATERTIGHT MANHOLES

The Contractor is herein advised that all manholes are to be constructed in a manner to ensure watertight work. Any leaks in the manholes shall be caulked, repaired, or the entire structure removed and rebuilt as directed by the Engineer.

652.03.08 Video Inspection of Sewer

Delete the entire sub section and add the following:

CLEANING, FLUSHING AND TELEVISING

All manholes and pipes shall be thoroughly cleaned and ample precautions shall be taken to prevent entrance of dirt and debris into the structures and lines after laying. Exposed ends of sewers shall be provided with temporary plugs or covers. All manholes and lines shall be cleaned of dirt and debris, prior to inspection for acceptance.

The Contractor shall be required to perform a TV inspection of the installed pipe using a radial view camera (360-degree optical lens). This camera provides the operator the ability to view into the laterals. The radial view camera must have remote control of the 360-degree rotational lens. The camera is capable of viewing the complete circumference of the pipe. Cameras incorporating mirrors for viewing sides or camera using exposed rotating heads are not acceptable. The camera lens is an auto-iris type with remote controlled manual override. The camera light-head includes a high-intensity side viewing lighting system to allow illumination of internal sections of lateral sewer connections in order to determine if it has been installed properly. A DVD format video record including viewing of the connected laterals, shall be provided for review by the owner prior to acceptance. This work shall be performed at no extra cost.

The Contractor shall furnish all material, labor and equipment required to video inspect the sewers to be lined.

Video inspection required includes, but is not limited to, the following:

1. All material, labor and equipment necessary for the video inspection of the sewers by the use of closed circuit, color television equipment;
2. All appurtenances required for the complete internal inspection of the sewers to the limits shown;
3. Portable television studios, color television cameras, audio equipment and monitors;
4. Power winches;
5. Traffic control equipment;
6. Color DVD, photographs and inspection log records; and
7. All other work and tools incidental to the closed circuit video inspection, as shown or specified.

STANDARDS

The Contractor shall be aware that this Contract requires work in live sewer manholes and shall follow all Federal, State and local requirements for safety when in confined spaces. The Contractor is specifically referred to recommendations in the National Institute for Occupational Safety and Health Publication No. 80-106, "Working in Confined Spaces."

Contractor shall have experience in television inspection of both small diameter and large diameter clay sewers. Documentation of prior experience shall be furnished upon request.

SUBMITTALS

Submit the following to Engineer for review:

1. Specifications on the studio to be used for the television inspection of the sewers; and
2. Plans for flow control to allow for video inspection of the sewer in accordance with the details herein.

EQUIPMENT

VIDEO INSPECTION

The Contractor shall provide mobile television studios, each large enough to accommodate 6 people and which will allow the comfortable seating of two viewing personnel authorized by the Owner or Engineer in addition to the operator, for the purpose of viewing the monitor while inspection is in progress. Each studio shall be parked in a location near an access manhole where disruption of traffic will be minimized. Unless winching and bypassing are remotely controlled from the studios, portable telephones or other suitable means of communication shall be set up between the two winches, the flow control and the monitor.

Each color television camera used for the inspections shall be especially designed and constructed for partially filled pipeline inspection with 360 deg minimum wide angle lens capable of operating continuously in 100 percent humidity condition and shall have its own lighting system which shall produce light levels from 50-100 ft-candles, which allows a clear in-focus picture of a minimum of 60 lineal feet of the inner periphery of the sewer.

The Contractor shall provide the capability of adjusting the brilliance of the lighting and the focus of the television camera by remote control from each studio. Focal length shall be adjustable from 6 in. to infinity.

The view seen by the television cameras shall be transmitted to monitors of not less than 17 in. Picture quality shall be such as to produce a continuous clear and stable 650-line resolution picture, free of electrical interference showing the entire periphery of the pipe. To ensure picture stability, the equipment used shall be constructed in such a manner as to withstand shock and vibration. A target shall be mounted in front of each camera to serve as a reference point for all sewer conditions noted. The target and supports shall conform to the details shown. In addition, the target shall be suitable for use with a laser, as specified in paragraph 3.1.

All units shall display on their monitors the following information: time, date, job code, footage, flow direction indicator, and stationing of camera. All data may be displayed separately or together. The information display shall be able to be moved horizontally and vertically over the face of the monitor and light intensity varied at will.

Each unit shall be designed so that the correct footage information is always available. The correct footage shall always be indicated on the monitor to the nearest tenth of a foot.

The video and audio information provided on the monitors shall be capable of being recorded on the DVD recording systems, so that the information becomes a permanent record along with the pipe condition recorded during the inspection, and shall include the infiltration information.

The need for accuracy of measurements cannot be stressed too strongly.

EXECUTION

VIDEO INSPECTION

Video inspection, as specified for each sewers reach shall be performed as soon as possible after the cleaning, and again after the lining of that reach. In no case shall more than 72 hours elapse between cleaning and video inspection. Manholes within and at the ends of each reach shall also be completely video inspected.

The internal inspection of each sewer shall be made by pulling the television camera through the sewer line to ascertain the internal conditions or features of the sewer as shown on the Contract Drawings. The Contractor shall supply the Engineer with typewritten logs noting the precise stationing of each defect in the reach. The logs shall also contain estimates of the amount of infiltration and notations of all variable leaks with a summary at the end of each reach.

Inspection shall be by a closed-circuit, color television and shall be performed in one reach at a time, suitably isolated from any excessive upstream flows by use of sewer plug flow restrictors or, if necessary to avoid house connection flooding, bypass pumping. The plugs shall be designed so that all or any portion of the sewage flows in excess of the maximum specified flow depths can be restricted or bypassed. Sewers shall have flows reduced to a minimum to allow video inspection of the top 70 percent of the sewer. Plugging and bypass pumping shall be in accordance with the Temporary Bypass Pumping System specifications.

Once the camera is installed in the pipeline, the distance from the camera target to the center of the manhole shall be measured. This measurement shall be set on an above ground meter, measuring cable length so that the centerline of the entry manhole is Station 0+00. The meter shall be accurate to within 0.2 ft of length measured. The meter shall be checked daily against a steel tape. In addition, the Contractor shall set a laser beam at a predetermined height below the crown of the pipe in each sewer reach, and shall adjust and record the height of the target on the camera sled such that accurate data concerning the level of remaining sediment between manholes may be obtained. The Contractor shall prepare records of such data and submit them with the record drawings.

The camera shall be moved through the pipe in either direction at a uniform rate using inelastic towing cables, stopping when necessary to ensure proper documentation of the sewer's condition. In no case shall the camera be pulled at a speed greater than 10 fpm. Manual winches, power winches, TV cable and power rewinds or other devices that do not obstruct the camera's view or interfere with the proper documentation of the sewers conditions shall be used to move the camera through the sewers reach.

Printed television inspection logs shall be recorded by the Contractor which clearly show the exact locations (stationing), in relation to the centerline of the entry manhole and circumferential position of each building connection, pipe replacement, cured-in-place pipe, spot repair, unusual condition, storm sewer connection, or other features.

Digital, 35 mm or other standard size color photographs of the image on the television monitor, or of problem areas, shall be taken by the Contractor upon request of the Owner or Engineer unless such photographing interferes with the Contractor's operation, in which case the cameras and film will be made available to the Engineer to perform the photography.

The Engineer will have a field representative with the television monitoring crew. No inspection shall be made without the presence of this field representative unless otherwise notified in writing by the Engineer.

A color DVD recording shall be made of the entire length of the sewer inspection. The audio shall identify the run by lower and upper manhole or starting and ending point. Stationing and where applicable, circumferential position will be given by audio recording at all points and sewers features and conditions identified in the printed log as they are encountered. The audio portion of the composite signal shall be sufficiently free from electrical interference and background noises to provide complete intelligibility of the oral report. Stationing shall be given by audio recordings at intervals of no less than 10 ft in any event. The stationing at the end of the run versus the ground measured distance from starting to ending points shall be audio recorded.

The DVD-recorder shall have sound dubbing facilities that will permit audio track to be added to existing video recording.

The Contractor shall present all DVD's, satisfactorily indexed in vinyl plastic boxes to the Engineer promptly after recording. Each DVD and vinyl box shall be labeled with the DVD number, municipal name, reach number, upstream Station 0+00 manhole number, stationing included on the DVD and date of recording. The Contractor shall supply an overall index of all completed DVDs in number order indicating all data on the labels. The Contractor shall also prepare an overall index listing all Contract sewers reaches in order of, reach number and upstream manhole numbers, indicating the DVD number, stationing and date of recording. Both indices shall be continuously updated and submitted to the Engineer on a weekly basis.

Ownership of the DVD of the video inspection shall remain with the Owner.

The Contractor shall keep records of all television investigation performed. These records shall be on a printed form furnished by the Engineer, showing the Owner's name, name of project, Contractor's name, date, manhole and section location, pipe size, length of section, type of video equipment used, all leaking house connections, crushed, broken or cracked pipe, and any special remarks concerning the condition of the pipe. Four printed copies of each shall be submitted to the Engineer on a weekly basis.

652.03.09 Sewer As-Built Plan

This article of the standard specifications is deleted.

652.04 MEASUREMENT AND PAYMENT

This article of the standard specifications is amended as follows:

The Department will measure and make payment for Items as follows:

Pay Item	*Pay Unit*
FURNISH AND INSTALL 6' DIA PRECAST CONCRETE SANITARY DROP, DOGHOUSE SEWER MANHOLE INCLUDING EXCAVATION, REMOVAL OF EXISTING MANHOLE, 6" OF NJDOT NO. 57 STONE BEDDING, CONCRETE MAT, CASTING AND COVER, LADDER RUNGS, FLEXIBLE MECHANICAL CONNECTIONS, 6" PVC SDR-35 SANITARY SEWER LATERAL STUB AND CAP, AND DEWATERING WHERE REQUIRED, BACKFILLING AND ALL ASSOCIATED WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS	UNIT

The Contractor is advised that the existing watermains and other utility lines shown on the plans are approximate and same must be verified by the Contractor with the utility company, including existing service connections. Compensation for same shall be included in the prices bid for sewer main as listed in the proposal.

Separate payment shall not be made for furnishing and installation of concrete markers, brass caps, transition couplings, concrete encasements and all other necessary appurtenances to complete installation of clean outs, sanitary sewer laterals and strap-on assemblies.

Payment for wyes associated with sanitary sewer riser and lateral connections to proposed sanitary sewer mains shall be made base on the number or units.

Watertight manhole covers are required in all areas subject to flooding along with proper venting where necessary.

Payment for the furnishing and installation of the precast concrete manholes and drop manholes as shown on the plans, including all work as required by the plans and specifications, or as necessary to provide a complete installation, shall be based on the unit price bid per each manhole satisfactorily installed.

The unit price per manhole shall include payment for excavation, dewatering, special backfill, and all work and appurtenances required, but not specifically paid for by other items in the bid form.

The Contractor is advised that a percentage of the payment for all sanitary sewer mains will be withheld until such time that the sewer mains are satisfactorily tested.

Payment for all video inspection shall be included in the prices bid for all work requiring the same.

THE FOLLOWING SECTION IS ADDED:

SECTION 654 – METAL WORKS

654.01 GENERAL

Requirements

The Contractor shall perform all metal work indicated and required for construction of the work, complete and in place, in accordance with the Contract Documents and Drawings. General Provisions of Contract, including, but not limited to, General and Supplementary Conditions, and Division 1 Specification Sections, apply to the work of this Section. The work shall include furnishing all labor, transportation, equipment, materials, and other essentials and incidentals necessary for performing the required installation of the metal supports for the piping, equipment supports, structural steel framing and supports, metal manholes, handrail and the metal repairs as shown or described in the Contract Documents and Drawings.

The Contractor shall take field measurements prior to preparation of shop drawings and fabrication to ensure proper fitting of the work. The Contract Drawings show the general arrangement of the miscellaneous metalwork; it is not intended to show every structural difficulty or electrical or piping interference that may be encountered. Metal fabrications shall be manufactured and installed to avoid any such interferences. Dimensions are provided for information only and must be confirmed in the field by the Contractor. The metal fabrications shall be installed to suit and the Contractor shall be responsible for the correctness of the details and dimensions of the finished articles.

Section Includes

The work under this section includes, but is not limited to, furnishing and installation of the following:

A. Metal surfaces shall be clean and free from mill scale, flake rust and rust pitting; well-formed and finished to shape and size.

B. Work shall be accurately fabricated according to approved details with straight, true edges, sharp angles and smooth surfaces, free of pits and scratches. Curves shall be smooth and even. Shearing and punching shall leave true lines and surfaces. Connections shall be as shown.

C. Work shall be amply strong and rigid with sound, strong, secure joints. Exposed joints shall be precise and close fitting.

D. Fastenings shall be concealed where possible. Exposed welds shall be ground smooth. Exposed bolts and screws shall be finished flush or countersunk. Bolts and screws shall be drawn-up tight and threads nicked to prevent loosening. Provide lock washers or lock nuts for all bolts. Use galvanized fastenings and accessories for galvanized metal.

E. Do all drilling, tapping, cutting and fitting of miscellaneous metal necessary for installation of or attachment to engaging work.

Related Work

Additional requirements and information necessary to complete the work of this section may be found in other documents including, but not limited to, the following related specification sections:

Section 651 – Water

Section 655 – Process Piping and Valves

Submittals

Furnish submittals in accordance with project requirements for Contractor Submittals.

At least thirty (30) calendar days before proceeding with the work, the Contractor shall submit to the Engineer for review the following:

A. Product Data: Submit producer's or manufacturer's specifications and installation instructions for following products. Include laboratory test reports, load and deflection tables and other data to show compliance with specifications (including specified standards).
   1. Structural steel (each type), including certified copies of mill reports covering chemical and physical properties.
   2. Manufacturer's Mill Certificate certifying that products meet or exceed specifications.
   3. Mill Test Reports indicating structural strength, destructive and non-destructive test analysis.

B. Shop Drawings: Submit shop drawings including complete details and schedules for fabrication and assembly of structural steel members, procedures and diagrams. Show materials, sizes, finishes, locations, attached hardware and fittings, and details for manufactured items and fabricated metalwork, including field erection details showing cuts, copes, connections, holes, thread fasteners and welds. Indicate welds, both shop and field, by symbols conforming to AWS standards. Indicate coatings or other protection against corrosion. Submittals shall be in accordance with the applicable sections of the Specifications.
   1. Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS symbols, and show size, length and type of each weld.
   2. Provide setting drawings, erection plans, templates, and directions for installation of backing plates, anchor bolts and other anchorages to be installed by others. Show type and location of all fasteners.
   3. Welder's Certificates certifying welders employed on the work, verifying AWS qualifications within the previous twelve (12) months.

C. Test Reports: Submit copies of reports of tests conducted on shop and field bolted and welded connections. Include data on type(s) of tests conducted and test results.

D. Submit samples of materials proposed for use, where required for testing.

References

Standards listed by reference, including revisions by issuing authority, form a part of this Specification section to the extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation. In case of conflict, the particular requirements of this Specification shall prevail. The latest publication as of the issue of this Specification shall prevail. The latest publication as of the issue of this Specification shall govern, unless indicated otherwise.

A. New Jersey Department of Transportation Standard Specifications for Road and Bridge Construction 2019 Edition

B. 2018 International Building Code, New Jersey Edition

C. American National Standards Institute (ANSI):
   1. ANSI A1264.1-1995(R2002) Safety Requirements for Workplace Floor and Wall Openings, Stairs, and Railing Systems

D. American Institute of Steel Construction (AISC):
   1. Steel Construction Manual, 15th Edition
   2. ANSI/AISC 303-22 Code of Standard Practice for Steel Buildings and Bridges
   3. ANSI/AISC 360-22 Specification for Structural Steel Buildings

4. AISC Specification for Structural Joints using High-Strength Bolts
5. AISC Detailing for Steel Construction, 3rd Edition

E. American Society for Testing Materials (ASTM):

1. ASTM A6/A6M-22 Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
2. ASTM A36/A36M-19 Standard Specification for Carbon Structural Steel
3. ASTM A48/A48M-22 Standard Specification for Gray Iron Castings
4. ASTM A53/A53M-22 Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
5. ASTM A108-18 Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
6. ASTM A123/A123M-17 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
7. ASTM A153/A153M-16a Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
8. ASTM A242/A242M-13(2018) Standard Specification for High-Strength Low-Alloy Structural Steel
9. ASTM A269/A269M-22 Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service
10. ASTM A276/A276M-17 Standard Specification for Stainless Steel Bars and Shapes
11. ASTM A307-21 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength
12. ASTM A312/A312M-22a Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
13. ASTM A536-84 (2019) e1 Standard Specification for Ductile Iron Castings
14. ASTM A572/A572M-21e1 Standard Specification for High-Strength-Low-Alloy Columbium-Vanadium Structural Steel
15. ASTM A588/A588M-19 Standard Specification for High-Strength Low-Alloy Structural Steel, up to 50 ksi (345 MPa) Minimum Yield Point, with Atmospheric Corrosion Resistance
16. ASTM A606/A606M-23 Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance
17. ASTM A653/A653M-23 Standard Specification for Steel, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
18. ASTM A1008/A1008M-21a Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable
19. ASTM A1011/A1011M-23 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with improved Formability, and Ultra-High Strength
20. ASTM B26/B26M-18e1 Standard Specification for Aluminum-Alloy Sand Castings
21. ASTM B209/B209M-21a Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
22. ASTM B211/B211M-19 Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire
23. ASTM B221-21 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
24. ASTM B241/B242M-22 Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube
25. ASTM B429/B429M-20 Standard Specification for Aluminum-Alloy Extruded Pipe and Tube
26. ASTM E894-18 Standard Test Method for Anchorage of Permanent Metal Railing Systems and Rails for Buildings
27. ASTM E935-21 Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings
28. ASTM F3125/F3125M-22 Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength

F. American Welding Society (AWS):

1. AWS D1.1/D1.1M:2020 Structural Welding Code – Steel
2. AWS D1.2/D1.2M:2014 Structural Welding Code – Aluminum
3. AWS A2.4:2020 Standard Symbols for Welding, Brazing, and Nondestructive Examination

G. The Society for Protective Coatings (SSPC) (founded as the Steel Structures Painting Council):

1. SSPC V1, 5th Edition, September 2016 - Good Painting Practice: Painting Manual Volume 1

H. Aluminum Association:

1. 2020 Aluminum Design Manual
2. AAIA Aluminum and Its Alloys
3. ASD2017USOL Aluminum Standards and Data, 2017
4. DAF-45 Designation System for Aluminum Finishes, 2003

I. National Association of Architectural Metal Manufacturers:

1. AMP 521-01 (R2012) Pipe Railing Systems Manual Including Round Tube

J. Military Specifications:

1. MS MIL-C-450 Coating Compound, Bituminous Solvent Type, Black (for Ammunition)

K. Occupational Safety and Health Administration Construction Standards and Interpretations, Title 29 Chapter XVII, Part 1926 latest revision related to excavation safety.

L. Construction Safety Code, latest edition, as prepared by the State of New Jersey Department of Labor and Industry, Bureau of Engineering and Safety.

Quality Assurance

A. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure".

B. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests within the previous 12 months.

1. If recertification of welders is required, retesting will be Contractor's responsibility.

Delivery, Storage, and Handling

Identify and match-mark, all materials, items and fabrications, for installation and field assembly. Deliver items to job site as complete units, wherever practicable, ready for installation or erection, with all anchors, hangers, fasteners and miscellaneous metal items required for installation. Carefully handle and store materials, protected from weather, rusting and other damage and to permit easy access for inspection and identification. Store structural shapes, pipes, tubes and sheets off the ground on suitable supports, with webs of flanged shapes vertical.

654.02 MATERIALS

General

A. Metal Surfaces, General: For fabrication of work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating and application of surface finishes.

B. Structural Steel

1. Plates and Bars: ASTM A36/A36M, latest edition.
2. Nuts, Bolts, Rivets, Washers, and Anchorage Devices: ASTM F3125/F3125M, latest edition, and AISC Specification referenced under References Section.

3. Sheets: Cold-rolled or hot-rolled carbon steel, ASTM A1008/A1008M, latest edition, or ASTM A1011/A1011M, latest edition.

4. Pipe: Steel shall conform to ASTM A53/A53M, latest edition, Schedule 40, Grade B, galvanized unless otherwise specified.

5. Shapes: ASTM A572/A572M, latest edition, Grade 50.

C. Stainless Steel: Alloy types conforming to ASTM A276/A276M, latest edition:

1. Stainless steel plates and bars shall be Type 304L for welding, otherwise Type 304, Type 316 or Type 317 as shown.

2. Stainless steel anchor bolts, bolts, nuts and washers shall be Type 316.

3. Stainless steel tubing: ASTM A269/A269M, latest edition.

4. Stainless steel pipe: ASTM A312/A312M, latest edition, Schedule 40 unless otherwise noted.

D. Cast Iron: Conform to ASTM A48/A48M, latest edition, Class 35B unless otherwise specified.

E. Ductile Iron: Conform to ASTM A536, latest edition, Grade 60-40-18 or better, unless otherwise specified.

F. Aluminum: Plates, rolled or extruded shapes, sheets or castings conforming (unless otherwise permitted or indicated) to Aluminum Association alloy and temper designations. Rolled structural shapes and plates - 6061-T6; extruded structural shapes - 6061-T6; gratings (bearing bars) - 6061-T6, (crimp bars) 6063-T6; castings - 214; sheets - Alcad 3003-H14 and 3003; bolts and nuts - 2024-T4; and pipe railings - 6063-T6.

G. Unfinished Threaded Fasteners: ASTM A307, latest edition, Grade A, regular low-carbon steel bolts and nuts.

H. High-Strength Threaded Fasteners: Heavy hexagon structural bolts, heavy hexagon nuts, and hardened washers, as follows:

1. Quenched and tempered medium-carbon steel bolts, nuts and washers, complying with ASTM AF3125/F3125M, latest edition.

2. Direct tension indicator washers may be used at Contractor's option.

I. Epoxy grout anchors shall be used for anchorages into existing concrete as follows:

1. Provide 316 or 304 stainless steel epoxy grout anchors, with diameter and embedment per manufacturer's instructions, Hilti HVA-HAS-SS or equal.

J. Expansion anchors shall be used only where specifically noted or detailed, shall be installed in accordance with current International Conference of Building Officials (ICBO) Research Report Approval and shall consist of the following:

1. For interior, dry locations provide Phillips Wedge Anchors, Hilti Kwik-Bolts or equal. All anchors shall be zinc coated.

2. For exterior or wet locations, provide stainless steel anchors, Type 304, Molly Parabolt Concrete Anchors, Phillips Wedge Anchors, Hilti Kwik-Bolts, or equal.

3. Expansion anchors will not be acceptable for anchorage of any vibrating machinery or equipment.

K. Electrodes for Welding: Comply with AWS Code.

1. Steel Electrodes: E70 series rod for shielded metal arc welding conforming to AWS A5.1 or A5.5; for submerged arc welding use F7X-EXXX conforming to AWS A5.17; for steel alloys other than ASTM A36 use electrodes recommended by AWS.

2. Aluminum Electrodes: Contingent upon alloys being welded; use only inert gas shielded or resistant welding process with filler alloys conforming to U.B.C. Standard No. 28, Table 28-1-C. Use no process requiring a welding flux.

3. Stainless Steel Electrodes: Perform welding of stainless steel with electrodes and techniques as contained in pertinent AWS A5 Series specification, and as recommended in welded Austenitic Chromium-Nickel Stainless Steel Techniques and Properties as published by the International Nickel Company, New York, New York.

L. Structural Steel Shop Primer Paint: For ferrous metals other than galvanized steel, stainless steel or cast iron, fabricator's standard rust-inhibiting primer, provided it meets or exceeds the requirements of Section 9.2 and all federal, state and local requirements with respect to volatile organic content (VOC).

M. Galvanizing: All galvanizing shall be done by the hot-dip process in conformity with the requirements of the appropriate ASTM and American Hot Dip Galvanizers Association, Inc. specifications.

1. Iron and Steel: Hot-dip galvanized, ASTM A123/A123M, latest edition, with average coating weight per square foot of 2.0 oz. and not less than 1.8 oz. per square foot.

2. Ferrous Metal Hardware Items: ASTM A153/A153M, latest edition, with average coating weight of 1.3 oz. per square foot.

3. Touch-Up Material for Galvanized Coatings: ZRC cold galvanizing compound as manufactured by ZRC Chemical Product Company or equal.

N. Bituminous coating: MS MIL-C-450 Standard

Fabrication

A. Fabricate true to shape, size and tolerances as indicated and specified with straight lines, square corners or smooth bends, free from twists, kinks, warps, dents, and other imperfections. Straighten work bent by shearing or punching. Dress exposed edges and ends of metal smooth, with no sharp edges and with corners slightly rounded. Construct connections and joints exposed to weather to exclude water.

B. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings. Provide camber in structural members where indicated.

C. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.

D. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs and other defects.

E. Connections: All connections are to develop the full strength of the member over the required span unless otherwise noted on the plans. All connections are to be standard two-sided AISC connection unless otherwise noted. All tube column-beam/girder connections are to have welded through plates unless otherwise noted. Weld or bolt shop connections, as indicated.

F. Bolt field connections, except where welded connections or other connections are indicated.

G. Provide high-strength threaded fasteners for all connections, except where unfinished bolts are indicated.

H. High-Strength Bolted Construction: Install high-strength threaded fasteners in accordance with AISC "Specifications for Structural Joints using ASTM F3125/F3125M, latest edition, or ASTM F3125/F3125M, latest edition, Bolts" (RCRBSJ).

I. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welding work. Welds shall be made with A-233 Class E70 series electrodes or by submerged arc Grade AWS-2. Steel, before being fabricated, shall be thoroughly wire-brush cleaned of scale and rust, and straightened by approved methods that will not injure the materials being worked. Welding shall be continuous along the entire line of contact except where tack or intermittent welding is permitted. Where exposed, welds shall be cleaned of flux and slag and ground smooth.

J. Assemble and weld built-up sections by methods which will produce true alignment of axes without warp.

K. Holes and Connections for Other Work: Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members, as shown on final shop drawings.

L. Provide threaded nuts welded to framing, and other specialty items (including but not limited to masonry anchors attached to the steel) as indicated to receive other work.

M. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

Painting and Protective Coatings

A. Shop coats shall be coordinated for compatibility with the painting systems specified in Section 09900.

B. Apply finishes as specified to surfaces which are inaccessible after assembly or erection.

C. Ferrous metal shall be cleaned and given one shop coat of specified paint before shipment. Anchors that are built into masonry or concrete shall be coated with asphalt paint unless specified to be galvanized or stainless steel. Hot-dip galvanized, aluminum, stainless steel or zinc-coated metal shall not be shop-primed unless specifically called for, but abraded surfaces and welds shall be touched-up. Materials to be welded in field shall not be painted within three (3) inch of joints to be welded. Before exposure to weather or shipment from fabrication shop, all other miscellaneous metalwork shall be cleaned and painted as specified below, and in accordance with instructions of manufacturer of coating.

D. Blast-cleaned surfaces shall be painted before any visible or detrimental rusting occurs and not more than eight hours after having been blasted. Pickled articles shall be painted while still warm, but not before thoroughly dry. Other surfaces shall be painted as soon as possible after cleaning and before any deterioration of surface occurs.

E. One shop coat of grease or other suitable rust resistant coating shall be applied to machined cast-iron and steel surfaces not to be painted.

F. Galvanize all components of members (or assemblies) after fabrication, whenever any component of the members (or assemblies) requires galvanizing. Zinc-coated by hot-dip process to be in conformity with ASTM A123/A123M or ASTM A153/A153M, latest editions.

G. After setting, the Contractor shall touch-up damaged shop coatings and galvanizing.

H. Aluminum in contact with concrete or dissimilar metals shall be isolated by coating the contact surfaces with bituminous coating.

654.03 EXECUTION

Erection

A. Field Assembly: Set structural frames accurately to lines and elevations indicated. Install work in accordance with approved shop drawings. Check elevations of concrete and masonry bearing surfaces and locations of anchor bolts and similar devices prior to proceeding with erection work and report discrepancies to the Engineer. Do not proceed with erection until corrections have been made or until compensating adjustments to structural steel have been agreed upon with the Engineer. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment. Do not field cut or alter structural members without approval of the Engineer. Provide for drainage in structural steel.

B. Level and plumb individual members of structure within specified AISC tolerances and in accordance with manufacturer's setting instructions.

C. Provide temporary shoring and bracing with connections of sufficient strength to bear the imposed loads, as required. The Contractor shall allow for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb and in true alignment until completion of erection and installation of permanent bracing.

D. Splice members only where indicated and accepted on shop drawings.

E. After erection, all abrasions and surfaces shall be primed.

F. Erection Tolerances:

1. Maximum variation from plumb: 1/4 inch, non-cumulative.

2. Maximum offset from true alignment: 1/4 inch.

Aluminum

A. Protect aluminum from contact with dissimilar metals, concrete, masonry or mortar; use one coat Bitumastic 300M, Kop-Coat/Carboline Co..; Epolon 22 Black Mastic, Con-lux Coatings, Inc, or equal.

B. Before coating application, clean contact surfaces, remove dirt, grease, oil, foreign substances, then emerge in or wipe thoroughly with an acceptable solvent. Rinse with clean hot water and dry thoroughly.

C. Protect aluminum against electrolysis from all sources.

D. After fabrication, all aluminum pipe railings and ladders shall receive an Aluminum Association Standard Anodic finish, Designation C22A31, followed by a shop coat of methacrylate lacquer.

Aluminum Handrails (If and Where Required)

A. All-welded assemblies of 1-½ inch IPS, schedule 40 minimum aluminum pipe, alloy 6063-T6 for stanchions and 1-½ inch Schedule 40 aluminum pipe, alloy 6063-T6 for top and intermediate rails and returns. Toeboards shall be ¼" thick by 4" high of alloy 6063-T6. Fabricate in panels with joints made in neat and inconspicuous manner. Grind all exposed welds smooth. Reinforce pipe rail stanchions with eight (8") inch long, 1-½ inch diameter solid aluminum rod inserts at bottom of stanchions. All pipe rails shall be designed to meet OSHA requirements and as noted on the Contract Drawings.

B. Cast aluminum brackets for wall-mounted handrails with curved tops and three (3") inch projection from wall to center of handrail.

C. Complete railing, including anchorage and framing, to withstand minimum load of 200 pounds applied in any direction at any point on top rail.

D. Handrail stanchions mounted on top of stair stringers, fitted over and fastened to reinforcing rods with two ½ inch flat head machine screws, and fillet welds at base. Reinforcing rods welded to aluminum plate for bolting to stringers.

E. Guard rail stanchions, side mounted to concrete, welded to extruded aluminum brackets. Brackets secured to concrete with four ½ inch diameter stainless steel epoxy anchor (Hilti HVA-HAS-SS, or equal) bolts.

F. Stanchions set into concrete curbs, set into preformed holes and secured in place with non-shrinking grout. Holes at least ½ inch greater in diameter than outside diameter of stanchions and minimum of 4 inch deep.

G. Handrail stanchions shall be evenly spaced at a maximum of 5'-0" on center.

H. Maximum horizontal and vertical space between the walking surface and the toeboard shall be ¼". Maximum open space between the end of handrail and other structures shall be 6".

I. Removable pipe railings fabricated in same manner as fixed railings.

J. Continuous full-length intermediate rails shall be provided to prevent passage of a 4-inch sphere, anywhere below the handrails, on both sides of the walking surface.

Aluminum Gratings (If and Where Required)

A. Swage locked with serrated walking surfaces, Type BS or DS, as required, by IKG Borden,; type GAL or SGAL, as required, by McNichols Co..; or equal. Bearing bars shall be 3/16-inch-thick by depth shown on Drawings for a 300 psf loading at a deflection of less than ¼ inch. Bearing bars spaced at 15/16 or 1-3/16 inches on center as required to meet load and deflection criteria. Fabricate in standard size sections and secure in place with four (minimum) acceptable stainless steel removable-type fasteners per panel. Apply bearing bar banding at all ends of grating sections and at fixture or pipe openings where three or more bearing bars are cut. Where angle frame is used for gratings in concrete surrounds, miter and weld corners, weld on anchors, and grind exposed welds smooth.

Painting

A. Aluminum shall be cleaned and coated at the factory with clear epoxy to preclude oxidation.

Cleaning

A. All installed, exposed miscellaneous metal work shall be left clean and free from any mud, mortar, plaster, or similar disfigurement, ready to receive final finish by others as required.

B. The Contractor shall be responsible for all error of detailing, fabrication, and for the correct fitting of the structural members.

C. Materials shall be stored out of contact with the ground in such a manner and location as will minimize contamination and deterioration.

D. Protect aluminum from contact with dissimilar metals, concrete, masonry or mortar; use one coat Bitumastic 300M, Kop-Coat/Carboline Co.; Epolon 22 Black Mastic, Con-lux Coatings, Inc., or equal.

E. Before coating application, clean contact surfaces, remove dirt, grease, oil, foreign substances, then emerge in or wipe thoroughly with an acceptable solvent. Rinse with clean hot water and dry thoroughly.

F. Protect aluminum against electrolysis from all sources.

G. After fabrication, all aluminum pipe railings and ladders shall receive an Aluminum Association Standard Anodic finish, Designation C22A31, followed by a shop coat of methacrylate lacquer.

Steel

A. Unless otherwise specified herein or required by local building code or regulations, all steel work shall conform to the current rules and practices set forth in the latest edition of AISC "Specification for Design, Fabrication and Erection of Structural Steel for Buildings". Erection shall conform to requirements of "Construction Safety Code" of State of New Jersey, Department of Labor and Industry, Bureau of Engineering and Safety.

B. All welding shall be done in accordance with the American Welding Society, "Standard Code for Arc and Gas Welding in Building Construction". Grind all welds to a perfectly smooth, even surface, ready for painting.

C. Miscellaneous metal work connected to structural steel shall be welded as required.

D. Certification that each welder is qualified in accordance with AWS D1.1 shall be provided. Any welder shall be retested and recertified when the work of the welder creates a reasonable doubt as to his proficiency. Tests, when required, shall be conducted at no additional expense to the Owner. Recertification of the welder shall be submitted only after the welder has taken and passed the required retest.

E. When items are finished and installed by this Contractor, he shall do all drilling, shimming, cutting, and fitting and provide all anchors and fastenings for setting materials in place and attaching to adjoining work.

Steel Requirements of Regulatory Agencies

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references thereto:

1. State and local building codes.
2. American Institute of Steel Construction (AISC): Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings revised to date. Erection shall conform to requirements of "Construction Safety Code" of State of New Jersey, Department of Labor and Industry, Bureau of Engineering and Safety.
3. AISC: Code of Standard Practice.
4. American National Standards Institute (ANSI): Standard B27.2 Plain Washers.
5. American Society for Testing and Materials (ASTM):
   a. A36/A36M — Standard Specification for Carbon Structural Steel
   b. A307 — Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength
   c. F3125/F3125M — Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength
6. American Welding Society (AWS): D1.1 Structural Welding Code, latest edition. Grind all welds to a perfectly smooth, even surface, ready for painting. Welding of aluminum shall be done before anodizing. Miscellaneous metal work connected to structural steel shall be welded as required.
7. Research Council on Riveted and Bolted Structural Joints (RCRBSJ) of the Engineering Foundation: Specification for Structural Joints using ASTM A325 or A490 Bolts, as revised to date.
8. All galvanizing shall be performed in accordance with the requirements of ASTM Specification A123/A123M as revised to date.

B. State and local building codes and AISC shall govern the work. Welding shall be in accordance with AWS D1.1, latest edition. High strength bolting shall be in accordance with the Project Specifications.

C. In case of conflict between codes and these specifications, the more stringent shall govern.

Checking Measurements

A. Before commencing work, the Contractor shall check all governing measurements of building, levels of all piers on which work is to stand, and notify the Owner’s representative of any discrepancies.

B. Work or erection shall not commence until all governing measurements and levels have been verified, and the condition of all footings, walls, piers, etc. on which this work is in any way dependent of its efficiency have been examined for possible defects.

Materials

Materials shall conform to the respective specifications and other requirements specified below:

A. Structural Steel: ASTM A36/A36M, latest edition.

B. High strength bolts, including nuts and washers: ASTM F3125/F3125M, latest edition.

C. Bolts and nuts, other than high strength: A307, latest edition, Grade A.

D. Plain washers, other than those in contact with high strength bolts: ANSI B27.2 Type B.

E. Standard Primer: S.S.P.C. #1 red oxide primer and raw linseed oil.

F. Aluminum Vented Soffits and Wrap Fascia Aluminum

1. All materials to be manufactured by Atlanta Metal Products, or approved equal.
2. Soffit shall be minimum .024" thick aluminum vented panels with inverted rib. Include all trim accessories required.
3. Wrap Fascia Aluminum - Provide and install factory bent minimum .024" thick sections in longest possible lengths over fascia and rake boards as called for on the Contract Drawings (No gluing of material. Use fasteners). Include rake flashing sections as shown on Wall Sections.
4. All material to have factory applied baked enamel finish. Color as selected by Engineer.
5. All fastening clips, brackets, gutter anchors, end caps, elbows at downspouts, etc. shall be provided as required for a complete installation. Color as selected in Item 4 above.

Fabrication and Erection

A. Fabricate and erect structural steel in accordance with local building code and AISC Specifications. Where conflict occurs between standards the more stringent rule shall govern.

1. Column bases shall be attached to columns. Bearing plates provided under beams. Align with steel shims until supported members have been plumbed, grouted.
2. Erect structural steel so the deviation from plumb, level and alignment not exceed 1/500.
3. Bolting up: as erection progresses, the work: securely bolted up to take care of all dead load, wind and erection stresses.
4. Temporary bracing: provided wherever necessary to take care of all loads to which the structure may be subjected.

B. Field Touch up Painting: after erection of structural steel, all abraded and scarified surfaces, including bolts, other connections: given touch up coat with same paint used for shop painting.

C. SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO FABRICATION.

D. The contractor shall be responsible for all errors of detailing, fabrication, and for the correct fitting of the structural members.

E. Certification that each welder is qualified in accordance with AWS D1.1 shall be provided. Any welder shall be re tested and recertified when the work of the welder creates a reasonable doubt as to his proficiency. Tests, when required, shall be conducted at no additional expense to the owner. Re certification of the welder shall be submitted only after the welder has taken and passed the required re test.

F. Materials shall be stored out of contact with the ground in such a manner and location as will minimize contamination and deterioration.

Cleaning and Protection

Contractor shall remove soil, stain, and extraneous materials caused by metal work, from adjacent surfaces. Remove foreign matter and clean metalwork to satisfactory conditions to receive specified finish. For metal work that will not receive further field finish, clean exposed surfaces to a uniform appearance. Remove and replace items that cannot be satisfactorily cleaned.

654.04 MEASUREMENT AND PAYMENT

Metals

A. Basis for Measurement: The metal work will not be measured separately for payment.

B. Basis for Payment: Payment for the work detailed in this section shall be included in the price bid for all items requiring same, including the furnishing of all labor, materials, tools, equipment and other essentials necessary for the completion of the work in a neat and workmanlike manner, in accordance with the Contract Documents and Specifications.

THE FOLLOWING SECTION IS ADDED:

SECTION 655 – PROCESS PIPING AND VALVES

655.01 WORK INCLUDED

The work includes the furnishing of all labor, materials, equipment, piping, fittings, valves and appurtenances along with all associated work necessary for the construction of the piping, all process piping, plumbing, and all other work as required by the Specifications and Contract Drawings or as required to fulfill the intent of same.

655.02 GENERAL

A. Coordination

The drawings show the general arrangement, direction, and sizes of pipes. It is not intended to show every offset, valve, and fitting, or every structural difficulty that may be encountered, but the piping appurtenances shall be installed to suit, and to avoid interference with the installation, operation, and maintenance of fixtures, equipment, or other piping. All measurements shall be verified at the job site. Conflicts between piping systems and equipment or structures shall be presented to the Engineer for determination of corrective measures before proceeding.

The plans show an approximate linear footage of pipe to be installed. However, the Contractor shall provide all pipe as is required to attach the new pipe to existing pipe at existing joints. To this end, if required, the Contractor shall make all test pits necessary to establish existing pipe joints within proximity of the proposed tie-in points and shall provide piping and all necessary fittings to attach to these joints. In no case shall the amount of pipe to be removed be less than that shown on the plans unless approved in writing by the Engineer.

The equipment and installation shall conform to the applicable provisions of local, State, and Federal codes and regulations which apply and also must be in strict accordance with the manufacturer's installation specifications.

The Contractor shall, at his own expense, do all work required by and in accordance with applicable State and local plumbing codes; shall arrange for all permits, inspections, and tests required by those codes; and shall do everything necessary to provide a complete system which will be ready for use without further expense to the Owner.

The Contractor shall coordinate his work with the work and requirements of the Contract. Testing operations and cleanup shall also be the responsibility of the Contractor.

All cutting and patching shall be the responsibility of the Contractor and all such work will be coordinated between the various equipment requirements and the Engineer. The work shall be in place and approved prior to concrete pours or masonry construction. Temporary halting of certain items of construction work to complete testing of piping systems shall be required to insure a fully functional system prior to it being concealed by other work.

The Contractor shall carefully check the installations against all Drawings and details, and note where walls, ceilings, beams and pipes are enclosed or receive special treatment. Prior to and during construction, the Contract Drawings shall be checked for requirements of process equipment, heating, ventilation, electrical or other work to ascertain locations of possible interference’s and plan for field modifications to the smaller piping systems.

The Contractor shall install all piping required to be concealed in floor or wall construction expeditiously so as not to cause delay to other work, and to allow ample time for the necessary tests and approvals. All horizontal piping runs from construction above shall be hung and located as close as possible to the bottoms of floors or beams so as to obtain the maximum headroom.

The Contractor shall make all necessary provisions for expansion and contraction of pipelines including installations of expansion joints where approved by the Engineer.

Necessary care shall be taken to prevent contact between pipes and structures or other members which could cause noises upon pipe expansion and contraction. The Contractor shall provide all necessary sleeves and escutcheons for piping as specified herein.

The Contractor shall not operate any valves to close off existing pipes or to fill new pipes without prior notice and approval of the owner.

B. Quality Assurance

Shop and field weldings shall be performed by:

1. Operators qualified as specified in the ASME Code for Unfired Pressure Vessels, Paragraph U-70.

2. Field welders having, within 6 months from proposed employment on this project, been successfully qualified under the requirements of Section IX of the ASME Boiler Construction Code.

Certification and qualifications shall be at Contractors expense. Contractor shall submit certification to Engineer. Certification will be returned and Contractor shall retain at the Contractor's field office.

Work performed by unqualified welders shall be removed by Contractor and be replaced by work installed by qualified and approved welders at Contractors expense.

C. System Description

Verify valve, special castings and fittings, pipe equipment, etc. to insure pipe work performed fits properly and conforms to the arrangement shown on the drawings.

Pipe and specials shall be accurate to the dimensions shown.

Provide hubs, spigots and flanges at right angles to the axis of the opening, and openings at exact angle specified.

Drawings do not necessarily show all fittings, offsets, unions, hangars, and supports. Furnish and install such items required for complete and satisfactory installation of equipment.

Install eccentric reducers with straight side at top of piping system, unless otherwise noted.

Valves shall open left, counter clockwise.

D. Products

Pipe, valves, fittings, couplings, operators and appurtenant items shall be per these specifications and the drawings. Note that flanged elbows shall be long radius unless otherwise noted. Process valves, controllers, positioners, regulators, pipe, fittings, couplings, and appurtenant items shall be new, free from defects or contamination, and wherever possible, shall be the standard product of the manufacturer. They shall be furnished in pressure or thickness classes as specified, or required by the piping system in which they are installed.

Unless otherwise noted, the sizes shown shall be the nominal pipe diameter.

When carbon steel or stainless steel flanges or flanged valves with raised face will be bolted directly to flat faced flanged fittings or valves; the raised face shall be removed or spacers approved by the valve or pipe manufacturer shall be installed to allow bearing over 100 percent of the flanged area.

Pipes shall have screwed, flanged, socket welded, soldered, mechanical coupling, as specified and shown on the drawings. Gaskets for flanged joints shall comply with ASTM B 16.21 and be suitable for exposure to the carried fluid.

Pipe mechanical couplings and expansion joints shall be provided at locations shown on the drawings as a minimum requirement. The Contractor shall have the option, however, to substitute mechanical couplings in lieu of flanges or unions where he so chooses if approved by the Engineer.

Where pipe is furnished with screw-on flanges, the flange shall be screwed tight on the pipe until the pipe end projects beyond the face of the flange. The flange shall then be faced to give a flush finish of the pipe and flange. The flanges shall then be drilled, after attachment to the pipe, to ensure bolt hole alignment. Flanges shall be Class 125 conforming to ANSI B16.1.

The Contractor, with the Engineer's approval, may provide stainless steel pipe and fittings in lieu of steel. If stainless steel is used, it shall have the same or higher pressure rating as the pipe it replaces. The Contractor shall submit calculations to the Engineer for approval substantiating the pipe pressure rating.

E. Handling

All piping, fittings and other accessories shall be loaded and unloaded by lifting with hoists and slings or skidding so as to avoid shock or damage. Under no circumstances shall such material be dropped from the delivery trucks or dumped into the trench.

Wherever possible, materials shall be unloaded opposite or near the place where it is to be installed. Pipe and fittings shall be handled in such fashion to prevent damage. Pipe, fittings, or accessories that are cracked, damaged, in poor condition, or with damage linings will rejected.

655.03 SUBMITTALS

Contractor shall make all submittals required by these specifications, including, but not limited to:

A. Product data

1. Valves.

a. Bill of materials showing kind and class of materials.
b. Catalog and engineering data.
c. Assembly instructions and spare parts list.
d. Preventative/corrective maintenance instructions.
e. Certificate of seat compatibility with entailed fluid exposure.

2. Motor - driven actuators.

a. Motor currents at the specified voltage corresponding to locked rotor.
b. Maximum seating torque.
c. Average running load and speed.
d. Dimension.
e. Weights.

B. Shop Drawings

1. Submit drawings for the following:

a. Pipe.
b. Pipe support and anchors.
c. Fittings.
d. Couplings.
e. Joints.
f. Coatings.
g. Appurtenances.

2. Include on drawings:

a. Material, grade and class.
b. Procedures for:
1) Setting, supporting anchoring valves.
2) Fitting of line pipe to valves for proper coupling.
3) Adjusting and testing valve assemblies.
c. Critical clearances.
d. Valve orientation.
e. Indication and identification of pipe, pipe joints, fittings, couplings, joint harnesses, hangars, supports, saddles, straps and other supports, and miscellaneous details including location and size of anchor bolts.
1) Each pipeline shall be identified according to the piping system designation.

C. Catalog and Engineering Data Sheets for all components such as flexible couplings, rubber gaskets, and insulating joints.

D. Installation Procedure

Written procedure covering in detail the following:

1. Preparation and making of mechanical, flanged, screwed joints and couplings.
2. Measures to ensure integrity of interior pipe lining and exterior protective coatings and joints and couplings.
3. Installation and adjustment of pipe hangars and other supports.

E. Testing Procedures

1. Procedure for testing.
2. Arrangements for obtaining and disposing of water for tests.
3. Itemized test equipment.
4. Details of bulkheads, flanges or caps for testing.

F. Record Drawings

Immediately upon completion of piping work, submit mylar tracings showing the actual in-place installation of all piping installed in inaccessible or buried locations, at a scale satisfactory to the Owner. The drawings shall show all piping on drawings and in sections, with all reference dimensions and elevations required for complete record drawings of the piping system. Two paper prints shall also by furnished. The tracings shall be furnished not later than 30 days after completion of the contract.

655.04 PROCESS PIPING

The contractor shall comply with all requirements of Division 15 for work to be performed under this item.

655.05 ALLOWABLE LEAKAGE

Flanged, welded, and soldered joint pipe lines shall show no leakage at the test pressure.

655.06 DUCTILE IRON PIPE AND FITTINGS

Ductile iron pipe and fittings shall be as specified below and as listed in the piping schedule. Ductile iron pipe shall be centrifugally cast conforming to ANSI A 21.51 (AWWA C151) American National Standard for Ductile-Iron Pipe Centrifugally Cast in Metal Molds or Sand-Line Molds for Water and Other Liquids. The fittings shall conform to ANSI A 21.10 (AWWA C110) American National Standard for Gray-Iron and Ductile-Iron Fittings, 3 Inches through 48 Inches for Water and Other Liquids. The cement mortar lining for pipe and fittings shall by twice the minimum thickness specified in and in full compliance with ANSI A 21.4 (AWWA C104) American National Standard for Cement-Mortar Lining for Ductile-Iron and Gray Iron Pipe and Fittings for Water. The lining shall receive a bituminous seal coat. Coal tar epoxy lining shall be suitable for use in a digester and applied by the manufacturer of the pipe. All flanged pipe shall be in conformance with ANSI A 21.15 (AWWA C115) American National Standard for Flanged Ductile-Iron and Gray-Iron Pipe with Threaded Flanges. Class designation shall be cast or painted on each piece of pipe or fitting 4-inches or greater in diameter. Flanges shall be ductile iron. The pipe shall be furnished in 18 to 20 feet nominal lengths. The pipe shall be a minimum thickness Class 52 except for flanged pipe which shall be Class 53 and for grooved coupling pipe which shall be Class 56, unless otherwise shown. Gaskets shall be 1/8" thick, red rubber or of a material suitable for contact with the material being carried and full face.

Bolts and nuts shall conform to ANSI B18.2.1 and ANSI B18.2.2. Exposed bolts and nuts shall be ASTM A307, Grade B. Buried or submerged bolts and nuts shall be Type 304 stainless steel with lock washers.

655.07 BLACK/GALVANIZED STEEL PIPE AND FITTINGS

Black/galvanized steel pipe shall be electrically butt-welded straight-seam or spiral-seam pipe or seamless pipe 6" in nominal diameter and larger. All steel pipe and fittings shall conform to ASTM A120 or A53. Galvanized pipe shall be hot-dipped galvanized in compliance with ASTM 153 and requirements of Section 5.1.

Piping shall be minimum schedule 80, reinforced, supported and braced as required to withstand stresses created by installation, testing and in-service use. End finish shall be threaded conforming to ASTM A120, flanged conforming to ANSI B-16.1, or grooved conforming to AWWA C606 as shown on the drawings or specified.

Welding operations, where required, shall be in accordance with AWWA C-206 AWWA Standard for Field Welding of Steel Pipe. At a minimum, steel pipe shall match thickness of existing steel pipes of same diameter.

Steel pipe fittings shall be threaded fittings, welding fittings or grooved fittings conforming to the contract drawings and specifications and shall be suitable for the appropriate pressures. Threaded fittings shall be black malleable iron conforming to ANSI B 16.3. Malleable iron shall conform to ASTM A47. Grooved fittings shall conform to AWWA C606.

Flanges for steel pipe shall be welding neck type or double fillet welded, slip-on type and shall be dimensioned and drilled in accordance with ANSI B16.1 for Class 125, except as noted on the drawings. A single fillet weld shall not be used to attach the flange to the pipe. Flanges rated higher than 150 pounds shall have faces machined flat for mating with iron body valves and other equipment items. Flange bolts and nuts shall be high strength carbon steel with galvanized finish. Grooved end joints for steel pipe shall be in accordance with AWWA C606, Standard Grooved and Shouldered Type Joints. Threaded end joints shall be in accordance with ASTM A120.

The contractor shall provide connections to all valves and fittings specified elsewhere in these specifications.

All small pipe taps shall be made utilizing factory welded tapped bosses.

Shop drawings showing all details for all fabricated steel piping shall be submitted to the Engineer for approval before fabrication.

All sections of the fabricated piping shall be shop tested at the specified test pressures and as noted on the Drawings. The completed installation shall also be tested at the test pressure with no leakage or failure before acceptance is made by the Owner.

Suitable and sufficient tapped bosses and special corporation stops shall be provided to facilitate all pipe testing as necessary.

655.08 Stainless Steel Pipe And Fittings

Stainless steel pipe and fittings larger than two inches in diameter shall be manufactured and fabricated from sheets and plates of Type 304L stainless steel, as noted on the Contract Drawings, conforming to ASTM-A240. The type of stainless steel used shall be selected to be compatible with the material conveyed in the pipeline. The sheet furnished shall be 2B plate finish No. 1. Pipe and fittings shall be designed for minimum 150 psi operating pressure.

Pipe and fittings shall be manufactured in accordance with ASTM A778 and A774 respectively.

Fabrication and welding shall be performed in the shop by certified welders to ASME approved procedures and AWS Standards. Field welding shall not be permitted. Welding shall be by the shielded arc, inert gas, MIG or TIG method. Filler wire shall be added to welds to provide a cross section of weld metal equal to, or greater than, the parent metal. Inert gas shielding shall be provided to the interior and exterior of the joint. Interior weld beads shall be smooth, even and not have an interior projection more than 1/16 inch beyond the I.D. of the pipe or fitting.

After manufacture, pipe and fittings shall be passivated by immersion in an air-agitated pickling tank containing a 25:1 solution of nitric and hydrofluoric acids for 40 to 50 minutes. The acid shall be neutralized by immersion in a rinse tank containing clean water and trisodium phosphate.

After fabrication, shop welds shall be wire brushed and scrubbed with the pickling solution, neutralized and washed clean in accordance with ASTM A380.

> Stainless steel components shall be handled, transported, fabricated and installed taking care not to make contact with ferrous material so as not to leave marks on the stainless steel caused by rusting of the ferrous materials.

Joints for pipe, fittings and specials shall be as shown on the drawings. Backing flanges for the flanged joints shall be stainless steel, drilled to ANSI B16.1 Class 125. Flanges shall meet the requirements of ANSI/AWWA C207, except that flange material shall be the same as specified. Bolts and nuts shall be 304 stainless steel.

Each pipe, fitting and fabrication shall have type, gauge and heat number marked and these designations shall be clearly legible.

Stainless steel pipe and fittings two inches and smaller shall be Schedule 40 304L and comply with ASTM A312.

655.09 PVC PRESSURE PIPING

PVC pipe shall be unplasticized normal-impact polyvinyl chloride (PVC) Schedule 80 pipe, conforming to ASTM Standard D1784, Type I and ASTM D1785. Fittings shall be of the same material and strength, shall be of the molded socket bell and

spigot design, conforming to ASTM Standard D2467, and shall be joined to the pipe with approved solvent. Threaded fittings shall not be used unless approved by the Engineer. Pipe unions shall be provided as shown on the plan or required by the Engineer. Solvent cement jointing shall conform to ASTM D2855, "Standard Recommended Practice for Making Solvent Cemented Joints with Polyvinylchloride (PVC) Pipe and Fittings" and the manufacturer's recommendations. Piping and supports shall be spaced no further apart than manufacturer's recommended spacing for the particular service. Pipe and fittings shall be marked with manufacturer's name, pipe schedule, and size.

All transitions to other materials shall be as follows:

1. Two inches (2”) and smaller – PVC male thread adapters as per ASTM D 2464 and ANSI/ASME B1.20.1.

2. 2½ inches and larger – PVC socket flanges, 150 pound dimension as per ANSI B 16.1. Bolts, nuts and washers shall be 316 stainless steel. Gasket shall be 1/8 inch thick full face neoprene or full face Teflon envelope type as noted.

The Contractor shall provide slip type PVC expansion joints with joint material as recommended by the manufacturer if necessary, for the type of service and temperature range anticipated.

The Contractor is cautioned to handle, load, unload and store PVC pipe and fittings in accordance with the manufacturer's recommendations. PVC pipe and fittings shall be stored under cover before using, and shall be transported in a vehicle with a bed long enough to allow the length of pipe to lay flat in order to eliminate undue bending or concentrated external load. Sections of pipe that have been dented or damaged will be discarded until damaged section of pipe is cut out and removed from the site.

655.10 CPVC PROCESS PIPING

All CPVC Schedule 80 pipe shall be manufactured from Type IV, Grade I, chlorinated polyvinyl Chloride (CPVC) compound with a cell classification of 23447 per ASTM D1748. The pipe shall be manufactured in strict conformance to ASTM F441, consistently meeting the quality assurance test requirement of this standard with regard to material, workmanship, burst pressure, flattening and extrusion quality. Fittings shall conform to the requirements of ASTM F439 for socket weld type and Schedule 80 ASTM F437 for threaded type. All joints shall be solvent socket weld except where connection to threaded valves and equipment. All pipes and fittings shall be manufactured with titanium dioxide for ultraviolet protection.

655.11 COPPER PIPING

Interior water system piping and other piping as indicated on the drawings shall be ASTM B88 Type "L" copper tubing. Buried water system piping and other piping as indicated on the drawings shall be ASTM B88 Type “K” copper tubing. Fittings shall be wrought copper pressure fittings with ASTM B16.18 and solder joints. ACID CORE SOLDER or ACID BASE FLUX IS SPECIFICALLY PROHIBITED. All solder joints shall be made by mechanics thoroughly experienced in copper pressure piping systems. All joints and pipes shall be thoroughly cleaned before fluxing and shortly thereafter heated and jointed using no-lead solder as conforming to the National Plumbing Code. All joints shall be wiped clean of excess solder and flux to provide a smooth and clean water tight joint and all piping, walls and equipment shall be wiped clean of flux and solder drippings. Vertical water lines shall be plumb and horizontal water lines shall be slightly pitched to provide drainage to a drain downpoint. All horizontal piping shall be parallel or perpendicular to all walls. The entire copper piping system shall be completed to provide a satisfactorily operating water system with neat and clean appearance.

Copper pipe shall be manufactured by Triangle, Phelps Dodge, Wolverine,, or equal. Copper fittings shall be as manufactured by Mueller, Bibco, Wolverine, or equal.

Valves on the water system, including gate, globe, ball and check, shall be of bronze construction with deep solder joints. Piping and valves shall be designed for 125 PSI working pressure. All valves shall be of the same manufacturer and shall be Walworth, Jenkings, Crane or equal.

Gate and ball valves shall be used for shut-off (non-throttling) installations. Globe valves shall be used for shut-off and throttling. Needle valves shall be used for fine adjustment and each valve installation shall be verified with the equipment manufacturer and the Engineer prior to construction. Ball valves shall be used where directed.

The Contractor shall make all necessary provisions for expansion and contraction of pipelines including installations of expansion joints where approved by the Engineer.

Dielectric pipe couplings shall be used wherever copper pipe connects to steel, stainless steel or ductile iron pipe and appurtenances. Couplings shall have steel bodies with non-conducting bushings on both ends. Ends shall have standard pipe

threads. Couplings shall be rated for at least 200 psi at 250° F. Couplings shall be as manufactured by Thermodynamics Corporation, Water Vallet Co., or equal.

655.12 PVC TUBING

The tubing shall be of reinforced polyvinylchloride construction of the sizes and with all appurtenances as shown on the drawings. Tubing shall be flexible. Pressure rating of tubing and appurtenances shall be a minimum of 125 PSI. Single lengths of tubing shall be as long as available or practical and the use of splices, fittings, connectors, etc., shall be minimized. No fittings shall be permitted within carrier pipes; tubing shall be installed into carrier pipe as a single length (no splices).

655.13 SPECIAL FITTINGS

The Contractor shall furnish and install all special fittings, adapters, flexible couplings, expansion joints, or other necessary fittings as required by the contract documents or as may be required for a satisfactory piping system.

Grooved type fittings, couplings and fittings shall also be provided as indicated by the drawings or as required.

A. Sleeve Type Coupling

Gasketed sleeve type couplings shall have diameter to properly fit the pipe, consisting of one (1) steel middle ring, of thickness and length specified, two (2) steel followers, two (2) rubber-compounded wedge section gaskets, and sufficient track-head steel bolts to properly compress the gaskets. Couplings on stainless steel pipe shall be of 316 Stainless steel with 304 Stainless steel hardware. Couplings on steel pipe shall be ASTM A513 steel with bolts conforming to AWWA C111/ANSI A21.11. Tie down rods shall be provided where shown on drawings. Gaskets shall be suitable for use with digester gas. All couplings shall be rated for gas duty and shall have 200 psi pressure rating. Field joints shall be made with this type of coupling.

1. The middle ring and followers of the coupling shall be true circular sections free from irregularities, flat spots, or surface defects. They shall be formed from mill sections with the follower-ring section of such design as to provide confinement of the gasket. After welding, they shall be tested by cold expanding a minimum of 1% beyond the yield point.

2. The coupling bolts shall be of the elliptic-neck, track-head design with rolled threads. The manufacturer shall supply information as to the recommended torque to which the bolts shall be tightened. All bolt holes in the followers shall be oval for greater strength.

3. The gaskets of the coupling shall be composed of a crude or synthetic rubber base compounded with other products to produce a material which will not deteriorate from age, from heat, or exposure to air under normal storage conditions. It shall also possess the quality of resilience and ability to resist cold flow of the material so that the joint will remain sealed and tight indefinitely when subjected to shock, vibration, pulsation and temperature or other adjustments of the pipe line.

The couplings shall be assembled on the job in a manner to insure permanently tight joints under all reasonable conditions of expansion, contraction, shifting and settlement, unavoidable variations in trench gradient, etc. The coupling shall be Dresser, Style 38, as manufactured by Dresser Manufacturing Division, Bradford, PA or equal.

B. Wall Pipes

Wall pipes shall be conformed to ANSI AWWA C110, latest revision, and shall be fully compatible with the intended

function. Wall pipes shall be as manufactured by Clow Corporation or equal.

C. Flexible Couplings

Flexible couplings on the gas compressor suction and discharge piping shall be Type 321 stainless steel corrugated inner tubing with outer shield of stainless wire braid, rated at 200 psi working pressure. Flexible couplings shall have flanged connections and shall be Metraflex SL pump connectors or equal.

D. Grooved Type Couplings, Fittings and Flanges

Split couplings shall be of the flexible, gasketed mechanical type. They shall be designed to mechanically engage and lock grooved or shouldered pipe ends, to form a positive couple allowing for some degree of angular deflection, contraction or expansion. Coupling shall have pressure ratings at least equal to the test pressures applied to the pipes being jointed. Coupling material shall be same as that of the pipe it is joining. Gaskets shall be of an elastomeric, synthetic rubber material and shall be of the type and composition recommended by the coupling manufacturer for the service and temperature intended.

Pipes designed to be jointed by split-type couplings shall have grooved or shouldered ends in accordance with the requirements of the coupling manufacturer. All pipe which is to be grooved shall have the minimum wall thickness recommended by the coupling manufacturer to insure that the removal of the metal does not lessen the strength or pressure rating of the pipe. The Contractor shall note that if this wall thickness exceeds that which is otherwise specified in this section, the thicker wall pipe shall be furnished at no additional cost to the Owner.

Grooved type fittings shall be of the grooved or shouldered design and compatible with mechanical grooved flange joint.

The flange shall be designed for the direct connection of flanged components into a radius grooved ductile iron pipe. Flange halves shall have identical castings hinged for ease of handling and assembly.

Housings for flange and fittings for ductile iron pipe shall be ductile iron conforming to ASTM-A536 and AWWA C-606.

Grooved couplings and pipe shall be as manufactured by Victaulic or equal.

E. Flanged Adapter

The flanged adapter shall be an assembled unit of the wedge-gasketed flared-sleeve type. Each adapter shall consist of a cast flanged body, cast follower, wedge gasket, flange gasket, and sufficient number of steel bolts to compress the wedge gasket.

The body shall be a casting with one end properly formed to receive the wedge gasket. The flange end of this adapter shall be in accordance with ANSI B16.1, Class 125 lb. cast iron flanges, and/or B16.5, Class 150 lb. steel flanges, and shall be equipped with a modified o-ring gasket.

The follower shall be a casting, and the design shall provide total confinement of the gasket.

Gaskets shall be rubber compounded material that will not deteriorate from age or exposure to air under normal storage or use conditions. The rubber in the gasket shall meet the following specifications:

Color	Jet Black
Surface	Non-blooming
Durometer Hardness	75 ± 5
Tensile Strength	1,500 PSI minimum
Elongation	15% minimum

Bolts shall be elliptical-neck, trackhead design. The elliptical neck shall correspond to the elliptical hole in the follower. Also, the flange bolts shall fit into a square section in the body to prevent bolts from turning.

F. Flexible Expansion Joints

Flexible expansion joints shall be of a size and installed in the locations indicated on the drawings and shall be manufactured of ductile-iron conforming to ANSI/AWWA C153/A21.53. All flexible expansion joints shall be capable of deflecting and expanding simultaneously to the amounts shown on the drawings utilizing two (2) 15□ ball joints. All flexible expansion joints shall have the expansion capability designed as an integral part of the ductile-iron ball castings. All wetted parts shall be lined with a minimum of 15 mils of Fusion Bonded Epoxy conforming to ANSI/AWWA C213. All flexible expansion joints shall be Flex-Tend as manufactured by EBAA Iron Inc., or equal.

G. Expansion Joints

Where shown on the contract drawings or as required, the contractor shall install expansion joints. The expansion joint shall be manufactured by Dresser Industries, Inc., Style 63, Type 1, or equal. The expansion joint shall be watertight against the line pressures.

H. Sample Ports

Where shown on the contract drawings or as required, the contractor shall install sample ports. The sample port shall consist of a 3/4" galvanized steel nipple, 3/4" bronze gate valve, 90□ elbow and vacuum break hose bib. All fittings shall be of brass or bronze construction with 3/4" NPT for assembly.

I. Rubber Spool Expansion Joint

The rubber spool expansion joint shall be of the flanged type based on one single arch design and have a minimum working pressure of 150 PSIG. It shall be capable of lateral and axial movement and shall be effective in avoiding problems associated with vibration, noise, shock and movement. Rubber spool expansion joints shall include stainless steel retaining rings and control rods. Rubber spool expansion joints shall be as manufactured by Mercer Rubber Co. or equal.

655.14 PIPE INSULATION AND HEAT TRACING SYSTEM

The Contractor shall furnish all labor, materials, and equipment to install pipe insulation and heat tracing as shown on the Drawings including all fittings, jackets, covers, and all appurtenances as required by the Contract Documents and as may be required for a satisfactory piping system.

A. Fiberglass Insulation

1. Manufacturer: Provide materials of one of the following:
    a. Owens Corning Fiberglass Corporation, Fiberglass 25 ASJ/SSL.
    b. Schuller International, Inc.
    c. CertainTeed Corp.
    d. Or approved equal.
2. Type: Heavy density sectional pipe insulation with vapor barrier and self-sealing lap.
3. Density: four (4) pounds per cubic foot, minimum.
4. Fittings: Molded fiberglass.
5. Jointing Materials: Manufacturer’s recommended adhesives and tape.
6. Valve Insulation: Miter cut nesting size covering segments of same thickness as pipeline, for insulation of valves.

B. Insulation Metal Jacket:

1. Manufacturer: Provide materials of one of the following:
    a. Childers Products Company, Lock-On and Slip-On.
    b. Pabco.
    c. RPR Inc.
    d. Or approved equal.
2. Type: Smooth aluminum jacket.
3. Thickness: 0.016 inches, minimum.
4. Moisture Barrier: one mil thick polyethylene film with a protective layer of 40 pound virgin craft paper laminated to inside of aluminum jacketing.
5. Conform to ASTM B 209.
6. Fastening: Pre-formed locking seam with 2-inch butt strap with sealant.
7. Bands: ½-inch aluminum bands.
8. Fittings:
    a. Type: Pre-fabricated aluminum, formed and shaped.
    b. Thickness: 0.010 inches, minimum.

C. Fitting Covers:

1. Manufacturer: Provide materials of one of the following:
    a. Childers Product Company.
    b. Pabco.
    c. RPR Co.
    d. Or approved equal.
2. Type: Factory fabricated metal jacketing for elbows, tees, valves, flanges, end caps, beveled collar fitting covers, etc.
3. Metals: Smooth aluminum with moisture barrier coating on interior.
4. Thickness: 0.024 inches or larger, as recommended by manufacturer.

5. Reference: Conform to ASTM C 585.

D. Heat Tracing:

1. Manufacturer: Provide materials of one of the following:
    a. Delta-Therm
    b. Or approved equal.
2. Type:
    a. Industrial grade, self-regulating freeze protection heating cable providing minimum 10 watts per foot.
    b. Electronic temperature control for heat trace cable including low and high temperature alarm. Provide PowerTrace etc1 control or equal.

3. Construction:
    a. Twin 16 AWG copper buss wires.
    b. Semi-conductive polymer core whose electrical resistance varies with temperature.
    c. Flame retardant, water resistant insulation jacket constructed of thermoplastic rubber.
    d. Tinned copper braid covering the jacket for ground and mechanical protection.
    e. Optional overjacket for increased water resistance and cable protection.
4. Thickness: One (1) inch, minimum, as recommended by manufacturer.
5. Reference: Heat tracing shall be:
    a. UL Listed for use in ordinary areas.
    b. CSA Certified for use in ordinary areas.
    c. FM - Factory Mutual certified for use in ordinary areas.
    d. Approved for use in treatment facilities by the manufacturer.

655.15 SUPPORTS AND ANCHORS

The drawings do not generally indicate locations or types of hangers, although the Contractor shall provide complete support systems as necessary to allow satisfactory operation of each system. Where piping supports or accessories are indicated, the information is supplied to indicate typical provisions for systems involving more critical consideration due to expansion, thrust or other conditions. The Contractor shall adapt the indicated typical conditions as necessary to suit the actual system requirements.

Product data, including installation instructions for each type of support and anchor. Submit pipe hanger and support schedule showing manufacturer's figure number, size, location and features for each required pipe hanger and support.

Product certificates signed by the manufacturer of hangers and supports certifying that their products meet the specified requirements.

Welder certificates signed by contractor certifying that welders comply with standard requirements.

Assembly-type shop drawings for each type of support and anchor, indicating dimensions, weights, required clearances, and methods of assembly of components.

All piping hanger components shall be designed for the maximum pressures and temperatures developed under all operating or test conditions as indicated.

Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

Comply with applicable plumbing codes pertaining to product materials and installation of supports and anchors.

The Contractor shall thoroughly support all piping with hangers and straps made from materials compatible with the piping materials and of substantial construction. Pipe supports shall be manufactured for the size and type of pipe to which they are applied. Strap hangers will not be acceptable. Pipe supports shall be furnished complete, with all necessary inserts, bolts, rods, nuts, washers, and other accessories. All auxiliary steel for pipe supports shall conform to the requirements of ASTM-A36/A36M. Hangers in contact with galvanized pipe steel shall be galvanized and hangers in contact with copper tubing shall be copper plated. All other steel hangers and support shall be given a shop coat of approved primer which will be compatible with the field finish coats specified under PAINTING.

Examine substrates and conditions under which supports and anchors are to be installed. Do not proceed with installing until unsatisfactory conditions have been corrected.

Threaded rods shall have threading to permit the maximum adjustment available in the support item. Threaded rod diameter shall be minimum 3/4-inch for 3-inch and smaller pipe and minimum 5/8-inch for 4-inch and larger pipe. Rod to be sized for the individual application. All hangers shall have provisions for vertical adjustment after installation.

Horizontal lines 1" and larger shall be supported at intervals not to exceed 8 feet; piping 3/4" and smaller shall be supported at intervals not to exceed 5 feet. Vertical runs shall be supported with clamps at a maximum spacing of 3 feet on center. Closer spacing of hangers shall be provided if noticeable deflection exists, in particular with PVC or other similar material.

Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.

Install hangers and supports to allow controlled movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.

Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.

Install hangers and supports to provide indicated pipe slopes, and so that maximum pipe deflections allowed by ASME B31.9 Building Services Piping Code is not exceeded.

The contractor shall furnish and install all necessary support brackets, expansion bolts, fasteners, foundations, etc., for supporting equipment and piping. Supports shall be of simple design and substantial construction acceptable to the engineer.

Hangers shall be located on all systems so as to provide at least one hanger immediately adjacent to each change of direction or offset and also additional hangers shall be provided wherever concentrated loads occur in the piping system from the installation of in-line equipment.

Expansion anchors shall be used to fasten supports to existing concrete and masonry. Design loads for inserts, brackets, clamps, and other support items shall not exceed the manufacturer's recommended loads.

Install anchors at proper locations to prevent stresses from exceeding those permitted by ASME B31.9 and to prevent transfer of loading and stresses to connected equipment.

Fabricate and install anchors by welding steel shapes, plates and bars to piping and to structure. Comply with ASME B31.9 and with AWS Standards D1.1.

Where expansion compensators are indicated, install anchors in accordance with expansion unit manufacturer’s written instructions to control movement to compensators.

Where not otherwise indicated, install anchors at ends of principal pipe runs, at intermediate points in pipe runs between expansion loops and bends. Make provisions for preset of anchors as required to accommodate both expansion and contraction of piping.

Anchorage shall be provided to resist thrust due to temperature changes, changes in diameter or direction, or dead ending. Anchors shall be located as required to force expansion and contraction movement to occur at expansion joints, loops or elbows, and as required to prevent excessive bending stresses and opening of mechanical couplings. Anchorage for temperature changes shall be centered between elbows used as expansion joints.

Provide dielectric isolation. Do not allow copper and other metals to make contact with each other.

All pipe supports and appurtenances located in digester shall be 304 stainless steel.

Group piping shall be supported on hangers constructed of Uni-Strut, Grinnel, or equal, with threaded rods and adjustable straps.

Where concrete pipe saddles or piers are indicated or specified or where approved for pipe support, the pier shall conform accurately to the bottom third to one-half of the pipe. Concrete supports shall be designed to carry the weight of the piping and shall be reinforced to withstand forces under all operating and test conditions. Concrete supports shall be secured to the floor and/or wall of the structure by approved dowels, reinforcing bars, or other means.

All piping over three (3) inches in diameter shall not be supported on masonry walls, but shall be supported by approved supports bearing on the concrete slab.

Touch-Up Painting: Cleaning and touch-up painting of field welds, bolted connections, and abraded areas of the shop paint on miscellaneous metal is specified in Division 9 section “Painting” of these specifications.

For galvanized surfaces clean welds bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A780.

655.16 PRESSURE GAUGES

The Contractor shall furnish, install, calibrate, and test gauges where shown on the drawings and as specified herein and elsewhere in the Specifications. Each gauge shall be a minimum of 4-1/2" diameter black enameled die cast aluminum or phenolic construction. Gauges shall have a phosphor bronze or 316 stainless steel bourdon tube with polycarbonate roller movement actuated by a self-returning "friction free" stainless steel band or a helical cam and roller. Gauges having gear type linkage segment or pinion will not be acceptable. The gauges shall be constructed with an overpressure stop or a decoupler mechanism to protect gauge from shutoff damage; zero reset adjustment shall be standard. Accuracy shall be at least 1% of the entire range. Connection 1/2" NPT male. Gauges shall be as manufactured by Helicoid Gage Division or American Chain and Cable Co.or equal.

All gauges shall be first-line high quality, suitable for operation in continuous and uninterrupted service with a minimum of maintenance, adjustment or repair. Diaphragms, snubbers, petcocks, nipples and other appurtenances shall be furnished and installed with the gauges wherever specified, or required for the process.

Diaphragm seals shall be used with all gauges. The seal and gauge shall be supplied as a single unit, filled with glycerin and calibrated after filling by the manufacturer. Diaphragms on lines with 500 psi or greater pressure shall be the continuous type, otherwise they shall be non-continuous. All diaphragms shall be clean-out type.Each seal shall have 1/2"NPT instrument connections. Diaphragm, seals, body and hardware shall be all stainless steel as manufactured by the Zavoda Manufacturing Company,; or equal.

Two (2) spare pressure gauges and seal assemblies packed for long-term storage shall be provided for each range used on the project.

655.17 VALVES

The contractor shall furnish all valves necessary for the construction and satisfactory operation of the facility as required by the contract documents, equipment installations, or as may be necessary.

The absence of a particular valve does not relieve the contractor of the responsibility of providing same as may be necessary for satisfactory operation of the facility.

Except where flanged valves are specified or required to suit flanged connections, the valves described below shall have screwed ends where used with pipe. Where used with copper tubing, solder-joint adapters for copper tubing shall be provided. In addition to the requirements hereinafter specified, all valves shall be equal in quality and performance to those made by Crane Co.,; Jenkins Bros; Kennedy Valve Mfg., Co; Lukenheimer Co.,; William Powell Co; Walworth Co., or approved equal.. Insofar as possible, all valves shall be the product of one manufacturer.

A. PVC Ball Valves

PVC valves shall be Schedule 80 made of Type IV, Grade 1 polyvinylchloride, as manufactured by Hayward or equal. Valves shall be suitable for 125 psi working pressure at 75 degrees F. Valves shall have socket type ends and shall be of the ball type with full port openings.

Ball valves shall have double union ends to permit removal of the valve without disconnecting the piping and shall be of the type which will not leak when the downstream union end is disconnected.

Valves shall be of all plastic construction with seals made of viton and seats of teflon.

Valves shall be anchored to prevent torque stress on the piping when opening and closing.

B. P.V.C. True Union Ball Check Valves

Ball check valves shall be Type I, PVC double end entry, self-lubricated, corrosion resistant, with true union type end connections by Hayward. Valves shall be complete with replaceable Viton seal rings and teflon seat rings. The free open area through the valve during full-flow design shall be equal to the equivalent pipe size.

C. Resilient Seat Gate Valves

Gate valves for finished water service shall conform with all applicable provisions of Standard Specification AWWA C509-87 "AWWA Standard for Resilient-Seated Gate Valves, 3 through 12 NPS, for Water Systems".

Resilient seat gate valves shall be iron body, inside screw, epoxy-coated inside and out, resilient seat with flanged ends except for buried valves which shall have mechanical joint ends. All valves shall open counter clock-wise and shall be furnished with hand wheel or chain wheel except for buried valves which shall have valve boxes and lids marked for water as described in Division 2.

All valves shall be suitable for working pressures to 200 psi with a bubble-tight shutdown and shall be installed as shown on the drawings. Lubrication and O & M Instructions and Parts List shall be furnished in quadruplicate for each type of valve provided. Resilient seat gate valves shall be Mueller, or equal.

D. Cushioned Swing Check Valve

The check valve shall be a counter-weighted, rubber seated swing check valve with external air cushion chamber. The valve shall permit flow in one direction only and close tightly, without slamming, when its discharge pressure exceeds its inlet pressure.

The valve body shall be of cast iron (ASTM A126-B) and with a cast iron disc of similar material.

The hinge shaft shall be of 18-8 stainless steel with the disc arm and counterweight arm keyed there on. The body seat and external cushion chamber shall be all bronze all items requiring same or bronze and stainless steel, and shall be field adjustable. The cushion chamber link and counterweight arm may be of the manufacturer's standard construction. No pre-charged air cylinders or chambers to assist closing shall be permitted on the valve.

The hinge shaft packing gland shall be of the adjustable packing gland design employing a compression type packing. Simple "O" ring shaft seals will not be accepted.

The hinge shaft shall be located completely above the waterway.

The valve shall be tight seating when closed, and provide a full equivalent pipe area when open fully. The seating shall be by a resilient field replaceable ring on the valve disc contacting a bronze (or stainless) seat ring in the valve body.

An external adjustable counterweight shall be provided to initiate valve closure, and an air cushion chamber mounted externally shall dampen valve closure, if necessary, due to counter-weight action.

The cushioned swing check valve shall be as manufactured by APCO, G.A. Ind., or equal.

E. Butterfly Valves

All butterfly valves shall be of the tight-closing, rubber-seat type with rubber seats that are securely fastened to the valve body. No metal-to-metal seating surfaces will be permitted. Valves shall be bubble-tight at rated pressures with flow in either direction, and shall be satisfactory for applications involving throttling service and/or frequent operation and for applications involving valve operation after long periods of inactivity. Valve discs shall rotate 90 degrees from the full open position to the tight shut position. Valves shall meet structural requirements of AWWA Standard C504, Class 150B. The manufacturer shall have manufactured tight-closing, rubber-seat butterfly valves for buried service for a period of at least 5 years.

All butterfly valves shall be as manufactured by Henry Pratt Company or equal. Valves shall be epoxy coated inside and out.

Valve bodies shall be constructed of cast iron ASTM A-126 Class B and shall have integrally cast flanged ends. Two trunnions for shaft bearings shall be integral with each valve body. Body thickness shall be in strict accordance with AWWA Standard C504, Class 150B.

Valve discs shall be constructed of cast iron ASTM A-126 Grade B with Ni-Cr edge (valves 6" through 20"). Larger sizes: Ductile iron with stainless steel seating edge (30" through 48" size) of cast iron with stainless steel seating edge (24" size only).

Shafts of all valves shall be turned, ground and polished. Valve shafts shall be constructed of 18-8 Type 304 stainless steel. Shaft diameters must meet minimum requirements established by AWWA Standard C504 for Class 150B.

Valve seats shall be a synthetic rubber compound. Valves 20" and smaller shall have bonded seats Bonded seats must be simultaneously molded in, vulcanized and bonded to the body. Seat bond must withstand 75 lbs under test procedure ASTM D429, Method B.

Valve seats on 24 inch diameter valves and larger shall be field adjustable and replaceable without dismantling operator, disc or shaft. Seats shall be retained in the valve body by mechanical means without use of metal retainers or other devices located in the flow stream.

Valves shall be fitted with sleeve-type bearings. Bearings shall be corrosion resistant and self-lubricating. Bearing load shall not exceed 1/5 of the compressive strength of the bearing or shaft material.

All valve actuators shall be designed as an integral part of the valve and shall meet all the requirements of AWWA C-504 (latest revision thereof). All units shall be hermetically seated and permanently lubricated with no exposed moving parts except for the valve position indicator (always required) and the input device in the case of manual units. All moving penetrations in the actuator shall have corrosion resistant surfaces in contact with the housing seals. All actuator types, in a given size, to be inter-changeable and fastened to valves with readily accessible external bolts. Actuators requiring disassembly for fastening to valves are not acceptable. All actuators must have outboard bearings to prevent any thrust loads from being applied to the valve shaft. All actuators must be pilot fitted to the valve trunnions to preclude any possibility of improper alignment and binding. Actuators that rely only on the valve shaft and bolting for alignment are not acceptable. All actuators must fit on the valves they are designed to operate in any mounted position or rotational direction without any special prior preparation to either the valve or the actuator.

F. Diaphragm Valve with Electric Operator

A properly sized ITT-Industries diaphragm valve with Dresser Electric Operator (modulating operation) or approved equal shall be provided for the locations indicated on the drawings.

The valve shall be electrically operated with a modulating positioner. The positioner shall be capable of receiving a remote signal (4-20mA) to open/close and shall report position feedback. The ability to manually open and close the valve shall be provided. The operator shall be 115 VAC, 1, phase, 60 Hz with NEMA 4 rating.

G. Metallic Ball Valves

Ball valves in water service shall be full port and have bronze three-piece body with blowout-proof stem, stainless steel trim, TFE seats, and soldered end connections. Ball valves shall be Nibco Model S-595-Y or equal.

H. Gate Valves

Gate valves 2½ inches and smaller shall be 125 lb. bronze valves with screwed ends, and body material shall conform to ASTM Standard Specification for Composition Bronze or Ounce Metal Castings, Designation B62-70. Valves shall have union bonnet, rising stem, inside screw and solid wedge gate.

I. Check Valves

Check valves 2½ inches and smaller shall be 125 lb. bronze valves with screwed ends. Body material shall conform to the before-mentioned ASTM Standard Specification B62. Valves shall have screw-in cap, bronze regrindable disk, swing check.

J. Solenoid Valves

Solenoid valves shall be bronze body, screwed-end, single-integral-seat, full pipe-area, globe type valves, with renewable composition disk seats. Valve shall be suitable for operation on 120 volt, single-phase, 60 Hertz current, and designed to close when energized. The solenoid valves shall be manufactured by Automatic Valve Co., Inc.,.; J.D. Gould CO.; Automatic Switch Co.,; Magnatrol Valve Corp. or equal.

K. Plug Valves

Plug valves shall be furnished and installed where shown on the Contract Drawings.

Valves shall be of non-lubricated eccentric type with natural or synthetic rubber resilient faced plugs, suitable for the intended service, and shall be furnished with end connections as shown on the plans. Plug valve shall rotate 90° from full open to fully closed positions. Port areas of valves shall be at least 80% of full port area. Flanged valves shall be faced and drilled to the ANSI 125/150 lb. standard. Mechanical joint ends shall be to the AWWA Standard C111-64, grooved ends per AWWA C-606-87. Screwed ends shall be to the NPT standard.

Valve bodies shall be of ASTM A126 Class B cast iron. Bodies in 3" and larger valves shall be furnished with a 1/8" welded overlay seat of not less than 90% pure nickel. Seat area shall be raised, with raised surface completely covered with weld to insure that the plug face contacts only nickel. Screwed-in seats shall be not acceptable.

Plugs shall be of ASTM A126 Class B cast iron. The plug shall have a cylindrical seating surface eccentrically offset from the center of the plug shaft. The interference between the plug face and body seat, with the plug in the closed position, shall be externally adjustable in the field with the valve in the line under pressure.

Valves shall have sleeve type metal bearings and shall be of sintered, oil impregnated permanently lubricated type 316 stainless steel, ASTM A743 Grade CF-8M in 1/2"-36" sizes. In valves larger than 36", the upper and lower plug journals shall be fitted with ASTM A-240 type 316 stainless sleeves with bearings of ASTM B30, Alloy C95400 aluminum bronze. Non-metallic bearings shall not be acceptable.

Valve shaft seals shall comply with AWWA C504, be of the multiple V-ring type and shall be externally adjustable and repackable without removing the bonnet or actuator from the valve under pressure. Valves utilizing O-ring seals or non-adjustable packing shall not be acceptable. Packing shall be nitrile butadiene.

Valve pressure ratings shall be 175 psi through 12" and 150 psi for 14" through 72". Each valve shall be given a hydrostatic and seat test with test results being certified when required by the specifications.

Manual valves shall have lever or gear actuators, handwheels or chainwheels, as indicated on the plans, specified or required per the installation. All valves 6" and larger shall be equipped with gear actuators. All gearing shall be enclosed in a semi-steel housing and be suitable for running in a lubricant with seals provided on all shafts to prevent entry of dirt and water into the actuator. The actuator shaft and the quadrant shall be supported on permanently lubricated bronze bearings. Actuators shall clearly indicate valve position and adjustable stops shall be provided to set closing torque and to provide seat adjustment to compensate for change in pressure differential or flow direction change. All exposed nuts, bolts and washers shall be zinc plated.

Valves and gear actuators for buried or submerged service shall have seals on all shafts and gaskets on the valve and actuator covers to prevent the entry of water. Actuator mounting brackets for buried or submerged service shall be totally enclosed and shall have gasket seals. All exposed nuts, bolts, springs and washers shall be stainless steel.

All valves and actuators shall be Series 118, with flanged connections, as manufactured by DeZurik or equal.

L. Miscellaneous Valves

Miscellaneous valves shall be provided as necessary for various functions of equipment connections. Valves shall be rugged bronze valves suitable for the intended use and manufactured by an approved manufacturer. Miscellaneous valves shall include, but not limited to: temperature pressure relief valves, pressure relief valves, solenoid valves, shutoff and draindown valves, plug valves, needle valves, regulator valves, and other as may be required.

M. Manual Actuators

All manual actuators will meet the requirements of AWWA C-504 for handwheel, chainwheel or nut input. All manual units will require at least 2 input turns per inch of valve size, except for the 24" valves where 44 input turns will be acceptable. Manual operators, except where otherwise shown or specified, shall be worm-gear or traveling nut type, as manufactured by Limitorgue, E-I-M, DeZurik or equal and shall be designed to hold the valve in any intermediate position between fully open and fully closed without creeping or fluttering. Adjustable stops shall be provided to prevent over-travel in the open and closed positions. Operators shall be equipped with a handwheel sized by manufacturer for each operation and shall be fully gasketed and grease packed for non-buried service. Valves shall close with a clockwise rotation of the handwheel operator. Valve operator components shall withstand an input torque of 300 ft. lbs. at

the extreme operator positions without damage. A handwheel shall be provided except where chainwheels are required. Valves 6 feet or more above the floor level shall be provided with chain wheels in lieu of handwheels or levers and shall be the manufacturer's standard, with galvanized chain to be furnished in the length required for operation and extending to within 3 feet of the operating level.

N. Electric Motor Operators

Each motor operator shall consist of an electric motor, reduction gearing and limit controls. The gears shall be totally enclosed in a waterproof and dustproof housing which shall have an integrally cast mounting for the motor, and a separate compartment with removable cover for the limit controls.

The motor operator shall be designed for use with an eccentric type plug valve.

Each operating unit shall be equipped with a hand wheel for manual operation.

Hand wheels shall be provided with chain wheel and chain where required.

Hand wheels shall be so arranged by an internal clutch that the hand-operating mechanism and the motor-operating mechanism cannot be engaged at the same time. The hand wheel shall have an arrow and the word OPEN cast on it to indicate the direction of turning to open, and shall not rotate when the unit is being operated electrically.

The reduction unit shall be of the worm-gear type, worm and planetary spur type, modified planetary type or acceptable reduction unit of the spur-gear type. Clutches and additional gears and shafting shall be provided in the two-speed units. Spur gears shall have cut teeth. If worm gears are used, the worm shaft shall operate in ball or roller bearings and shall be machine cut, ground and highly polished; the worm wheel shall be of bronze and shall have a large contact area. The worm, spur gears, and all shafts shall be of heat-treated steel an accurately machined. The output or driving shaft shall operate in bronze bearings or in ball or roller bearings. Provisions shall be made to take the thrust in both directions.

Light controls for operators shall be positive in action and shall ensure tight seating and full openings. The mechanism shall be so designed as to minimize draft or overtravel and to open or close the gate or valve to a fixed, predetermined point at every operation. The controls shall disconnect the driving mechanism from the stem. Controls may be of either the geared-limit or torque-limit type, but shall be capable of ready adjustment for predetermined limits of opening and closing travel.
Controls shall be of such design that the closing of the gate or valve on an obstruction will not damage any part of the operating unit or cause excessive loads to be transmitted to the supporting structure or valve. The right is reserved by the Engineer to test the gate or valve operation in this respect by placing an obstruction in the opening and attempting to close the gate or valve.

The operating units shall be fully wired at the factory and furnished complete with terminal strips for external power and control connections which are specified under the appropriate electrical sections.

Motors shall be a 1-phase, 60-Hertz, squirrel-cage, reversible, high torque motors of standard make with grease-packed ball bearings. The motor speed shall not exceed 1,800 rpm.

O. Backflow Preventer

A Reduced Pressure Zone Assembly shall be installed at each cross-connection to prevent backsiphonage and backpressure of hazardous materials into the potable water supply. The assembly shall consist of a pressure differential relief valve located in a zone between two positive seating check valves. Backsiphonage protection shall include provision to admit air directly into the reduced pressure zone via a separate channel from the water discharge channel, or directly into the supply pipe via a separate vent. The assembly shall include two tightly closing shutoff valves before and after the assembly, test cocks and a protective strainer upstream of the No. 1 shutoff valve. The assembly (specify Model 909 for temperatures up to 140°F (60°C) or Model 909HW for temperatures up to 210°F (99°C)) shall meet the requirements of ASSE Std. 1013; AWWA Std. C-511- 92 CSA B64.4; FCCCHR of USC Manual Section 10. Listed by IAPMO (UPC). SBCCI (Standard Plumbing code). The assembly shall be a Watts Regulator Company Series 909 or approved equal.

Mainline valve body and caps including relief valve body and cover shall by bronze. All hydraulic sensing passages shall be internally located within the mainline and relief valve bodies and relief valve cover. Relief valve shall have removable seat ring. Check valve and relief valve components shall be constructed so they may be serviced without removing the valve body from the line. Shut-off valves and test cocks shall be full ported ball valves.

The assembly shall be rated to 175 psi MWWP and water temperature range from 32°F to 140°F.

P. Reserved

Q. Air Release Valves

The valve shall be float operated and shall incorporate a compound lever mechanism to enable the valve to automatically exhaust accumulated air from a fluid system while the system is pressurized and operational.

Valves shall have ASTM A126 Class B cast iron body and cover with a threaded inlet and outlet connection, designed to withstand a test pressure of 300 psig. The valve shall close drop tight, incorporating a Buna-N orifice button. Valves shall have a stainless steel float capable of withstanding a test pressure of 1000 psig and a replaceable seat of Buna-N or other suitable material. Internal linkage mechanism shall be 18-8 stainless steel; plastic or bronze is not acceptable. Valve shall fully conform to the requirements of AWWA Standard C512-91. The linkage/lever mechanism shall be able to be removed from the valve without disassembly of the mechanism and shall b e designed to prevent jamming.

Valve inlet size shall be as listed in the schedule or shown on plans. Air release valves with an inlet 1 in. and larger shall be compound lever construction, smaller valves shall be simple lever. Orifice shall be stainless steel and suitable for 175 PSI maximum working pressure.

The valve shall be the Series 34 Air Release Valve, manufactured by Cla-Val Co., and as represented by Harper International, Inc.; equal as manufactured by Golden-Anderson, distributed by Hoyns Associates; or equal.

R. Sample Flow Control Valves

The backpressure control valves shall maintain a minimum pressure in the water sampling piping. This valve shall close driptight when the pressure falls below the setpoint.

The backpressure control valve shall be a normally closed, direct acting, adjustable, spring loaded diaphragm valve designed to open when pressure in the sensing chamber exceeds the force of the spring. The valve body shall be all stainless steel with stainless steel trim. The valve shall include a round Buna-N diaphragm retained by the eight screws. The rubber disc that seals against the stainless steel stem shall be compression molded into a stainless steel disc retainer. The disc retainer shall be connected to the actuating diaphragm assembly with a stainless steel stem. When inlet pressure is higher than the set point of the control valve, the valve shall open. The valve shall be adjustable from 0-75 psi.

The valve shall be the Model 55FxHI Backpressure Control Valve, manufactured by Cla-Val Co., and as represented by Harper International, Inc.; equal as manufactured by Golden-Anderson, distributed by Hoyns Associates; or equal.

S. Air Pressure Control Regulator

The air pressure control regulator shall be sized for 750 scfm and reducing the inlet pressure of 90-100 psi to an outlet pressure of 40 psi. The regulator shall be a Fisher Controls Type 99 Pressure Reducing Regulator or equal. The regulator shall be adjustable, pilot operated with a cast iron body with brass trim and neoprene, disc style seat. Regulator shall be provided with filter and brass or copper tubing and fittings. Contractor shall provide downstream control line connection as required by the manufacturer.

655.18 SLEEVES AND ESCUTCHEONS

Piping 4" and larger passing through outside walls below grade shall be provided with extra heavy cast iron or steel pipe sleeves with an internal diameter approximately 1-1/2 inches minimum larger than the OD of the pipe, unless otherwise indicated on the drawings. Such piping shall be run continuously through the wall sleeve and a bell or other connection shall be located not more than two (2) feet from the wall.

Piping smaller than 4" passing through the outside wall below grade shall be provided with sleeves as manufactured by Clow Corporation or equal, unless otherwise indicated on the drawings. Such sleeves shall be satisfactory for use with the particular pipe being utilized. The contractor shall provide steel pipe sleeves in concrete floor slabs and concrete walls for passage of piping. Piping passing through masonry walls shall be wrapped with a ½" thickness of sponge insulation within the wall faces. Pipe sleeves set even with the finished floor shall be sealed with a combination of jute and flexible caulking material.

Escutcheon plates shall be provided where directed by the engineer.

Piping for the water main passing through outside walls below grade or passing through the barrier walls shall be provided as indicated with the following seal wall pipe penetrations.

A. Modular Interlocking Mechanical Seal

Seals shall be modular mechanical type consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and wall opening. Links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe with a pressure plate under each bolt head and nut. After the seal assembly is positioned in the sleeve, tightening of the bolts shall cause the rubber sealing elements to expand and provide an absolutely watertight seal between the pipe and wall opening.

B. Wall Openings

The contractor shall determine the required inside diameter of each individual wall opening or sleeve before ordering, fabricating or installing. The inside diameter of each wall opening shall be sized as recommended by the manufacturer to fit the pipe and seal to assure a water-tight joint.

655.19 ROTOMETERS

All rotometers shall be equal to Model 1114 manufactured by the Brooks Instrument Division or equal. Rotometers shall be of standard construction with 127-mm. scale and shall have wetted metal parts of Type 316 stainless steel.

655.20 QUICK COUPLINGS

Quick couplings shall be of PVC construction and shall be supplied with male or female connection as shown on the drawings or as required. Couplings shall be supplied with dust covers attached to the coupling with chain.

655.21 STRAINERS

Strainers shall be bronze-bodied Y-pattern units with monel or stainless steel screens and shall be Hoffman 420, Cla-Val X43 "Y" Strainer, or equal. The blowoff from each strainer shall be equipped with a ball valve.

655.22 SUMP PUMP

The pump shall be suitable for pumping solids laden water with a maximum solids diameter of ½" and shall be provided with a corrosion resistant intake screen. The sump pump shall be of the submersible type with a one-piece cast-iron body and epoxy powder coat finish. Impeller shall be vortex style for solids handling and constructed of high temperature engineering polymer. Motor shaft shall be constructed of stainless steel. The motor shall be sealed against dirt, moisture and water. Bearings shall be heavy-duty permanently lubricated. All fasteners shall be non-corrosive stainless steel.

The motor shall be 1/3 HP and oil filled with built-in automatic reset thermal overload protection. The sump pump shall be started and stopped by a VMF switch, magnetically operated vertical float. The sump pump shall be Liberty Series 257 or equal. The pumping unit shall conform to the following minimum characteristics:

Horsepower:	1/3 HP, 115V
Motor Speed (Nominal):	1725 RPM
Discharge Size:	1.5 inches
Dimensions:	Height – 10.5” Width – 9.6”
Solids Capacity:	½-inch diameter
Min. Sump Size:	10” dia.

The pump shall be non-overloading across entire range and shall be suitable for operating under continuous operation.

655.23 MECHANICAL IDENTIFICATION

Contractor shall provide and install plastic pipe markers, equipment identification and valve tags. Signs shall be as manufactured by seton nameplate company or equal. Plastic pipe markers shall be factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Minimum information on markers shall be flow direction arrow and fluid being conveyed.

A. Painted identification materials

- Stencils: standard fiberboard stencils, prepared for required applications with letter sizes generally complying with recommendations of ansi a13.1 for piping and similar applications, but not less than 1¼“ high letters for ductwork and not less than ¾” high letters for access door signs and similar operational instructions.

- Stencil paint: standard exterior type stenciling enamel, black, except as otherwise indicated; either brushing grade or pressurized spray can form and grade.

- Identification paint: standard identification enamel of colors indicated or, if not otherwise indicated for piping systems, comply with ansi a13.1 for colors.

B. Plastic pipe markers

- Snap-on type: provide manufacturer’s standard pre-printed, semi-rigid, snap-on, color-coded pipe markers, complying with ansi a13.1.

- Pressure sensitive type: provide manufacturer’s standard pre-printed, permanent adhesive, color-coded, pressure sensitive vinyl pipe markers, complying with ansi a13.1.

- Insulation: furnish one inch thick molded fiberglass insulation with jacket for each plastic pipe marker to be installed or un-insulated pipes subjected to fluid temperatures of 125E f (52E c) or greater. Cut length to extend two inches beyond each end of plastic pipe marker.

- Small pipes: for external diameters less than six inches (including insulation if any), provide full-band pipe markers, extending 360E around each pipe at each location, fastened by one of the following methods:

    1. Snap-on application of pre-tensioned semi-rigid plastic pipe marker;
    2. Adhesive lap joint in pipe marker overlap;
    3. Laminated or bonded application of pipe marker to pipe (or insulation); or
    4. Taped to pipe (or insulation) with color-coded plastic adhesive tape, not less than ¾” wide; full circle at both ends of pipe marker, tape lapped 1½”.

- Large pipes: for external diameters of six inches and larger (including insulation if any), provide either full-band or strip-type pipe markers, but not narrower than three times letter height (and of required length), fastened by one of the following methods:

    1. Laminated or bonded application of pipe marker to pipe (or insulation);
    2. Taped to pipe (or insulation) with color-coded plastic adhesive tape, not less than ¾” wide; full circle at both ends of pipe marker, tape lapped 1½”; or

    3. Strapped to pipe (or insulation) application of semi-rigid type, with manufacturer’s standard stainless steel bands.

- Lettering: manufacturer’s standard pre-printed nomenclature which best describes piping system in each instance, as selected by architect/engineer in case of variance with names as shown or specified.

- Lettering: comply with piping system nomenclature as specified, scheduled or shown, and abbreviate only as necessary for each application length.
- Arrows: print each pipe marker with arrows indicating direction of flow, either integrally with piping system service lettering (to accommodate both directions), or as a separate unit of plastic.

C. Plastic tape

- General: provide manufacturer’s standard color-coded pressure-sensitive (self-adhesive) vinyl tape, not less than 3 mils thick.

- Width: provide 1½” wide tape markers on pipes with outside diameters (including insulation, if any) of less than six inches, 2½” wide tape for larger pipe.

- Color: comply with ansi a13.1, except where another color selection is indicated.

D. Underground-type plastic line marker

General: manufacturer's standard permanent, bright-colored, continuous-printed plastic tape, intended for direct burial service; not less than 6" wide x 4 mils thick. Provide tape with printing which most accurately indicates the type of service of buried pipe.

Equipment identification shall be with black stenciled letters spray painted on 6" x 4" rectangular yellow background. Identification shall duplicate symbol shown on p&id.

Valve tags shall be heavily stamped or engraved tags duplicating valve symbol shown on p&id, including hexagons and/or circles with notations, as applicable. Tags shall be fabricated of minimum 3/32 inch thick brass or minimum 18-gauge type 302 stainless steel, a minimum of 1¼" inch diameter. Valve tags shall be secured to valves with 18-gauge type 304 stainless steel wire or chain through hole in tag.

Coordination: where identification is to be applied to surfaces which require insulation, painting or other covering or finish, including valve tags in finished mechanical spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.

Do not install signs when ambient temperature is below 70□f. Maintain this minimum during and after installation of signs. Apply pipe identification to all exposed pipes after painting. Apply equipment identification as directed by the engineer. Apply valve tags to all valves. Lettering shall be oriented to read from common viewing angle. Wherever necessary, orient in both directions. Apply pipe markers with arrow tape around full pipe perimeter at each end of marker indicating flow direction. Pipe markers shall be located within 3-feet of each change in direction, of each side of the elbow or tee and at intervals of not greater than 9 feet. Locate on horizontal and vertical runs.

General: provide valve tag on every valve, cock and control device in each piping system; exclude check valves, valves within factory-fabricated equipment units, plumbing fixture faucets, convenience and lawn-watering hose bibs, and shut-off valves at plumbing fixtures, hvac terminal devices and similar rough-in connections of end-use fixtures and units. List each tagged valve in valve schedule for each piping system.

Identifications of piping shall conform to requirements of ansi a13.1, scheme for the identification of piping systems, unless otherwise specified.

Furnish minimum of 5% extra stock of each mechanical identification material required, including additional numbered valve tags (not less than three) for each piping system, additional piping system identification markers, and additional plastic laminate engraving blanks of assorted sizes.

Where stenciled markers are provided, clean and retain stencils after completion of stenciling and include used stencils in extra stock, along with required stock of stenciling paints and applicators.

655.24 INSTALLATION

The different kinds of piping shall be installed in accordance with the drawings and the procedures and methods submitted with the approved shop and erection drawings.

A. Such procedures and methods shall conform to or exceed the minimum requirement of the pipe manufacturer, and shall be as supplemented by the provisions specified herein.

B. The interior of pipe, fittings, and couplings shall be clean and free from contamination when installed, and effective means shall be taken to prevent the entrance of foreign matter during progress of the work.

C. The types and sizes of pipes and fittings to be used shall be as specified herein and as shown on the drawings. Where fittings are omitted from the drawings, they shall be same size as the piping and shall conform to the code requirements.

Pipe shall be carefully placed and supported at the proper lines and grades and, where practicable, shall be sloped to permit complete drainage. Piping runs shown on the drawings shall be followed as closely as possible, except for minor adjustments to avoid architectural and structural features. If relocations are required, they shall be approved by the Engineer.

In erecting the pipe, a sufficient number of screw unions, flanged joints, or mechanical couplings shall be used to allow any section or run of pipe to be disconnected without taking down adjacent runs.

A. Screw unions may be employed on pipelines 2-1/2 inches in diameter and under, except for the stainless steel gas piping.

B. Flanged joints or mechanical couplings shall be employed on pipe 3 inches in diameter or larger unless otherwise shown on the drawings.

C. Dielectric unions must be installed at the junction of dissimilar metals.

Dimensions essential to the correct location of the pipe, or fit of piping at equipment and valves, or to the proper location and orientation of pipe sleeves and wall castings, or to the avoidance of obstructions or conflict with other improvements, shall be accurately determined by the Contractor prior to fabrication of the piping involved. Required changes from the nominal locations shown on the Drawings shall be made by the Contractor and shall be included as part of the work hereunder and be approved by the Engineer.

Pipe Quality:

A. Pipe shall be carefully inspected for defects before installation. Such inspection shall include light tapping with a hammer while the pipe is suspended in the air.

B. No pipe or fittings which are cracked or which show defects excluded by the specifications for such pipe or fittings shall be used. All injuries to the protective coating of the pipe or fittings shall be carefully repaired by the Contractor.

C. Pipes, valves and fittings shall be carefully cleaned before installation. Open ends of a pipe shall be carefully and securely plugged or capped before leaving the shop.

Install piping in accordance with the approved shop drawings and the erection procedure submitted with the approved shop drawings.

A. Horizontal piping shall be run parallel to the building walls and shall be level except where otherwise shown or specified.

B. Parallel lines shall be grouped on the same horizontal or vertical plane wherever possible.

C. Vertical piping shall be plumb, and the entire piping configuration shall allow adequate clearances for access for painting and preventive maintenance of valves.

D. Piping shall clear obstructions, preserve headroom and keep openings and passageways clear.

E. If structural difficulties or other work prevent the running of pipes or the setting of equipment at the point indicated on the drawings, the necessary minor deviations therefrom, as determined by the Contractor and approved by the Engineer, will be allowed, and shall be shown on the shop drawings to be furnished.

F. Except as otherwise shown or specified, piping installation work shall conform to the requirements of the written recommendations of the manufacturer of the product involved for the given conditions as approved.

Install joints and couplings conforming to the following requirements:

A. Joints and couplings shall be made in accordance with the approved shop drawings.

B. Pipe threads:

1. In accordance with the requirements of ANSI B2.1, and shall be cut full and free from torn or ragged surfaces.

2. No more than 3 threads on the pipe at any joint shall remain exposed after installation.

3. Threaded joints shall be established with Teflon tape applied to the male ends only.

4. The use of thread cement or caulking of threaded joints to stop or prevent leakage will not be permitted.

5. Sharp-toothed pipe wrenches or similar wrenches shall not be used in making up copper or brass pipe.

C. Flanged joints:

1. Provide with gaskets centered in the joint.

2. Bolts, studs and nuts shall be lubricated with graphite and oil so that the nuts can be turned by hand. Care shall be taken to prevent excessive initial tension to the bolt and studs and so that the tension applied is as nearly uniform as possible.

3. The rust preventive compound applied to the faces of flanges before shipment shall be removed before installation.

4. Slip-on flanges shall be fillet welded to the pipe on both front and back sides.

D. Tubing:

1. Soldered tubing shall be cut square, and all burrs shall be removed.

2. Both the inside of the fitting and the outside of the tubing shall be well cleaned with steel wool before sweating. Care shall be taken to prevent annealing of fittings or hard-drawn tubing when making connections.

3. Joints for soldered fittings shall be made with a non-lead, non-corrosive, paste flux and solid string or wire solder. Soft solder or cored solder will not be permitted.

4. Tubing to be coupled with flared compression type fittings shall conform to the applicable provisions of the Joint Industry Conference (JIC) Standards and the recommendations of the manufacturer.

E. Installation of Steel Pipe:

1. Horizontal and vertical pipe shall be anchored securely by means of pipe hangers or supports.

2. Sufficient unions or mechanical couplings shall be provided to facilitate taking down pipe.

3. Pipe ends shall be reamed to the full bore of the pipe.

4. Threads shall conform to the requirements of ANSI B2.1. In making up threaded joints, Teflon tape shall be applied to the male ends only.

5. Gas piping shall be welded at a location remote from the digester. Final connections shall be made by the flanged connections shown on the drawings.

F. Connection at Dissimilar Metals:

1. Provide an insulating union, coupling or flange connector for corrosion control wherever pipes of dissimilar metals join.

2. Connectors shall include an approved type dielectric separator.

3. Connectors shall be the product of Dresser Corporation, F.H. Maloney Company, Universal Controls Corporation, or equal.

4. Stainless steel nuts, bolts and washers shall be used at all places where dielectric separators are used.

G. Welding:

1. The Contractor shall be responsible for the quality of work performed by his welding organization. Welding operators shall be qualified as previously specified.

2. The Engineer shall have the right at any time to call for and witness the making of test specimens by any welder in accordance with these specifications, and the expense of such tests shall be borne by the Contractor.

3. Welds considered by the Engineer to be deficient in quality, or made contrary to any mandatory provision of these specifications, shall be removed throughout their depth to expose clean base metal. In case of a strictly local deficiency, the weld need not be removed throughout its entire length, provided that sufficient amount shall be removed to ensure that sound weld metal, only, remains. A cracked weld shall be removed throughout its length.

H. Valves:

1. Valves shall be installed as nearly as possible in the positions indicated on the drawings consistent with conveniences of operating the handwheel or wrench. All valves shall be carefully erected and supported in their respective positions free from all distortion and strain or appurtenances during handling and installation. All material shall be carefully inspected for defects in workmanship and material, all debris and foreign material cleaned out of valve openings and seats, all operating mechanisms operated to check their proper functioning, and all nuts and bolts checked for tightness. Valves and other equipment which do not operate easily or are otherwise defective shall be repaired or replaced at the Contractor's expense.

2. Install valves rigidly held in place using supports and hangers as specified.

3. The stem orientation of valves in elevated piping shall be as approved by the Engineer for accessibility, but no valve shall have stem in the downward direction.

4. Plug valves shall be installed with the plug up in a horizontal run.

5. Soldered end valves shall be installed with unions adjacent to the valves.

655.25 MODIFICATIONS TO EXISTING PROCESS PIPING

When the Contract Drawings call for removal of existing piping or existing fittings, the new piping or fitting shall be attached with new gaskets and bolt sets.

Where an existing pipe is to be cut and a new pipe is to be connected, the Contractor shall either remove a length of pipe that is to be reused back to its last connection and install a new flange on the pipe or provide a new length of pipe in lieu of the existing pipe.

Old gaskets and bolts shall not be reused.

If the project drawings show a pipeline to be cut and new piping added, the Contractor, for ease of execution, may remove more pipe with the approval of the Engineer and at no additional cost to the Owner.

On pipes that are to be plugged or blind flanged, existing gaskets and bolts may not be reused. The pipeline must be tested to assure the seal or plug is functional.

655.26 CLEANING OF PIPELINES

At the conclusion of the piping installation, but prior to testing the system, the Contractor shall thoroughly clean new and existing pipelines by flushing with water or by some other means approved by the Engineer. Cleaning shall be sufficient to remove all dirt, stones, pieces of wood and debris which may have entered during the construction period.

The Contractor shall provide all water and other cleaning materials as well as dispose of the debris.

655.27 TESTING

The Engineer shall be notified in advance of tests, and tests shall be conducted to his satisfaction. Tests shall be made prior to insulating, covering or concealing piping. Repairs to the various systems shall be made with new materials. No caulking of threaded joints, cracks or holes will be acceptable. Where it becomes necessary to replace pieces of pipe, the replacement shall be the same material and thickness as the defective piece. Tests shall be repeated after defects disclosed thereby have been made good or work replaced. Tests shall be repeated until the system and components receive the approval of the Engineer. Piping shall be adequately braced and supported during the tests so that no movement, displacement, or damage shall result from the application of the test pressure. Relief devices in the various systems shall be capped or plugged during the tests. Damage resulting from the tests shall be repaired or replaced immediately by the Contractor at no cost to the Owner.

When a section of pipe length deemed adequate by the Engineer is ready for testing, the lines designed for carrying liquids shall be thoroughly vented and a leakage test made with the line free of air. Lines designed for carrying air or gas shall be tested with air and the joints brushed with a water and soap solution to aid in detecting leakage. Leaks at joints or in the pipe and fittings shall be corrected by approved means and the piping retested in accordance with the specifications until it successfully passes the tests.

All exposed piping, regardless of service and type of jointing shall show no signs of leakage during the two hour test period.

Equipment used in testing shall be subject to the approval of the Engineer, and shall be such as to properly develop, maintain and measure test pressures. The test pressure shall be 1.5 times the operating or shutoff pressure, whichever is greater, or as otherwise specified. The test pressure shall be maintained for at least two hours with no pressure drop. Gravity flow piping systems, inside or under the various structures, shall be filled with water and there shall be no drop in level after two hours unless otherwise specified. The Contractor shall furnish all necessary equipment, materials and labor for testing and inspecting all piping systems. All costs for power and water usage shall be borne by the Contractor.

655.28 STERILIZATION

The Contractor shall be responsible for performing all sterilization of potable water lines. Sterilization of potable water lines shall be performed by competent personnel under the direct supervision of the Contractor's superintendent. Such sterilization shall comply with AWWA C651 latest edition, "A Standard Procedure for Disinfection of Water Mains" and sterilization shall comply with local plumbing codes.

655.29 PAYMENT

Payment for the work included under this section including all labor, equipment and materials shall be included in the prices bid for items requiring same.

TABLE OF CONTENTS

DIVISION 700 – ELECTRICAL

SECTION	
701	GENERAL ITEMS
705	SECURITY SYSTEMS
706	UNDERGROUND FULLY AUTOMATIC IRRIGATION SYSTEM

SECTION 701 – GENERAL ITEMS

701.01 DESCRIPTION
THE FOLLOWING IS ADDED TO THIS SUBSECTION:

The Contractor will be responsible to provide and install CT cabinet with associated metering per coordination with utility company. Contractor also to provide and install free-standing enclosure, 10" thick reinforced concrete pad for utility transformer, board on board perimeter fence, conduits, junction boxes, handholes, wiring, hardware and all else necessary parts for a fully functional and operational electrical system. .

Contractor to perform and install all trenching, and conduits for PSEG underground primary feeders to the transformer. Install trench and secondary feed from transformer to metering equipment and distribution panel. Primary feeders to be furnished and installed by utility company.

The Contractor will be responsible for the installation of all pole mounted light fixtures in the parking lots, park entrance access road, and receptacle outlets where listed on the drawings.

The Contractor will be responsible for the installation of all conduits and cablings listed on the electrical plans.

701.02 MATERIALS

701.03 CONSTRUCTION

701.03.01 Existing Systems

701.03.02 Rigid Metallic Conduit (Earth)

701.03.03 Rigid Metallic Conduit (Roadway)

701.03.04 Rigid Metallic Conduit (Exposed)

701.03.05 Rigid Nonmetallic Conduit

B. Installation
THE LAST PARAGRAPH IS CHANGED TO:

Install true tape marked in 1-foot increments for the length of the rigid non-metallic conduit. Install a tracer wire continuously for the entire run of conduit, including through the junction boxes, mounting it on the wall. Splice the tracer wire only in the junction box. Seal the ends of rigid nonmetallic conduit carrying the tracer wire. If wire or cable is not scheduled to be installed within 6 months of conduit installation, cap and seal the other conduits leaving the true tape inside. Install warning tape in the trench above the conduit.

701.03.06 Flexible Metallic Conduit

701.03.07 Flexible Nonmetallic Conduit

B. Installation
THE SECOND PARAGRAPH IS CHANGED TO:

Terminate flexible nonmetallic conduit according to manufacturer's recommendations.

THE LAST PARAGRAPH IS CHANGED TO:

Install true tape marked in 1-foot increments for the length of the flexible non-metallic conduit. Install a tracer wire continuously for the entire run of conduit, including through the junction boxes, mounting

it on the wall. Splice the tracer wire only in the junction box. Seal the ends of flexible nonmetallic conduit carrying the tracer wire. If wire or cable is not scheduled to be installed within 6 months of conduit installation, cap and seal the other conduits leaving the true tape inside. Install warning tape in the trench above the conduit.

701.03.08 Junction Box

701.03.09 Metal Junction Boxes

701.03.10 Junction Box Foundation

703.03.11 Junction Box Frame and Cover

703.03.12 Foundations

701.03.13 Cable Rack

701.03.14 Metal Cabinet

701.03.15 Cable and Wire

A. Installing
THE FOLLOWING IS ADDED TO THIS SUBSECTION:

Test the existing tracer wire in the conduit for continuity. If there is no existing tracer wire in any of the conduits in the same trench, then install a continuous tracer wire between the adjacent junction boxes without any splice when installing the cable and wire as directed by the RE.

701.04 MEASUREMENT AND PAYMENT
THIS SUBSECTION IS CHANGED TO:

Delete the entire text of this subsection and substitute the following:

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
FURNISH AND INSTALL 4'' SCH80 PVC CONDUIT	LINEAR FOOT
FURNISH AND INSTALL 2'' SCH80 PVC CONDUIT	LINEAR FOOT
FURNISH AND INSTALL 1'' SCH80 PVC CONDUIT	LINEAR FOOT
FURNISH AND INSTALL 4" RIGID ALUMINUM CONDUIT	LINEAR FOOT
FURNISH AND INSTALL XXHW-2 #6 AWG WIRE	LINEAR FOOT
FURNISH AND INSTALL TYPE W #2/0 AWG WIRE	LINEAR FOOT
FURNISH AND INSTALL TYPE W #6 AWG WIRE	LINEAR FOOT
FURNISH AND INSTALL XHHW-2 #10AWG	LINEAR FOOT
FURNISH AND INSTALL XHHW-2 #8AWG	LINEAR FOOT

Item	*Pay Unit*
FURNISH AND INSTALL XHHW-2 #2AWG	LINEAR FOOT
FURNISH AND INSTALL XHHW-2 #600KMCIL WIRE	LINEAR FOOT
FURNISH AND INSTALL ¾" X 10' COPPER GROUND ROAD	UNIT
FURNISH AND INSTALL XXHW-2 #2/0 AWG WIRE	LINEAR FOOT
FURNISH AND INSTALL 24"X 24" X 16" ELECTRICAL HANDHOLE AND ALL APPURTENANCES	UNIT
FURNISH AND INSTALL 36"X 36" X 36" ELECTRICAL HANDHOLE AND ALL APPURTENANCES	UNIT
FURNISH AND INSTALL 48"X 48" X 36" ELECTRICAL HANDHOLE AND ALL APPURTENANCES	UNIT
ELECTRICAL TRENCHING	CUBIC YARD
FURNISH AND INSTALL SINGLE POLE MOUNTED LED LUMINAIRE, INCLUDING CONDUIT, WIRE, POLE, CONCRETE FOUNDATIONS AND ALL OTHER ASSOCIATED WORK	UNIT
FURNISH AND INSTALL UTILITY TRANSFORMER CONCRETE PAD. 800A MAIN DISTRIBUTION PANEL, 100A LIGHTING DISTRIBUTION PANEL, REINFORCED CONCRETE PAD, WOODEN PERIMETER FENCE, AND ALL ASSOCIATED MISCELLANEOUS COMPONENTS NECESSARY FOR FULL SYSTEMS INTEGRATION AND OPERATION	LUMP SUM

THE FOLLOWING SECTION IS ADDED:

SECTION 705 – SECURITY SYSTEM

705.01 DESCRIPTION

The work shall consist of the design and furnishing of all labor, equipment and materials to provide fully functional surveillance camera systems.

The intent of this specification is to describe the surveillance systems. The video surveillance camera systems will be capable of obtaining license plate information of vehicles entering and exiting the park, and monitoring the walking trail. All cameras shall be motion activated, unless noted otherwise, to reduce unnecessary data storage.

Where any item of material or equipment is specified by proprietary name, trade name or manufacturer, it is to be understood that the item named, or the equal thereof, is intended, subject to the approval of the ENGINEER. Any item substituted for the item named shall be equal or better in quality, capacity and performance, and shall be suitable for the available space, electrical power and required arrangement. It shall be the CONTRACTOR's

responsibility to furnish all data that may be required by the ENGINEER to evaluate the equipment that the CONTRACTOR is proposing to install.

Under this project the CONTRACTOR is required to provide the hardware and the camera configuration for a complete system from the individual cameras to the Digital Video Management System (DVMS) including a computer for review of archived data. The CONTRACTOR will also provide a new Flat Panel High Definition Monitor with multiple inputs. The CONTRACTOR will also be responsible for providing the image managing software and any appurtenant software contracts.

Under this project the CONTRACTOR is required to provide the cameras, mounting bracket assemblies, camera grounding, anchoring and surge protection. Anchoring includes wedge anchor bolts, concrete, reinforcing steel, embedded anchor bolts, structural bolts, and structural clamps. All of the mounting assemblies are to be either 316SS or aluminum.

All work shall conform to the requirements of the latest editions of the following codes, regulations and specifications:

National Electrical Code (NEC)
National Electrical Safety Code (ANSI C2)
National Fire Protection Association (NFPA)
National Electrical Manufacturers Association (NEMA)
Institute of Electrical and Electronic Engineers (IEEE)
Underwriters Laboratories (UL)
American National Standards Institute (ANSI)

705.02 MATERIALS

Power requirements for the video cameras shall be 24V – 60Hz AC, and shall activate on motion. All cameras shall be outdoor, weather proof cameras. The cameras shall be constructed of a durable material and shall be magnetically and electro-statically shielded. The video cameras shall be UL listed.

<u>License Plate Recognition (LPR) Camera Sets:</u>

The license plate recognition camera sets shall consist of one (1) color day/night LPR camera and one (1) black and white high contrast LPR camera. These cameras shall be industrial grade, designed specifically for LPR applications and with DNR (digital noise reduction) and infrared (IR) LED illumination. The cameras must be motion activated and must be capable of capturing images in any weather and lighting conditions. The minimum light requirements shall be approximately 0.01 lux for day mode, and 0 lux for night mode (IR on). The cameras shall be mounted to the existing street light poles on Mannino Park Drive.

The LPR cameras shall be Messoa SCR520HB-HN2 Dual LPR License Plate Capture Camera Set or approved equal. This camera set is to be fully integrated as an assembly and the assembly must be UL listed. The Contractor shall utilize the existing power lines from the street lights to power the proposed LPR cameras.

All exposed above ground video cable shall be encased in rigid galvanized steel conduit and shall be securely fastened to the street light poles.

<u>Minimum Performance Specifications:</u>

	B/W LPR Camera:	Color Day/Night LPR Camera:
Power Requirement	AC24V	CL: AC90 ~ 260V
Power Consumption	85 W (with heater and blower)	90 W (with heater and blower)

Signal System	EIA/CCIR	NTSC/PAL
Application	7.4 mm x 5.95 mm	4.9 mm x 3.7 mm
Video Standard	1/2" SONY CCD	1/3" SONY CCD
Web Browser	EIA (768H x 494V) CCIR (752H x 582V)	NTSC (768H x 494V) PAL (752H x 582V)
Scanning System	EIA (2:1 Interlace V: 59.94Hz, H: 15.734 KHz) CCIR (2:1 Interlace V: 50Hz, H: 15.625 KHZ)	NTSC (2:1 Interlace V: 59.94 Hz, H: 15.734 KHz) CCIR (2:1 Interlace V: 50 Hz, H: 15.625 KHZ)
Sync System	Internal (INT) / Line-Lock (LL) (AC input only)	
Image Sensor	600 TV lines	540/600 TV lines (day/night mode)
Resolution of Image Sensor	70 m distance, 850 nm wavelength, 6° angle	70 m distance, 850 nm wavelength, 50° angle
IR LED	Superior Power: 96 pcs LEDs; Metaphase-type LEDs, high-efficient array	Superior Power: 96 pcs LEDs; Metaphase-type LEDs, high-efficient array
Focal Length	10.45/1	
Focus Mode	IR on 0 lux	0.01 lux (F1.2, AGC on, 10IRE) (day mode) 0 lux (night mode IR on)
Software Integration	F: 75 mm; F: 3.9 ~ 32 (Manual Iris)	F: 7.5-50 mm F1.3, IR-corrected
Privacy Mask	-	On / Off, up to 8 zones
Day / Night mode	-	IR cut moving filter for day/night: Auto/Manual/B.C.G./LPR
Iris Control	-	Video / DC drive
Gain Control	-	Turbo / Normal / Off
White Balance	-	ATW1 / ATW2 / Manual
Electric Shutter	Auto: 1/60 to 1/100,000 sec Manual (9 steps): (1/60, 1/100, 1/250, 1/500, 1/1k, 1/2k, 1/4k, 1/10k, 1/100k sec) Auto: 1/50 to 1/100,000 sec Manual (9 steps): (1/50, 1/120, 1/250, 1/500, 1/1k, 1/2k, 1/4k, 1/10k, 1/100k sec)	Auto: 1/60 to 1/100,000 sec Manual (9 steps): (1/60, 1/100, 1/250, 1/500, 1/1k, 1/2k, 1/4k, 1/10k, 1/100k sec) Auto: 1/50 to 1/100,000 sec Manual (9 steps): (1/50, 1/120, 1/250, 1/500, 1/1k, 1/2k, 1/4k, 1/10k, 1/100k sec)
BLC	BLC1 / BLC2 / BLC3 / BLC4 / off	BLC1 / BLC2 / BLC3 / BLC4 / off
Aperture	High / Mid / Low	
Chroma	NA	9 Level
ODS	Yes	
Remote Control	RS485 via PELCO P/D	
Video Output	1.0 Vpp composite output 75 Ω	
Dimension	Approx 494(W) x 460(D) x 327(H) mm	
Weight	Approximately 9 kg	
Accessories	Pole Mount	
Ambient Operating Temperatures	-30º C ~ +50° C (-22 º F ~ +122° F)	
Ambient Operating Humidity	0% ~ 90 % max. RH	
Storage Temperature	-30º C ~ +60° C (-22 º F ~ +140° F)	

Infrared (IR) Outdoor Cameras:

The IR cameras shall be industrial grade, weather proof and motion activated. The cameras shall produce color images during the day and must have active-infrared night vision for night time surveillance. Minimum ranges for these cameras shall be 330 ft for detection, 300 ft for classification, 250 feet for recognition and 150 ft for identification.

The IR cameras shall be Bosch EX30 Infrared Imager or approved equal. This camera is to be fully integrated as an assembly and the assembly must be UL listed.

All exposed above ground video cable for the cameras mounted on street light poles shall be encased in rigid galvanized steel conduit and shall be securely fastened to the street light poles.

Minimum Performance Specifications:

Power Requirements	12 to 24 VDC or VAC
Power Consumption	36 W maximum
Sensor	Extended Hi-Resolution Day / Night CCD
Effective Pixels (H x V)	NTSC: 768 (H) x 494 (V) PAL: 752 (H) x 582 (V)
Resolution	540 TVL color / 540 TVL monochrome
S/N Ratio	Greater than 48 dB (AGC off)
Daytime sensitivity	0.02 lux at F1.4
Night time sensitivity	0.0 lus with infrared (B/W)
Lens	IR corrected 5 to 50 mm varifocal auto-iris, DC drive
Gamma	0.45
Video Output	1.0 Vpp, 75 Ω
Day – Night Switching	Photocell – controlled, automatic
Photocell	Automatic, sensitivity adjustable
LEDs	Black Diamond Infrared, intensity adjustable
Wavelength	850 nm (semi-covert) or 940 nm (covert)
Construction	Robust aluminum casting
Finish	Baked enamel finish, black standard
Bracket	Cable managed wall bracket / Pole mounting bracket
Dimensions	131 x 139 x 207 mm (H x W x D)
Weight	1.4 kg (3.4 lb)

Infrared (IR) Building Dome Cameras:

The IR dome cameras shall be industrial grade, weather proof, vandal proof and motion activated. The cameras shall produce color images during the day and must have active-infrared night vision. These cameras must also have DNR (Digital Noise Reduction.

The IR dome cameras shall be CNB V2815NVR IR Vandal Proof Dome Cameras or approved equal. This camera is to be fully integrated as an assembly and the assembly must be UL listed.

Minimum Performance Specifications:

Power Requirements	24 VAC or 12 VDC Dual Voltage
Power Consumption	6 W maximum
Signal System	NTSC
Scanning System	2:1 Interlace
Scanning Frequency (H)	15.734 KHz
Scanning Frequency (V)	59.94 Hz
Image Sensor	1/3” SONY Super HAD CCD
Total Pixels	811 (H) x 508 (V) 410K
Total / Effective Pixels	768 (H) x 494 (V) 380K
Horizontal Resolution	550 TV lines
Video Output	1.0 Vpp (75 Ω, Composite)

S/N Ratio	More than 50 dB (AGC off)
Lens	DC Iris Vari-focal Lens (f=3.8~9.5 mm F1.2)
Digital Zoom Ratio	2x (On/Off, Dip Switch)
Minimum Illumination	Day (0.3 Lux), Night (0.0 Lux, IR LED On)
IR LED and Sensor	IR LED (850 nm, 30°) 20EA, Sensor 1 EA
IR LED Visible Range	Max. 20m
Day & Night (ICR)	On/Off (Dip Switch)
SDNR	Built-in
DSS	On/Off (Dip Switch)
White Balance	Auto
AGC, BLC, Flickerless	On/Off (Dip Switch)
Shutter Speed	1/60~1/120,000 Sec.
Dimensions (ØxH)	Surface: 100.0 x 124.5 mm Flush: 100.0 x 111.0 mm
Weight	Approx. 1130 g

MOUNTING

Mounting hardware is to be aluminum, all welded construction, stainless steel hardware that provides a rigid camera mount and is designed specifically for this purpose.

If alternate enclosures are used mounting hardware is to be manufactured by the same company as the enclosure. Mounting hardware shall be as recommended by the manufacturer.

OUTDOOR FIBER ENCLOSURE

The proposed fiber enclosure shall be FIB-CEN-ESTC-12-S/TM Outdoor Fiber Enclosure as manufactured by Century Fiber Optics, or approved equal. The enclosure shall be constructed of heavy gauge aluminum and have the capacity to hold up to 12 fiber splices. It shall be designed to withstand outdoor environments, have lockable gasketed doors, and have stainless steel hinges.

The fiber enclosure shall be mounted inside a NEMA 3R aluminum cabinet, Model No. TC362015 as manufactured by APX Technologies, Inc. or approved equal. The box shall be mounted on a concrete foundation pad Type "1-M" as per 2007 NJDOT Standard Electrical Details.

MONITORING AND RECORDING EQUIPMENT

The equipment shall be as specified herein or approved equivalent:

Digital Video Monitoring System (DVMS)
The proposed DVMS shall be SRX-Pro 24024RA DVMS or approved equal. The total capacity of the digital disk recorders shall provide for the ultimate expansion of the system to up to 24 channels of video (16 Analog, 8 IP) and shall be capable of storing 24 hours per day of video for a minimum of 30 days from the fully expanded system.

The system shall be capable of future expansion for radio transmission of the surveillance footage to the Union County Police Department.

Computer
A host PC shall be provided to process the data from the DVR's and for the viewing of the archived data. The minimum requirements for this PC system shall be: Intel® Core 2 Duo E8400 Processor 3GHz or approved equal, 6MB L2 Cache, 1333 MHz front side bus, Genuine Windows® XP Home Edition or approved equal, 2GB DDR2 Non-ECC SDRAM 800MHz-2 DIMMs, 160GB SATA 3GB/s Hard Drive (5400RPM) and 8MB

DataBurst Cache™ or approved, 16X (DVD+/-RW) Burner Drive, Intel® Graphics Media Accelerator 3100 or approved equal, USB Keyboard, Optical Scroll Mouse, 19" flat panel monitor, 3 Year Basic Limited Warranty and 3 Year next business day onsite service (or comparable service).

A shelf shall be included with the mounting rack for the computer, monitor and appurtenances for the reviewing of the archived data.

Cabling
Cabling between the concession building and the DVMS at the YMCA building shall be a 6 stranded multimode 62.5 outdoor fiber optic cable. The cabling between the cameras and the fiber optic cable shall be a 4-pair, Cat5e, 350 MHz, CMR rated cable.

VIDEO TRANSMISSION SYSTEMS

The equipment shall be as specified herein or approved equivalent:

INFRARED CAMERA VIDEO TRANSMITTERS
The proposed transmitters/receivers for the infrared cameras shall be 404 Series four channel digital video multimode fiber transmitter/receiver as manufactured by American Fibertek, Inc. or approved equal.

LPR CAMERA VIDEO TRANSMITTERS
The proposed transmitters/receivers for the LPR cameras shall be 980 Series eight channel digital video multimode fiber transmitter/receiver as manufactured by American Fibertek, Inc. or approved equal.

705.03 CONSTRUCTION

SUPERVISION OF CONSTRUCTION PROCEDURES
It shall be the CONTRACTOR's responsibility to completely supervise and direct the work, using their best skill and attention. They shall be solely responsible for all construction means, techniques, sequence and procedures and for coordinating all portions of the work under the Contract.

The CONTRACTOR shall completely familiarize himself with the entire project, including the work of other trades, and shall coordinate their work with that of the other trades. The CONTRACTOR shall also familiarize himself with and conduct their work in accordance with other portions of the complete Contract Documents.

WORKMANSHIP
The entire installation shall be furnished and constructed in every part in a first-class, substantial and workmanlike manner, according to the full intent and meaning of the Drawings and Specifications. Everything necessary for the completion of the installation and successful operation thereof, whether the same be specified or not, or indicated on the Drawings, shall be furnished and finished in a manner corresponding with the rest of the work as faithfully as though the same were herein distinctly and specifically provided for. This is intended to refer to the smaller details necessary for a workmanlike job, but not usually specified or indicated on the Drawings.

The arrangement of the conduit, wiring and equipment shall be as shown on the Drawings. Detailed drawings of proposed installations shall be submitted to the ENGINEER for approval.

EXAMINATION OF THE SITE

The CONTRACTOR shall examine the site and observe the conditions under which the work will be done or other circumstances which will affect the contemplated work. No allowance will be made subsequently in this connection for any error or negligence on the CONTRACTOR's part.

STORAGE

The CONTRACTOR shall provide suitable storage facilities at the site for the proper protection and safe storage of their construction materials. All storage facilities shall be removed at the completion of the work, along with all unused materials and debris.

PROTECTION

All work, equipment and materials shall be protected at all times. All equipment, devices and components shall be tightly covered and protected during construction up to the time of operation. The protection shall be arranged and of such design as to prevent damage from dust, debris, plaster, pipe insulation materials, moisture, chemicals, etc. Where equipment is to be stored in unheated or damp areas, heating elements shall be temporarily installed within enclosures to prevent moisture damage.

All surfaces, either finished or in preparation for finishing, or finished material application, shall be protected against damage from welding, cutting, burning, soldering or similar construction functions. The protection shall be accomplished by care in operations, covering and shielding. Special care shall be directed to masonry, metal or wood surfaces and painted surfaces. Corrective measures required shall be accomplished by the trade which made the original installation, when and as directed by the ENGINEER, at the expense of the CONTRACTOR causing the damage.

The CONTRACTOR shall adequately cover and protect all fixtures until completion of the work. The CONTRACTOR shall be responsible for damage or breakage of fixtures, fixture lenses and other glass parts attached to or incidental to the electrical equipment. All such damaged items shall be replaced at no additional cost to the ENGINEER.

All exposed metal fittings, parts and devices shall either have a protective coating applied and maintained during the course of construction, or be masked out with masking tape.

All finished painted surfaces of electrical equipment shall be protected against plaster damage, paint spots, pipe insulation covering material, cement finish damage or other similar splashed contamination of the surface. All wiring devices installed before final painting is applied to the surfaces surrounding wiring devices shall be masked to prevent paint contamination. Wiring cover plates shall not be installed until the final coat of paint is applied to the surface.

The CONTRACTOR shall be held responsible for any and all damage which may be a result of transportation of material on or from the premises, the opening or blocking of streets, excavating for any purposes, or by neglecting to provide the proper lights, guards, barriers or any other safeguards that prevent damage to property or injury to persons.

The CONTRACTOR shall be held responsible for all damages to other work caused by their work or through the neglect of their workmen. All patching and repair of damaged work shall be done by the CONTRACTOR who installed the work, as directed by the ENGINEER, but the cost of the same shall be paid by the CONTRACTOR who is responsible for the damage.

705.04 MEASUREMENT AND PAYMENT

Item	*Pay Unit*
TRAIL SECURITY SYSTEM ALLOWANCE	ALLOWANCE

Measurement and payment for TRAIL SECURITY SYSTEM ALLOWANCE will be made based on the actual cost as evidenced by supporting records, itemized billing and copies of receipts. **An amount of one hundred thousand dollars and zero cents ($100,000.00) is established for this item and is included in the Proposal.**

This item also does not include provisions for payment related to any paperwork or damages caused by delays related to this item.

Measure and payment shall include all monitoring and recording system including computer, all labor, material and equipment, monitor, DVR recorder, mounting rack and hardware, conduit, video cable, battery backup, connection to existing power source, power and video surge protection, electrical wiring and devices, training, testing and all else necessary and incidental thereto to provide a fully functional system.

Measure and payment shall include all-weather high performance color/high contrast B/W dual license plate recognition cameras including all labor, materials and equipment, mounting brackets and hardware, RGS conduit, video cable, power supplies, connection to existing power source, power and video surge protection, electrical wiring and devices, testing and all else necessary and incidental thereto to provide a fully functional system.

Measure and payment shall include new all-weather vandal proof day/night infrared dome cameras including all labor, materials and equipment, mounting brackets and hardware, RGS conduit, video cable, power supplies, connection to existing power source, power and video surge protection, electrical wiring and devices, testing and all else necessary and incidental thereto to provide a fully functional system.

The above allowance is to be considered all inclusive and therefore shall include all labor, equipment and materials necessary for their completion and to provide a fully functional system.

THE FOLLOWING SECTION IS ADDED:

SECTION 706 – UNDERGROUND FULLY AUTOMATIC IRRIGATION SYSTEM

706.01 WORK INCLUDED

The Contractor shall install irrigation piping and sprinkler heads to achieve coverage on the grassed area of the open lawns, and landscape beds as indicated on the plans. Configuration and layout of sprinkler heads, timing, and other associated work will be the responsibility of the contractor. No separate payment will be made for design, or layout.

The contractor will be required to perform flow tests as necessary in order to provide hydraulic calculations to the Engineer. Should it be determined that pumping equipment will be necessary to provide the pressures needed to operate the system, same shall be included in the design

The contractor should note that the irrigation components indicated on the plans are a minimum requirement. The contractor should utilize the plans and details to design the irrigation layout. No separate payment will be made.

706.02 QUICK COUPLING VALVES

All quick coupler valves shall be installed on Schedule 80 swing joints as manufactured by Hunter Industries or approved equal. The quick coupler valve shall be installed plumb, even with finish grade level, with a Dura Quick Lock quick coupler stabilizer kit, or approved equal and in accordance with manufacturer's recommendations.

Backfilling around the swing joint and quick coupler valves shall be done by hand and with clean fill, free of large rocks, roots, or foreign debris. Care in tamping shall be taken not to damage the quick coupler valve.

The Contractor will guarantee all quick coupler valves to be level to grade for a period of one year from the date of completion. Any valves found to have settled or heaved shall be reset at the Contractor's expense.

706.03 IRRIGATION SYSTEM REQUIREMENTS

706.03.01 Installation

To install pipe, wire, valves, sprinklers, pumping equipment, controllers and all other appurtenances in strict accordance with the manufacturer's recommended procedures, standard industry practices and the Plans and Specifications.

The Contractor shall stake out all proposed lines prior to trenching operations. The location of said lines shall be approved by the Owner prior to trenching. Of particular importance is the location of sprinkler heads where prevailing winds, surface slope and special ground conditions must be taken into consideration. The final location of all sprinklers must be approved by the Owner or owners' representative. Configuration and layout of sprinkler heads, timing, and other associated work will be the responsibility of the contractor. No separate payment will be made for design, or layout.

The contractor will be required to perform flow tests as necessary in order to provide hydraulic calculations to the Engineer. Should it be determined that pumping equipment will be necessary to provide the pressures needed to operate the system, same shall be included in the design

706.03.02 Excavation of trench

The Contractor will do all necessary excavation required for the proper installation of the system. All equipment used for excavation, as well as material handling and transportation, are required to be equipped with rubber tires unless otherwise approved by the Owner.

Trenches are to be excavated to a depth sufficient to provide not less than EIGHTEEN INCHES (18") of covering over the pipe as measured from the top of the barrel of the pipe to the surface grade for 3" in diameter or greater. A covering of not less than TWELVE INCHES (12") will be required for pipe 2-1/2" and less. The trench is to be of sufficient width to allow soil to be tamped solidly under the pipe to provide firm continuous support for the pipe, and to allow for proper installation of pipe.

The bottom of the trench is to be graded to a line so that the pipe, as nearly as possible, will have bearing for its full length. All rock and organic material shall be removed from the trench bottom prior to placing of pipe. If rock is encountered in the excavation, the trench must be excavated an additional depth of six inches (6") and filled with suitable material. There will be at least six inches (6") of earth between the bottom or sides of the pipe and any rock. If unstable bedding material is encountered, it will be removed and replaced with suitable material supplied by the Contractor at additional cost to the Owner.

All crossings or paved areas shall be sleeved with steel pipe or PVC pipe as required by the local codes. Throughout the projects entirety, the Contractor will be responsible for all open excavations and, as a means of protection, shall keep protective devices at proper intervals along the excavation to protect the public from injury as may be required.

706.03.03 Pipe, Fittings, and Accessories

Pipe, fittings and accessories shall be handled in such a manner as to ensure delivery to the trench in sound, undamaged condition. If the coating or lining of any type of pipe or fitting is damaged, the repair shall be made by the Contractor, at their expense.

Pipe shall be carried into position, not dragged. The interior of the pipe, fittings and accessories shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations by plugging the open end or other approved methods.

Before installation, the pipe shall be inspected for defects. Rubber gaskets that are not to be installed immediately shall be stored in a cool dark place and out of the direct rays of the sun.

Cutting of the pipe shall be done in a neat and workmanlike manner. The edge shall be true and at right angles to the pipe. The end shall be reamed out to the original diameter of the pipe. Appropriate angle fittings must be used where the angle of pipe deflection is greater than five degrees off center.

Pipe, fittings and accessories shall be carefully lowered into the trench with suitable equipment. Under no conditions shall any of the water main materials be dropped or dumped into the trench. Care should be taken to avoid abrasion of pipe coating. The full length of each section of pipe shall rest solidly upon the pipe bed with recesses excavated to accommodate coupling and joints. Pipe that has the grade or joint disturbed after laying shall be taken up and relaid.

When work is not in progress, open ends of pipe, fittings and accessories shall be securely closed so that no earth or other substances can enter.

Pipe ends left for future connections shall be valved, plugged or capped. Where connections are made between the new work and existing mains, special fittings shall be used to suit the actual conditions. Standard methods are readily available for making connections to various types of pipe, either under pressure or in a dewatered condition. Where made under pressure, these connections shall be installed according to the recommendations of the manufacturer of the pipe being tapped.

Rubber gaskets shall be handled, lubricated where necessary and installed in accordance with the recommendations of the manufacturer.

The installation of steel couplings, cast iron couplings, mechanical joints and bolted joints shall be in accordance with the recommendations of the manufacturer.

Connections between different types of pipe, fittings and accessories shall be made with transition fittings recommended by the manufacturer.

During the installation of PVC pipe the installer shall provide safeguards against the problem of contraction of the PVC by "snaking" the pipe as much as possible in the trench according to manufacturer’s recommendations.

Where solvent weld joints are used, only the solvent and cleaner recommended by the pipe manufacturer should be used. The solvent weld joints shall be made in the following manner:

All pipe ends, inside of fittings and bell ends shall be completely cleaned with the recommended cleaner. The pipe end shall receive a liberal application of solvent (no solvent shall be applied to the inside of the fittings). The pipe and fitting shall be promptly joined, the pipe shall be pushed to the full extent of the fitting, then the pipe shall be turned 1/2 in the fitting to insure an even coating of solvent. All excess solvent shall be wiped off the pipe and fittings.

All pipe, fittings and accessories shall be installed in accordance with recommendations of the pipe manufacturer.

706.03.04 Thrust Block

Pipe up to 2 1/2" in diameter joined by Solvent Weld and or threaded connection do not require thrust blocking.

Any pipe 3" in diameter or greater requires thrust blocking, regardless of connection.

Concrete thrust blocks of adequate size must be provided on the thrust side whenever the pipe line.

a. changes direction (as at tees and bends)
b. changes size (as at reducers)
c. stops (as at a dead end, or valves)

Thrust blocks are to be made of concrete and placed between the fitting and the trench wall. The concrete shall be fresh and extend to the undisturbed (freshly cut) trench wall. The concrete mix shall consist of one part cement, two parts sand and three parts 3/4" clean gravel (washed sand and gravel should be used) and will be a dry or stiff mix (minimum amount of water). Mixing of concrete shall be according to manufacturer's recommendations.

On the smaller sizes of pipe, up to and including 4" pipe, the construction of horizontal thrust blocks requires only the simplest of forms; the stiff concrete is shaped to block a wedge with its widest part against solid trench wall; larger blocks require form construction at the sides to achieve proper bearing area with a minimum of concrete. In a stable clay soil, a 4" line will require 2 square feet of bearing area, a 6" pipe will require 6 square feet of bearing area, an 8" pipe will require 10 square feet of bearing area and a 10" pipe will require 16 square feet of bearing area.

If the ground is too soft to provide proper support for the thrust block, the Contractor will furnish and install clamps and tie rods for the retainment of the fitting.

706.03.05 Backfilling

Backfilling of all trenches shall progress as rapidly as the conditions of the work permit. Excavated material may be used for fill subject to the provisions of Section 202. Any imported backfill material required to complete backfilling shall be approved and shall be free of roots, wood scrap material, other vegetable matter, refuse, stones, organic or frozen materials. This shall be supplied by the Contractor at the Owner's expense.

In all areas, trenches shall be backfilled in two compacted layers to finish grade. Compaction shall be such that the original density of the material is obtained.

The Contractor will guarantee all trenches, disturbed areas and irrigation equipment to be free from heaving or settling more than 1/2" from the original grade. This "no settlement" clause shall extend over the entire period of the Contractor's guarantee.

706.03.06 Vibratory Plowing Pipe

The use of vibratory plowing will not be permitted.

706.03.07 Pipe crossings of roadways

When the irrigation pipe must be installed beneath a paved road other than the Owner's private road, the Owner shall contact and obtain the necessary permission of the agency or persons having jurisdiction. The Contractor shall install the pipe, sleeves, and wire as needed in accordance with the governing agency's guidelines. The Contractor shall pay for all costs incurred including road surface replacement or repair if pavement is removed or damaged by their operations.

706.03.08 Valves 1” to 2-1/2”

In line valves shall be installed in conjunction with the installation of the piping system. PVC Schedule 40 male adapters shall be used between valve and pipe. Valves shall be placed in an upright position on a layer of level bricks. (Bricks shall be solid paving type). Valves shall be housed in a Carson Valve Box (Part Number 1419-12-4) or approved equal. A snap lock unlocking tool (Number 14402) shall be provided the owner. The bottom of the valve box shall be cut to go over the pipe allowing the valve box to rest on the bricks. Each valve shall be installed in accordance with manufacturer's recommendations.

706.03.09 Valves 3” and larger

In line valves shall be installed in conjunction with the installation of the piping system. Gasket joints shall be pushed on to the pipe to the full extent of the fitting. Valves shall be placed on a concrete thrust block slightly larger than the valve. Two U-shaped 3/8" reinforcing rod shall be placed over the valve imbedded into the thrust block with the end of the rods bent to 90E and pointed towards the center of the valve. The valve shall be housed in a Carson Valve

Box (Part Number 1419-12-4) or approved equal. The valve box shall rest on the top of the valve. Each valve shall be installed in accordance with manufacturer's recommendations.

706.03.10 Sprinkler Heads

All sprinklers shall be installed on swing joints, and located in the irrigation areas as shown on the Plan. The sprinkler head shall be installed plumb, even with the finished grade level and in accordance with manufacturer's recommendations. All sprinkler head threaded connections shall be wrapped with teflon tape. The use of pipe dope is prohibited.

Backfilling around the swing joint and sprinklers shall be done by hand and with clean fill, free of large rocks, roots, or foreign debris. Care in tamping shall be taken not to damage sprinkler head.

The Contractor will guarantee all sprinkler heads to be level to grade for a period of one year from the date of completion. Any heads found to have settled or heaved shall be reset at the Contractor's expense.

Sprinkler heads to shall be manufactured by Hunter Industries or approved equal.

706.03.11 Quick Coupling Valves

All quick coupler valves shall be installed on Schedule 80 swing joints. The quick coupler valve shall be installed plumb, even with finish grade level, with a Dura Quick Lock quick coupler stabilizer kit, or approved equal and in accordance with manufacturer's recommendations.

Backfilling around the swing joint and quick coupler valves shall be done by hand and with clean fill, free of large rocks, roots, or foreign debris. Care in tamping shall be taken not to damage the quick coupler valve.

The Contractor will guarantee all quick coupler valves to be level to grade for a period of one year from the date of completion. Any valves found to have settled or heaved shall be reset at the Contractor's expense.

706.03.12 Wire

Do not yank, stretch, or excessively pull wire during installation. Provide a minimum of one foot of slack, in an expansion coil, in each 100 feet of wire. Lay wire on a firm, even bed in the trench, which shall support the wire its entire length. At splice locations, provide sufficient slack to allow the splice to be raised a minimum of 24" above grade for inspection. Take strict precautions to ensure that wires are not cut, scraped or nicked during installation. Do not lay wire above, or on top of, the pipe, except where pipe and wire are being vibratory plowed simultaneously.

Accurately locate the valve box with measurements on the drawing of record. All wiring shall be buried to a depth of at least 18" (minimum) and to the depth of the pipe when new pipe is installed. Wire splices shall be kept to an absolute minimum number.

NOTE: All wiring to be installed shall be sized and located as indicated on the wiring plans and/or described in the drawing notes and specifications.

When a central-satellite control system is installed the pulse wire(s) shall be of a different color(s) than the 115 V.A.C. power wires.

If and when multiple pulse wires are required, these wires shall also be of different colors, so that no two 115 V.A.C. pulse wires shall be of the same color. Pulse wires shall be of different colors than those of the 115 V.A.C. power wiring.

All 115 V.A.C. power and pulse wiring and all valve wiring shall be bundled, taped at minimum intervals of approximately 10' and laid in the trench to the side of the pipeline.

Splice all wires to requirements of local wire code regulations or to the manufacturer's Specifications, whichever is more restrictive. Make all splices by baring a minimum of three-quarters inch of copper conductor, twisting the leads together. Water proof connectors which are UL listed are acceptable. Make the splice using wire nuts and connector kits in strict accordance with manufacturer's recommendations, especially concerning ambient temperatures during installation.

Only one splice shall be put in a splice kit. All splices not located at sprinkler heads, isolation valves or controller sites shall be placed in a valve box as manufactured by Carson Part No.910-10-4 or approved equal. The contractor is to accurately mark the locations on the As-Built drawings. Power and pulse wires shall be laid in continuous paths with minimal splices.

Splice kits shall be UL listed for waterproof use and as manufactured by 3M or approved equal, specifically "Scotch Lock" and "DBR" kits shall be used in accordance with manufacturers recommendations.

706.03.13 Pipe

All PVC pipe from size 3/4" to 2" shall be belled end solvent weld pipe conforming to the National Sanitation Foundation (NSF) standards for potable water pipe. The pipe shall be class 200, and have a Standard Dimension Ratio (SDR) classification of 21.

All PVC pipe from size 2-1/2" to 14" shall be gasketed joint, all pipe shall be of the "integral bell" gasket joint so as to reduce chance of installation error. All pipe shall conform to the National Sanitation Foundation (NSF) standards for potable water pipe. The pipe shall be Class 200, and have a standard dimension ratio (SDR) classification of 21.

706.03.14 Fittings

All fittings for pipe from size 3/4" to 2" shall be of the solvent weld type schedule 40 structure for use with potable water. All solvent connections shall be made with a primer and solvent as recommended by the manufacturer.

All fittings for pipe from size 2-1/2" to 14" shall be of ductile iron grade 65-45-12 ,which meets or exceeds ASTM A536-80 as manufactured by Harrington Corporation or approved equal. The gasket shall be of virgin SBR which meets or exceeds ASTM F477. The Fitting and shall be pressure rated at 350 PSI.

Galvanized fittings shall be of the galvanized malleable iron type and shall be a minimum of Schedule 40 and installed in accordance with manufacturer's recommendations.

706.03.15 Swing Joints

Sprinkler head and quick coupler swing joints shall be manufactured by Hunter Industries., or approved equal. Each swing joint shall be of Schedule 80 PVC construction, with a double "O" ring seal at each "swing" joint for sealed flexibility. Risers and extensions shall be of no less than Schedule 80 PVC construction and shall be assembled using PVC solvent as per manufacturers recommendations.

Swing joints shall be of the same IPS thread size as the valve or sprinkler they are connecting. No street ells or close nipples shall be used. The swing joint risers and nipple lengths shall be of a sufficient size to allow for a minimum of 4 inch swing above and below the finished grade and in accordance with manufacturer's recommendations.

706.03.16 115 V.A.C. Power Wiring

All wiring shall have a copper conductor with 600 V.A.C. rated polyethylene (PE) or polyvinyl chloride (PVC) UF rated insulation. All 115 V.A.C. electric power wiring shall be installed in accordance with applicable electric installation codes. 115 V.A.C. service to controller shall be a two conductor with ground for wire size 14-2 through 6-2. Larger wire shall consist of one black, one white and one ground wire.

706.03.17 24 V.A.C. Power Wiring

Control wiring for the 24 V.A.C. remote control irrigation valves shall be single strand copper wire with UF polyethylene insulation rated for a minimum of 300 V.A.C.. All control wiring shall have a soft drawn single strand copper conductor of the color specified as follows.

Valve common wires shall be AWG wire with white insulation, while control wires to the valves shall be AWG wire with red insulation wire sizes as indicated on the Bill of Materials. These color assignments shall be adhered to unless otherwise specified.

All wire shall be manufactured by Paige Electric or Approved Equal.

706.03.18 Sleeving beneath paved areas

Sleeving for pipe and wire under paved areas shall be provided and installed by the Contractor. This sleeving shall conform to all local and/or national building codes regarding water pipe and electrical conduit.

706.03.19 Valve

Valves shall be of gate type construction rated for a minimum of 200 PSI. All gate valves shall be of brass construction and provided with female I.P.S. threaded inlets as manufactured by Nibco, Inc. or approved equal.

Gate valves as manufactured by Matco or Waterous shall conform to the American Water Works Association Standard C500-61. They shall be of the non-rising stem type with cast iron body and with seats, wedge and stem of bronze.

706.03.20 Valve Boxes

Access to isolation and drain valves shall be provided by Carson plastic 10" or 12" valve boxes, with cover model 910-10-4 or 1419-12-4 or equal. Wire splices not associated with satellite controllers shall be housed in a Valve box as indicated above.

706.03.21 Submittals

Contractor shall deliver six (6) copies prior to the start of the job a complete design showing head placement, piping, pipe sizes, valve locations, backflow prevention assembly, quick coupler, pump station, if necessary; controller and timer location for Engineer's review. Contractor shall also deliver catalog cut sheets as well as exploded parts breakdowns and price lists of the following items. (Deliver six copies).

1. Pump Station (If Necessary)
2. Sprinkler Heads
3. Valves
4. Valve Boxes
5. Electrical Splices
6. Lateral Pipe
7. Lateral Fitting
8. Control Wire
9. Quick Coupler
10. Swing Joints

706.03.22 Water As-Builts

Upon completion of all construction of the water systems, as-built drawings shall be provided to the owner and engineer. As-builts shall include all physical locations, horizontal and vertical, of installed water components including, but not limited to, the irrigation main, bends, valves, irrigation lines, sprinkler heads, cam lock quick couplers, and all other associated components.

706.03.23 Controller and Rain Sensor

The contractor shall install a fully automatic irrigation controller and rain sensor manufactured by Hunter Industries, or approved equal. The contractor shall coordinate the final location of the automatic irrigation controller with the engineer. The rain sensor shall be installed near the irrigation control area and shall be indicated on the as-built drawing.

706.04 MEASUREMENT AND PAYMENT

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
FURNISH AND INSTALL FULLY AUTOMATIC IRRIGATION SYSTEM FOR ALL OPEN LAWNS AND LANDSCAPED BEDS WHERE INDICATED, INCLUDING LATERALS, HEADS, FITTINGS, NOZZLES, BOOSTER PUMPS, IRRIGATION CONTROLLER, IRRIGATION MAIN, UTILITY CONNECTIONS, ELECTRICAL CIRCUIT AND ALL HARDWARE NECESSARY FOR A COMPLETE INSTALLATION	LUMP SUM

Payment for furnishing and installing the fully automatic irrigation system including laterals, heads, fittings, nozzles, backflow preventer, booster pumps, irrigation controller, irrigation main, utility connections, electrical circuit and all hardware necessary for a complete installation will be made at the lump sum price bid for said items as listed in the bid form.

No separate payment will be made for the design/layout of the system, laterals, heads, fittings, nozzles, backflow preventer, irrigation controller, irrigation main, utility connections, electrical circuit and all hardware and labor necessary for a complete installation.

Separate payment will not be made for furnishing and delivering the irrigation as-builts. Payment shall be included in the prices bid for all items requiring same.

TABLE OF CONTENTS

DIVISION 800 – LANDSCAPING

SECTION	
801	SELECTIVE VEGETATION REMOVAL
802	TRIMMING AND REMOVING TREES
803	PREPARATION OF EXISTING SOIL
804	TOPSOIL SPREADING
806	FERTILIZING AND SEEDING
807	TOPSOIL STABILIZATION
809	MULCHING
811	PLANTING

SECTION 801 – SELECTIVE VEGETATION REMOVAL

801.01 DESCRIPTION

THE FOLLOWING IS ADDED:

Requirements for the cutting, removal and legal disposal of existing trees / vegetation shall be in accordance with the methods of this Section and Section 802 of these Specifications.

The work covered under this Section of the Specifications includes furnishing all facilities, labor, supplies, tools, equipment, appliances, appurtenant devices, transportation, supervision, and materials, and performing all operations in connection with clearing the ground, within the limits indicated, of trees, brush, stumps, rubbish, and all objectionable materials in accordance with the Drawings and Specifications.

The Contractor will be responsible to remove all dead or fallen trees, debris, undergrowth, vegetation, scrub, brush, removal and /or grinding of stumps / roots; backfill all stump / root removal areas, branch pruning including all other associated work within the limit of disturbance.

The Contractor shall maintain the site in a clean and orderly condition at all times during the project and their time on the site. The Contractor shall be responsible for the cleaning up of the job site upon completion of work to the satisfaction of the Owner.

801.02 MATERIALS

801.03 CONSTRUCTION

THE FOLLOWING SUBSECTION IS ADDED:

801.03.01 Selective Thinning

801.03.02 Selective Clearing

THE FOLLOWING IS ADDED:

The Contractor shall notify the Engineer 3 days before beginning work. The Engineer will designate trees, shrubs and other vegetation to be removed within the designated areas. Ensure that work is supervised by a skilled person. At least 7 days before beginning the work, submit the name and qualifications to the Engineer for approval.

THE FOLLOWING SUBSECTION IS ADDED:

801.03.03 Application of Herbicides

Comply with the requirements and procedures of N.J.A.C. 7:30-1 Et. Seq. for the application of herbicides.

809.04 MEASUREMENT AND PAYMENT

Delete the entire text of this Article and substitute the following:

The Department will measure and make payment for Items as follows:

Item	*Pay Unit*
SELECTIVE CLEARING	SQUARE YARD
SELECTIVE THINNING	SQUARE YARD

Measurement and payment for “Selective Clearing” shall include clearing and grubbing of all vegetation including shrubs, roots, trees, branches, stumps, and debris located within the limit of disturbance.

Measurement and payment for “Selective Clearing” shall include the cutting and removal of various size trees as denoted, including stump and root removal and backfill of suitable material. The Contractor shall verify all trees to be removed with the Engineer and County personnel prior to removal.

Measurement and payment for "Selective Thinning" shall include the pruning of trees at locations as directed by the County and Engineer. The Contractor shall verify all trees to be pruned with the Engineer and County prior to pruning.

The Contractor is herein advised that the item for "Selective Clearing" does not distinguish between the various caliper trees that may have to be removed under this Contract. The Contractor shall, therefore, take this into consideration when bidding this item.

The Contractor is directed to verify all necessary tree removals with the engineer prior to beginning any tree removal work. The Contractor is advised that the individual locations of existing trees on the plans are approximate and are not guaranteed as to accuracy, nor can they be assumed to be the only trees within the project limits.

The Department will not make payment for backfill with suitable excavated materials from the project.

The legal disposal of the removed materials shall be the sole responsibility of the Contractor.

SECTION 802 – TRIMMING AND REMOVING TREES

802.01 DESCRIPTION
THE FOLLOWING IS ADDED:

No areas outside the clearing limits are to be disturbed without prior approval. The Contractor shall ascertain the limits of work for the project. This responsibility shall rest solely on the Contractor.

The Contractor shall maintain the site in a clean and orderly condition at all times during the project and their time on the site. The Contractor shall be responsible for the cleaning up of the job site upon completion of work to the satisfaction of the Owner.

All removed material shall be satisfactorily removed and legally disposed of off the site. Timber may be chipped. Only if and where requested by Owner's representatives, some of the chipped material shall become the property of the Owner and shall be hauled by the Contractor to a location provided by the Owner on-site. The quality of the wood chips shall be accepted by the Owner. If all or some of the chipped material is not to be used by the Owner, the wood chips shall be legally disposed of by the Contractor off the site.

802.02 MATERIALS

802.03 CONSTRUCTION

802.03.01 Trimming Existing Trees
THE FOLLOWING IS ADDED:

Comply with the requirements and procedures of N.J.A.C. 7:30-1 Et. Seq. for the application of herbicides.

802.03.02 Tree Removal

THE SECOND PARAGRAPH IS DELETED AND THE FOLLOWING SUBPARTS ARE ADDED:

Project Conditions

A. Protection of Existing Improvements: Provide protections necessary to prevent damage to existing improvements indicated to remain in place.

1. Protect improvements on adjoining properties and on Owner's property.

2. Prevent damage to all pipes, structures, conduits, wires, cable, property or improvements above or below ground. Do not remove land monuments, property markers, or official datum points until an authorized agent has witnessed or otherwise referenced their location and approved their removal.

3. Control operations to prevent damage to trees and shrubs, which are to be preserved. Protection may include fences and boards lashed to trees, and the use of "rub" trees to prevent damage from skidding or machine operations.

4. Restore damaged improvements to their original condition, as acceptable to property Owners.

B. Protection of Existing Trees and Vegetation: Protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide silt fence as needed to protect trees and vegetation to be left standing.

1. Provide protection for roots over 1-1/2 inch diameter that are cut during construction operations. Coat cut faces with emulsified asphalt, or other acceptable coating, formulated for use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out; cover with earth as soon as possible.

2. Repair trees and vegetation indicated to remain, which are damaged by construction operations, in a manner acceptable to Owner. Employ a licensed arborist to repair damages to trees and shrubs.

3. Replace trees, which cannot be repaired and restored to full-growth status, as determined by arborist.

Tree Protection and Trimming

A. Trees to remain shall be protected from damage. The Contractor shall employ a qualified arborist to ensure proper protection of key trees is provided to recognized standards and to certify that where damage does occur, trees are promptly and properly treated.

The arborist shall have successfully completed tree protection and trimming, and perform the following work:

1. Remove branches from remaining trees, as required.
2. Recommend procedures for protection and care of existing trees.
3. Perform tree repair work for damage incurred by new construction.

B. At the direction of the Owner's representatives, key trees shall be encircled with construction or silt fence to protect them from damage. Construction fence shall remain in place until commencement of finish work in that area.

Stump Removal

A. The Contractor shall remove all stumps and buttress roots in their entirely as designated by the Owner's representatives. Additionally, the Contractor shall remove all surface and adjacent subsurface roots as may be necessary to eliminate "humps" or mounds in the ground adjacent to the stump. The Contractor will be responsible for backfilling of removed stump holes to eliminate depressions with 6" thick topsoil including clean fill material below the topsoil layer, where applicable.

Disposal of Materials

A. Burning of brush materials will not be permitted on the project site.

B. Remove all trash, waste materials, logs, stumps, roots, trees and branches from the project site and legally dispose of same off-site.

C. Wood chips shall be removed from the site unless approved for use on-site by the Owner.

Sucker Growth

A. In the event that adventitious (sucker) growth should occur, the Contractor shall be responsible for regrinding to eliminate sucker growth for a period of one year after initial grinding. Regrinds must be restored to grade and reseeded at no additional cost to the Owner. Care shall be taken not to damage other trees, shrubs, turf areas, paths and sprinklers during regrinding and restoration operations.

THE FOLLOWING IS ADDED:

Comply with the requirements and procedures of N.J.A.C. 7:30-1 Et. Seq. for the application of herbicides.

Remove trees and shrubs that interfere with the construction of the various items. Backfill stump holes with Dense Graded Aggregate within proposed pavement area, curb and sidewalk areas.

802.04 MEASUREMENT AND PAYMENT
THIS SUBSECTION IS CHANGED TO:

Separate Measurement and Payment shall not be made for Trimming and Removal of Trees. Measurement and Payment shall be included in the unit price bid for "Selective Clearing".

SECTION 803 – PREPARATION OF EXISTING SOIL

803.01 DESCRIPTION

803.02 MATERIALS

803.03 CONSTRUCTION

803.04 MEASUREMENT AND PAYMENT
DELETE THE ENTIRE TEXT OF THIS SUBSECTION AND THE FOLLOWING ITEM IS ADDED:

Separate Measurement and Payment shall not be made for Preparation of Existing Soil. Measurement and Payment shall be included in the unit price bid for items requiring same.

SECTION 804 – TOPSOIL SPREADING

804.01 DESCRIPTION

THIS SUBSECTION IS CHANGED TO:

This section describes the requirements for preparing and placing topsoil stripped from the project site if deemed acceptable for use as topsoil. This Section also describes the requirement for preparing, screening and placing topsoil imported from off-site approved sources.

This work shall also consist of the fine grading of all disturbed areas.

804.02 MATERIALS
THE FOLLOWING IS ADDED:

Engineered soil shall be a uniform mix, free of stones, stumps, roots, hard clods, sods or other similar objects larger than one inch. No other materials or substances shall be mixed or dumped within the green infrastructure area that may be harmful to plant growth or prove hindrance to the planting or maintenance operations. The engineered soil shall be free of noxious weeds. Engineered soil shall be free from lime, cement, ashes, slag, concrete, tar residues, tarred paper, boards, chips, sticks, glass or any other undesirable material. The engineered soil shall consist of 85% to 95% sand by weight, with

no more than 20% of the sand as fine or very fine sands; and no more than 15% combined silt and clay with 2% to 5% clay content. The entire aggregate mix must then be amended with 3% to 6% organic matter by weight. Organic content shall be mature (carbon/nitrogen ratio (c:n) less than or equal to 25) and from plant based materials. Manure and biosolids (e.g. sludge) based organic content shall not be utilized. The phosphorus content of the soil bed material should not be excessive, available p by mehlich-3 method should be between 25 to 100 mg/kg. The cation exchange capacity (cec) shall be greater than or equal to 5 milliequivalents/100g dry soil. The soil bed material shall have a minimum infiltration rate (ksat) of at least 2 inches/hour at 85% of maximum dry density. The soil bed material shall be placed in lifts not to exceed 8 inches. The pH of the in place soil bed material shall range from 5.5 to 8.0.

The Contractor shall furnish all required Borrow Topsoil from off-site sources as necessary to complete the project.

Borrow Topsoil shall be "fine sandy loam" or "sandy loam" determined by mechanical analysis (ASTM D-422) and based on the "USDA Classification System". Screened Sandy Loam has the following mechanical analysis:

Textural Class	Percentage of Total Weight	Average Percentage
Sand (0.05-2.0mm)	55-85	70
Silt (0.002-0.05mm)	15-35	25
Clay (less than 0.002mm)	5-10	5

Screened Sandy Loam shall be a natural product consisting primarily of natural topsoil, free from subsoil, and obtained from an area that has never been stripped, as noted above, the location of the source of the loam must be submitted to the Owner. Screened Sandy Loam shall not contain less than five percent (5%) nor more than ten percent (10%) organic matter as determined by the loss on ignition of oven dried samples at 100 degrees C. To adjust organic matter content, the soil may be amended prior to site delivery by the addition of composted leaf mold or peat moss. Use of organic amendments is accepted only if random soil sampling indicates a thorough incorporation of these materials. No missing or mending of Sandy Loam will be permitted on-site. The Sandy Loam shall not be delivered in wet or frozen condition.

Screened Sandy Loam shall consist of fertile, friable, natural loam capable of sustaining vigorous plant growth. Sandy Loam shall be without admixture of subsoil and refuse resulting in a homogenous material free of stones greater than 1/2" in the longest dimension, be free of lumps, plants, glass, roots, sticks, excessive stone content, debris, and extraneous matter as determined by the Owner. Screened Sandy Loam shall be within the pH range of 5.5-6.5. It shall be uncontaminated by salt water, foreign matter and substances harmful to plant growth. The maximum soluble salt index shall be 100. Screened Sandy Loam shall not have levels of aluminum greater than 200 parts per million.

The Contractor will be required to provide enough limestone to amend the soil to a pH of 5.5 to 6.5.

The Owner will reject any material delivered to the site that does not meet these specifications after post-delivery testing. If the delivered screened Sandy Loam does not meet the specifications, it shall be immediately removed by the Contractor at his expense.

Sandy Loam shall not be handled or moved in a wet or frozen condition. Sandy Loam structure shall not be destroyed through excessive handling or compaction. Inappropriate handling leading to the deterioration of the soil structure will result in rejection of the soil for use.

804.03 CONSTRUCTION

804.03.01 Topsoil Spreading

Add the following text to this Article of the Standard Specifications:

Thoroughly clear all sticks, roots, branches, coarse sods, and other deleterious matter, and all stones larger than 1 inch in diameter from all topsoil before spreading it. Do not handle or spread topsoil when it is in a frozen or muddy condition, or otherwise unsuitable for handling.

If on-site stripped topsoil is deemed acceptable, Contractor shall remove all stones equal to or larger than 1/2 inch in any dimension and other debris such as tree roots, clods, lumps, wires, cables, piece of concrete, piece of asphalt and other deleterious substances. Add pulverized limestone at the rate of 100 lbs. per 1,000 square feet to all replaced topsoil, on-site and off-site. Import screened topsoil in excess of that obtained from stripping.

Do not spread topsoil before completion of all construction in the area or before all fills are fully stabilized, or before a sample has been submitted and approved by the Engineer. Before spreading topsoil, clear all stones & debris from the subgrade. Pulverize to a depth of 3 inches by plowing or other methods acceptable to the Engineer any portions of the subgrade which have been compacted to a hard surface.

804.03.02 Borrow Topsoil

804.04 MEASUREMENT AND PAYMENT

Delete the entire text of this Subsection and substitute the following:

The Department will measure and make payment for Items as follow:

Item	*Pay Unit*
TOPSOIL SPREADING, 4" THICK	SQUARE YARD
BORROW TOPSOIL (IF AND WHERE DIRECTED)	CUBIC YARD

Separate measurement and payment will not be made for Borrow Topsoil as required for the construction of other improvements specified in the contract documents. This work will be included in the unit price bid for each item requiring the same as listed in the Bid Form.

Where deemed necessary by the Engineer and the County, the Contractor shall provide borrow topsoil material to be used to supplement topsoil or where there is a deficient amount of stripped topsoil from the site.

Payment for furnishing and installing Borrow Topsoil material, specifically ordered by the Engineer, shall be based on the unit price bid per cubic yard as listed in the Bid Form; for the loam material ordered and actually installed to the satisfaction of the Engineer.

The unit price for Borrow Topsoil shall include fine grading of the subgrade, the cost of all materials, equipment, labor and all else necessary to satisfactorily complete the work specified above to the satisfaction of the Engineer.

Measurement for payment shall be based on the in-place measurement of the completed work as measured by the Engineer.

SECTION 806 – FERTILIZING AND SEEDING

806.01 DESCRIPTION

806.02 MATERIALS

806.03 CONSTRUCTION

806.04 MEASUREMENT AND PAYMENT

Delete the entire text of this Subsection and substitute the following:

Item	*Pay Unit*
FERTILIZING AND SEEDING, TYPE D	SQUARE YARD

Item	*Pay Unit*
FERTILIZING AND SEEDING, MODIFIED ERNMX-123	SQUARE YARD
FERTILIZING AND SEEDING, MODIFIED ERNMX-122	SQUARE YARD
FERTILIZING AND SEEDING, MODIFIED ERNMX-280	SQUARE YARD

Measurement and payment for fertilizing and seeding shall be made commensurate with the percentage of work completed and the area in which the Contractor has established a satisfactory stand of grass.

Payment will not be made for areas disturbed by construction operations beyond the prescribed grading limits.

SECTION 807 – TOPSOIL STABILIZATION

807.01 DESCRIPTION

807.02 MATERIALS

807.03 CONSTRUCTION

807.04 MEASUREMENT AND PAYMENT

The following text is added to the specifications:

The Department will measure and make payment for Items as follow:

Item	*Pay Unit*
TOPSOIL STABILIZATION, TYPE 1 MAT	SQUARE YARD

SECTION 809 - MULCHING

809.01 DESCRIPTION

809.02 MATERIALS

809.03 CONSTRUCTION

809.04 MEASUREMENT AND PAYMENT

This Subsection of the Standard Specifications is amended as follows:

Separate measurement and payment will not be made for wood mulching. All costs shall be included in the price bid for plant material.

The Department will measure and make payment for Items as follow:

Item	*Pay Unit*
STRAW MULCHING (IF AND WHERE DIRECTED)	SQUARE YARD

SECTION 811 – PLANTING

811.01 DESCRIPTION

All plant material shall be purchased, transported, and installed where indicated on the construction drawings and as directed by the Engineer in a healthy, vigorous, and undamaged condition. The planting contractor will provide the Owner with a guarantee for the health and survival of all trees planted in this contract throughout the period of the Maintenance Bond (2 years) following the final acceptance of the contract. Stakes must be removed after one (1) year.

811.02 MATERIALS

THE FOLLOWING IS ADDED:

All plant materials used shall be true to name and size in conformity with the American Standard of Nursery Stock and shall be typical of their species or variety. All plants shall have normal well-developed branches, a strong central leader free of defects and vigorous root systems. They shall be sound, healthy, vigorous and free from defects, disfiguring knots, stress, drought abrasions of the bark, sunscald injuries, plant diseases, insect eggs, borers and all other forms of infection. All plants must be accompanied by a Nursery Certificate or Plant Dealer certificate to confirm nursery stock certification by the New Jersey Department of Agriculture (NJSA4: 7-15 et seq.) for the Owner's files.

A. Standard #1 (Ed Gilman University of Florida) shall be used to evaluate the minimal acceptable diagram outlines of the following: *
   1. Rootball soil firmness
   2. Good/strong, straight tree trunk taper
   3. Good quality tree crown shapes
   4. The highest quality tree trunk forms
   5. Good quality tree branch scaffold spacing

B. Standard #1 diagrams outlines of the following: *
   1. Unacceptable tree trunk forms
   2. Unacceptable loose rootball soil
   3. Unacceptable poor quality crown shapes
   4. Unacceptable poor/weak tree trunk taper
   5. Unacceptable poor quality tree branch scaffold spacing

All plants are to be protected during storage period and not allowed to dry out. Plants shall be installed on the day of arrival at the site.

Contractor is to provide the Engineer with the location of nurseries where plants are to be purchased from or stored and plants to be purchased are to be tagged for inspection by the Engineer (if feasible) prior to digging and delivery to the site. All plant material is subject to review and approval by the Engineer upon arrival at the site, prior to installation.

All plant material and sizes are specified on the landscaping plan. No substitutes shall be made without specific approval of the Engineer.

Topsoil used in planting pits and for backfilling for trees and shrubs shall be fertile agricultural soil, capable of sustaining vigorous plant growth and shall have a pH of five point five (5.5) to six point five (6.5). It shall have uniform composition, be free from large stones, wood and other foreign objects and shall not contain substances toxic to plant growth. Planting pit and backfilling material shall not be used unless it meets this requirement. All planting pit backfill material shall be in compliance with same as identified on the set of construction drawings.

A backfill soil amendment is required to be added to each tree's planting pit as follows:

A. Granular form or tablets:
   1. Bio-stimulants
   2. Organic matter
   3. Hydrogel type
   4. Ectomycorrhizal fungi

5. Endomcorrhizal fungi
6. The approved soil amendment formula (granular or tab) will be layered into planting pit soil backfill at 1/3 to1/2 the depth of the root ball. The manufacturer's label description of the soil amendment and hydrogel must be submitted for review and approval prior to planting. Deviations from the mandated soil amendment specifications noted above in Soil Amendment A, one through five will not be permitted.

811.03 CONSTRUCTION

811.03.01 Planting

I. Watering.

DELETE THE ENTIRE TEXT OF THIS SUBSECTION AND SUBSTITUTE THE FOLLOWING:

Water plants with sufficient frequency and quantity to ensure that the soil surrounding the root system remains moist but not saturated.

THE FOLLOWING SUBHEADING IS ADDED:

O. Wrapping.

Wrap all deciduous trees more than 2 inches in caliper. Wind burlap wrapping material or creped kraft paper from ground line to six (6) inches above the lowest main branches. Tie wrapping material at the bottom and at the top and at maximum 24-inches intervals between. Wrap within 4 days after planting but not before the condition of the trunks has been inspected by the RE.

THE FOLLOWING SUBSECTIONS ARE ADDED:

811.03.01 Planting

O. Planting Season

Planting shall normally be undertaken when the soil is free of frost and friable, unless otherwise specified. No planting shall be done during abnormally hot weather. The time of planting, however, shall be agreed upon at the conference between the Engineer, Project Engineer and the Contractor, and a specific schedule shall be set up.

Deciduous trees and all evergreens over six (6) feet tall shall be staked if necessary. This should be done according to current Nursery and Arboricultural standards as indicated on the construction drawings and used in the following manner.

STAKES SHOULD ONLY BE INSTALLED IF NECESSARY.

A. Two (2) stakes shall be driven a minimum of two (2) feet into the soil and outside the planting pit if possible.

B. Stakes, when driven, must be one-half (1/2) to two-thirds (2/3) the height of the tree measured from ground level.

C. Stakes shall be a minimum of three (3) inches in diameter at the thick end, hardwood or cedar posts.

D. Stakes shall be placed in line with the prevailing winds when possible.

E. Stakes shall be attached to the tree with any of the commercially available synthetic material designed specifically for trees such as "arbor tie".

F. All stakes and ties shall be removed by the Contractor not less than twelve (12) months nor more than eighteen (18) months from the time of planting. No portion of any maintenance bond will be released until the Contractor has removed all the stakes and ties.

P. Protection During Transportation

Trees shall be protected from dying and breakage due to wind during transportation. Trees may be transported in a covered van or on an open flatbed with tarp tightly tied so that the tarps do not flap or rebound more than four (4) inches at highway speeds.

Tree root balls shall be thoroughly watered immediately prior to transport.

Tree root balls shall be thoroughly watered immediately upon completion of unloading.

Trees shall be sufficiently watered daily until planted to prevent desiccation.

Q. Plant Installation

1. The diameter of all planting pits shall be at least one and two-thirds (1 2/3) larger than the ball diameter. In areas of poor soil or where trees are placed between sidewalk and curb the planting pit is to be four (4) times greater than the ball diameter. Topsoil meeting the requirement of the section labeled (soil) shall be provided at a minimum depth of six (6) inches below the ball or root system. The pit for bare root trees and shrubs must be at least six (6) inches deeper than existing roots and twelve (12) inches wider.

2. Plants shall be planted so the trunk flare is slightly above finished grade. At no time shall the plants be set lower then finished grade. All soil in the planting pits shall be firmed to prevent air pockets and settling.

3. After balled and burlapped plants are set at the proper level in the holes, all cord and burlap shall be untied from the trunk and removed from the planting pit. Synthetic non-biodegradable ties shall be removed from the ball and planting pit prior to backfill. Remove all burlap and rope from the top 2/3 of the root ball. All wire and wire baskets, shall be entirely removed at the time of planting prior to backfill. All plants shall be backfilled with topsoil that meets the requirements noted above. All plants shall be thoroughly watered in at the time of planting to prevent air pockets and settling. Watering for plant survival shall be the Contractor's responsibility until final acceptance of the project by the Owner.

4. After materials are planted, all damaged branches shall be removed by pruning utilizing the current standards of the American Association of Nurserymen and the National Arborist Association recommendations. No other pruning is permitted. All nursery tags should be removed following inspection and approval by the Engineer.

5. All newly planted trees shall be fertilized as directed by the Engineer or Owner.

Caliper indicates diameter of a tree trunk measured, in inches, six (6) inches above ground level for trees up to four (4) inches, and at twelve (12) inches above ground level for larger trees over four (4) inches. Ground level refers to the ground level of the tree or plant at the time of digging in the nursery, otherwise known as the "root collar."

A three (3) inch minimum layer of organic mulch shall be applied around each individual tree, except next to the trunk where no mulch is to be placed. The mulch around the tree must be saucer-shaped with the concave depression located nearest the trunk as indicated on the construction drawings.

All "mulch" shall be considered any material, organic in nature, composted, that is not readily subject to movement by wind or water.

Wood chips, partially decayed or nitrogen enriched, may be used. New chips are not acceptable due to the nitrogen depletion by bacteria from the soil preventing use of nitrogen by the plant. Treated triple shredded hardwood mulch is recommended.

Deer protection shall be provided around the trunks of all single stem deciduous trees as per the Deciduous Tree Planting Detail within the plans, if and when directed by the Engineer. The deer protection shall be A.M. Leonard Rigid Mesh Tree Bark Protectors, Model: BG48, (48" high), from A.M. Leonard Horticultural Supply Company, or approved equal. Tree bark protectors shall not be required on any multi-stem deciduous ornamental trees or shrubs. The tree bark protectors shall be cut down to size if necessary and shall be affixed with jute in three (3) locations: top, bottom and center.

811.04 MEASUREMENT AND PAYMENT

Delete the entire text of this Subsection and substitute the following:

Item	*Pay Unit*
RIVER BIRCH, 2"-2.5" CAL., B&B, 8'-10' HT.	UNIT
SWEETSHADE YELLOWWOOD, 2"-2.5" CAL., B&B, 8'-10' HT.	UNIT
BLACKGUM, 2.5"-3" CAL., B&B, 8' - 10' HT.	UNIT
SWAMP WHITE OAK, 2"-2.5" CAL., B&B, 8' - 10' HT.	UNIT
SPLENDID RED BUCKEYE 2"-2.5" CAL., B&B, 7' - 8' HT.	UNIT
AMERICAN HORNBEAM 2"-2.5" CAL., B&B, 7' - 8' HT.	UNIT
FOREST PANSY EASTERN REDBUD 2"-2.5" CAL., B&B, 7' - 8' HT.	UNIT
GREEN SHADOW SWEETBAY MAGNOLIA 2"-2.5" CAL., B&B, 7' - 8' HT.	UNIT
SASSAFRAS 2"-2.5" CAL., B&B, 7' - 8' HT.	UNIT
LEYLAND CYPRESS, B&B, 8' - 10' HT.	UNIT
AMERICAN HOLLY, B&B, 8' - 10' HT.	UNIT
CORCORCOR EASTERN RED CEDAR, B&B, 8' - 10' HT.	UNIT
BRACKEN'S BROWN BEAUTY SOUTHERN MAGNOLIA, B&B, 7'-8" HT.	UNIT
LITTLE GEM SOUTHERN MAGNOLIA, B&B, 7'-8" HT.	UNIT
BOTTLEBRUSH BUCKEYE, #5 CAN, 30"-36" HT.	UNIT
HUMMINGBIRD SUMMERSWEET, #3 CAN, 18"-24" HT.	UNIT
DWARF FOTHERGILLA, #3 CAN, 18"-24" HT.	UNIT
INKBERRY HOLLY, #5 CAN, 30"-36" HT.	UNIT
SHAMROCK INKBERRY HOLLY, #3 CAN, 18"-24" HT.	UNIT
ROSEBAY RHODODENDRON, #5 CAN, 30"-36" HT.	UNIT
MAPLELEAF VIBURNUM, #5 CAN, 30"-36" HT.	UNIT
BLACKHAW VIBURNUM, #5 CAN, 30"-36" HT.	UNIT
YELLOWROOT, #5 CAN, 30"-36" HT.	UNIT
BALD CYPRESS 2"-2.5" CAL., B&B, 8' - 10' HT.	UNIT

Item	*Pay Unit*
OCTOBER GLORY RED MAPLE, 2” – 2.5” CAL., B&B	UNIT
SWEETGUM, 2” – 2.5” CAL., B&B	UNIT
PIN OAK, 2” – 2.5” CAL., B&B	UNIT
LIVE STAKES, CORNUS AMOMUM – SILKY DOGWOOD (TYPE21.D)	UNIT

Separate measurement and payment shall not be made for the initial watering and subsequent watering of the plants during the plant establishment and maintenance period. Same shall be included in the unit price bid for the various plants listed in the Bid Form.

TABLE OF CONTENTS

DIVISION 900 – MATERIALS

SECTION	
901	AGGREGATES
902	ASPHALT
903	CONCRETE
904	PRECAST AND PRESTRESSED CONCRETE
905	TOPSOIL SPREADING
906	REINFORCEMENT METALS
907	BEARING ASSEMBLIES
908	BOLTS AND BOLTING MATERIAL
909	DRAINAGE
910	MASONRY UNITS
911	SIGNS, SIGN SUPPORTS, AND DELINEATORS
912	PAINTS, COATINGS, TRAFFIC STRIPES, AND TRAFFIC MARKINGS
913	GUIDE RAIL, FENCE, RAILING, AND BOX BEAM
914	JOINT MATERIALS
915	TIMBER AND TIMBER TREATMENT
916	POLYMER STRUCTURAL MEMBERS
917	LANDSCAPING MATERIALS
918	ELECTRICAL MATERIALS
919	MISCELLANEOUS

DIVISION 900 - MATERIALS

SECTION 901 - AGGREGATES

901.01 SOURCE

901.02 STOCKPILES

901.03 COARSE AGGREGATE

901.04 BLAST FURNACE SLAG

901.05 AGGREGATES FOR HMA

901.06 AGGREGATES FOR CONCRETE, MORTAR, AND GROUT

901.07 GRIT

901.08 RIPRAP STONES

901.09 GABION BASKET STONE

901.10 DENSE-GRADED AGGREGATE (DGA)

901.10.02 Recycled Concrete Aggregate (RCA)
THIS SUBPART IS DELETED

901.10.03 Virgin and RAP Mixture
THIS SUBPART IS DELETED

901.11 SOIL AGGREGATE

SECTION 902 – ASPHALT

902.01 BITUMINOUS MATERIALS

902.02 HOT MIX ASPHALT (HMA)

902.03 OPEN-GRADED FRICTION COURSE (OGFC) AND MODIFIED OPEN-GRADED FRICTION COURSE (MOGFC)

902.04 ULTRA-THIN HMA

902.05 STONE MATRIX ASPHALT (SMA)

902.06 ASPHALT-STABLIZED DRAINAGE COURSE (ASDC)

902.07 ASPHALT-RUBBER OPEN-GRADED FRICTION COURSE (AR-OGFC)

902.08 HIGH PERFORMANCE THIN OVERLAY (HPTO)

902.09 MICRO SURFACING

902.10 SLURRY SEAL

902.11 BINDER RICH INTERMEDIATE COURSE (BRIC)

902.12 ASPHALT RUBBER GAP GRADED COURSE

902.13 HOT MIX ASPHALT HIGH RAP

902.14 BRIDGE DECK WATERPROOF SURFACE COURSE (BDWSC)

902.15 RETROFIT STRIP SEAL JOINT SYSTEM

SECTION 903 – CONCRETE

903.01 CEMENT

903.02 CONCRETE ADMIXTURES

903.03 CONCRETE
903.03.05 Control and Acceptance Testing Requirements

E. Acceptance Testing for Strength for Pay-Adjustment Items.
Concrete Items which are subject to pay adjustment and the base prices are as follows:

903.04 PAVEMENT REPAIR MIXES CLASS V AND E

903.05 HIGH PERFORMANCE CONCRETE (HPC)

903.06 SELF-CONSOLIDATING CONCRETE (SCC)

903.07 QUICK-SETTING PATCH MATERIALS

903.08 MORTAR AND GROUT

903.09 CONTROLLED LOW STRENGTH MATERIAL (CLSM)

903.10 CURING MATERIALS

SECTION 904 – PRECAST AND PRESTRESSED CONCRETE

904.01 NON-STRUCTURAL PRECAST CONCRETE

904.02 PRECAST RETAINING WALLS

904.03 STRUCTURAL PRECAST CONCRETE

904.04 PRESTRESSED CONCRETE

SECTION 905 – REINFORCEMENT METALS

905.01 REINFORCEMENT STEEL

905.02 PRESTRESSING AND POST-TENSIONING REINFORCEMENT

905.03 REINFORCEMENT FOR CONCRETE PAVEMENT

905.04 REBAR COUPLING DEVICES

SECTION 906 – STRUCTURAL STEEL

906.01 STRUCTURAL STEEL MATERIALS

906.02 STEEL PILES

906.03 STEEL CASINGS FOR DRILLED SHAFTS

906.04 STRUCTURAL STEEL FABRICATION

906.05 SIGN STRUCTURES FABRICATION

906.06 CLEANING AND PAINTING OF STRUCTURAL STEEL IN THE SHOP

906.07 STEEL BAR BRIDGE RAILING

906.08 STEEL TUBE FOR DRILLED SHAFTS

SECTION 907 – BEARING ASSEMBLIES

907.01 STRUCTURAL BEARING ASSEMBLIES

907.02 REINFORCED ELASTOMERIC BEARING ASSEMBLIES

907.03 BEARING PADS

SECTION 908 – BOLTS AND BOLTING MATERIAL

908.01 STEEL BOLTING MATERIALS

908.02 HIGH-STRENGTH STEEL BOLTING MATERIALS

908.03 DIRECT TENSION INDICATORS (DTI)

908.04 STAINLESS STEEL BOLTING MATERIALS

908.05 ALUMINUM ALLOY BOLTING MATERIALS

SECTION 909 – DRAINAGE

909.01 PIPE BEDDING

909.01.03 Class C Bedding
THIS SUBPART IS CHANGED TO:

Use coarse aggregate No. 57 as specified in 901.03 and Table 901.03-1.

909.02 PIPE

909.03 CASTINGS AND COMPONENTS FOR DRAINAGE STRUCTURES

SECTION 910 – MASONRY UNITS

910.01 CLAY OR SHALE BRICK

910.02 CONCRETE BLOCK FOR INLETS AND MANHOLES

910.03 CONCRETE BRICK

910.04 STONE CURB

910.05 STONE FACING FOR PIER SHAFTS

910.06 STONE PAVING BLOCK

SECTION 911 - SIGNS, SIGN SUPPORTS, AND DELINEATORS

911.01 SIGNS

911.01.01 Materials

B. Retroreflective Sheeting
THIS SUBSECTION IS CHANGED TO:

All sign types shall conform to ASTM D 4956 and shall use Type XI retroreflective sheeting. Mount and install according to the Manufacturer's recommendation.

911.02 SIGN SUPPORTS

911.03 FLEXIBLE DELINEATORS

SECTION 912 - PAINTS, COATINGS, TRAFFIC STRIPES, AND TRAFFIC MARKINGS

912.01 PAINTS AND STAINS

912.02 COATINGS

912.03 PERMANENT TRAFFIC STRIPES AND MARKINGS

912.04 TEMPORARY TRAFFIC STRIPES AND MARKINGS

SECTION 913 - GUIDE RAIL, FENCE, RAILING, AND BOX BEAM

913.01 BEAM GUIDE RAIL

913.02 FENCE

913.03 BRIDGE RAILING

913.04 BOX BEAM FOR CONSTRUCTION BARRIER CURB

SECTION 914 – JOINT MATERIALS

914.01 PREFORMED JOINT FILLER

914.02 JOINT SEALER
THE FOLLOWING IS ADDED:

Use Sikaflex-1A, Gray 1-component high performance polyurethane sealant, as manufactured by Sika Chemical Core of Lyndhurst, New Jersey or approved equal for sealing joints in concrete sidewalk.

914.03 POLYMERIZED JOINT ADHESIVE

914.04 JOINT ASSEMBLIES

SECTION 915 - TIMBER AND TIMBER TREATMENT

915.01 SAWN TIMBER POSTS, TIMBER SPACERS, AND ROUTED TIMBER SPACERS

915.02 ROUND TIMBER PILING

915.03 DIMENSION LUMBER FOR SHEET PILING

915.04 DIMENSION LUMBER, TIMBER, AND DECKING FOR STRUCTURES

915.05 TIMBER TREATMENT

915.06 TIMBER CONNECTORS AND HARDWARE

SECTION 916 - POLYMER STRUCTURAL MEMBERS

916.01 POLYMER STRUCTURAL MEMBERS

SECTION 917 – LANDSCAPING MATERIALS

917.01 TOPSOIL

917.02 SOIL ADDITIVES

917.03 SEED MIXTURES

917.04 MULCH

917.05 TACKFIERS

917.06 TOPSOIL STABILIZATION MATTING

917.07 SOD

917.08 PLANT MATERIALS

H. Inspection.
THE SECOND PARAGRAPH IS CHANGED TO:

Notify the re at least 7 days in advance of delivery to the project limits for installation.

917.09 MISCELLANEOUS LANDSCAPE MATERIALS

SECTION 918 – ELECTRICAL MATERIALS

918.01 CONDUIT AND FITTINGS

918.02 CABLE AND WIRE

918.03 BONDING AND GROUNDING MATERIALS

918.04 CABLE CONNECTORS

918.05 RESIN SPLICING KITS

918.06 ELECTRICAL TAPE

918.07 CABLE RACKS

918.08 CAST BOXES AND FITTINGS

918.09 CABINETS

918.10 PANEL BOARDS AND CIRCUIT BREAKERS

918.11 PHOTOELECTRIC CONTROLS

918.12 PEDESTALS, POLES, TRANSFORMER BASES, AND MAST BRACKET ARMS

918.13 TOWER POLES

918.14 LAMPS

SECTION 919 – MISCELLANEOUS

919.01 GEOTEXTILES

919.02 SEDIMENT CONTROL BAG

919.03 HAY AND STRAW

919.04 GABION WIRE BASKETS

919.05 GEOMEMBRANE LINEAR

919.06 WATERSTOPS

919.07 EPOXY BONDING COMPOUND

919.08 WATER

919.09 SODIUM CHLORIDE (ROCK SALT)

919.10 SLEEVES

919.11 EPOXY INJECTION MATERIAL

919.12 POLYETHYLENE SHEETING

919.13 FLOATING TURBIDITY BARRIER

919.14 DETECTABLE WARNING SURFACE
THIS SUBSECTION IS CHANGED TO:

The cast-in-place tile with truncated domes is to fully comply with the Revised ADA Regulations implementing Title II and the 2010 ADA Standards for Accessible Design, and OSHA requirements for dome size, spacing and color.

919.15 POLYESTER MATTING
THE FOLLOWING SUBSECTION IS ADDED:

919.16 FLEXIBLE WATERTIGHT GASKET

Flexible watertight gaskets shall be installed in accordance with manufacturer's recommendations.

TABLE OF CONTENTS

DIVISION 1000 – EQUIPMENT

SECTION	
1001	TRAFFIC CONTROL EQUIPMENT
1002	COMPACTION EQUIPMENT
1003	HMA SITE EQUIPMENT
1004	PILE DRIVING EQUIPMENT
1005	CONCRETE SITE EQUIPMENT
1006	CONCRETE PAVEMENT REHABILITATION EQUIPMENT
1007	TRAFFIC STRIPING EQUIPMENT
1008	MISCELLANEOUS EQUIPMENT
1009	HMA PLANT EQUIPMENT
1010	CONCRETE PLANT AND MIXING EQUIPMENT
1011	PRECAST AND PRESTRESSED CONCRETE PLANT EQUIPMENT
1012	PAVEMENT SURFACE TREATMENTS EQUIPMENT

DIVISION 1000 - EQUIPMENT

SECTION 1001 – TRAFFIC CONTROL EQUIPMENT

1001.01 FLASHING ARROW BOARD

1001.02 PORTABLE VARIABLE MESSAGE SIGN

1001.03 TRAFFIC CONTROL TRUCK MOUNTED CRASH CUSHIONS

SECTION 1002 – COMPACTION EQUIPMENT

1002.01 PNEUMATIC – TIRED COMPACTOR

1002.02 DYNAMIC COMPACTOR

1002.03 STEEL-WHEEL ROLLER

1002.04 PADFOOT ROLLER

SECTION 1003 – HMA SITE EQUIPMENT

1003.01 MATERIALS TRANSFER VEHICLE (MTV)

1003.02 HMA CURB MACHINE

1003.03 HMA PAVER

1003.04 SPRAY PAVER

1003.05 HMA COMPACTOR

1003.06 VIBRATORY DRUM COMPACTOR

1003.07 BITUMINOUS MATERIAL DISTRIBUTOR

1003.08 SEALER APPLICATION SYSTEM

SECTION 1004 – PILE DRIVING EQUIPMENT

1004.01 IMPACT HAMMER

1004.02 VIBRATORY HAMMER

1004.03 LEADS AND FOLLOWERS

SECTION 1005 – CONCRETE SITE EQUIPMENT

1005.01 PAVEMENT FORMS

1005.02 SPREADING AND FINISHING MACHINE

1005.03 SPREADING AND FINISHING MACHINE FOR CONCRETE BRIDGE DECKS

1005.04 VIBRATOR

1005.05 SLIP-FORM PAVER

1005.06 SLIP FORM (EXTRUSION) MACHINE

1005.07 EPOXY RESIN INJECTION EQUIPMENT

SECTION 1006 – CONCRETE PAVEMENT REHABILITATION EQUIPMENT

1006.01 BREAKER

1006.02 SEATING EQUIPMENT

1006.03 GROUT PUMPING UNIT

1006.04 MIXER

1006.05 INJECTION DEVICE

1006.06 LIFT MONITORING EQUIPMENT

1006.07 DEFLECTION TESTING EQUIPMENT

1006.08 GRINDING MACHINE

1006.09 SCARIFICATION EQUIPMENT

SECTION 1007 – TRAFFIC STRIPING EQUIPMENT

1007.01 EPOXY STRIPING UNIT

1007.02 THERMOPLASTIC APPLICATOR

1007.03 TRAFFIC STRIPE AND MARKING REMOVAL EQUIPMENT

1007.04 RUMBLE STRIP CUTTING MACHINE

SECTION 1008 – MISCELLANEOUS EQUIPMENT

1008.01 MILLING MACHINE

1008.02 STRAIGHTEDGE

1008.03 MECHANICAL SWEEPER

1008.04 PAVEMENT SAW

1008.05 AIR COMPRESSOR

1008.06 HOT-AIR LANCE

SECTION 1009 – HMA PLANT EQUIPMENT

1009.01 HMA PLANT

1009.02 HMA TRUCKS

1009.03 ASPHALT-RUBBER BINDER BLENDING EQUIPMENT

SECTION 1010 – CONCRETE PLANT AND MIXING EQUIPMENT

1010.01 BATCHING PLANT

1010.02 CONCRETE TRUCKS

1010.03 MOBILE MIXER

1010.04 SMALL-BATCH MIXER

SECTION 1011 – PRECAST AND PRESTRESSED CONCRETE PLANT EQUIPMENT

1011.01 PRECAST PLANT

1011.02 PRESTRESSED PLANT

1011.03 ME'S OFFICE

SECTION 1012 – PAVEMENT SURFACE TREATMENTS EQUIPMENT

1012.01 MICRO SURFACING AND SLURRY SEAL PAVER

1012.02 MECHANICAL FINE AGGREGATE SPREADER

NJDOT TEST METHODS

SECTION 26 00 01 - GENERAL ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

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.

B. REFERENCE STANDARDS

NFPA 70 ..... National Electrical Code ®
NFPA 72 ..... National Fire Alarm and Signaling Code ®
NFPA 101 ..... Life Safety Code ®
IEEE ..... Institute of Electrical and Electronics Engineers
IEC ..... International Electrotechnical Commission
NECA 1 ..... Standard for Good Workmanship in Electrical Construction
IESNA ..... Illuminating Engineering Society of North America
ANSI/NEMA FB 1-2014 ..... Fittings, Boxes & Conduit, Electrical Metallic Tubing
ANSI C80.3-2020 ..... American National Standard for Electrical Metallic Tubing
ASHRAE 90.1 ..... American Society of HVAC & R Engineering
All Applicable Local Codes, as Required by Authority Having Jurisdiction

C. CONTRACTOR RESONSIBILITY

1. Provide a complete electrical installation including, but not limited to, electrical equipment, labor, material, tools, transportation; procurement of all necessary permits, certificates and other incidental services, whether described in these specifications and Drawings or not, to provide a satisfactorily operating electrical installation.

2. All work shall be performed in strict compliance with the applicable State and Local Codes, and the latest edition of the National Electrical Code (NEC) of the National Fire Protection Association (NFPA), and the Occupational Safety and Health Administration (OSHA) Standards.

3. Review installation procedures under other Sections and coordinate installation of items that must be installed under this Contract.

4. Drawings show principal elements of electrical installation and protection of electrical equipment during construction. They are not intended to be detailed working drawings for the electrical work, but as a complement to the Specifications to clarify the principal features of the electrical system.

5. It is the intent of this Section that all equipment and devices, furnished and installed under this and other Sections, be properly connected and interconnected with other equipment so as to render the installations complete for successful operation, regardless of whether all the connections and interconnections are specifically mentioned in the Specifications or shown on the Drawings.

6. Neither the Owner nor the Engineer shall be responsible for the means, methods, techniques, sequence of procedures or installation selected to complete the work under this Contract.

D. WORKING DRAWINGS

1. Secure all certified special wiring diagrams, specifications and drawings from equipment suppliers before wiring, installation, mounting, and/or connecting the equipment supplied.

2. Accuracy of certified wiring diagrams, specifications and drawings furnished by the equipment suppliers is the responsibility of the Contractor and failure to wire or install in accordance with such diagrams, specifications and drawings, furnished by others, shall be corrected at the Contractor's expense.

3. Provide detailed dimensional working drawings showing all conduit and equipment layouts based on the Construction Drawing layouts. Drawings shall be submitted as shop drawings and be accepted prior to any installation work.

4. All working drawings shall be prepared based on certified shop drawings for the equipment to be connected.

E. RECORD DRAWINGS

1. Drawings are not intended to serve as working or installation drawings. Drawings are for engineering and general arrangement purposes only. Drawings shall show all details of construction, such as dimensioned equipment, conduit layouts, and similar drawings depicting the construction and installation work performed.

2. Maintain a record set of drawings, updated as construction proceeds, showing all work completed based on the construction drawings.

3. After completion of work furnish to the Engineer a complete set of Record Drawing "As-Builts" with reproducible tracings of all electrical construction drawings, such as conduit layouts, interconnection, point-to-point and elementary wiring diagrams.

4. Furnish one set of manufacturer's drawings and operating instructions marked to reflect "As-Built" conditions. This data shall also be furnished to the Engineer. All Record Drawings submitted to the Engineer shall be so marked with 1/2" high letters as follows "RECORD DRAWING".

5. Record drawings furnished upon completion of the work shall be corrected to show any deviations from the Drawings and shall reflect the actual as built, as left conditions.

6. In addition, the Contractor's name shall appear on the drawings along with the signature of the person who prepared same and the date prepared shall also be affixed thereto.

F. SUBMITTALS

1. Furnish for Engineer review, all manufacturer's specifications, drawings, operating and maintenance instructions, and any other data required to provide a complete description of the equipment being supplied and the construction to be performed. Furnish samples of electrical construction material such as conduit and cable, etc., if instructed to do so by the Engineer.

2. This data shall be in addition to those required for the Contractor's own use.

3. Installation of materials, or equipment before review and acceptance by the Engineer will be at the Contractor's risk. Equipment or materials installed by the Contractor which are not accepted by the Engineer will be removed and replaced at the expense of the Contractor.

4. The Contractor shall furnish five (5) detailed shop drawings, including elementary, point-to-point and interconnection wiring diagrams, in addition to those required for the Contractor's own use.

5. All wiring diagrams shall bear wire numbers required for the Contractor's own use. All wiring diagrams shall bear wire numbers using a uniform numbering method so that wiring can be easily followed.

6. All interconnection and point-to-point wiring diagrams shall be included in the Record Drawings.

7. All shop drawings shall be marked to indicate actual materials installed. These shop drawings shall be included in the record drawings.

8. Submit testing requirements and testing sheets for all equipment and wiring, as required, for review and approval by engineer. Submit completed, filled-out testing sheet for approval by engineer.

G. REQUIRED SUBMITTALS

The submittals and additional information listed below shall be provided for all items utilized in the project, not all items listed are applicable to the project, provide required submittals based on the construction drawings and design. Raceways, connectors and accessories

1. Raceways, connectors and accessories
2. Wire, connectors, and accessories
3. Supporting devices, connectors, and accessories
4. Electrical metering components
5. Grounding and Bonding
    a. Test Well(s)
    b. Ground rod(s)
    c. Grounding arrangement and connections
    d. Field quality-control test reports
    e. Operation and Maintenance Data
6. Panelboards
    a. Breaker layout drawing with dimensions indicated and nameplate designation

b. Component list
c. Conduit entry/exit locations
d. Assembly ratings including:
    1) Short-circuit rating
    2) Voltage
    3) Continuous current
    4) NEMA rating
e. Cable terminal sizes
f. Product data sheets

7. Overcurrent Protective Devices
    a. Assembly ratings including:
        1) Short-circuit rating
        2) Voltage
        3) Continuous current
        4) Adjustable setting parameters, as applicable.
8. Transformers
    a. Outline dimensions and weights
    b. Transformer ratings including:
        1) kVA
        2) Primary and secondary voltage
        3) Taps
        4) Basic impulse level (BIL) for equipment over 600 volts
        5) Design impedance
        6) Insulation class and temperature rise
        7) Sound level.
    c. Product data sheets
9. Enclosures
    a. Outline dimensions and weights
    b. Internal equipment layout and spacing
    c. NEMA ratings
10. Lighting and Controls System
    a. Lighting Fixture Schedule, arranged in order of designation
        1) Construction Details, Dimensions, Wiring Schematics, Photometrics, etc.
    b. Site plan with fixture tags
    c. Lighting controls schedule
        1) Site plan with controls sequence
11. Fire Detection and Alarm
    a. Proposal Documents: Submit the following with cost/time proposal:
        1) NFPA 72 "Record of Completion", filled out to the extent known at the time.
        2) Certification by Contractor that the system design will comply with Contract Documents.
        3) Proposed maintenance contract.
    b. Evidence of designer qualifications.
    c. Design Documents: Submit all information required for plan review and permitting by authorities having jurisdiction, including but not limited to floor plans, riser diagrams, and description of operation:
        1) Copy (if any) of list of data required by authority having jurisdiction.
        2) NFPA 72 "Record of Completion", filled out to the extent known at the time.

3) Clear and concise description of operation, with input/output matrix similar to that shown in NFPA 72 Appendix A-7-5-2.2(9), and complete listing of software required.
4) System zone boundaries and interfaces to fire safety systems.
5) Location of all components, circuits, and raceways; mark components with identifiers used in control unit programming.
6) Circuit layouts; number, size, and type of raceways and conductors; conduit fill calculations; spare capacity calculations; notification appliance circuit voltage drop calculations.
7) List of all devices on each signaling line circuit, with spare capacity indicated.
8) Manufacturer's detailed data sheet for each component, including wiring diagrams, installation instructions, and circuit length limitations.
9) Description of power supplies; if secondary power is by battery include calculations demonstrating adequate battery power.
10) Detailed drawing of graphic annunciator(s).
11) Certification by either the manufacturer of the control unit or by the manufacturer of each other component that the components are compatible with the control unit.
12) Certification by the manufacturer of the control unit that the system design complies with Contract Documents.
13) Certification by Contractor that the system design complies with Contract Documents.

12. Test Sheets and Testing Requirements

H. ACCEPTANCE

1. Final acceptance shall be made after all adjustments to furnished equipment, including interfacing equipment furnished under other sections of the specifications, demonstrate it fulfills all requirements of the specifications and plans and has furnished all the required certificates.

1.2 SUMMARY

A. This Section includes the following items, and shall be utilized as applicable, based on the associated design documents:

1. Electrical Demolition
2. Testing.
3. Conductors.
4. Grounding and Bonding for Electrical Systems
5. Supports for Electrical Components.
6. Raceways.
7. Boxes, Enclosures, And Cabinets
8. Electrical Identification.
9. Connectors and Splices.
10. Low-Voltage Electrical Service Entrance.
11. Panelboards.
12. Interior / Exterior Lighting.
13. Fire Detection and Alarm

14. Concrete Equipment Bases.
15. Cutting, Patching and Touchup Painting.

1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.
B. FMC: Flexible metal conduit.
C. IMC: Intermediate metal conduit.
D. LFMC: Liquid-tight flexible metal conduit.
E. LFNC: Liquid-tight Flexible Nonmetallic Conduit
F. PVC: Rigid Polyvinyl Chloride Conduit
G. RGS: Rigid Galvanized Steel Conduit
H. RNC: Rigid nonmetallic conduit.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.5 COORDINATION

A. Coordinate chases, slots, inserts, sleeves, and openings with general construction and arrange in building structure during progress of construction to facilitate the electrical installations that follows:

1. Set inserts and sleeves in poured-in-place concrete, masonry work, and other structural components as they are constructed.

B. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of work. Coordinate installation of large equipment requiring positioning before closing in the building or substantial competition of base work.

C. Coordinate electrical service connections to components furnished by utility companies.

1. Coordinate installation and connection of exterior underground and overhead utilities and services, including provision for electricity-metering components.

2. Comply with requirements of authorities having jurisdiction and of utility company providing electrical power and other services.

D. Coordinate location of access panels and doors for electrical items that are concealed by finished surfaces. Access doors and panels are specified in Division 8 Section "Access Doors," if applicable.

E. Where electrical identification devices are applied to field-finished surfaces, coordinate installation of identification devices with completion of finished surface.

PART 2 - PRODUCTS

2.1 GENERAL NOTES

A. The products and additional information detailed in the following section shall be required for all items utilized in the project, not all items listed are applicable to the project, provide equipment, materials and labor as detailed in the following section and based on the construction drawings and design.

B. In Part 2 articles titled below where lists are included, the following requirements apply to product selection:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 CONDUCTORS

A. Manufacturers:

   1. American Insulated Wire Corp.; a Leviton Company.
   2. General Cable Corporation.
   3. Southwire Company.
   4. Or Approved Equivalent Manufacturer.

B. Conductors, No. 10 AWG and Smaller: Solid or stranded copper. Comply with NEMA WC 70.

C. Conductors, Larger Than No. 10 AWG: Stranded copper.

D. Insulation: Thermoplastic, rated at 75 deg C minimum. Comply with NEMA WC 70 for types: THHN/THWN, and XHHW.

E. Multiconductor Cable: Comply with NEMA WC 70 for armored cable, Type AC; metal-clad cable, Type MC; mineral-insulated, metal-sheathed cable, Type MI; with ground wire.

2.3 GROUNDING AND BONDING

A. CONDUCTORS

   1. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

   2. Bare Copper Conductors:

      a. Solid Conductors: ASTM B 3.
      b. Stranded Conductors: ASTM B 8.
      c. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
      d. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
      e. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

3. Grounding Bus: Rectangular bars of annealed copper, 1/4 by 2 inches in cross section, unless otherwise indicated; with insulators.

B. CONNECTORS

1. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

2. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.

3. Pipe Connectors: Clamp type, sized for pipe.

4. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

5. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.

6. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

C. GROUNDING ELECTRODES

1. Utilize the following grounding electrodes, as applicable and available, in project. Provide at minimum, three (3) ground rods in triad formation.

   a. Triad Ground Rods:
      1) Copper-clad steel
      2) 3/4 inch minimum in diameter by 10-foot length
      3) Arranged in a Triad (triangular) formation.
      4) Ground rods shall be spaced at minimum, equal to the length of the rod, or more.
      5) Chemical-Enhanced Grounding Electrodes shall not be used.

   b. Plate electrode.
      1) Minimum of 2 square feet of surface area in contact with Earth.
      2) Minimum thickness of plate shall be 1/4 inch.

   c. Concrete-encased electrode (Ufer ground);
      1) Bare, zinc-galvanized, or other steel reinforcing bars or rods
      2) Not less than 1/2 inch in diameter and at least 20 foot in length.
      3) Coated in electrically conductive material.
      4) Encased in a minimum of 2 inches of concrete in direct contact with Earth.

   d. Metal In-Ground Support Structure (Building steel);
      1) Building steel shall directly contact Earth.
      2) Minimum of 10 feet vertically in contact with the ground.
      3) With or without concrete-encasement.

e. Metal underground water piping (Water bond);
   1) Minimum of 10 feet of metallic piping in direct contact with Earth.
   2) Minimum of pipe trade size of 3/4 inch.

f. Ground ring.
   1) Minimum of 2-1/2 feet below finished foundation.
   2) At least 20 feet of #2 AWG copper.

2.4 SUPPORTING DEVICES

A. Material: Cold-formed steel, with corrosion-resistant coating acceptable to authorities having jurisdiction.

B. Metal Items for Use Outdoors or in Damp Locations: 304 Stainless Steel or approved outdoor rated material suitable for wet environment.

C. Slotted-Steel Channel Supports: Flange edges turned toward web, and 9/16-inch diameter slotted holes at a maximum of 2 inches o.c., in webs.

D. Slotted-Steel Channel Supports: Comply with Division 5 Section "Metal Fabrications," if applicable, for slotted channel framing.

1. Channel Thickness: Selected to suit structural loading.
2. Fittings and Accessories: Products of the same manufacturer as channel supports.

E. Nonmetallic Channel and Angle Systems: Structural-grade, factory-formed, glass-fiber-resin channels and angles with 9/16-inch diameter holes at a maximum of 8 inches o.c., in at least one surface.

1. Fittings and Accessories: Products of the same manufacturer as channels and angles.
2. Fittings and Accessory Materials: Same as channels and angles, except metal items may be stainless steel.

F. Raceway and Cable Supports: Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers.

G. Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.

H. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for nonarmored electrical cables in riser conduits. Plugs have number and size of conductor gripping holes as required to suit individual risers. Body constructed of malleable-iron casting with hot-dip galvanized finish.

I. Expansion Anchors: Carbon-steel wedge or sleeve type.

J. Toggle Bolts: All-steel springhead type.

K. Powder-Driven Threaded Studs: Heat-treated steel.

2.5 RACEWAYS

A. Manufacturers:

1. Allied Tube & Conduit; a Tyco International Ltd. Co.
2. RACO; a Hubbell Company.
3. Thomas & Betts Corporation.
4. Or Approved Equivalent Manufacturer.

B. Utilize raceways listed below as applicable to scope of work. Refer to “Raceway - Schedule of Application, Section 3.2” for intended use of each raceway.

C. EMT: ANSI C80.3 and listed and labeled as complying with UL 797, zinc-coated steel, with set-screw or compression fittings.

D. RGS: ANSI C80.1 and listed and labeled as complying with UL 6.

E. FMC: standard-wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems.

F. LFMC: Polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.

G. PVC: rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; Schedule 40 or Schedule 80 as indicated.

H. PVC-RGS: Rigid galvanized steel conduit with external polyvinyl chloride (PVC) coating complying with NEMA RN 1 and listed and labeled as complying with UL 6.
1. Exterior Coating Thickness: 40 mil, 0.040 inch, minimum.
2. Interior Coating Thickness: 20 mil, 0.002 inch minimum.

I. HDPE: High-density polyethylene solid-wall conduit complying with ASTM F2160; NEMA TC 7; and listed and labeled as complying with UL 651A; Schedule 80 unless otherwise indicated.

J. Fittings for Conduit (All types including Flexible and Liquid-tight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.
1. All fittings shall be steel construction, unless otherwise noted or approved.
2. Fittings for EMT: Insulated set screws ½” through 2”; compression type 2 ½” through 4”.
3. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 6.
4. Hazardous/Classified Locations: Use threaded fittings listed and labeled as complying with UL 1203 for classification of installed location.
5. Coating for Fittings for PVC-Coated Conduit: Minimum thickness, 0.040 inch, with overlapping sleeves protecting threaded joints.

K. Joint Compound for RGS or IMC: Listed for use in cable connector assemblies, and compounded for use to lubricate and protect threaded raceway joints from corrosion and enhance their conductivity.

L. Fittings for RNC: NEMA TC 3; match to conduit or tubing type and material.

M. Fittings for LFNC: UL 514B.

2.6 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers:

1. Hubbell Incorporated; Killark Electric Manufacturing Co. Division.
2. Thomas & Betts Corporation.
3. Walker Systems, Inc.; Wiremold Company (The).
4. Hoffman.
5. Or Approved Equivalent Manufacturer.

B. General Requirements:

1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.

2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.

3. Provide products listed, classified, and labeled as suitable for the purpose intended.

4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

5. Provide grounding terminals within boxes where equipment grounding conductors terminate.

C. Outlet and Device Boxes Up to 100 cubic inches (1,650 cu cm), Including those used as Junction and Pull Boxes:

1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.

2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.

3. Use suitable concrete type boxes where flush-mounted in concrete and suitable masonry type boxes where flush-mounted in masonry walls.

4. Use shallow boxes where required by the type of wall or floor construction.

5. Do not use "through-wall" boxes designed for access from both sides of wall.

6. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL514A.

7. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as with UL 514A; furnish with threaded hubs.

8. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.

9. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gang-able boxes unless specifically indicated or permitted.

D. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):

1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.

2. Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):
   a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.

E. Installation:

1. Install electrical boxes and fittings as indicated, in accordance with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation" and in accordance with recognized industry practices to fulfill project requirements.

2. Coordinate installation of electrical boxes and fittings with wire/cable, wiring devices, and raceway installation work.

3. Provide weathertight outlets for interior and exterior locations exposed to weather or moisture.

4. Install electrical boxes in those locations which ensure ready accessibility to enclosed electrical wiring.

5. Avoid installing aluminum products in concrete.

6. Position recessed Outlet boxes accurately to allow for surface finish thickness.

7. Set floor boxes level and flush with finish flooring material.

8. Fasten electrical boxes firmly and rigidly to substrates, or structural surfaces to which attached, or solidly embed electrical boxes in concrete or masonry.

9. Box support must be independent of conduit.

10. Provide electrical connections for installed boxes.

11. Ground electrical boxes properly upon completion of installation work and demonstrate compliance with requirements.

2.7 ELECTRICAL IDENTIFICATION

A. Identification Devices: A single type of identification product for each application category. Use colors prescribed by ANSI A13.1, NFPA 70, and these Specifications.

B. Raceway and Cable Labels: Comply with ANSI A13.1, Table 3, for minimum size of letters for legend and minimum length of color field for each raceway and cable size.

1. Type: Pretensioned, wraparound plastic sleeves. Flexible, preprinted, color-coded, acrylic band sized to suit the diameter of the item it identifies.
2. Type: Preprinted, flexible, self-adhesive, vinyl. Legend is overlaminated with a clear, weather- and chemical-resistant coating.
3. Color: Black letters on orange background.
4. Legend: Indicates voltage.

C. Colored Adhesive Marking Tape for Raceways, Wires, and Cables: Self-adhesive vinyl tape, not less than 1 inch wide by 3 mils thick.

D. Underground Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape with the following features:

1. Not less than 6 inches wide by 4 mils thick.
2. Compounded for permanent direct-burial service.
3. Embedded continuous metallic strip or core.
4. Printed legend that indicates type of underground line.

E. Tape Markers for Wire: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.

F. Color-Coding Cable Ties: Type 6/6 nylon, self-locking type. Colors to suit coding scheme.

G. Engraved-Plastic Nameplates, and Instruction Plates: Engraving stock, melamine plastic laminate punched or drilled for mechanical fasteners 1/16-inch minimum thickness for signs up to 20 sq. in. and 1/8-inch minimum thickness for larger sizes. Engraved legend in white letters on black background.

H. Label Tape for Nameplates, devices, equipment, etc.: Self-adhesive plastic label, UV, chemical, water, heat, and abrasion resistant, for indoor use only, use factory pre-printed; machine-printed; Do not use handwritten text unless otherwise indicated. Label shall be not less than 1” in width, with font not less than 1/2” in width. Label shall be black lettering on white background.

I. Interior Warning and Caution Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145. Preprinted, aluminum, baked-enamel-finish signs, punched or drilled for mechanical fasteners, with colors, legend, and size appropriate to the application.

J. Exterior Warning and Caution Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch, galvanized-steel backing, with colors, legend, and size appropriate to the application. 1/4-inch grommets in corners for mounting.

K. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32 stainless-steel machine screws with nuts and flat and lock washers.

2.8 CONNECTORS AND SPLICES

A. Manufacturers:

1. Hubbell Power Systems, Inc.
2. 3M; Electrical Products Division.
3. Tyco Electronics Corp.
4. Thomas & Betts Corporation.
5. Or Approved Equivalent Manufacturer

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.9 LOW-VOLTAGE ELECTRICAL SERVICE ENTRANCE

A. Utility owned meters shall be furnished by Utility Company.

B. Provide new electrical service consisting of all required conduit, conductors, equipment, metering provisions, supports, accessories, etc. as necessary for connection between Utility Company point of supply and service entrance equipment.

C. Comply with Utility company requirements for service rated products not provided by Utility Company

2.10 TRANSFORMERS

A. Manufacturers:

1. Eaton Corp.
2. Schneider Electric, a Square D Company.
3. ABB, Ltd.
4. Or Approved Equivalent Manufacturer.

B. Manufacturer of dry-type distribution transformers shall be the same as the manufacturer of the other major electrical distribution equipment on the project.

C. Manufacturer shall be ISO 9001 or 9002 certified.

D. Manufacturer shall be a participant in the UL Data Acceptance Program (DAP) under the Client Test Data Program (CTDP) certification to ensure UL test methodologies and record traceability complies with the requirements of ISO 17025.

E. Transformer must bear the UL Energy Efficiency Verification Mark to confirm that the unit meets the requirements of 10 CFR Part 431.

F. Manufacturer of equipment shall have produced similar electrical equipment for a minimum period of five (5) years.

G. All transformers shall be UL listed and bear the UL label.

H. Unless noted otherwise, transformer ratings indicated are for continuous loading according to IEEE C57.96 under the following service conditions:
   1. Altitude: Less than 3,300 feet (1,000 m).
   2. Ambient Temperature:
      a. Greater than 10 kVA: Not exceeding 104 degrees F (40 degrees C).
      b. Less than 10 kVA: Not exceeding 77 degrees F (25 degrees C).

I. Basic Impulse Level: 10 kV.

J. Nameplate: Include transformer connection data, ratings, wiring diagrams, and overload capacity based on rated winding temperature rise.

K. RATINGS

   1. kVA and voltage ratings shall be as indicated on the drawings.
   2. Transformers shall be designed for continuous operation at rated kVA, for 24 hours a day, 365 days a year operation, with normal life expectancy as defined in ANSI C57.96.
   3. Transformers shall meet the requirements of the most current version of federal law 10 CFR Part 431 "Energy Efficiency Program for Certain Commercial and Industrial Equipment".
   4. Transformers efficiency shall be measured according to federal law 10 CFR Part 431.

L. CONSTRUCTION – GENERAL PURPOSE TRANSFORMERS

   1. Description: Self-cooled, two winding transformers listed and labeled as complying with UL 506 or UL 1561; ratings as indicated on the drawings.

   2. Primary Voltage: 480 volts delta, 3Ø; 208 volts delta, 3Ø; 208 volts, 1Ø.

   3. Secondary Voltage: 208Y/120 volts, 3Ø; 480Y/277 volts, 3Ø; 120/240 volts, 1Ø.

   4. Insulation System and Allowable Average Winding Temperature Rise:
      a. Less than 15 kVA: Class 180 degrees C insulation system with 115- or 80-degrees C average winding temperature rise.
      b. 15 kVA and Larger: Class 220 degrees C insulation system with 150; 115- or 80-degrees C average winding temperature rise.

   5. Required performance shall be obtained without exceeding the above indicated temperature rise in a 40 degrees C maximum ambient, and a 24-hour average ambient of 30 degrees C

   6. All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635

M. Core and Coil Assemblies

1. Core: High grade, non-aging silicon steel with high magnetic permeability and low hysteresis and eddy current losses. Keep magnetic flux densities substantially below saturation point, even at 10 percent primary overvoltage. Tightly clamp core laminations to prevent plate movement and maintain consistent pressure throughout core length.

2. Three-phase units rated 75 kVA and below and single-phase units rated 25 kVA and below, core and coil assembly shall be completely encapsulated in a proportioned mixture of epoxy or resin and aggregate to provide a moisture proof, shock-resistant seal. Core and coil encapsulation system shall minimize the sound level.

3. Three-phase units rated 112.5 kVA and above and single-phase units rated 37.5 kVA and above, coil assembly shall be impregnated with non-hydroscopic, thermosetting varnish and cured to reduce hot spots and seal out moisture; the core shall be coated with HAPs (Hazardous Air Pollutants) free water reducible electrical varnish to give good corrosion resistance. Assembly shall be installed on vibration-absorbing pads

4. Terminals shall be welded to the leads of the coils for better conductivity, less maintenance, and lower risk of hot spots. Terminals shall not be spot welded or bolted to the coil leads.

N. Taps

1. Three-phase transformers rated 15 through 225 kVA shall be provided with six 2-1/2% taps, two above and four below rated primary voltage. Three-phase transformers rated greater than 225 kVA shall be provided with manufacturer's standard taps for that rating.

2. All single-phase transformers, and three-phase transformers rated below 15 kVA and above 500 kVA, shall be provided with the manufacturer's standard tap configuration.

O. WIRING/TERMINATIONS

1. Recommended external cable shall be rated 90 degrees C (sized at 75 degrees C ampacity) for encapsulated and 75 degrees C for ventilated designs. Connectors should be selected on the basis of the type and cable size used to wire the specific transformer.

P. ENCLOSURE

1. Enclosure shall be made of heavy-gauge Grade 316 stainless steel. All transformers shall be equipped with a wiring compartment suitable for conduit entry and large enough to allow convenient wiring. The maximum temperature of the enclosure shall not exceed 90 degrees C per UL requirement. The core of the transformer shall be grounded to the enclosure.

2. Three-phase units rated 75 kVA and below and single-phase units rated 25 kVA and below, the enclosure construction shall be encapsulated, totally enclosed, non-ventilated, NEMA 3R with lifting provisions.

3. Three-phase units rated 112.5 kVA and above and single-phase units rated 37.5 kVA and above, the enclosure construction shall be ventilated, NEMA 2, drip-proof, with lifting provisions. All ventilation openings shall be protected against falling dirt. On outdoor units, provide weather shields over ventilated openings.

2.11 PANELBOARDS

A. Manufacturers:

1. Eaton Corp.
2. Schneider Electric, a Square D Company.
3. Siemens Corporation.
4. Or Approved Equivalent Manufacturer.

B. RATINGS

1. Panelboards rated 240 Vac or less shall have short-circuit ratings as shown on the drawings or panelboard schedules, but not less than 10,000 amperes RMS symmetrical.

2. Panelboards rated 480 Vac shall have short-circuit ratings as shown on the drawings or panelboard schedules, but not less than 14,000 amperes RMS symmetrical.

3. Panelboards shall be labeled with a UL short-circuit rating. Series rated panelboards shall be provided with a label or manual stating the conditions of the UL series ratings. Information in the manual shall include, at minimum:

   a. Size and type of upstream device
   b. Branch devices that can be used
   c. UL tested and listed series short-circuit rating

C. CONSTRUCTION

1. Panelboard interiors shall be completely factory assembled; and shall be designed such that switching and protective devices can be replaced without disturbing adjacent units or without removing the main bus connectors.

2. Branch circuit panelboard trims shall be supplied with a hinged door over all circuit breaker. Doors shall not uncover any live parts. Doors shall have a semi flush cylinder lock and catch assembly. Provide door-in-door trim enclosure. Both hinged trim and trim door shall utilize three-point latching. No tools shall be required to install or remove trim. Trim shall be equipped with a door-actuated trim locking tab. Equip locking tab with provision for a screw such that removal of trim requires a tool. Installation shall be tamper-resistant with no exposed hardware on the panelboard trim.

3. Surface trims shall be same height and width as box. Flush trims shall overlap the box by 3/4 of an inch on all sides.

4. A directory card with clear plastic cover shall be supplied and mounted on the inside of each door.

5. All locks shall be keyed alike.

6. Provide solidly bonded equipment ground bus in panelboard, with a suitable lug for each feeder and branch circuit equipment grounding conductor.

7. Future Provisions: Prepare all unused spaces for future installation of devices including bussing, connectors, mounting hardware and all other required provisions.

D. BUS

1. Main bus bars shall be tin-plated copper, sized in accordance with UL standards to limit temperature rise on any current carrying part to a maximum of 65 degrees C above an ambient of 40 degrees C maximum.

2. A system ground bus shall be included in all panels.

3. Full-size (100%-rated) insulated stand-off neutral bars shall be included for panelboards shown with neutral. Bus bar taps for panels with single-pole branches shall be arranged for sequence phasing of the branch circuit devices. Neutral busing shall have a suitable lug for each outgoing feeder requiring a neutral connection.

E. BRANCH CIRCUIT PANELBOARDS – CIRCUIT BREAKER

1. The minimum short-circuit rating for branch circuit panelboards shall be 10,000 amperes symmetrical at 240 volts, and 14,000 amperes symmetrical at 480 volts, or as indicated on the drawings. Panelboards shall be fully rated. Panelboards shall be Eaton type Pow-R-Line 1a, Pow-R-Line 2a, Pow-R-Line 3a or approved equal.

2. Bolt-on type, heavy-duty, quick-make, quick-break, single- and multi-pole circuit breakers of the types specified herein, shall be provided for each circuit with toggle handles that indicate when unit has tripped.

3. All circuit breakers shall be thermal-magnetic type with common handle for all multiple pole circuit breakers. Circuit breakers shall be minimum 100-ampere frame. Ratings through 100-ampere trip shall take up the same pole spacing. Circuit breakers shall be UL listed as type SWD for lighting circuits.

4. Circuit breaker handle locks (ON position) shall be provided for all circuits that supply exit signs, emergency lights, energy management, and control system (EMCS) panels and fire alarm panels.

5. Manufacturer of the assembly shall be the manufacturer of the major components within the assembly.

F. ENCLOSURE

1. Enclosures shall be at least 20 inches wide made from galvanized steel. Provide minimum gutter space in accordance with the National Electrical Code. Where feeder cables supplying the mains of a panel are carried through its box to supply other electrical equipment, the box shall be sized to include the additional required wiring space. At least four interior mounting studs with adjustable nuts shall be provided.

2. Enclosures shall be provided with blank ends.

3. Where indicated on the drawings, branch circuit panelboards shall be column width type.

4. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.

5. Boxes: Galvanized steel unless otherwise indicated.

6. Provide wiring gutters sized to accommodate the conductors to be installed.

7. Lockable Doors: All locks keyed alike unless otherwise indicated.

G. NAMEPLATES

1. Provide an engraved nameplate for each panel section.

2.12 DISCONNECT SWITCHES

1. Manufacturers

a. Cutler-Hammer, Inc.; An Eaton Corporation.
b. Square D, Inc.
c. General Electric, Co.
d. Or Approved Equivalent Manufacturer.

2. General Duty Disconnect Switches:

a. General type, sheet steel enclosed switch

1) Type, size and electrical characteristics as indicated;

a) 600 volts, 30/60/100/200/400/600 amperes, 60 Hz, 3-blades, 3-poles.
b) Spring assisted, quick-make, quick break.
c) Constructed that switch blades are visible in OFF position with door open. Equipped with operating handle as integral part of enclosure base and operating position is easily recognizable, and capable of being padlocked in OFF position.

d) Construct current carrying parts of high-conductivity copper, with silver tungsten type switch contacts, and stamped enclosure knockouts.
e) NEMA Type 1 Enclosure. For indoor or enclosure use only.

3. Heavy Duty Safety Switches:

a. Heavy duty type sheet steel enclosed safety switch

1) Type, size and electrical characteristics as indicated;

a) 600 volts, 30/60/100/200/400/600 amperes, 60 Hz, 3-blades, 4-poles; solid neutral; fusible type.
b) Spring assisted, quick make, quick break type switches.
c) Constructed that switch blades are visible in OFF position with door open. Equipped with operating handle as integral part of enclosure base and operating position is easily recognizable, and capable of being padlocked in OFF position.
d) Construct current carrying parts of high conductivity copper, with silver tungsten type switch contacts, and positive pressure type reinforced fuse clips.
e) NEMA 1 or NEMA Type 3R enclosure, for use in outdoor locations.

4. Fuses: Provide fuses, as recommended by switch manufacturer, of classes, types and ratings needed to fulfill electrical requirements for service indicated.

2.13 INTERIOR LIGHTING

A. Refer to design documents for light fixture schedule for all details and information regarding the light fixtures, detailing: manufacturer, wattage, voltage, mounting, and light distribution; lighting controls system; circuiting; etc.

B. Luminaires, materials and equipment shall be in accordance with NEC, UL, ANSI, and as shown on the drawings and specified.

C. EXIT SIGNS
1. Description: Exit signs complying with NFPA 101 and applicable state and local codes; and listed and labeled as complying with UL 924.
a. Number of Faces: Single- or double-face as indicated or as required for installed location.
b. Directional Arrows: As indicated or as required for installed location.

2. Powered Exit Signs: Internally illuminated with LEDs unless otherwise indicated.
a. Manufacturers:
1) Acuity Brands, Inc
2) Cooper Lighting;
3) Hubbell Lighting, Inc;
4) Philips Lighting North America Corporation;
5) Or Approved Equivalent Manufacturer.

b. Self-Powered Exit Signs:
   1) Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.
   2) Battery: Sealed, maintenance-free, nickel cadmium unless otherwise indicated.
   3) Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.
   4) Provide low-voltage disconnect to prevent battery damage from deep discharge.
   5) Self-Diagnostics: Provide units that self-monitor functionality and automatically perform testing required by NFPA 101 where indicated; provide indicator light(s) to report test and diagnostic status.

3. Accessories:
   a. Provide compatible accessory high-impact polycarbonate vandal shields where indicated.
   b. Provide compatible accessory wire guards where indicated.

2.14 EXTERIOR LIGHTING

A. Refer to design documents for light fixture schedule for all details and information regarding the light fixtures, detailing: manufacturer, wattage, voltage, mounting, and light distribution; lighting controls system; circuiting; etc.

B. Luminaires, materials and equipment shall be in accordance with NEC, UL, ANSI, and as shown on the drawings and specified.

2.15 FIRE DETECTION AND ALARM

A. MANUFACTURERS

1. Edwards/EST Life Safety
2. Simplex
3. Or Approved Equivalent Manufacturer

B. FIRE ALARM SYSTEM

1. Fire Alarm System: Provide a performance design by a Licensed Qualified Designer. Submit new automatic fire detection and alarm system for owner and engineer approval:

2. Provide all components necessary, regardless of whether shown in Contract Documents or not.

3. Protected Premises: Entire building shown on drawings.

4. Comply with the following; where requirements conflict, order of precedence of requirements is as listed:

    a. ADA Standards.
    b. The requirements of the State Fire Marshal.
    c. The requirements of the local authority having jurisdiction, which is Fire Marshal of Hudson County, New Jersey.
    d. Applicable local codes.
    e. Contract Documents (drawings and specifications).
    f. NFPA 101.
    g. NFPA 72; where the word "should" is used consider that provision mandatory; where conflicts between requirements require deviation from NFPA 72, identify deviations clearly on design documents.

5. Evacuation Alarm: Single zone smoke zone; allow for evacuation notification of entire building.

6. Voice Notification: Provide emergency voice/alarm communications with multichannel capability; digital.

7. General Evacuation Zone: Smoke zone is considered a general evacuation zone unless otherwise indicated, with alarm notification in zone on the same floor.

8. Staff Response Zones: Smoke zone where occupants are not ambulatory, program notification zone as directed to notify staff in areas outside the normal notification zone and in other buildings, for response to assist in evacuation.

9. Program notification zone and voice messages as directed by Owner.

10. Hearing Impaired Occupants: Provide visible notification devices in all public areas and in dwelling units.

11. Fire Command Center: Location indicated on drawings, as applicable.

12. Fire Alarm Control Unit: New, located at fire command center, as applicable.

13. Two-Way Telephone: Provide two-way telephone service for the use of the fire service and others; provide jacks and two portable handsets.

14. Guard's Tour: Provide guard's tour supervisory service in accordance with NFPA 601.

15. Combined Systems: Do not combine fire alarm system with other non-fire systems.

C. Supervising Stations and Fire Department Connections:

1. Public Fire Department Notification: By on-premises supervising station.

2. On-Premises Supervising Station: Proprietary station operated by Owner, refer to design documents for location.

3. Means of Transmission to On-Premises Supervising Station: Directly connected noncoded system.

4. Means of Transmission to Remote Supervising Station: Digital alarm communicator transmitter (DACT), 2 telephone lines.

5. Auxiliary Connection Type: Local energy.

D. Circuits:

1. Initiating Device Circuits (IDC): Class B, Style A.
2. Signaling Line Circuits (SLC) Within Single Building: Class B, Style 0.5.
3. Signaling Line Circuits (SLC) Between Buildings: Class A, Style 2.
4. Notification Appliance Circuits (NAC): Class B, Style W.

E. Spare Capacity:

1. Initiating Device Circuits: Minimum 25 percent spare capacity.
2. Notification Appliance Circuits: Minimum 25 percent spare capacity.
3. Speaker Amplifiers: Minimum 25 percent spare capacity.
4. Fire Alarm Control Units: Capable of handling all circuits utilized to capacity without requiring additional components other than plug-in control modules.

F. Power Sources:

1. Primary: Dedicated branch circuits of the facility power distribution system or system tap ahead of main distribution board.
2. Secondary: Storage batteries.
3. Capacity: Sufficient to operate entire system for period specified by NFPA 72.

G. EXISTING COMPONENTS
1. Existing Fire Alarm System, if applicable: Replace existing system completely with new system if system has been deemed obsolete by manufacturer.
2. On-Premises Supervising Station: Include as part of this work all modifications necessary to existing supervising station to accommodate new fire alarm work.
3. Remove unused existing components and materials from site and dispose of properly.

H. FIRE SAFETY SYSTEMS INTERFACES
1. HVAC:
   a. Duct Smoke Detectors: Coordinate requirements of HVAC system with mechanical drawings.

I. COMPONENTS
1. General:
   a. Provide flush mounted units where installed in finish areas; in unfinished areas, surface mounted unit are acceptable.
   b. Provide legible, permanent labels for each control device, using identification used in operation and maintenance data.

2. Addressable Fire Alarm Control Unit - Basis of Design: Simplex 4007ES Fire Alarm Control Unit, or approved equal.
   a. System Capacity: 100 addresses; six (expandable to 250) notification appliance circuits (NACs); four input/output (I/O) circuits; 24 software zones.
   b. Features: Strobe synchronization; dedicated alarm, supervisory and trouble relays; 4,000 event history buffers; built-in IP communicator; Ethernet port for programming and network connectivity; e-mail system status, reports and event information.

3. Initiating Devices, provide as applicable based on design documents:
   a. Addressable Systems:
      1) Addressable Devices: Individually identifiable by addressable fire alarm control unit.
      2) Provide suitable addressable interface modules as indicated or as required for connection to conventional (non-addressable) devices and other components that provide a dry closure output.

   b. Manual Pull Stations.
      1) Provide 1 extra.

   c. Smoke Detectors.
      1) Provide 1 extra.

   d. Duct Smoke Detectors.
      1) Provide 1 extra.

   e. Heat Detectors.
      1) Provide 1 extra.

   f. Addressable Interface Devices.
      1) Provide 1 extra.

   g. Notification Appliances:
      1) Bells.
         a) Provide 1 extra.

      2) Speakers.
         a) Provide 1 extra.

      3) Strobes.
         a) Provide 1 extra.

4. Circuit Conductors: Copper or optical fiber; provide 200 feet (60 m) extra; color code and label.

5. Surge Protection: In accordance with IEEE C62.41.2 category B combination waveform and NFPA 70; except for optical fiber conductors.
   a. Equipment Connected to Alternating Current Circuits: Maximum let through voltage of 350 V(ac), line-to-neutral, and 350 V(ac), line-to-line; do not use fuses.

b. Initiating Device Circuits, Notification Appliance Circuits, and Communications Circuits: Provide surge protection at each point where circuit exits or enters a building; rated to protect applicable equipment; for 24 V(dc) maximum dc clamping voltage of 36 V(dc), line-to-ground, and 72 V(dc), line-to-line.
c. Signaling Line Circuits: Provide surge protection at each point where circuit exits or enters a building, rated to protect applicable equipment.

6. Locks and Keys: Deliver keys to Owner.

7. Instruction Charts: Printed instruction chart for operators, showing steps to be taken when a signal is received (normal, alarm, supervisory, and trouble); easily readable from normal operator's station.
   a. Frame: Stainless steel or aluminum with polycarbonate or glass cover.
   b. Provide one for each control unit where operations are to be performed.
   c. Obtain approval of Owner prior to mounting; mount in location acceptable to Owner.
   d. Provide extra copy with operation and maintenance data submittal.

8. Storage Cabinet for Spare Parts and Tools: Steel with baked enamel finish, size appropriate to quantity of parts and tools.
   a. Padlock eye and hasp for lock furnished by Owner.
   b. Locate as directed by Owner.

2.16 CONCRETE BASES

A. Concrete Forms and Reinforcement Materials: As specified in Division 3 Section "Cast-in-Place Concrete," if applicable.

B. Concrete: 3000-psi, 28-day compressive strength as specified in Division 3 Section "Cast-in-Place Concrete," if applicable.

2.17 TOUCHUP PAINT

A. For Equipment: Equipment manufacturer's paint selected to match installed equipment finish.

B. Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.

PART 3 - EXECUTION

3.1 ELECTRICAL DEMOLITION

A. Protect existing electrical equipment and installations indicated to remain. If damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.

B. Accessible Work: Remove exposed electrical equipment and installations, indicated to be demolished, in their entirety.

C. Abandoned Work: Cut and remove buried raceway and wiring, indicated to be abandoned in place, 2 inches below the surface of adjacent construction. Cap raceways and patch surface to match existing finish.

D. Remove demolished material from Project site.

E. Remove, store, clean, reinstall, reconnect, and make operational components indicated for relocation.

3.2 TESTING & FIELD QUALITY CONTROL

A. The Contractor shall perform tests as required for all components of the completed installation to demonstrate satisfactory functionality of all equipment and the adequacy of the entire electrical system.

B. Any equipment or materials which fail under test shall be repaired or replaced and retested until satisfactory results are obtained, entirely at the expense of the contractor.

C. The Contractor shall assume full responsibility for the proper functioning and quality of the entire electrical installation to the extent that any breakdowns, deficiencies or deteriorations caused by poor workmanship, equipment, materials or method of installation shall be promptly remedied, replaced or repaired by the contractor.

D. Any corrections required during the guarantee period and established following a survey of the installation at the end of the guarantee period shall be modified as above. The terms of the guarantee are stipulated elsewhere in these specifications.

E. Unless waived in writing by the Engineer, all tests shall be made in the presence of a duly authorized representative of the Engineer. When the presence of such representative is so waived, sworn statements, in duplicate, of the tests made and the results thereof, shall be furnished to the Engineer by the Contractor.

F. Cost of all tests shall be borne by the Contractor and shall be included in the Contract bid price.

G. Perform a test and inspection for equipment requiring electrical termination. Prepare test report and provide a copy to engineer for review.

H. Inspect installed components for damage and faulty work, including the following:

1. Raceways.
2. Building wire and connectors.
3. Supporting devices for electrical components.
4. Electrical identification.
5. Concrete bases.
6. Electrical demolition.
7. Cutting and patching for electrical construction.
8. Touchup painting.

I. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and electrical circuits to insure circuit continuity, insulation resistance, proper splicing and freedom from improper grounds.

J. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

K. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each splice in cables and conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner.

1. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each splice 11 months after date of Substantial Completion.

2. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

3. Record of Infrared Scanning: Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken and observations after remedial action.

L. Megger tests of the insulation resistance for all power circuits shall be conducted.

1. The results will be accepted when the megger shows the insulation resistance to be 50 mega ohms or more and phases do not deviate by more than 25% at 20ºC using a megger.
2. Test duration shall be one minute and utilize a 1000V megger for cables rated 600V.
3. Test reports shall indicate date, weather conditions, cable size, length of run and resistance observed on a per conductor basis. Test shall be conducted phase to phase, phase to neutral and phase to ground for all feeders and branch circuits.
4. Test results shall be given in ohms at 20ºC or 20 degrees centigrade ambient. All tests and resistance readings shall be made per the applicable ANSI Standards which apply.

M. The grounding system shall have a resistance to ground of ten (10) ohms or less when measured by a fall of potential ground resistance test, I.E.E.E. Standard No. 81, Section 9.04.

1. Two (2) additional reference ground rods must be driven away from the ground under test.
2. The ground under test and the reference ground rods shall be connected to the test instrument with insulated lead wires.
3. Tests shall not be conducted when the soil within a 10-foot radius of the ground under test is water logged or has been subjected to chemical additives.

N. Test Reports: Prepare a written report to record the following:

1. Test procedures used.

2. Test results that comply with requirements.
3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

O. Four (4) copies each of all test results shall be forwarded to the Engineer by the Contractor for review and record purposes.

P. No equipment shall be energized until all tests and adjustments have been made to the satisfaction of the Engineer and the Owner.

Q. Tests shall be witnessed by the Engineer. The cause of any failure shall be impartially examined by the Engineer and the results shall be binding on the Contractor, if in the Engineer's judgment such failure was caused by poor workmanship, materials and/or equipment provided by the Contractor.

3.3 WIRING METHODS FOR POWER, LIGHTING, AND CONTROL CIRCUITS

A. Feeders: THHN/THWN or XHHW insulated conductors in raceway.

B. Underground Feeders and Branch Circuits: Type XHHW single-wire, insulated conductors in raceway.

C. Branch Circuits in Ceiling, Walls, and Partitions: Type THHN/THWN insulated conductors in raceway. Armored or nonmetallic sheathed cable where permitted by authorities having jurisdiction and where concealed in ceilings and gypsum board partitions.

D. Branch Circuits in Above Ground Exposed Areas: Type THHN/THWN insulated conductors in raceway.

E. Remote-Control Signaling and Power-Limited Circuits: Type THHN/THWN insulated conductors in raceway for Classes 1, 2, and 3, unless otherwise indicated.

3.4 WIRING INSTALLATION

A. Install splices and taps that are compatible with conductor material and possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

B. Install wiring at outlets with at least 12 inches of conductor slack at each outlet.

C. Connect outlet and component connections to wiring systems and to ground. Tighten electrical connectors and terminals, according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use values specified in UL 486A.

3.5 ELECTRICAL SUPPORTING DEVICE APPLICATION

A. Damp Locations and Outdoors: 304 Stainless Steel or nonmetallic, U-channel system components.

B. Dry Locations: Steel materials.

C. Support Clamps for PVC Raceways: Click-type clamp system.

D. Selection of Supports: Comply with manufacturer's written instructions.

E. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four; minimum of 200-lb design load.

3.6 SUPPORT INSTALLATION

A. Install support devices to securely and permanently fasten and support electrical components.

B. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assemblies and for securing hanger rods and conduits.

C. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.

D. Size supports for multiple raceway installations so capacity can be increased by a 25 percent minimum in the future.

E. Support individual horizontal raceways with separate, malleable-iron pipe hangers or clamps.

F. Install 1/4-inch diameter or larger threaded steel hanger rods, unless otherwise indicated.

G. Spring-steel fasteners specifically designed for supporting single conduits or tubing may be used instead of malleable-iron hangers for 1-1/2-inch and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings and for fastening raceways to slotted channel and angle supports.

H. Arrange supports in vertical runs so the weight of raceways and enclosed conductors is carried entirely by raceway supports, with no weight load on raceway terminals.

I. Simultaneously install vertical conductor supports with conductors.

J. Separately support cast boxes that are threaded to raceways and used for fixture support. Support sheet-metal boxes directly from the building structure or by bar hangers. If bar hangers are used, attach bar to raceways on opposite sides of the box and support the raceway with an approved fastener not more than 24 inches from the box.

K. Install metal channel racks for mounting cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices unless components are mounted directly to structural elements of adequate strength.

L. Install sleeves for cable and raceway penetrations of concrete slabs and walls unless core-drilled holes are used. Install sleeves for cable and raceway penetrations of

masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.

M. Securely fasten electrical items and their supports to the building structure, unless otherwise indicated. Perform fastening according to the following unless other fastening methods are indicated:

1. Wood: Fasten with wood screws or screw-type nails.

2. Masonry: Toggle bolts on hollow masonry units and expansion bolts on solid masonry units.

3. New Concrete: Concrete inserts with machine screws and bolts.

4. Existing Concrete: Expansion bolts.

5. Instead of expansion bolts, threaded studs driven by a powder charge and provided with lock washers may be used in existing concrete.

6. Steel: Welded threaded studs or spring-tension clamps on steel.

   a. Field Welding: Comply with AWS D1.1.

7. Welding to steel structure may be used only for threaded studs, not for conduits, pipe straps, or other items.

8. Light Steel: Sheet-metal screws.

9. Fasteners: Select so the load applied to each fastener does not exceed 25 percent of its proof-test load.

3.7 RACEWAY - SCHEDULE OF APPLICATION

A. Use the following raceways for outdoor installations:

1. Exposed: RGS.
2. Exposed, Hazardous locations: PVC-coated rigid steel conduit, PVC Sch 80.
3. Concealed: IMC.
4. Underground, Single Run: RNC or PVC-coated rigid steel conduit.
5. Underground, Grouped: RNC or PVC-coated rigid steel conduit.
6. Connection to Vibrating Equipment: LFMC.
7. Boxes and Enclosures: NEMA 250, Type 3R or Type 4.

B. Use the following raceways for indoor installations:

1. Exposed: EMT.
2. Concealed: EMT.
3. Connection to Vibrating Equipment: FMC; except in wet or damp locations, use LFMC.
4. Damp or Wet Locations: IMC.
5. Boxes and Enclosures: NEMA 250, Type 1, unless otherwise indicated.

3.8 RACEWAY AND CABLE INSTALLATION

A. Conceal raceways and cables, unless otherwise indicated, within finished walls and ceilings.

B. Install raceways and cables at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Locate horizontal raceway runs above water and steam piping.

C. Use temporary raceway caps to prevent foreign matter from entering.

D. Make conduit bends and offsets so inner diameter is not reduced. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated.

E. Use raceway and cable fittings compatible with raceways and cables and suitable for use and location.

F. Raceways installed embedded in slabs shall be in middle third of slab thickness, maintain at least 1-inch concrete cover, where practical.

1. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
2. Space raceways laterally to prevent voids in concrete.
3. Install conduits larger than 1-inch trade size parallel to or at right angles to main reinforcement. Where conduit is at right angles to reinforcement, place conduit close to slab support.
4. Transition from nonmetallic tubing to Schedule 80 nonmetallic conduit, rigid steel conduit, or IMC before rising above floor.
5. Make bends in exposed parallel or banked runs from same centerline to make bends parallel. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for exposed parallel raceways.

G. Install pull wires in all raceways. Use No. 14 AWG zinc-coated steel or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 18 inches of slack at each end of the pull wire.

H. Install raceways, 2-inch trade size and smaller, in maximum lengths of 150 feet and with a maximum of two 90-degree bends or equivalent. Separate lengths with pull or junction boxes where necessary to comply with these requirements, in addition to requirements above.

I. Connect motors and equipment subject to vibration, noise transmission, or movement with a maximum of 72-inch flexible conduit. Install LFMC in wet or damp locations. Install separate ground conductor across flexible connections.

J. Set floor boxes level and trim after installation to fit flush to finished floor surface.

3.9 ELECTRICAL EQUIPMENT INSTALLATION

A. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide the maximum possible headroom. Provide at minimum, required working clearance per NEC 110.

B. Materials and Components: Install material and components level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.

C. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.

D. Right of Way: Give to raceways and piping systems installed at a required slope.

3.10 IDENTIFICATION MATERIALS AND DEVICES

A. Install at locations for most convenient viewing without interference with operation and maintenance of equipment.

B. Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated in the Contract Documents or required by codes and standards. Use consistent designations throughout Project.

C. Self-Adhesive Identification Products: Clean surfaces before applying.

D. Identify raceways and cables with color banding as follows:

1. Bands: Pretensioned, snap-around, colored plastic sleeves or colored adhesive marking tape. Make each color band 2 inches wide, completely encircling conduit, and place adjacent bands of two-color markings in contact, side by side.

2. Band Locations: At changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

3. Colors: As follows:

a. Fire Alarm System: Red.
b. Security System: Blue and yellow.
c. Telecommunication System: Green and yellow.

E. Tag and label circuits designated to be extended in the future. Identify source and circuit numbers in each cabinet, pull and junction box, and outlet box. Color-coding may be used for voltage and phase identification.

F. Install continuous underground plastic markers during trench backfilling, for exterior underground power, control, signal, and communication lines located directly above power and communication lines. Locate 6 to 8 inches below finished grade. If width of multiple lines installed in a common trench or concrete envelope does not exceed 16 inches, overall, use a single line marker.

G. Color-code 208/120-V system secondary service, feeder, and branch-circuit conductors throughout the secondary electrical system as follows:

1. Phase A: Black.
2. Phase B: Red.
3. Phase C: Blue.

H. Color-code 480/277-V system secondary service, feeder, and branch-circuit conductors throughout the secondary electrical system as follows:

1. Phase A: Yellow.
2. Phase B: Brown.
3. Phase C: Orange.

I. Install warning, caution, and instruction signs where required to comply with 29 CFR, Chapter XVII, Part 1910.145, and where needed to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.

J. Install engraved-laminated emergency-operating signs with white letters on red background with minimum 3/8-inch high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.

3.11 LOW-VOLTAGE ELECTRICAL SERVICE ENTRANCE

A. INSTALLATION

1. Install and connect service entrance conduits and conductors to service entrance equipment, as indicated on construction drawings.

B. EXAMINATION

1. Verify service equipment is properly installed, connected and terminated. Mark lugs, indicated proper torque requirements. Verify equipment is ready to be energized.

3.12 LOW-VOLTAGE TRANSFORMERS

A. FACTORY TESTING

1. The following standard factory tests shall be performed on the equipment provided under this section. All tests shall be in accordance with the latest version of ANSI and NEMA standards.

a. Ratio tests at the rated voltage connection and at all tap connections
b. Polarity and phase relation tests on the rated voltage connection
c. Applied potential tests
d. Induced potential test

e. No-load and excitation current at rated voltage on the rated voltage connection

B. INSTALLATION

1. The Contractors shall install all equipment per the manufacturer's recommendations and the contract drawings.

C. FIELD ADJUSTMENTS

1. Adjust taps to deliver appropriate secondary voltage.

D. FIELD TESTING

1. Measure primary and secondary voltages for proper tap settings.

3.13 PANELBOARDS

A. FACTORY TESTING

1. Standard factory tests shall be performed on equipment provided. All tests shall be in accordance with the latest version of NEMA and UL standards.

B. INSTALLATION

1. Install all equipment per manufacturer's recommendations and construction drawings.

3.14 ELECTRICAL CONNECTIONS FOR EQUIPMENT

A. Install electrical connections as indicated and in accordance with connector manufacturer's instructions and wiring diagrams. Comply with UL, NEC and NECA's "Standard of Installation".

B. Provide FMC/LFMC or FNC/LFNC raceway with matching fittings, based on supplying raceway type, to terminate transformers, disconnects, light fixtures, motors, or other equipment that may experience vibration, swaying or movement that may be hampered by a solid raceway connection.

C. Provide connectors and terminals per manufacturers recommendations.

D. Utilize electrical insulating tape, heat-shrinkable insulating tubing and boots, electrical solder, electrical soldering flux, cable ties, wirenuts, lugs and clamps as recommended for use by accessories manufacturers for type services indicated.

3.15 DISCONNECT SWITCHES

A. Coordinate disconnect switch installation work with electrical raceway and cable work, as necessary for proper interface. Provide adequate working clearances as required per NEC 110.

B. Install disconnect switches for use with motor driven appliances, and motors and controller within sight of controller position unless otherwise indicated.

3.16 EXTERIOR LIGHTING

A. Refer to design documents for details and information regarding installation locations, mounting procedures, wiring, controls and interconnections.

B. INSTALLATION

1. Install lighting in accordance with the NEC, as shown on the drawings, and in accordance with manufacturer's recommendations.

C. POLE FOUNDATIONS:

1. Excavate only as necessary to provide sufficient working clearance for installation of forms and proper use of tamper to the full depth of the excavation. Prevent surface water from flowing into the excavation. Thoroughly compact backfill with compacting arranged to prevent pressure between conductor, jacket, or sheath, and the end of conduit.

2. Set anchor bolts according to anchor-bolt templates furnished by the pole manufacturer.

3. Install poles as necessary to provide a permanent vertical position with the bracket arm in proper position for luminaire location.

4. After the poles have been installed, shimmed, and plumbed, grout the spaces between the pole bases and the concrete base with non-shrink concrete grout material. Provide a plastic or copper tube, of not less than 9 mm (0.375-inch) inside diameter through the grout, tight to the top of the concrete base to prevent moisture weeping from the interior of the pole.

5. Install lamps in each luminaire.

6. Adjust luminaires that require field adjustment or aiming.

D. GROUNDING

1. Ground noncurrent-carrying parts of equipment, including metal poles, luminaires, mounting arms, brackets, and metallic enclosures, as specified in Section XX, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS. Where copper grounding conductor is connected to a metal other than copper, provide specially-treated or lined connectors suitable and listed for this purpose.

E. ACCEPTANCE CHECKS AND TESTS

1. Verify operation after installing luminaires and energizing circuits.

2. Provide products listed, classified, and labeled as suitable for the purpose intended.

3. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.

4. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, poles, foundations, supports, trims, accessories, etc. as necessary for a complete operating system.

5. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

3.17 INTERIOR LIGHTING

A. Refer to design documents for details and information regarding installation locations, mounting procedures, wiring, controls and interconnections.

3.18 FIRE DETECTION AND ALARM

A. INSTALLATION

1. Install in accordance with applicable codes, NFPA 72, NFPA 70, and Contract Documents.

2. Conceal all wiring, conduit, boxes, and supports where installed in finished areas. Where conduit cannot be concealed, paint conduit red and label “Fire Alarm.”

3. Obtain Owner's approval of locations of devices, before installation.

4. Provide instruction cards and labels, as required.

B. INSPECTION AND TESTING FOR COMPLETION

1. Notify Owner 7 days prior to beginning completion inspections and tests.

2. Owner will provide the services of an independent fire alarm engineer or technician to observe all tests.

3. Notify authorities having jurisdiction and comply with their requirements for scheduling inspections and tests and for observation by their personnel.

4. Provide the services of the installer's supervisor or person with equivalent qualifications to supervise inspection and testing, correction, and adjustments.

5. Prepare for testing by ensuring that all work is complete and correct; perform preliminary tests as required.

6. Provide all tools, software, and supplies required to accomplish inspection and testing.

7. Perform inspection and testing in accordance with NFPA 72 and requirements of local authorities; document each inspection and test.

8. Correct defective work, adjust for proper operation, and retest until entire system complies with Contract Documents.

9. Diagnostic Period: After successful completion of inspections and tests, Operate system in normal mode for at least 14 days without any system or equipment malfunctions.

    a. Record all system operations and malfunctions.
    b. If a malfunction occurs, start diagnostic period over after correction of malfunction.
    c. Owner will provide attendant operator personnel during diagnostic period; schedule training to allow Owner personnel to perform normal duties.
    d. At end of successful diagnostic period, fill out and submit NFPA 72 "Inspection and Testing Form."

10. Provide instruction to designated Owner Personnel, on-site using operational system.

C. CLOSEOUT

1. Demonstrate proper operation of all functions to Owner.

    a. Have at least one copy of operation and maintenance data, preliminary copy of project record drawings, input/output matrix, and operator instruction chart(s) available during demonstration.
    b. Have authorized technical representative of control unit manufacturer present during demonstration.
    c. Demonstration may be combined with inspection and testing required by authority having jurisdiction; notify authority having jurisdiction in time to schedule demonstration.
    d. Repeat demonstration until successful.

2. Occupancy of the project will not occur prior to Substantial Completion.

3. Substantial Completion of the project cannot be achieved until inspection and testing is successful.

3.19 FIRESTOPPING

A. Apply firestopping to cable and raceway penetrations of fire-rated floor and wall assemblies to achieve fire-resistance rating of the assembly. Firestopping materials and installation requirements are specified in Division 7 Section "Firestopping," if applicable.

3.20 CONCRETE BASES

A. Construct concrete bases of dimensions indicated, but not less than 4 inches larger, in both directions, than supported unit. Follow supported equipment manufacturer's anchorage recommendations and setting templates for anchor-bolt and tie locations,

unless otherwise indicated. Use 3000-psi, 28-day compressive-strength concrete and reinforcement as specified in Division 3 Section "Cast-in-Place Concrete," if applicable.

3.21 CUTTING AND PATCHING

A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.

B. Repair and refinish disturbed finish materials and other surfaces to match adjacent undisturbed surfaces. Install new fireproofing where existing firestopping has been disturbed. Repair and refinish materials and other surfaces by skilled mechanics of trades involved.

3.22 REFINISHING AND TOUCHUP PAINTING

A. Refinish and touch up paint. Paint materials and application requirements are specified in Division 9 Section "Painting," if applicable.

1. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit the degree of damage at each location.

2. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.

3. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

4. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.23 CLEANING AND PROTECTION

A. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.

A. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

PART 4 - MEASUREMENT AND PAYMENT

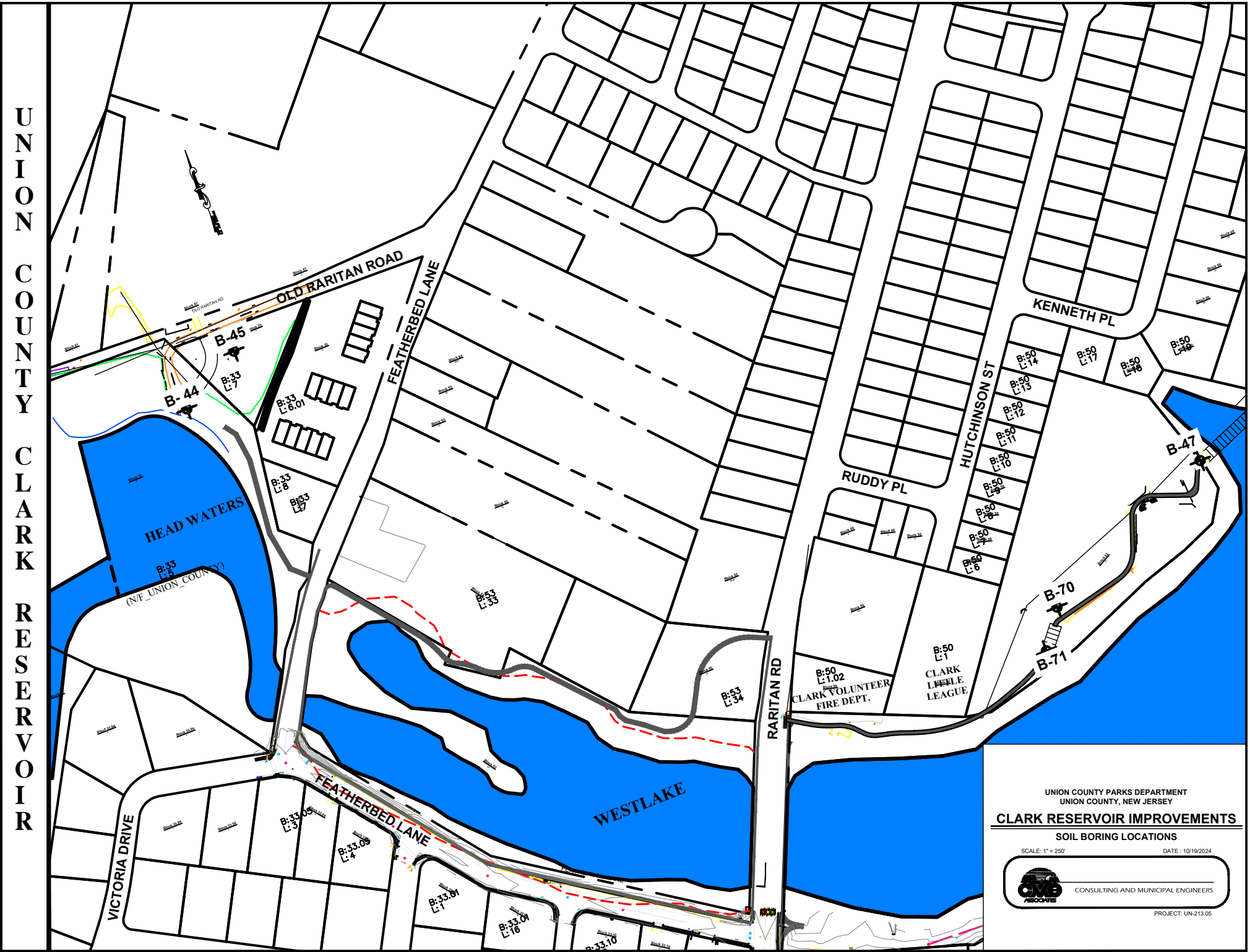
4.1 Payment for Electrical, Lighting and Fire Alarm Systems shall include all equipment, materials, labor and work, as shown on the contract drawings required to satisfactorily complete the same shall be included in the Lump Sum prices as listed in the Bid Form.

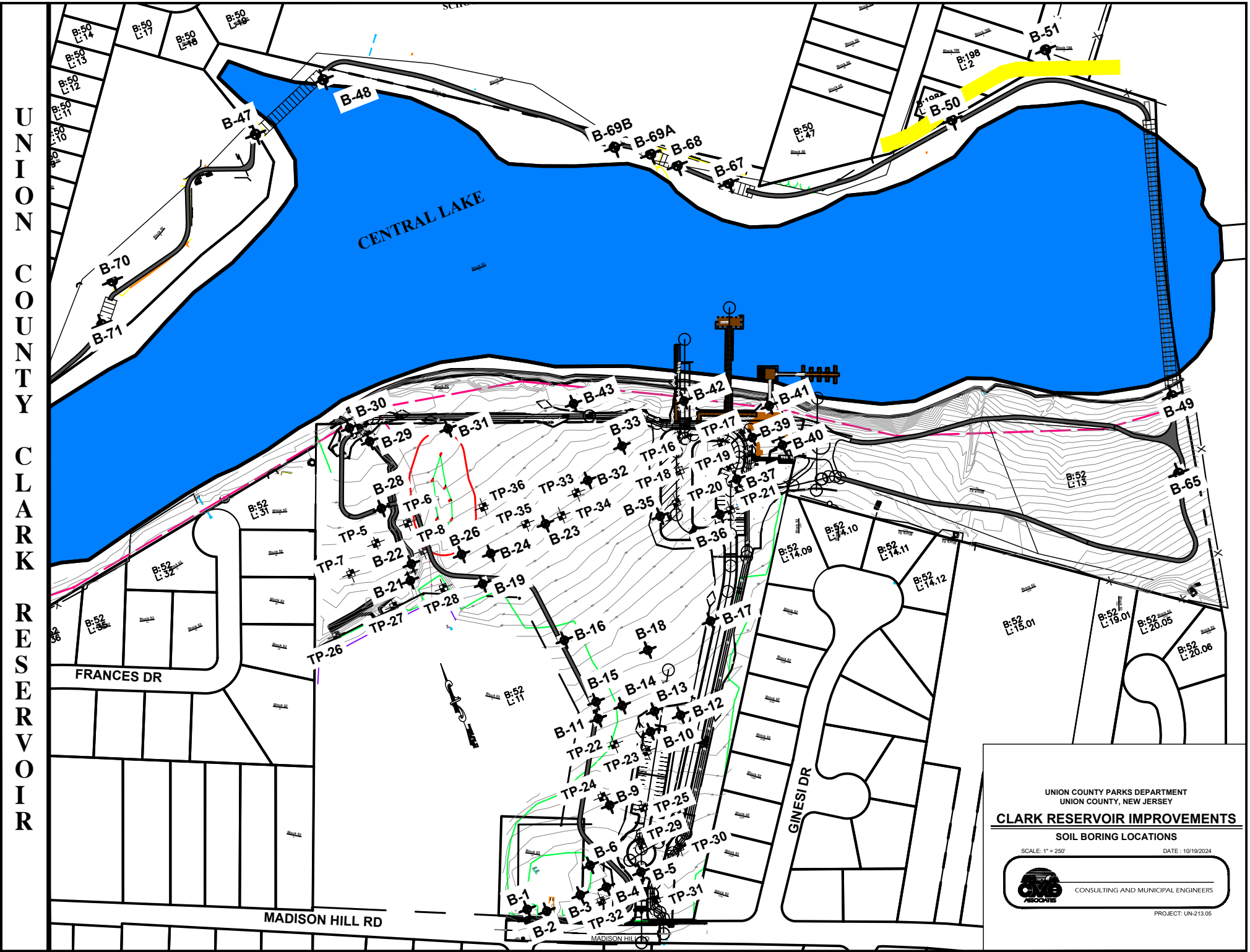
4.2 Separate payment for item described, and shown on the contract drawings, not listed in the bid form will not be made and shall be included in the unit price bid for all items requiring same.

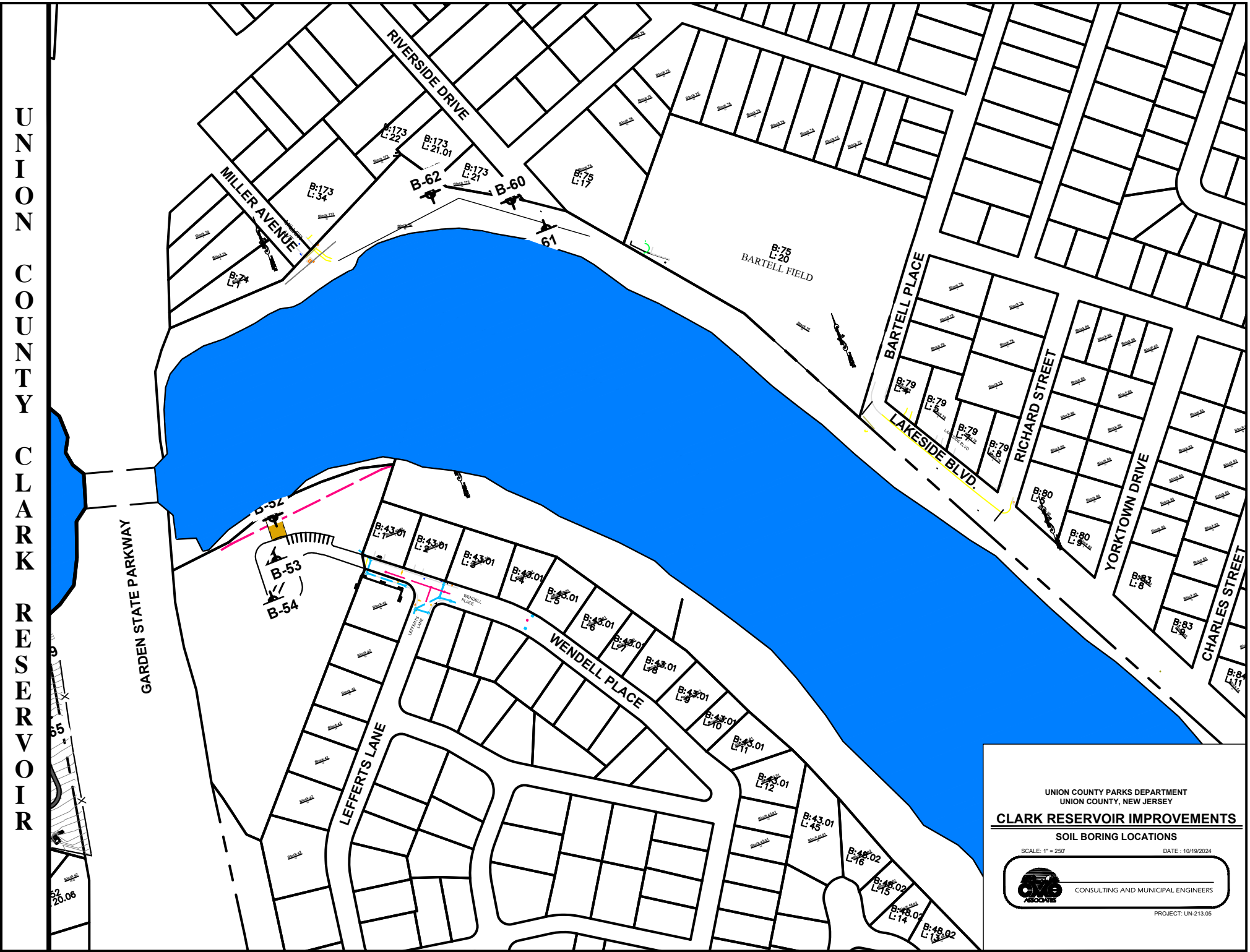
END OF SECTION 260001

APPENDIX

SOIL BORING LOGS


UNION COUNTY CLARK RESERVOIR
OLD RARITAN ROAD
FEATHERBED LANE
KENNETH PL
HUTCHINSON ST
RUDDY PL
RARITAN RD
VICTORIA DRIVE
FEATHERBED LANE
WESTLAKE
HEAD WATERS
(N/F UNION COUNTY)
CLARK VOLUNTEER FIRE DEPT.
CLARK LITTLE LEAGUE
B-45
B- 44
B-47
B-70
B-71
B:33 L:6.01
B:33 L:7
B:33 L:8
B:33 L:5
B:33 L:9
B:53 L:33
B:53 L:34
B:50 L:1.02
B:50 L:1
B:50 L:14
B:50 L:13
B:50 L:12
B:50 L:11
B:50 L:10
B:50 L:6
B:50 L:17
B:50 L:18
B:33.05 L:3
B:33.05 L:4
B:33.01 L:1
B:33.01 L:16
B:33.10
UNION COUNTY PARKS DEPARTMENT
UNION COUNTY, NEW JERSEY
CLARK RESERVOIR IMPROVEMENTS
SOIL BORING LOCATIONS
SCALE: 1" = 250'
DATE : 10/19/2024
CONSULTING AND MUNICIPAL ENGINEERS
PROJECT: UN-213.05


UNION COUNTY CLARK RESERVOIR
CENTRAL LAKE
B-1
B-2
B-3
B-4
B-5
B-6
B-9
B-10
B-11
B-12
B-13
B-14
B-15
B-16
B-17
B-18
B-19
B-21
B-22
B-23
B-24
B-26
B-28
B-29
B-30
B-31
B-32
B-33
B-34
B-35
B-36
B-37
B-39
B-40
B-41
B-42
B-43
B-47
B-48
B-49
B-50
B-51
B-65
B-67
B-68
B-69A
B-69B
B-70
B-71
TP-5
TP-6
TP-7
TP-8
TP-16
TP-17
TP-18
TP-19
TP-20
TP-21
TP-22
TP-23
TP-24
TP-25
TP-26
TP-27
TP-28
TP-29
TP-30
TP-31
TP-32
TP-33
TP-34
TP-35
TP-36
FRANCES DR
MADISON HILL RD
GINESI DR
UNION COUNTY PARKS DEPARTMENT
UNION COUNTY, NEW JERSEY
CLARK RESERVOIR IMPROVEMENTS
SOIL BORING LOCATIONS
SCALE: 1" = 250'
DATE : 10/19/2024
CONSULTING AND MUNICIPAL ENGINEERS
PROJECT: UN-213.05


UNION COUNTY CLARK RESERVOIR
RIVERSIDE DRIVE
MILLER AVENUE
B-62
B-60
61
B-52
B-53
B-54
BARTELL FIELD
BARTELL PLACE
LAKESIDE BLVD.
RICHARD STREET
YORKTOWN DRIVE
CHARLES STREET
GARDEN STATE PARKWAY
WENDELL PLACE
LEFFERTS LANE
UNION COUNTY PARKS DEPARTMENT
UNION COUNTY, NEW JERSEY
CLARK RESERVOIR IMPROVEMENTS
SOIL BORING LOCATIONS
SCALE: 1" = 250'
DATE : 10/19/2024
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
PROJECT: UN-213.05

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 1

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 2/16/2024
End Date: 2/16/2024

Ground Elevation:
Depth to Water 6 ft
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		Push	Push			S-1	0 - 2	S-1 (Top 5"): Dk. Gray-brown **Clayey SILT** (Topsoil)	
2				Push	4			(Bottom 19"): Reddish-brown **Silty CLAY**, trace^{+} mf Gravel	
3		2	5			S-2	2 - 4	S-2: **Same**	
4				7	10				
5		9	11			S-3	4 - 6	S-3: Reddish-brown **Silty CLAY**, trace^{+} cf Gravel	
6				16	14				
7		11	14			S-4	6 - 8	S-4: **Same** (wet)	
8				16	14				
9		7	9			S-5	8 - 10	S-5: **Same**	
10				10	13				
11								End of Boring @ 10 ft.	
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 2
Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 2/16/2024
End Date: 2/16/2024
Ground Elevation:
Depth To Water: Dry
Ground Water Elev:
Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		Push	1			S-1	0 - 2	S-1 (Top 8"): Dk. Gray-brown **Clayey SILT**, with fibrous roots (Topsoil)	
2				2	4			(Bottom 16"): Lt. Orange-brown **Silty CLAY**	
3		4	6			S-2	2 - 4	S-2: Reddish-brown **Silty CLAY**, with occasional cf Gravel (top wet)	
4				7	8				
5		8	12			S-3	4 - 6	S-3: **Same** as S-2 (not wet)	
6				13	13				
7		10	13			S-4	6 - 8	S-4: Reddish-brown **Silty CLAY**, some cf Gravel,	
8				14	9			with fragments of Siltstone	
9		10	7			S-5	8 - 10	S-5: Reddish-brown **Silty CLAY**, occasional c Gravel	
10				8	8				
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 3

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 2/15/2024
End Date: 2/15/2024

Ground Elevation:
Depth To Water: 11.5 ft
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		2	2			S-1	0 - 2	S-1 (Top 8"): Dk. Brown **Clayey SILT** (Topsoil)	
2				2	2			(Bottom 16"): Orange-brown **Clayey SILT**	
3		2	3			S-2	2 - 4	S-2 (Top 6"): Orange-brown **Clayey SILT**, little cf Gravel	
4				7	9			(Bottom 18:): Pale Reddish-brown & Tan **Silty CLAY**, trace f Sand,	
5		4	11			S-3	4 - 6	little^{-} mf^{+} Gravel (mottled)	
6				8	10			S-3 (Top 6"): **Same**	
7		10	10			S-4	6 - 8	(Bottom 18"): Pale Red-brown **Silty CLAY**, little+ cf Gravel (silstone frags)	
8				11	11			S-4: **Same** as S-3 Bottom	
9		4	6			S-5	8 - 10	S-5: **Same**	
10				9	11				
11		10	8			S-6	10 -12	S-6: **Same**	
12				7	7				
13									
14									
15		5	6			S-7	15 - 17	S-7 (Top 8"): **Same**	
16				6	9			(Bottom 16"): Reddish-brown c^{-}mf **SAND**, little^{+} Silt (wet)	
17									
18									
19									
20		9	13			S-8	20-22	S-8: **Same** as S-7 Bottom	
21				20	19				
22									
23									
24									
25		9	13			S-9	25-27	S-9 (Top 14"): **Same**	
26				20	19			(Bottom 8"): Reddish-brown **Clayey SILT** (Bull's Liver)	
27									
28									
29									
30		8	15			S-10	30-32	S-10 (Top 14"): Reddish-brown c^{-}mf **SAND**, little^{+} Silt	
31				16	22			(Bottom 10"): Reddish-brown **Clayey SILT** (Bull's Liver)	
32								End of Boring @ 32 ft	
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 4

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 2/15/2024
End Date: 2/15/2024

Ground Elevation:
Depth To Water: Dry
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		Push	Push			S-1	0 - 2	S-1 (Top 6"): Dk.Gray-brown **Clayey SILT** (Topsoil)	
2				1	2			(Bottom 18"): Brown **CLAY & SILT**	
3		1	3			S-2	2 - 4	S-2: Orange-reddish-brown **Silty CLAY** (Top 12" wet; bottom damp)	
4				4	7				
5		6	8			S-3	4 - 6	S-3: Reddish-brown **Silty CLAY,** with occasional mf Gravel	
6				11	14				
7		12	16			S-4	6 - 8	S-4: Reddish-brown **Silty CLAY**, some cf Gravel	
8				23	18				
9		9	11			S-5	8 - 10	S-5: Reddish-brown **Silty CLAY**, some cf Gravel (moist)	
10				10	19				
11								End of Boring @ 10 ft	
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 5

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 2/15/2024
End Date: 2/15/2024

Ground Elevation:
Depth To Water: Dry
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		1	1			S-1	0 - 2	S-1 (Top 6"): Very Dk.Gray-brown **Clayey SILT** (Topsoil)	
2				1	1			(Bottom 18"): Reddish-brown **CLAY & SILT**	
3		1	1			S-2	2 - 4	S-2: Orange-reddish-brown **Silty CLAY**	
4				1	1				
5		6	8			S-3	4 - 6	S-3: Reddish-brown **Silty CLAY,** little - mf Gravel (siltstone fragments)	
6				11	13				
7		11	18			S-4	6 - 8	S-4: **Same** as S-3	
8				13	21				
9		11	20			S-5	8 - 10	S-5: Reddish-brown **Silty CLAY**, trace cf Sand, some - cf Gravel	
10				15	13				
11								End of Boring @ 10 ft	
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist
Clayey SILT	slight PL	Thread 1/4"
SILT & CLAY	low PL	Thread 1/8"
CLAY & SILT	med PL	Thread 1/16"
Silty CLAY	high PL	Thread 1/32"
CLAY	very high PL	Thread 1/64"

Relative Density (Dr) of Granular Soils	
Very Loose	0-15%
Loose	15-35%
Medium	35-65%
Dense	65-85%
Very Dense	85-100%

Consistency of Clayey Soils (Based on Shearing Strength)	
soft (S)	0.1-0.5 tsf
firm (F)	0.5-1.0 tsf
med hard (MH)	1.0-2.0 tsf
hard (H)	2.0-4.0 tsf
very hard (VH)	over 4.0 tsf

Proportions Used	
trace	1-10%
little	10-20%
some	20-35%
and	35-50%

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 6
Sampler: 2" split spoon
Location Plan: (See Attached)
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Drilling Company: Environmental Technical Drilling, Inc.
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Project#: PUN00213.05
Ground Elevation:
Drilling Inspector: Joseph Sullivan, P.E.
Start Date: 2/15/2023
Depth To Water:
Soils Engineer: Joseph Sullivan, P.E.
End Date: 2/15/2023
Ground Water Elev:

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		1	4			S-1	0-2	S-1 (Top 3"): Dk. Gray-brown **Clayey SILT**, with organic matter (Topsoil)	
2				2	2			(Bottom 21"): Reddish-brown **Clayey SILT**, trace^{+} cf Gravel	
3		2	5			S-2	2-4	S-2: **Same** as S-1	
4				4	4				
5		3	7			S-3	4-6	S-3: Reddish-brown **SILT** (Bull's Liver)	
6				11	12				
7		13	10			S-4	6-8	S-4 (Top 18"): **Same** as S-3	
8				10	13			(Bottom 6"): Reddish-brown cf **SAND**, trace^{+} Silt	
9		16	12			S-5	8-10	S-5: Dk. Reddish-brown **SILT** (Bull's Liver; wet)	
10				21	13				
11						S-6	10-12	S-6: **Same** as S-5	
12									
13									
14									
15		4	5			S-7	15-17	S-7: Reddish-brown **SILT**, with occasional c Gravel (Bull's Liver)	
16				6	6				
17									
18									
19									
20		6	11			S-8	20-22	S-8: **Same** as S-7	
21				11	11				
22									
23									
24									
25		5	9			S-9	25-27	S-9: **Same**	
26				19	20				
27								End of Boring @ 27 ft	
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 3

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 2/15/2024
End Date: 2/15/2024

Ground Elevation:
Depth To Water:
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample: ID	Sample: Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		2	2			S-1	0 - 2	S-1 (Top 3"): Dk. Gray-brown **Clayey SILT**, with organic matter (Topsoil)	
2				2	2			(Bottom 21"): Reddish-brown **Clayey SILT**, trace^{+} cf Gravel	
3		2	3			S-2	2 - 4	S-2: **Same** as S-1	
4				7	9				
5		4	11			S-3	4 - 6	S-3: Reddish-brown **SILT** (Bull's Liver)	
6				8	10				
7		10	10			S-4	6 - 8	S-4 (Top 18"): **Same** as S-3	
8				11	11			(Bottom 6"): Reddish-brown cf **SAND**, trace^{+} Silt	
9		4	6			S-5	8 - 10	S-5: Dk. Reddish-brown **SILT** (Bull's Liver; wet)	
10				9	11				
11		10	8			S-6	10 -12	S-6: **Same** as S-5	
12				7	7				
13									
14									
15		5	6			S-7	15 - 17	S-7: Reddish-brown **SILT**, with occasional c Gravel (Bull's Liver)	
16				6	9				
17									
18									
19									
20		9	13			S-8	20-22	S-8: **Same** as S-7	
21				20	19				
22									
23									
24									
25		9	13			S-9	25-27	S-9: **Same**	
26				20	19				
27									
28									
29									
30		8	15			S-10	30-32	S-10: **Same**	
31				16	22				
32								End of Boring @ 32 ft	
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 9
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	2/15/2024	Depth To Water:	
End Date:	2/15/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Casing per ft.	Blows Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		Push	Push			S-1	0 - 2	S-1 (Top 5"): Dk. Gray-brown Clayey SILT (Topsoil)	
2				1	2			(Bottom 19"): Reddish-brown Silty CLAY, trace+ mf Gravel	
3		1	5			S-2	2 - 4	S-2: Same	
4				7	10				
5		11	13			S-3	4 - 6	S-3: Reddish-brown Silty CLAY, trace+ cf Gravel	
6				12	21				
7		12	16			S-4	6 - 8	S-4: Same (wet)	
8				13	14				
9		8	9			S-5	8 - 10	S-5: Same	
10				15	13				
11								End of Boring @ 10 ft	
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 10
Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 2/19/2024
End Date: 2/19/2024
Ground Elevation:
Depth To Water:
Ground Water Elev:
Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		1	1			S-1	0 - 2	S-1 (Top 5"): Dk. Gray-brown Clayey SILT (Topsoil)	
2				1	2			(Bottom 19"): Reddish-brown Silty CLAY, trace+ mf Gravel	
3		3	6			S-2	2 - 4	S-2: Same	
4				13	12				
5		11	12			S-3	4 - 6	S-3: Reddish-brown Silty CLAY, trace+ cf Gravel	
6				11	13				
7		12	13			S-4	6 - 8	S-4: Same (wet)	
8				13	20				
9		10	13			S-5	8 - 10	S-5: Same	
10				12	14				
11								End of Boring @ 10 ft	
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 11
Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 2/19/2024
End Date: 2/19/2024
Ground Elevation:
Depth To Water:
Ground Water Elev:
Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		Push	2			S-1	0 - 2	S-1 (Top 6"): Dk.Gray-brown **Clayey SILT** (Topsoil)	
2				3	7			(Bottom 18"): Brown **CLAY & SILT**	
3		4	7			S-2	2 - 4	S-2: Orange-reddish-brown **Silty CLAY** (Top 12" wet; bottom damp)	
4				9	10				
5		10	12			S-3	4 - 6	S-3: Reddish-brown **Silty CLAY**, with occasional mf Gravel	
6				11	12				
7		8	11			S-4	6 - 8	S-4: Reddish-brown **Silty CLAY**, some cf Gravel	
8				12	13				
9		10	10			S-5	8 - 10	S-5: Reddish-brown **Silty CLAY**, some- cf Gravel (moist)	
10				9	10				
11								End of Boring @ 10 ft	
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 12

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 2/19/2024
End Date: 2/19/2024

Ground Elevation:
Depth To Water: 8 ft
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample: ID	Sample: Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		Push	Push			S-1	0 - 2	S-1 (Top 3"): Dk. Gray-brown **Clayey SILT**, with organic matter (Topsoil)	
2				1	5			(Bottom 21"): Reddish-brown **Clayey SILT**, trace^{+} cf Gravel	
3		4	8			S-2	2 - 4	S-2: **Same** as S-1	
4				8	12				
5		16	11			S-3	4 - 6	S-3: Reddish-brown **SILT** (Bull's Liver)	
6				13	12				
7		8	10			S-4	6 - 8	S-4 (Top 18"): **Same** as S-3	
8				12	11			(Bottom 6"): Reddish-brown cf **SAND**, trace^{+} Silt	
9		5	10			S-4	6 - 8	S-5: Dk. Reddish-brown **SILT** (Bull's Liver; wet)	
10				12	18				
11		14	13			S-5	8 - 10	S-6: **Same** as S-5	
12				11	11				
13									
14									
15		8	11			S-7	15 - 17	S-7: Reddish-brown **SILT**, with occasional c Gravel (Bull's Liver)	
16				7	7				
17									
18									
19									
20		8	19			S-8	20-22	S-8: **Same** as S-7	
21				22	48				
22									
23									
24									
25		6	14			S-9	25-27	S-9: **Same**	
26				21	50/3				
27									
28									
29									
30		50/4				S-10	30-30.3	S-10: **Same**	
31									
32								End of Boring @ 30.3" ft	
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 13

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 2/15/2024
End Date: 2/15/2024

Ground Elevation:
Depth To Water: 10.5 ft
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		1	1			S-1	0 - 2	S-1 (Top 4"): Dk. Brown **Clayey SILT** (Topsoil)	
2				1	1			(Bottom 20"): Tan-brown **Silty CLAY**	
3		2	4			S-2	2 - 4	S-2: Reddish-brown **Silty CLAY**	
4				9	9				
5		4	7			S-3	4 - 6	S-3: **Same** as S-2	
6				10	12				
7		13	10			S-4	6 - 8	S-4: Reddish-brown **Silty CLAY**, with occasional c Gravel	
8				11	12			(fragments of siltstone)	
9		5	6			S-5	8 - 10	S-5: Dk. Reddish-brown **Silty CLAY**, little^{-} mf Gravel	
10				8	7				
11		7	11			S-6	10 -12	S-6 (Top 6"): Dk. Reddish-brown **Silty CLAY**, little^{-} cf Gravel (quartz)	
12				10	12			(Bottom 18"): Reddish-brown **Clayey SILT**, with occasional c Gravel	
13									
14									
15		6	7			S-7	15 - 17	S-7: **Same** as S-6 Bottom	
16				8	8				
17									
18									
19									
20		5	6			S-8	20-22	S-8 (Top 18"): Reddish-brown **Clayey SILT**	
21				8	9			(Bottom 6"):Reddish-brown **CLAY & SILT**	
22									
23									
24									
25		6	17			S-9	25-27	S-9: Reddish-brown **Clayey SILT**, trace^{+} f Gravel	
26				22	21				
27									
28									
29									
30		7	20			S-10	30-32	S-10: **Same** as S-9	
31				23	25				
32								End of Boring @ 32 ft	
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 14
Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 2/15/2024
End Date: 2/15/2024
Ground Elevation:
Depth To Water:
Ground Water Elev:
Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		1	3			S-1	0 - 2	S-1 (Top 5"): Dk. Brown **Clayey SILT** (Topsoil)	
2				5	9			(Bottom 19"): Pale Red-brown **Silty CLAY** (bottom 4" mottled)	
3		7	8			S-2	2 - 4	S-2: Reddish-brown **Silty CLAY**, with ocassional c Gravel	
4				9	12				
5		6	6			S-3	4 - 6	S-3: **Same** as S-2	
6				9	10				
7		7	8			S-4	6 - 8	S-4: **Same**	
8				14	8				
9		4	6			S-5	8 - 10	S-5: Dk. Reddish-brown **Silty CLAY**, little c Gravel	
10				6	6				
11		9	10			S-6	10 -12	S-6: Reddish-brown **Silty CLAY**, with ocassional c Gravel	
12				13	15				
13								Note: Resistance to augering at 13 ft (cobbles)	
14									
15		4	4			S-7	15 - 17	S-7 (Top 14"): **Same** as S-6 Bottom (wet)	
16				10	11			(Bottom 10"): Reddish-brown **Clayey SILT** (Bull's Liver)	
17									
18									
19									
20		10	14			S-8	20-22	S-8: **Same** as S-7 Bottom	
21				16	24				
22									
23									
24									
25		6	3			S-9	25-27	S-9: **Same**	
26				19	18				
27									
28									
29									
30		10	10			S-10	30-32	S-10: **Same**	
31				15	22				
32								End of Boring @ 32 ft	
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CME ASSOCIATES	**CLARK RESERVOIR IMPROVEMENTS** **Township of Clark, Union County, NJ**	Sheet: 1 of 1 Boring No.: B - 15
	Sampler: 2" split spoon Hammer/Fall: 140lbs/30" Auto Trip Hammer Rig Type/Drilling Method: ATV / Hollow Stem Auger	Location Plan: (See Attached) Drilling Company: Environmental Technical Drilling, Inc.

Project#:	PUN00213.05	Ground Elevation:		Drilling Inspector:	Joseph Sullivan, P.E.
Start Date:	2/16/2024	Depth To Water:		Soils Engineer:	Joseph Sullivan, P.E.
End Date:	2/16/2024	Ground Water Elev:			

DRAFT

Depth Below Surface (ft)	Blows Casing per ft.	Blows Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		Push	Push			S-1	0 - 2	S-1 (Top 8"): Dk. Brown **Clayey SILT** (Topsoil)	
2				2	2			(Bottom 16"): Lt. Orange-brown and Tan **Silty CLAY** (mottled)	
3		6	9			S-2	2 - 4	S-2: Dk. Reddish-brown **Silty CLAY**	
4				9	10				
5		7	6			S-3	4 - 6	S-3: Dk. Reddish-brown **Silty CLAY**, with ocassional c Gravel	
6				7	9				
7		8	7			S-4	6 - 8	S-4: **Same** as S-3	
8				8	20				
9		14	10			S-5	8 - 10	S-5: **Same**	
10				14	11				
11		8	8			S-6	10 -12	S-6: Reddish-brown **CLAY & SILT**, with frequent fragments of c Gravel	
12				7	9				
13								Note: Resistance to augering at 13 ft to 15 ft (cobbles)	
14									
15		6	6			S-7	15 - 17	S-7: Reddish-brown **Clayey SILT** (Bull's Liver; wet)	
16				10	15				
17									
18									
19									
20		11	16			S-8	20-22	S-8: **Same** as S-7	
21				21	19				
22									
23									
24									
25		10	14			S-9	25-27	S-9: **Same**	
26				18	21				
27									
28									
29									
30		9	11			S-10	30-32	S-10 (Top 18"): **Same** as S-9	
31				21	38			(Bottom 6"): Reddish-brown **Silty CLAY**, some cf Gravel (Siltstone frags)	
32								End of Boring @ 32 ft	
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 16
Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	2/19/2024	Depth To Water:	
End Date:	2/19/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		1	1			S-1	0 - 2	S-1 (Top 6"): Dk.Gray-brown **Clayey SILT** (Topsoil)	
2				5	11			(Bottom 18"): Brown CLAY & SILT	
3		6	13			S-2	2 - 4	S-2: Orange-reddish-brown **Silty CLAY** (Top 12" wet; bottom damp)	
4				11	11				
5		12	11			S-3	4 - 6	S-3: Reddish-brown **Silty CLAY**, with occasional mf Gravel	
6				12	11				
7		11	10			S-4	6 - 8	S-4: Reddish-brown **Silty CLAY**, some cf Gravel	
8				9	9				
9		8	7			S-5	8 - 10	S-5: Reddish-brown **Silty CLAY**, some- cf Gravel (moist)	
10				8	10				
11								End of Boring @ 10 ft	
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 17
Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 2/19/2024
End Date: 2/19/2024
Ground Elevation:
Depth To Water:
Ground Water Elev:
Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		1	1			S-1	0 - 2	S-1 (Top 6"): Dk.Gray-brown Clayey SILT (Topsoil)	
2				5	11			(Bottom 18"): Brown CLAY & SILT	
3		6	13			S-2	2 - 4	S-2: Orange-reddish-brown Silty CLAY (Top 12" wet; bottom damp)	
4				11	11				
5		12	11			S-3	4 - 6	S-3: Reddish-brown Silty CLAY, with occasional mf Gravel	
6				12	11				
7		11	10			S-4	6 - 8	S-4: Reddish-brown Silty CLAY, some cf Gravel	
8				9	9				
9		8	7			S-5	8 - 10	S-5: Reddish-brown Silty CLAY, some- cf Gravel (moist)	
10				8	10				
11								End of Boring @ 10 ft	
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32								End of Boring @ 32 ft	
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 18
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	2/15/2024	Depth To Water:	13 ft
End Date:	2/15/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample: ID	Sample: Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		1	4			S-1	0 - 2	S-1 (Top 5"): Dk. Gray-brown **Clayey SILT** (Topsoil)	
2				4	6			(Bottom 19"): Lt. Brown **CLAY & SILT, with Tan mottles**	
3		4	7			S-2	2 - 4	S-2: Pale Reddish-brown **CLAY & SILT**, trace^{+} mf Gravel (mottled)	
4				8	10				
5		5	14			S-3	4 - 6	S-3: Reddish-brown & Tan Clayey **SILT**, with frequent frags of siltstone	
6				11	9			(mottled)	
7		8	8			S-4	6 - 8	S-4: Reddish-brown & Tan **Clayey SILT**, trace mf Gravel	
8				10	6				
9		3	5			S-5	8 - 10	S-5 (Top 18"): **Same** as S-6	
10				7	8			(Botom 6"): Reddish-brown **SILT** (Bull's Liver)	
11		11	14			S-6	10 -12	S-6: Reddish-brown **CLAY & SILT**, little^{-} mf Gravel	
12				13	20				
13									
14									
15		9	9			S-7	15 - 17	S-7 (Top 12"): Red-brown **Silty CLAY**, with frags of siltstone	
16				11	14			(Bottom 12"): Reddish-brown c^{+} f **SAND**, trace^{-} Silt, little f Gravel	
17									
18									
19									
20		12	18			S-8	20-22	S-8 (Top 6"): **Same** as S-7 Bottom	
21				20	20			(Bottom 18"): Reddish-brown c^{-} mf **GRAVEL**, some^{+} Clay & Silt,	
22								little c^{+} f Sand	
23									
24									
25		11	14			S-9	25-27	S-9: Reddish-brown **SILT** (Bull's Liver)	
26				19	24				
27								End of Boring @ 27 ft	
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

End of Boring @ 32 ft

	Clayey Soils	@ Ball Moist
Clayey SILT	slight PL	Thread 1/4"
SILT & CLAY	low PL	Thread 1/8"
CLAY & SILT	med PL	Thread 1/16"
Silty CLAY	high PL	Thread 1/32"
CLAY	very high PL	Thread 1/64"

Relative Density (Dr) of Granular Soils	
Very Loose	0-15%
Loose	15-35%
Medium	35-65%
Dense	65-85%
Very Dense	85-100%

(Based on Shearing Strength)	
soft (S)	0.1-0.5 tsf
firm (F)	0.5-1.0 tsf
med hard (MH)	1.0-2.0 tsf
hard (H)	2.0-4.0 tsf
very hard (VH)	over 4.0 tsf

Proportions Used	
trace	1-10%
little	10-20%
some	20-35%
and	35-50%

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 19

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 5/28/2024
End Date: 5/28/2024

Ground Elevation:
Depth To Water: 6.00
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample: ID	Sample: Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		1	1			S-1	0 - 2	S-1 (Top 6"): Dk. Reddish-brown **Clayey SILT**, with roots (Toposoil)	
2				1	1			(Bottom 16"): Pale Red-brown **CLAY & SILT**	
3		5	15			S-2	2 - 4	S-2: Pale Red-brown **CLAY & SILT**, little c^{+} f Gravel (quartzite, siltstone)	
4				15	18				
5		7	8			S-3	4 - 6	S-3: **Same** as S-2	
6				10	9				
7		8	11			S-4	6 - 8	S-4: **Same** (wet)	
8				12	6				
9		5	7			S-5	8 - 10	S-5: Red-brown **CLAY & SILT**, some c^{+} f Gravel (siltstone fragments)	
10				14	8				
11		3	4			S-6	10 -12	S-6: **Same** as S-5	
12				4	7				
13									
14									
15		10	25			S-7	15 - 17	S-7: Reddish-brown **Clayey SILT** (Bull's Liver)	
16				34	48				
17									
18									
19									
20		10	20			S-8	20-22	S-8: Reddish-brown **Clayey SILT**, little^{+} c^{+} f Gravel	
21				26	30				
22									
23									
24									
25		10	15			S-9	25-27	S-9: Reddish-brown **Clayey SILT** (Bull's Liver)	
26				19	24				
27								End of Boring @ 27 ft	
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

End of Boring @ 32 ft

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		(Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 21

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	5/28/2024	Depth To Water:	8 ft
End Date:	5/29/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		1	1			S-1	0 - 2	S-1 (Top 4"): Dk. Gray **Clayey SILT** (Topsoil)	
2				1	2			(Bottom 20"): Brown **Clayey SILT**, with roots	
3		3	3			S-2	2 - 4	S-2: Orange-brown & Tan-brown **Clayey SILT** (mottled)	
4				4	4				
5		6	9			S-3	4 - 6	S-3: Reddish-brown **Clayey SILT**	
6				10	9				
7		12	16			S-4	6 - 8	S-4: Reddish-brown **Clayey SILT**, little cf Gravel (siltstone fragments)	
8				16	17				
9		10	15			S-5	8 - 10	S-5: Reddish-brown **Clayey SILT**, little^{+} c^{+}f Gravel (siltstone fragments)	
10				14	10				
11		7	6			S-6	10 -12	S-6: Reddish-brown **Clayey SILT**, some^{-} c^{+}f Gravel (siltstone fragments)	
12				9	10				
13									
14									
15		9	11			S-7	15 - 17	S-7: Reddish-brown **Clayey SILT**, some^{-} c^{+}f Gravel (thinly laminated)	
16				17	21				
17									
18									
19									
20		11	20			S-8	20-22	S-8: Reddish-brown **Clayey SILT**, some^{+} c^{+}f Gravel	
21				24	38				
22									
23									
24									
25		11	20			S-9	25-27	S-9 (Top 16"): **Same** as S-8	
26				24	33			(Bottom 8"): Reddish-brown **Clayey SILT**	
27									
28									
29									
30		10	17			S-10	30=32	S-10 : Reddish-brown **Clayey SILT**	
31				25	31				
32								End of Boring @ 32 ft	
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

	Clayey Soils	@ Ball Moist
Clayey SILT	slight PL	Thread 1/4"
SILT & CLAY	low PL	Thread 1/8"
CLAY & SILT	med PL	Thread 1/16"
Silty CLAY	high PL	Thread 1/32"
CLAY	very high PL	Thread 1/64"

Relative Density (Dr) of Granular Soils	
Very Loose	0-15%
Loose	15-35%
Medium	35-65%
Dense	65-85%
Very Dense	85-100%

End of Boring @ 32 ft

(Based on Shearing Strength)		Proportions Used	
soft (S)	0.1-0.5 tsf	trace	1-10%
firm (F)	0.5-1.0 tsf	little	10-20%
med hard (MH)	1.0-2.0 tsf	some	20-35%
hard (H)	2.0-4.0 tsf	and	35-50%
very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 22

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 5/29/2024
End Date: 5/29/2024

Ground Elevation:
Depth To Water: 7.5 ft
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		1	1			S-1	0 - 2	S-1 (Top 4"): Dk. Gray-brown **Clayey SILT** (Topsoil)	
2				5	4			(Bottom 20"): Brown **Clayey SILT**	
3		4	5			S-2	2 - 4	S-2: Lt. Orange-tan & Reddish-brown **SILT & CLAY** (mottled)	
4				4	6				
5		4	13			S-3	4 - 6	S-3: Reddish-brown & Lt. Gray **Clayey SILT**, and c^{+}f Gravel	
6				14	16			(fragmented siltstone)	
7		10	14			S-4	6 - 8	S-4: Reddish-brown **Clayey SILT**, little^{-} cf Gravel (Bottom wet)	
8				19	14				
9		14	17			S-5	8 - 10	S-5: Reddish-brown **Clayey SILT**, little^{+} c^{+}f Gravel	
10				12	13				
11		5	7			S-6	10 -12	S-6: Reddish-brown **Clayey SILT**, little+ cmf^{-} Gravel	
12				11	13				
13									
14									
15		5	9			S-7	15 - 17	S-7: Pale Reddish-brown **SILT**, with occasional mf Gravel (Bull's Liver)	
16				15	20				
17									
18									
19									
20		8	15			S-8	20-22	S-8: **Same** as S-7	
21				18	19				
22									
23									
24									
25		5	8			S-9	25-27	S-9: Reddish-brown **SILT** (Bull's Liver)	
26				8	9				
27									
28									
29									
30		8	22			S-10	30=32	S-10 (Top 14"): **Same** as S-9	
31				31	31			(Bottom 10"): Brown mf **SAND**, little Silt (damp)	
32								End of Boring @ 32 ft	
33								Note: Scattered cobbles and boulders in adjacent stream bed	
34									
35									
36									
37									
38									
39									
40									
41									
42									

	Clayey Soils	@ Ball Moist
Clayey SILT	slight PL	Thread 1/4"
SILT & CLAY	low PL	Thread 1/8"
CLAY & SILT	med PL	Thread 1/16"
Silty CLAY	high PL	Thread 1/32"
CLAY	very high PL	Thread 1/64"

Relative Density (Dr) of Granular Soils	
Very Loose	0-15%
Loose	15-35%
Medium	35-65%
Dense	65-85%
Very Dense	85-100%

End of Boring @ 32 ft

(Based on Shearing Strength)		Proportions Used	
soft (S)	0.1-0.5 tsf	trace	1-10%
firm (F)	0.5-1.0 tsf	little	10-20%
med hard (MH)	1.0-2.0 tsf	some	20-35%
hard (H)	2.0-4.0 tsf	and	35-50%
very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 23

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	2/19/2024	Depth To Water:	8 ft
End Date:	2/19/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample: ID	Sample: Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		Push	Push			S-1	0 - 2	S-1 (Top 5"): Dk. Gray **Clayey SILT** (Topsoil)	
2				1	3			(Bottom 19"): Brown **Clayey SILT**	
3		8	11			S-2	2 - 4	S-2: Reddish-brown **Clayey SILT**,with thinly laminated siltstone frags	
4				16	21				
5		13	16			S-3	4 - 6	S-3: Dk.Reddish-brown **Clayey SILT**, some $^{+}$ cf Gravel	
6				12	11				
7		9	7			S-4	6 - 8	S-4: Dk. Reddish-brown **Clayey SILT**, little $^{+}$ cf Sand, little c $^{+}$ f Gravel	
8				10	10				
9		7	8			S-5	8 - 10	S-5: Reddish-brown cf **GRAVEL**, some c $^{+}$ f Sand (wet)	
10				10	12				
11								End of Boring @ 10 ft	
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 24
Sampler: 2" split spoon
Location Plan: (See Attached)
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Drilling Company: Environmental Technical Drilling, Inc.
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	5/28/2024	Depth To Water:	6 ft
End Date:	5/29/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows Casing per ft.	Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		Push	2			S-1	0 - 2	S-1 (Top 8"): Dk. Gray-brown **Clayey SILT** (Topsoil)	
2				3	4			(Bottom 16"): Pale Reddish-brown **CLAY & SILT**, little^{+} c^{+} f Gravel	
3		10	12			S-2	2 - 4	S-2: Reddish-brown **Clayey SILT**, some c+f Gravel (silstone fragments)	
4				18	21				
5		6	8			S-3	4 - 6	S-3: **Same** as S-2 (wet)	
6				8	8				
7		3	7			S-4	6 - 8	S-4: **Same**	
8				9	8				
9		7	12			S-5	8 - 10	S-5: **Same**	
10				11	9				
11		7	8			S-6	10 -12	S-6: Reddish-brown **Clayey SILT**, little^{+} cf Gravel	
12				15	21				
13									
14									
15		6	10			S-7	15 - 17	S-7: Brown CLAY & **SILT**, with occasional c Gravel	
16				13	18				
17									
18									
19									
20		12	16			S-8	20-22	S-8: Reddish-brown **Clayey SILT,** little^{+} cf Gravel	
21				24	23				
22									
23									
24									
25		9	12			S-9	25-27	S-8: Reddish-brown **Clayey SILT,** some^{+} cf Gravel	
26				32	31				
27									
28									
29									
30		10	19			S-10	30=32	S-10: Reddish-brown **Clayey SILT,** little^{+} cf Gravel	
31				27	23				
32								End of Boring @ 32 ft	
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%

End of Boring @ 32 ft

(Based on Shearing Strength)		Proportions Used	
soft (S)	0.1-0.5 tsf	trace	1-10%
firm (F)	0.5-1.0 tsf	little	10-20%
med hard (MH)	1.0-2.0 tsf	some	20-35%
hard (H)	2.0-4.0 tsf	and	35-50%
very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 26
Sampler: 2" split spoon
Location Plan: (See Attached)
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Drilling Company: Environmental Technical Drilling, Inc.
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	5/28/2024	Depth To Water:	8 ft
End Date:	5/29/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		1	1			S-1	0 - 2	S-1 (Top 5"): Dk. Gray-brown **Clayey SILT** (Topsoil)	
2				1	3			(Bottom 17"): Lt. Brown **CLAY** &**SILT**	
3		3	9			S-2	2 - 4	S-2: Palr Reddish-brown **Clayey SILT**, trace+ cf Sand	
4				11	13				
5		9	14			S-3	4 - 6	S-3: Reddish-brown **Clayey SILT**, trace^{+} c^{+} f Gravel	
6				12	11				
7		12	22			S-4	6 - 8	S-4: Reddish-brown **Clayey SILT**, little^{+} c^{+} f Gravel	
8				10	7				
9		4	4			S-5	8 - 10	S-5: Reddish-brown **Clayey SILT**, some cf Gravel	
10				5	6				
11		4	5			S-6	10 -12	S-6: Reddish-brown **Clayey SILT**, little cf Gravel	
12				7	7				
13									
14									
15		4	5			S-7	15 - 17	S-7: Reddish-brown **SILT** (Bull's Liver)	
16				15	22				
17									
18									
19									
20		14	28			S-8	20-22	S-8: Reddish-brown **SILT**, with occasional cf Gravel (Bull's Liver)	
21				29	23				
22									
23									
24									
25		14	22			S-9	25-27	S-9: **Same** as S-8(Bull's Liver)	
26				27	28				
27									
28									
29									
30		9	14			S-10	30=32	S-10 (Top 12") Reddish-brown **SILT** (Bull's Liver)	
31				39	28			(Bottom 12"): Brown mf **SAND**, trace+ Silt	
32								End of Boring @ 32 ft	
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

End of Boring @ 32 ft

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		(Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 28

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	5/29/2024	Depth To Water:	8 ft
End Date:	5/29/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		1	1			S-1	0 - 2	S-1 (Top 4"): Dk. Brown **Clayey SILT** (Topsoil)	
2				1	1			(Bottom 20"): Lt. Brown **CLAY & SILT**	
3		2	6			S-2	2 - 4	S-2: Reddish-brown **Clayey SILT**	
4				10	5				
5		10	10			S-3	4 - 6	S-3: Reddish-brown **Clayey SILT**, trace mf Gravel	
6				11	16				
7		10	10			S-4	6 - 8	S-4: Reddish-brown **Clayey SILT**, trace mf Gravel, with Black specles	
8				12	11				
9		10	14			S-5	8 - 10	S-5: Reddish-brown **Clayey SILT**, trace mf Gravel	
10				12	10				
11		4	5			S-6	10 -12	S-6: Reddish-brown **Clayey SILT**, little + c Gravel (siltstone fragments)	
12				6	7				
13									
14									
15		4	7			S-7	15 - 17	S-7: Reddish-brown **SILT**(Bull's Liver)	
16				11	13				
17									
18									
19									
20		5	10			S-8	20-22	S-8: **Same** as S-7	
21				15	25				
22									
23									
24									
25		11	23			S-9	25-27	S-9: **Same**	
26				23	33				
27									
28									
29									
30		8	25			S-10	30=32	S-10 (Top 12"): **Same**	
31				24	28			(Bottom 12"): Brown cf **SAND,** trace + Silt	
32								End of Boring @ 32 ft	
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

	Clayey Soils	@ Ball Moist
Clayey SILT	slight PL	Thread 1/4"
SILT & CLAY	low PL	Thread 1/8"
CLAY & SILT	med PL	Thread 1/16"
Silty CLAY	high PL	Thread 1/32"
CLAY	very high PL	Thread 1/64"

Relative Density (Dr) of Granular Soils	
Very Loose	0-15%
Loose	15-35%
Medium	35-65%
Dense	65-85%
Very Dense	85-100%

End of Boring @ 32 ft

(Based on Shearing Strength)		Proportions Used	
soft (S)	0.1-0.5 tsf	trace	1-10%
firm (F)	0.5-1.0 tsf	little	10-20%
med hard (MH)	1.0-2.0 tsf	some	20-35%
hard (H)	2.0-4.0 tsf	and	35-50%
very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
9Boring No.: B - 29
Sampler: 2" split spoon
Location Plan: (See Attached)
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Drilling Company: Environmental Technical Drilling, Inc.
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Project#: PUN00213.05
Ground Elevation:
Drilling Inspector: Joseph Sullivan, P.E.
Start Date: 5/30/2024
Depth To Water: 7 ft
Soils Engineer: Joseph Sullivan, P.E.
End Date: 5/30/2024
Ground Water Elev:

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		Push	1			S-1	0 - 2	S-1 (Top 3"): Dk. Gray-brown **Clayey SILT** (Topsoil)	
2				2	2			(Middle 9"): Brown **Clayey SILT**	
3		1	4			S-2	2 - 4	(Bottom 12"): Lt. Brown & Lt. Orange-brown **Clayey SILT**	
4				8	11			S-2 (Top 6"): **Same** as S-1 Bottom)	
5		5	11			S-3	4 - 6	(Bottom 18"): Reddish-brown **Clayey SILT**, little^{+} cf Gravel	
6				20	18			S-3: Pale Reddish-brown **Clayey SILT**, trace+ cf Gravel	
7		12	10			S-4	6 - 8	S-4: Reddish-brown **Clayey SILT**, little+ cf Gravel	
8				12	12				
9		6	7			S-5	8 - 10	S-5: **Same** as s-4 (wet)	
10				5	6				
11		4	4			S-6	10 -12	S-6: **Same**	
12				5	4				
13									
14									
15		6	7			S-7	15 - 17	S-7: Reddish-brown **Clayey SILT**, little mf Gravel	
16				9	10				
17									
18									
19									
20		6	11			S-8	20-22	S-8: Pale Reddish-brown **SILT**, with occasional cf Gravel (Bull's Liver)	
21				17	16				
22									
23									
24									
25		7	11			S-9	25-27	S-9: Pale Reddish-brown **SILT** (Bull's Liver)	
26				16	29				
27									
28									
29									
30		10	18			S-10	30=32	S-10: Pale Reddish-brown c^{-}mf **SAND**, trace^{+} Silt	
31				18	20				
32								End of Boring @ 32 ft	
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

	Clayey Soils	@ Ball Moist
Clayey SILT	slight PL	Thread 1/4"
SILT & CLAY	low PL	Thread 1/8"
CLAY & SILT	med PL	Thread 1/16"
Silty CLAY	high PL	Thread 1/32"
CLAY	very high PL	Thread 1/64"

Relative Density (Dr) of Granular Soils	
Very Loose	0-15%
Loose	15-35%
Medium	35-65%
Dense	65-85%
Very Dense	85-100%

End of Boring @ 32 ft

(Based on Shearing Strength)		Proportions Used	
soft (S)	0.1-0.5 tsf	trace	1-10%
firm (F)	0.5-1.0 tsf	little	10-20%
med hard (MH)	1.0-2.0 tsf	some	20-35%
hard (H)	2.0-4.0 tsf	and	35-50%
very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
9Boring No.: B - 30

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 5/30/2024
End Date: 5/30/2024

Ground Elevation:
Depth To Water: 7 ft
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		Push	1			S-1	0 - 2	S-1 (Top 3"): Dk. Gray-brown **Clayey SILT** (Topsoil)	
2				2	2			(Bottom 21"): Brown **Clayey SILT**	
3		1	4			S-2	2 - 4	S-2: Reddish-brown **Clayey SILT**, little^{+} cf Gravel	
4				8	11				
5		5	11			S-3	4 - 6	S-3: Pale Reddish-brown **Clayey SILT**, trace+ cf Gravel	
6				20	18				
7		12	10			S-4	6 - 8	S-4: Reddish-brown **Clayey SILT**, little cf Gravel	
8				12	12				
9		6	7			S-5	8 - 10	S-5: **Same** as s-4 (wet)	
10				5	6				
11		4	4			S-6	10 -12	S-6: **Same**	
12				5	4				
13									
14									
15		6	7			S-7	15 - 17	S-7: Reddish-brown **Clayey SILT**, little mf Gravel	
16				9	10				
17									
18									
19									
20		6	11			S-8	20-22	S-8: Pale Reddish-brown **SILT** (Bull's Liver)	
21				17	16				
22									
23									
24									
25		7	11			S-9	25-27	S-9: **Same** as S-8	
26				16	29				
27									
28									
29									
30		11	20			S-10	30=32	S-10: Reddish-brown c^{-} mf **SAND**, little^{-} Silt	
31				19	23				
32								End of Boring @ 32 ft	
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

	Clayey Soils	@ Ball Moist
Clayey SILT	slight PL	Thread 1/4"
SILT & CLAY	low PL	Thread 1/8"
CLAY & SILT	med PL	Thread 1/16"
Silty CLAY	high PL	Thread 1/32"
CLAY	very high PL	Thread 1/64"

Relative Density (Dr) of Granular Soils	
Very Loose	0-15%
Loose	15-35%
Medium	35-65%
Dense	65-85%
Very Dense	85-100%

End of Boring @ 32 ft

(Based on Shearing Strength)		Proportions Used	
soft (S)	0.1-0.5 tsf	trace	1-10%
firm (F)	0.5-1.0 tsf	little	10-20%
med hard (MH)	1.0-2.0 tsf	some	20-35%
hard (H)	2.0-4.0 tsf	and	35-50%
very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 31

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 5/30/2024
End Date: 5/30/2024

Ground Elevation:
Depth To Water: 6.5 ft
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		1	5			S-1	0 - 2	S-1 (Top 5"): Dk. Gray-brown **Clayey SILT** (Topsoil)	
2				4	7			(Bottom 19"): Reddish-brown **Clayey SILT**	
3		8	9			S-2	2 - 4	S-2: Reddish-brown **Clayey SILT**, little cf Gravel	
4				10	11				
5		12	15			S-3	4 - 6	S-3: Reddish-brown **Clayey SILT**, little cf Gravel, with ocassional cobbles	
6				25	20				
7		18	24			S-4	6 - 8	S-4: **Same** as S-3 (wet)	
8				29	42				
9		17	20			S-5	8 - 10	S-5: Reddish-brown **Clayey SILT**, little^{+} cf Gravel	
10				22	24				
11								End of Boring @ 10 ft	
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 32
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	5/29/2024	Depth To Water:	6 ft
End Date:	5/29/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		Push	1			S-1	0 - 2	S-1 (Top 4"): Dk. Gray-brown Clayey SILT(Topsoil)	
2				3	5			(Bottom 20"): Brown **Clayey SILT**	
3		4	5			S-2	2 - 4	S-2: Pale Reddish-brown **Clayey SILT**, some + cf Gravel	
4				8	17				
5		6	7			S-3	4 - 6	S-3: Reddish-brown **Clayey SILT**, some cf Gravel	
6				8	9				
7		7	8			S-4	6 - 8	S-4 **Same** as S-3 (wet)	
8				8	13				
9		10	14			S-5	8 - 10	S-5: Reddish-brown **Clayey SILT**, and + e cf Gravel)	
10				10	12				
11		5	11			S-6	10 -12	S-6 (Top 10"): **Same** as S-5	
12				11	12			(10" - 16"): Pale Red-brown **Cobble** (completely disintegrated siltstone)	
13								(Bottom 8"): Reddish-brown **SILT** (Bull's Liver)	
14									
15		4	7			S-7	15 - 17	S-7 (Top 2"): **Same** as S-6 Bottom	
16				10	10			(2" - 18"): Reddish-brown **cf SAND**, little + Silt	
17								(Bottom 6"): Reddish-brown **SILT** (Bull's Liver)	
18									
19									
20		10	14			S-8	20-22	S-8: Reddish-brown **Clayey SILT**, little + cf Gravel	
21				15	24				
22									
23									
24									
25		16	21			S-9	25-27	S-9 (Top 15"): Reddish-brown **Clayey SILT**, little cf Gravel Same	
26				21	19			(Bottom 9"): Reddish-brown **SILT (Bull's Liver)**	
27									
28									
29									
30		9	32			S-10	30=32	S-10: **Same** as S-9 Bottom	
31				50	50/2				
32								End of Boring @ 32 ft	
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

	Clayey Soils	@ Ball Moist
Clayey SILT	slight PL	Thread 1/4"
SILT & CLAY	low PL	Thread 1/8"
CLAY & SILT	med PL	Thread 1/16"
Silty CLAY	high PL	Thread 1/32"
CLAY	very high PL	Thread 1/64"

Relative Density (Dr) of Granular Soils	
Very Loose	0-15%
Loose	15-35%
Medium	35-65%
Dense	65-85%
Very Dense	85-100%

End of Boring @ 32 ft

(Based on Shearing Strength)		Proportions Used	
soft (S)	0.1-0.5 tsf	trace	1-10%
firm (F)	0.5-1.0 tsf	little	10-20%
med hard (MH)	1.0-2.0 tsf	some	20-35%
hard (H)	2.0-4.0 tsf	and	35-50%
very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
9Boring No.: B - 33

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 5/30/2024
End Date: 5/30/2024

Ground Elevation:
Depth To Water: 7 ft
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		Push	1			S-1	0 - 2	S-1 (Top 4"): Dk. Gray-brown Clayey SILT(Topsoil)	
2				1	3			(Bottom 20"): Lt. Brown **CLAY & SILT**	
3		3	6			S-2	2 - 4	S-2: Lt. Pale Reddish-brown and Tan **Clayey SILT** (mottled)	
4				10	13				
5		6	12			S-3	4 - 6	S-3: Reddish-brown **Clayey SILT**, some^{-} cf Gravel (siltstone fragments)	
6				18	18				
7		8	13			S-4	6 - 8	S-4 (Top 12"): Reddish-brown **Clayey SILT**, little^{+} cf Gravel	
8				10	9			(Bottom 12"): Brown cf **SAND**, some^{-} Silt (wet)	
9		7	9			S-5	8 - 10	S-5: Dk. Reddish-brown **Clayey SILT**, little cf Gravel)	
10				11	12				
11		5	8			S-6	10 -12	S-6 (Top 12"): Same as S-5	
12				6	8			(Bottom 12"): Brown c^{+} f **SAND**, some^{-} Silt	
13									
14									
15		5	6			S-7	15 - 17	S-7 (Top 10"): **Same** as S-6 Bottom	
16				7	10			(Bottom 14"): Reddish-brown **SILT** (Bull's Liver)	
17									
18									
19									
20		8	15			S-8	20-22	S-8: **Same** as S-7 Bottom	
21				20	28				
22									
23									
24									
25		8	13			S-9	25-27	S-9: **Same**	
26				14	20				
27									
28									
29									
30		9	19			S-10	30=32	S-10: Brown cf **SAND**, trace+ Silt	
31				26	27				
32								End of Boring @ 32 ft	
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

	Clayey Soils	@ Ball Moist
Clayey SILT	slight PL	Thread 1/4"
SILT & CLAY	low PL	Thread 1/8"
CLAY & SILT	med PL	Thread 1/16"
Silty CLAY	high PL	Thread 1/32"
CLAY	very high PL	Thread 1/64"

Relative Density (Dr) of Granular Soils	
Very Loose	0-15%
Loose	15-35%
Medium	35-65%
Dense	65-85%
Very Dense	85-100%

End of Boring @ 32 ft

(Based on Shearing Strength)	
soft (S)	0.1-0.5 tsf
firm (F)	0.5-1.0 tsf
med hard (MH)	1.0-2.0 tsf
hard (H)	2.0-4.0 tsf
very hard (VH)	over 4.0 tsf

Proportions Used	
trace	1-10%
little	10-20%
some	20-35%
and	35-50%

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 35
Sampler: 2" split spoon
Location Plan: (See Attached)
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Drilling Company: Environmental Technical Drilling, Inc.
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	6/3/2024	Depth To Water:	Dry
End Date:	6/3/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		1	1			S-1	0 - 2	S-1 (Top 3"): Dk. Gray-brown **Clayey SILT** (Topsoil)	
2				1	7			(Bottom 21"): Pale Reddish-brown **Clayey SILT**	
3		7	16			S-2	2 - 4	S-2: Reddish-brown **Clayey SILT**, with occasional c Gravel	
4				13	18				
5		10	15			S-3	4 - 6	S-3: Reddish-brown **Clayey SILT**, little c^{+}f Gravel	
6				13	14				
7		14	10			S-4	6 - 8	S-4: Reddish-brown **Clayey SILT**, some^{+} c^{+}f Gravel	
8				6	7				
9		19	18			S-5	8 - 10	S-5: Reddish-brown **Clayey SILT**	
10				19	20				
11								End of Boring @ 10 ft	
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 36

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 6/3/2024
End Date: 6/3/2024

Ground Elevation:
Depth To Water: Dry
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		Push	Push			S-1	0 - 2	S-1 (Top 4"): Dk. Gray-brown **Clayey SILT** (Topsoil)	
2				1	2			(Bottom 20"): Reddish-brown **Clayey SILT**	
3		4	7			S-2	2 - 4	S-2: Pale Reddish-brown **Clayey SILT**	
4				8	11				
5		13	14			S-3	4 - 6	S-3: Reddish-brown **Clayey SILT**, trace^{+} cf Gravel	
6				11	17				
7		14	22			S-4	6 - 8	S-4: Reddish-brown **Clayey SILT**, some^{+} c^{+} f Gravel	
8				28	23				
9		25	32			S-5	8 - 10	S-5: **Same** as S-4	
10				23	25				
11								End of Boring @ 10 ft	
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 37
Sampler: 2" split spoon
Location Plan: (See Attached)
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Drilling Company: Environmental Technical Drilling, Inc.
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	6/3/2024	Depth To Water:	8 ft
End Date:	6/3/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows Casing per ft.	Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		Push	1			S-1	0 - 2	S-1 (Top 12"): Dk. Gray-brown **Clayey SILT** (Topsoil)	
2				7	6			(Bottom 12"): Lt. Orange & Tan **Clayey SILT**	
3		7	10			S-2	2 - 4	S-2: Reddish-brown & Tan **Clayey SILT**	
4				11	12				
5		6	6			S-3	4 - 6	S-3: Reddish-brown **Silty CLAY**	
6				10	12				
7		12	12			S-4	6 - 8	S-4: Dk. Reddish-brown **Silty CLAY**, some cf Gravel (fragments of siltstone)	
8				19	15				
9		7	6			S-5	8 - 10	S-5: Pale Reddish-brown **Silty CLAY** (wet)	
10				7	9				
11		4	5			S-6	10 -12	S-6: **Same** as S-5 (wet)	
12				6	4				
13									
14									
15		4	5			S-7	15 - 17	S-7: Pale Reddish-brown **CLAY & SILT**, with occasional c Gravel	
16				6	4				
17									
18									
19									
20		10	18			S-8	20-22	S-8: Reddish-brown **SILT**, trace c Gravel (Bull's Liver)	
21				18	22				
22									
23									
24									
25		10	26			S-9	25-27	S-9: (Top 10"): **Same** as S-8	
26				36	35			(Bottom 10"): Reddish-brown **Clayey SILT**, little cf Gravel (Bull's Liver)	
27								End of Boring @ 27 ft	
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 39
Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 6/3/2024
End Date: 6/3/2024
Ground Elevation:
Depth To Water: 10.5 ft
Ground Water Elev:
Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		2	3			S-1	0 - 2	S-1 (Top 4"): Dk. Gray-brown **Clayey SILT** (Topsoil)	
2				7	8			(Bottom 20"): Pale Red-brown **Clayey SILT**	
3		6	10			S-2	2 - 4	S-2: Pale Red-brown **Clayey SILT**, little $^{+}$ c $^{+}$ f Gravel	
4				14	19				
5		12	12			S-3	4 - 6	S-3: Dk. Reddish-brown **Clayey SILT**, little $^{+}$ c $^{+}$ f Gravel	
6				15	15				
7		11	12			S-4	6 - 8	S-4: **Same** as S-3	
8				13	13				
9		10	20			S-5	8 - 10	S-5: Dk. Reddish-brown **Clayey SILT**, some $^{-}$ c $^{+}$ f Gravel	
10				16	14				
11		7	8			S-6	10 -12	S-6: **Same** as S-5 (wet)	
12				10	17				
13									
14									
15		11	18			S-7	15 - 17	S-7: **Same**	
16				17	16				
17									
18									
19									
20		5	15			S-8	20-22	S-8 (Top 18"): Reddish-brown cf **SAND**, some $^{-}$ Silt (wet)	
21				18	12			(Bottom 16"): Reddish-brown **SILT** (Bull's Liver)	
22									
23									
24									
25		10	17			S-9	25-27	S-9 (Top 10"): **Same**	
26				31	42			(Bottom 14"): Reddish-brown **SILT**, little cf Gravel (Bull's Liver)	
27									
28									
29									
30		12	27			S-10	30-32	S-10: Reddish-brown **SILT**, some c $^{+}$ f Gravel (Bull's Liver)	
31				29	35				
32									
33									
34									
35		11	26					S-11: Reddish-brown **SILT**(Bull's Liver)	
36				25	26				
37								End of Boring @ 37 ft	
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 40
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	6/3/2024	Depth To Water:	8 ft
End Date:	6/3/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		1	1			S-1	0 - 2	S-1 (Top 3"): Dk. Gray-brown **Clayey SILT** (Topsoil)	
2				2	2			(Bottom 21"): Pale Red-brown **Clayey SILT**, with roots	
3		3	7			S-2	2 - 4	S-2 (Top 12"): Pale Red-brown & Tan **Clayey SILT (mottled)**	
4				10	14			(Bottom 12"): Pale Red-brown **Clayey SILT**, little $^{+}$ c $^{+}$ f Gtravel	
5		9	12			S-3	4 - 6	S-3 (Top 10"): **Same** as S-2 Bottom	
6				12	12			(Bottom 14"):Reddish-brown **Clayey SILT**, trace $^{+}$ c $^{+}$ f Gravel	
7		10	13			S-4	6 - 8	S-4: Reddish-brown **Clayey SILT**, little cf Gravel	
8				15	13				
9		9	13			S-5	8 - 10	S-5: Reddish-brown **Clayey SILT**, little $^{+}$ c $^{+}$ f Gravel (Bull's Liver; wet)	
10				15	20				
11		5	13			S-6	10 -12	S-6: Reddish-brown **Clayey SILT**, some $^{+}$ c $^{+}$ f Gravel (Bull's Liver)	
12				12	15				
13									
14									
15		12	12			S-7	15 - 17	S-7: Reddish-brown **Clayey SILT** (Bull's Liver)	
16				16	17				
17									
18									
19									
20		12	16			S-8	20-22	S-8: **Same** as S-7	
21				20	22				
22									
23									
24									
25		10	21			S-9	25-27	S-9: Reddish-brown **Clayey SILT**, little cf Gravel (Bull's Liver)	
26				27	37				
27									
28									
29									
30		15	20			S-10	30-32	S-10: Reddish-brown **Clayey SILT** (Bull's Liver)	
31				27	32				
32									
33									
34									
35		9	22			S-11	35-37	S-11: **Same** as S-10	
36				32	37				
37								End of Boring @ 37 ft	
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 41
Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	6/3/2024	Depth To Water:	8 ft
End Date:	6/3/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		5	3			S-1	0 - 2	S-1 (Top 3"): Dk. Gray-brown **Clayey SILT**, with organic matter (Topsoil)	
2				3	3			(Bottom 21"): Reddish-brown **Clayey SILT**, trace + cf Gravel	
3		4	7			S-2	2 - 4	S-2: **Same** as S-1	
4				10	13				
5		6	9			S-3	4 - 6	S-3: Reddish-brown **SILT** (Bull's Liver)	
6				7	8				
7		8	8			S-4	6 - 8	S-4 (Top 18"): **Same** as S-3	
8				10	11			(Bottom 6"): Reddish-brown cf **SAND**, trace + Silt	
9		6	9			S-5	8 - 10	S-5: Dk. Reddish-brown **SILT** (Bull's Liver; wet)	
10				10	9				
11		8	11			S-6	10 -12	S-6: **Same** as S-5	
12				15	12				
13									
14									
15		7	13			S-7	15 - 17	S-7: Reddish-brown **SILT**, with occasional c Gravel (Bull's Liver)	
16				13	17				
17									
18									
19									
20		7	12			S-8	20-22	S-8: **Same** as S-7	
21				14	18				
22									
23									
24									
25		11	17			S-9	25-27	S-9: **Same**	
26				16	18				
27									
28									
29									
30		10	13			S-10	30-32	S-10: **Same**	
31				27	24				
32								End of Boring @ 32 ft	
33									
34									
35									
36									
37									
38									
39									
40									

DRAFT

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 42
Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 5/31/2024
End Date: 5/31/2024
Ground Elevation:
Depth To Water: 7 ft
Ground Water Elev:
Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		Push	Push			S-1	0 - 2	S-1 (Top 6"): Dk. Gray-brown **Clayey SILT** (Topsoil)	
2				5	6			(Bottom 18"): Reddish-brown **Clayey SILT**, trace^{+} c Gravel	
3		5	16			S-2	2 - 4	S-2: Reddish-brown **Clayey SILT**, some^{+} c^{+} f Gravel	
4				11	11				
5		7	12			S-3	4 - 6	S-3: **Same** as S-2	
6				12	11				
7		9	9			S-4	6 - 8	S-4: Reddish-brown **Clayey SILT**, little^{+} cf Gravel (wet)	
8				8	8				
9		8	9			S-5	8 - 10	S-5: **Same** as S-4	
10				10	10				
11		5	6			S-6	10 -12	S-6: Reddish-brown **Clayey SILT**, trace^{+} cf Gravel	
12				8	6				
13									
14									
15		5	7			S-7	15 - 17	S-7 (Top 6"): **Same** as S-6	
16				7	6			(Bottom 18") :Reddish-brown **SILT** (Bull's Liver)	
17									
18									
19									
20		13	14			S-8	20-22	S-8: **Same** as S-7	
21				14	15				
22									
23									
24									
25		11	16			S-9	25-27	S-9: Reddish-brown **SILT**, with occasional c Gravel (fragments of shale)	
26				20	29				
27									
28									
29									
30		8	25			S-10	30-32	S-10: Reddish-brown **SILT** (Bull's Liver)	
31				30	46				
32								End of Boring @ 32 ft	
33								Note: Scattered cobbles and boulders on ground surface	
34									
35									
36									
37									
38									
39									
40									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 43
Sampler: 2" split spoon
Location Plan: (See Attached)
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Drilling Company: Environmental Technical Drilling, Inc.
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	5/30/2024	Depth To Water:	6.5 ft
End Date:	5/31/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		3	6			S-1	0 - 2	S-1 (Top 5"): Dk. Gray-brown **Clayey SILT,** with organic matter (Topsoil)	
2				4	7			(Bottom 19"): Brown **Clayey SILT**, trace $^{+}$ c Gravel	
3		4	7			S-2	2 - 4	S-2: Pale Reddish-brown **Clayey SILT**, with occasional c Gravel	
4				12	8				
5		6	11			S-3	4 - 6	S-3: Reddish-brown **Clayey SILT**, some c^{+}f Gravel (siltstone frags)	
6				10	8				
7		19	10			S-4	6 - 8	S-4 (Top 16"): **Same** as S-3 (wet)	
8				9	8			(Bottom 8"): Reddish-brown cmf^{-} **SAND**, trace Silt, trace^{+} mf Gravel	
9		10	9			S-5	8 - 10	S-5 (Top 6"): **Same** as S-4 Bottom	
10				9	13			(Bottom 18"): Reddish-brown **SILT** (Bull's Liver)	
11		4	8			S-6	10 -12	S-6: **Same** as S-5 Bottom	
12				9	10				
13									
14									
15		7	16			S-7	15 - 17	S-7: Reddish-brown **SILT**, with occasional cf Gravel	
16				17	20			(fragments of siltstone, Bull's Liver)	
17									
18									
19									
20		7	14			S-8	20-22	S-8: Reddish-brown **SILT** (Bull's Liver)	
21				26	27				
22									
23									
24									
25		19	25			S-9	25-27	S-9: **Same** as S-8	
26				39	40				
27									
28									
29									
30		25	27			S-10	30-32	S-10: Reddish-brown mf **SAND**, trace^{+} Silt	
31				42	51				
32								End of Boring @ 32 ft	
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 44
Sampler: 2" split spoon
Location Plan: (See Attached)
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Drilling Company: Environmental Technical Drilling, Inc.
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	6/4/2024	Depth To Water:	2.5 ft
End Date:	6/4/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows Casing per ft.	Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		2	5			S-1	0 - 2	S-1 (Top 5"): Dk. Gray-brown **Clayey SILT** (Topsoil)	
2				8	8			(Bottom 19"): Dk. Reddish-brown **Clayey SILT**	
3		7	8			S-2	2 - 4	S-2: **Same** as S-1 Bottom	
4				9	7				
5		8	22			S-3	4 - 6	S-3 (Top 12"): Dk. Reddish-brown **Clayey SILT**, little^{+} c^{+} f Gravel (wet)	
6				10	9			(Bottom 12"): Dk. Reddish-brown **SILT** (Bull's Liver)	
7		5	7			S-4	6 - 8	S-4 (Top 20"): **Same** as S-3	
8				7	7			(Bottom 4"): Reddish-brown cf **SAND**, trace^{+} Silt	
9		4	5			S-5	8 - 10	S-5 (Top 18"): **Same** as S-4 Bottom	
10				7	8			(Bottom 6"): Reddish-brown **SILT** (Bull's Liver)	
11		3	4			S-6	10 -12	S-6: Reddish-brown **SILT**, with occasional c Gravel	
12				14	7				
13									
14									
15		9	17			S-7	15 - 17	S-7: **Same** as S-6	
16				34	26				
17									
18									
19									
20		12	15			S-8	20-22	S-8 (Top 16"): Reddish-brown Clayey **SILT**, and c^{+} f Gravel	
21				16	12			(Bottom 8"): Reddish-brown **Clayey SILT**, little^{-} cf Gravel	
22									
23									
24									
25		25	38			S-9	25-27	S-9: (Top 12"): Reddish-brown **cf SAND**, trace Silt	
26				38	50/2			(Bottom 12"): Reddish-brown **Clayey SILT**	
27								End of Boring @ 27 ft	
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 45
Sampler: 2" split spoon
Location Plan: (See Attached)
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Drilling Company: Environmental Technical Drilling, Inc.
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Project#: PUN00213.05
Ground Elevation:
Drilling Inspector: Joseph Sullivan, P.E.
Start Date: 6/4/2024
Depth To Water: 4 ft
Soils Engineer: Joseph Sullivan, P.E.
End Date: 6/4/2024
Ground Water Elev:

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample: ID	Sample: Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		2	8			S-1	0 - 2	S-1 (Top 6"): Dk. Gray-brown **Clayey SILT**, little+ mf Gravel	
2				4	3			(Bottom 18"): Lt. Orange-brown **Clayey SILT**	
3		1	2			S-2	2 - 4	S-2: Reddish-brown **Clayey SILT**	
4				6	8				
5		5	7			S-3	4 - 6	S-3 (Top 6"): **Same** as S-2 (wet)	
6				7	6			(Bottom 18"): Reddish-brown cmf^{-} **SAND**, trace^{+} Silt (wet)	
7		3	5			S-4	6 - 8	S-4: Reddish-brown mf^{+} **SAND**, some Silt	
8				4	5				
9		3	6			S-5	8 - 10	S-5: Reddish-brown **SILT** (Bull's Liver)	
10				4	5				
11		1	1			S-6	10 -12	S-6: **Same** as S-5	
12				2	2				
13		2	2			S-7	12-14	S-7: **Same**	
14				3	6				
15		4	5			S-8	15 - 17	S-8: Reddish-brown **SILT**, with occasional mf Gravel (Bull's Liver)	
16				9	7				
17									
18									
19									
20		29	23			S-9	20-22	S-9: (Top 6"): **Same** as S-8 (Bull's Liver)	
21				21	28			(Bottom 18"): Reddish-brown mf^{+} **SAND**, trace^{+} Silt, some^{+} cf Gravel	
22									
23									
24									
25		27	44			S-10	25-27	S-10: Reddish-brown mf+ **SAND**, trace Silt, little mf Gravel	
26				49	62				
27								End of Boring @ 27 ft	
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B-47
Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Drop Hammer
Rig Type/Drilling Method: Tripod
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 7/3/2024
End Date: 7/3/2024
Ground Elevation:
Depth to Water 7.5 ft
Ground Water Elev:
Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		10	12			S-1	0-2	S-1: Pale Brown & Reddish-brown **Clayey SILT**, little+ cf Gravel	
2				13	11				
3		10	8			S-2	2-4	S-2: **Same** as S-1	
4				6	5				
5		5	12			S-3	4-6	S-3: Pale Brown **Clayey SILT**	
6				14	18				
7		23	26			S-4	6-8	S-4 (Top 12"): Pale Red-brown & Tan **Clayey SILT** (faint mottling)	
8				36	25			(Bottom 12"): Reddish-Brown **Clayey SILT** (Bottom wet)	
9		36	30			S-5	8-10	S-5: Reddish-brown **Clayey SILT** (wet)	
10				31	16				
11		18	13			S-6	10-12	S-6: Reddish-brown **Silty CLAY**	
12				13	14				
13		6	14			S-7	12-14	S-7: **Same** as S-6	
14				20	31				
15		48	24			S-8	14-16	S-8 (Top 14"): Reddish-brown cf **SAND**, trace^{+} Silt	
16				43	42			(Bottom 10"): Dk. Reddish-brown **Clayey SILT**, some c^{+} f Gravel	
17		40	40			S-9	16-18	S-9 (Top 6"): **Same** as S-8 Bottom	
18				56	50/2			(Bottom 18") Reddish-brown cf **SAND**, little- Silt	
19								End of Boring @ 18 ft	
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B-48

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Drop Hammer
Rig Type/Drilling Method: Tripod

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	7/3/2024	Depth to Water	6 ft
End Date:	7/3/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		3	4			S-1	0-2	S-1 (Top 2"): Dk. Brown **Clayey SILT**, with organic matter (Topsoil)	
2				4	3			(Bottom 22"): Tan-brown **CLAY & SILT**	
3		3	3			S-2	2-4	S-2 (Top 12"): Tan-brown **CLAY & SILT**, with Reddish-brown mottles	
4				11	21			(Bottom 12"): Reddish-brown & Tan **Clayey SILT**	
5		11	18			S-3	4-6	S-3: Reddish-brown **Clayey SILT**, some c f Gravel	
6				17	20				
7		13	16			S-4	6-8	S-4: Reddish-brown **Silty CLAY**, little cf **Gravel** (wet)	
8				15	16				
9		16	11			S-5	8-10	S-5: Reddish-brown **Silty CLAY**, with ocassional c Gravel (wet)	
10				11	10				
11		11	11			S-6	10-12	S-6: Reddish-brown **Silty CLAY**	
12				20	22				
13		11	15			S-7	12-14	S-7: Reddish-brown **SILT** (Bull's Liver)	
14				16	32				
15		18	22			S-8	14-16	S-8: Reddish-brown **Clayey SILT**, little mf Sand	
16				17	50/1				
17									
18								End of Boring @ 16 ft	
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 49
Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 6/19/2024
End Date: 6/19/2024
Ground Elevation:
Depth To Water: 4 ft
Ground Water Elev:
Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		2	4			S-1	0 - 2	S-1 (Top 2"): Dk. Brown **Clayey SILT** (Topsoil)	
2				11	7			(Bottom 22"): Pale Red-brown **Clayey SILT**, little^{+} cf Gravel (shale frags)	
3		8	10			S-2	2 - 4	S-2: **Same** as S-1 Bottom	
4				10	11				
5		9	10			S-3	4 - 6	S-3: Dk. Red-brown **Clayey SILT**, some^{+} cm^{+} f Sand, little^{+} cf Gravel (wet)	
6				12	21				
7		13	7			S-4	6 - 8	S-4: Dk. Red-brown cf **SAND**, and- Silt, trace+ cf Gravel (wet)	
8				4	6				
9		7	6			S-5	8 - 10	S-5 (Top 16"): Red-brown cf **SAND**, little Silt, trace^{+} mf Gravel	
10				6	7			(Bottom 8"): Red-brown Clayey SILT, trace cf Sand, some cf Gravel	
11		6	10			S-6	10-12	S-6: Reddish-brown mf **SAND**, trace^{+} Silt	
12				11	19				
13		50/1				S-7	12-12.1	S-7: Pale Reddish-brown cf **GRAVEL** (completely disintegrated shale)	
14						NX Core Run 1	12.1-17.1		
15								RUN 1: Fractured **Shale**	
16								REC = 100%	
17								RQD = 42%	
18									
19						NX Core Run 2	17.1-22.1		
20								RUN 1: Fractured **Shale**	
21								REC = 100%	
22								RQD = 82%	
23								End of Boring @ 22.1 ft	
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 2
Boring No.: B - 50
Sampler: 2" split spoon
Location Plan: (See Attached)
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Drilling Company: Environmental Technical Drilling, Inc.
Rig Type/Drilling Method: Truck / Mud Rotary

Project#: PUN00213.05
Ground Elevation:
Drilling Inspector: Joseph Sullivan, P.E.
Start Date: 6/4/2024
Depth To Water: 13.5 ft
Soils Engineer: Joseph Sullivan, P.E.
End Date: 6/5/2024
Ground Water Elev:

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample: ID	Sample: Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		10	13			S-1	0 - 2	S-1 (Top 8"): Gray cf **SAND**, and cf Gravel (Fill)	
2				14	12			(Bottom 16"): Brown **Clayey SILT**, little^{+} cf Gravel	
3		12	15			S-2		S-2: **Same** as S-1 Bottom	
4				16	15				
5		12	11			S-3	4 - 6	S-3: Red-orangr-brown **Clayey SILT**, little cf Gravel	
6				16	16				
7		17	17			S-4	6 - 8	S-4: Brown **Clayey SILT**, trace$^{=}$ c^{+}f Sand, and^{-} c^{+}f Gravel	
8				15	21				
9		16	29			S-5	8 - 10	S-5: Brown **Clayey SILT**, and^{-} cf Gravel	
10				18	17				
11		21	26			S-6	10 -12	S-6: Reddish-brown **Clayey SILT**, and- cf Gravel	
12				25	25				
13									
14									
15		22	21			S-7	15 - 17	S-7: Reddish-brown **Clayey SILT**, little cf Gravel	
16				27	44				
17									
18									
19									
20		15	19			S-8	20-22	S-8 (Top 22"): **Same** as S-7	
21				26	25			(Bottom 2"): Reddish-brown cf **SAND**, little Silt	
22									
23									
24									
25		17	23			S-9	25-27	S-9 (Top 6"): **Same** as S-8 Bottom)	
26				26	29			(Bottom 16"): Reddish-brown **Clayey SILT** (Bull's Liver)	
27									
28									
29									
30		21	26			S-10	30-32	S-10: Reddish-brown **Clayey SILT**, with occasional c Gravel	
31				30	34			(Bull's Liver)	
32									
33									
34									
35		11	24			S-11	35-37	S-11: Reddish-brown **Clayey SILT** (Bull's Liver)	
36				33	42				
37									
38									
39									
40		12	26			S-12	40-42	S-12: **Same** as S-11	
41				29	45				
42								Cont'd	

	Clayey Soils	@ Ball Moist
Clayey SILT	slight PL	Thread 1/4"
SILT & CLAY	low PL	Thread 1/8"
CLAY & SILT	med PL	Thread 1/16"
Silty CLAY	high PL	Thread 1/32"
CLAY	very high PL	Thread 1/64"

Relative Density (Dr) of Granular Soils	
Very Loose	0-15%
Loose	15-35%
Medium	35-65%
Dense	65-85%
Very Dense	85-100%

(Based on Shearing Strength)	
soft (S)	0.1-0.5 tsf
firm (F)	0.5-1.0 tsf
med hard (MH)	1.0-2.0 tsf
hard (H)	2.0-4.0 tsf
very hard (VH)	over 4.0 tsf

Proportions Used	
trace	1-10%
little	10-20%
some	20-35%
and	35-50%

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 2 of 2
Boring No.: B - 50
Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: Truck / Mud Rotary
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	6/4/2024	Depth To Water:	13.5 ft
End Date:	6/5/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows Casing per ft.	Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
45		10	18			S-13	45-47	S-13: Brown cf **SAND**, trace Silt, trace mf Gravel	
46				31	45				
47								End of Boring @ 47 ft	

	Clayey Soils	@ Ball Moist
Clayey SILT	slight PL	Thread 1/4"
SILT & CLAY	low PL	Thread 1/8"
CLAY & SILT	med PL	Thread 1/16"
Silty CLAY	high PL	Thread 1/32"
CLAY	very high PL	Thread 1/64"

Relative Density (Dr) of Granular Soils	
Very Loose	0-15%
Loose	15-35%
Medium	35-65%
Dense	65-85%
Very Dense	85-100%

(Based on Shearing Strength)	
soft (S)	0.1-0.5 tsf
firm (F)	0.5-1.0 tsf
med hard (MH)	1.0-2.0 tsf
hard (H)	2.0-4.0 tsf
very hard (VH)	over 4.0 tsf

Proportions Used	
trace	1-10%
little	10-20%
some	20-35%
and	35-50%

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 2
Boring No.: B - 51
Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: Truck / Mud Rotary
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 6/5/2024
End Date: 6/6/2024
Ground Elevation:
Depth To Water: 7 ft
Ground Water Elev:
Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		3	3			S-1	0 - 2	S-1: Dk. Gray-brown & Red-brown **Clayey SILT**, some cf Gravel (Fill)	
2				9	7				
3		13	29			S-2		S-2: Reddish-brown **Clayey SILT**, some cf Gravel	
4				22	16				
5		12	8			S-3	4 - 6	S-3: Reddish-brown **Clayey SILT**, little cf Gravel	
6				5	5				
7		4	7			S-4	6 - 8	S-4: **Same** as S-3 (Bottom wet)	
8				7	9				
9		9	8			S-5	8 - 10	S-5: **Same**	
10				9	8				
11		5	7			S-6	10 -12	S-6: **Same**	
12				11	12				
13									
14									
15		6	8			S-7	15 - 17	S-7: **Same**	
16				12	48				
17									
18									
19									
20		10	23			S-8	20-22	S-8: Reddish-brown **Clayey SILT**, little cf Gravel (Bull's Liver)	
21				19	30				
22									
23									
24									
25		19	39			S-9	25-27	S-9: Reddish-brown **Clayey SILT**, and c^{+}f Gravel	
26				44	44			(completely disintegrated sandstone)	
27									
28									
29									
30		17	30			S-10	30-32	S-10: Reddish-brown **cf SAND**, little Silt,trace f Gravel	
31				40	30				
32									
33									
34									
35		17	32			S-11	35-37	S-11: Reddish-brown c^{+}f **SAND**, trace Silt, little^{-} f Gravel	
36				33	41				
37									
38									
39									
40		12	21			S-12	40-42	S-12 (Top 12"): Reddish-brown cf **SAND**, trace^{+} Silt	
41				22	22			(Bottom 12"): Pale Reddish-brown **Clayey SILT** (Bull's Liver)	
42								Cont'd	

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		(Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 2 of 2
Boring No.: B - 51
Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: Truck / Mud Rotary
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	6/5/2024	Depth To Water:	13.5 ft
End Date:	6/6/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows Casing per ft.	Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
45		12	19			S-13	45-47	S-13: Pale Reddish-brown **Clayey SILT** (Bull's Liver)	
46				19	19				
47									
								End of Boring @ 47 ft	

	Clayey Soils	@ Ball Moist
Clayey SILT	slight PL	Thread 1/4"
SILT & CLAY	low PL	Thread 1/8"
CLAY & SILT	med PL	Thread 1/16"
Silty CLAY	high PL	Thread 1/32"
CLAY	very high PL	Thread 1/64"

Relative Density (Dr) of Granular Soils	
Very Loose	0-15%
Loose	15-35%
Medium	35-65%
Dense	65-85%
Very Dense	85-100%

(Based on Shearing Strength)	
soft (S)	0.1-0.5 tsf
firm (F)	0.5-1.0 tsf
med hard (MH)	1.0-2.0 tsf
hard (H)	2.0-4.0 tsf
very hard (VH)	over 4.0 tsf

Proportions Used	
trace	1-10%
little	10-20%
some	20-35%
and	35-50%

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 52

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 6/6/2024
End Date: 6/6/2024

Ground Elevation:
Depth to Water Dry
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		3	6			S-1	0 - 2	S-1 (Top 2"): Dk. Gray-brown **Clayey SILT** (Topsoil)	
2				5	5			(Bottom 22"): Pale Reddish-brown **Silty CLAY**, some $^{+}$ ^{c}f Gravel	
3		5	12			S-2	2 - 4	S-2: **Same**	
4				45	52				
5		50/0				S-3	4	S-3: **Same**	
6									
7								End of Boring @ 4 ft.	
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 53

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Drop Hammer
Rig Type/Drilling Method: Tripod

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 6/6/2024
End Date: 6/6/2024

Ground Elevation:
Depth to Water Dry
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		1	1			S-1	0 - 2	S-1 (Top 3"): Dk. Gray-brown **Clayey SILT** (Topsoil)	
2				1	2			(Bottom 21"): Lt. Brown **Clayey SILT**	
3		3	4			S-2	2 - 4	S-2: Pale Red-brown **Clayey SILT**, some - cf Gravel	
4				7	12				
5		11	17			S-3	4-6	S-3: Pale Red-brown **Clayey SILT**, some - cf Gravel, with highly	
6				18	26			fractured shale cobbles	
7		21	50/2			S-4	6-6.7	S-4: **Same** as S-3	
8									
9								End of Boring @ 6.7 ft	
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 54

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Drop Hammer
Rig Type/Drilling Method: Tripod

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 6/6/2024
End Date: 6/6/2024

Ground Elevation:
Depth to Water Dry
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		2	3			S-1	0 - 2	S-1 (Top 3"): Dk. Gray-brown **Clayey SILT**, w / fibrous rootmat (Topsoil)	
2				3	4			(Bottom 21"): Brown **Clayey SILT**	
3		5	8			S-2	2 - 4	S-2: Pale Red-brown **Clayey SILT**, little + cf Gravel	
4				11	15				
5		11	12			S-3	4-6	S-3: **Same** as S-2	
6				12	14				
7		11	11			S-4	6-8	S-4: Pale Red-brown **Clayey SILT**, some cf Gravel, with shale cobble	
8				30	32				
9		15	18			S-5	8-10	S-5: **Same** as S-4	
10				28	27				
11								End of Boring @ 10 ft	
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist
Clayey SILT	slight PL	Thread 1/4"
SILT & CLAY	low PL	Thread 1/8"
CLAY & SILT	med PL	Thread 1/16"
Silty CLAY	high PL	Thread 1/32"
CLAY	very high PL	Thread 1/64"

Relative Density (Dr) of Granular Soils	
Very Loose	0-15%
Loose	15-35%
Medium	35-65%
Dense	65-85%
Very Dense	85-100%

Consistency of Clayey Soils (Based on Shearing Strength)	
soft (S)	0.1-0.5 tsf
firm (F)	0.5-1.0 tsf
med hard (MH)	1.0-2.0 tsf
hard (H)	2.0-4.0 tsf
very hard (VH)	over 4.0 tsf

Proportions Used	
trace	1-10%
little	10-20%
some	20-35%
and	35-50%

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 60
Sampler: 2" split spoon
Location Plan: (See Attached)
Hammer/Fall: 140lbs/30" Drop Hammer
Drilling Company: Environmental Technical Drilling, Inc.
Rig Type/Drilling Method: Tripod

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	6/13/2024	Depth to Water	Dry
End Date:	6/13/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows Casing per ft.	Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		4	6			S-1	0 - 2	S-1 (Top 5"): Dk. Brown **Clayey SILT (Topsoil)**	
2				7	7			(Bottom 19"): Pale Red-brown **Clayey SILT**, little cf Gravel	
3		8	9			S-2	2 - 4	S-2: **Same** as S-1	
4				14	18				
5		21	29			S-3	4 - 6	S-3: **Same**	
6				26	28				
7		39	50/2			S-4	6-6.7	S-4: Reddish-brown cf **GRAVEL** (completely disintegrated shale)	
8									
9								End of Boring @ 6.7 ft	
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 61
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	6/19/2024	Depth To Water:	28 ft
End Date:	6/19/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample: ID	Sample: Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		3	3			S-1	0 - 2	S-1 (Top 4"): Brown **Clayey SILT** (Topsoil)	
2				7	8			(Bottom 20"): Lt. Pale Reddish-brown **Clayey SILT**	
3		5	7			S-2	2 - 4	S-2: Lt. Pale Reddish-brown & Tan **Clayey SILT**	
4				8	10				
5		7	20			S-3	4 - 6	S-3 (Top 12"): **Same** as S-2	
6				22	19			(Bottom 12"): Lt. Tan **Clayey SILT**, trace mf Gravel	
7		12	16			S-4	6 - 8	S-4: Reddish-brown **Clayey SILT**	
8				12	17				
9		8	15			S-5	8 - 10	S-5: Reddish-brown **Clayey SILT**, some^{+} c^{+} f Gravel (frags of siltstone)	
10				13	20				
11		17	18			S-6	10 -12	S-6: **Same** as S-5	
12				23	37				
13									
14									
15		26	30			S-7	15 - 17	S-7: Reddish-brown **Clayey SILT**, and^{+} cf Gravel (frags of siltstone)	
16				25	25				
17									
18									
19									
20		10	36			S-8	20-22	S-8: Reddish-brown **Clayey SILT**, and^{-} cf Gravel (frags of siltstone)	
21				28	16				
22									
23									
24									
25		18	29			S-9	25-27	S-9: Reddish-brown **Clayey SILT**, and^{+} c^{+} f Gravel (frags of siltstone)	
26				37	24				
27									
28									
29									
30		21	18			S-10	30=32	S-10: Reddish-brown c^{+} f **SAND**, little^{-} Silt, some^{+} cmf^{+} Gravel	
31				27	50/4				
32									
33									
34									
35		48	50/1					S-1: **Same** as S-10	
36								End of Boring @ 35.6 ft	
37								Notes: Scattered cobbles and boulders, including one large boulder,	
38								on ground surface in general area.	
39									
40									
41									
42									

	Clayey Soils	@ Ball Moist
Clayey SILT	slight PL	Thread 1/4"
SILT & CLAY	low PL	Thread 1/8"
CLAY & SILT	med PL	Thread 1/16"
Silty CLAY	high PL	Thread 1/32"
CLAY	very high PL	Thread 1/64"

Relative Density (Dr) of Granular Soils	
Very Loose	0-15%
Loose	15-35%
Medium	35-65%
Dense	65-85%
Very Dense	85-100%

End of Boring @ 32 ft

(Based on Shearing Strength)		Proportions Used	
soft (S)	0.1-0.5 tsf	trace	1-10%
firm (F)	0.5-1.0 tsf	little	10-20%
med hard (MH)	1.0-2.0 tsf	some	20-35%
hard (H)	2.0-4.0 tsf	and	35-50%
very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 62
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Drop Hammer
Rig Type/Drilling Method: Tripod

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	6/13/2024	Depth to Water	Dry
End Date:	6/13/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows Casing per ft.	Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		4	9			S-1	0 - 2	S-1: Pale Red-brown **Clayey SILT**, some - cf Gravel	
2				6	8				
3		16	33			S-2	2 - 4	S-2: **Same** as S-1	
4				25	30				
5		43	35			S-3	4-6	S-3: **Same**	
6				55	50/1				
7								End of Boring @ 5.6 ft	
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 62
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Drop Hammer
Rig Type/Drilling Method: Tripod

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	6/13/2024	Depth to Water	Dry
End Date:	6/13/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows Casing per ft.	Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		4	9			S-1	0 - 2	S-1: Pale Red-brown **Clayey SILT**, some - cf Gravel	
2				6	8				
3		16	33			S-2	2 - 4	S-2: **Same** as S-1	
4				25	30				
5		43	35			S-3	4-6	S-3: **Same**	
6				55	50/1				
7								End of Boring @ 5.6 ft	
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 64
Sampler: 2" split spoon
Location Plan: (See Attached)
Hammer/Fall: 140lbs/30" Drop Hammer
Drilling Company: Environmental Technical Drilling, Inc.
Rig Type/Drilling Method: Tripod

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	6/13/2024	Depth to Water	Dry
End Date:	6/13/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows Casing per ft.	Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		6	10			S-1	0 - 2	S-1: Pale Red-brown **Clayey SILT**, some cf Gravel	
2				9	8				
3		11	16			S-2	2 - 4	S-2: **Same** as S-1	
4				12	20				
5		28	30			S-3	4-6	S-3: **Same**	
6				19	9				
7		12	13			S-4	6-7.3	S-4: **Same**, with fractured shale fragments in spoon tip	
8				50/4					
9								End of Boring @ 7.3 ft	
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 65
Sampler: 2" split spoon
Location Plan: (See Attached)
Hammer/Fall: 140lbs/30" Auto Trip Hammer
Drilling Company: Environmental Technical Drilling, Inc.
Rig Type/Drilling Method: ATV / Hollow Stem Auger

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	6/13/2024	Depth To Water:	Dry
End Date:	6/13/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		Push	1			S-1	0 - 2	S-1: Pale Reddish-brown **Clayey SILT** (Topsoil)	
2				1	3				
3		6	10			S-2	2 - 4	S-2: Reddish-brown **Clayey SILT**, little $^{+}$c $^{+}$f Gravel	
4				11	12				
5		12	19			S-3	4 - 6	S-3: Reddish-brown **Clayey SILT**, some c^{+}f Gravel	
6				16	17				
7		27	22			S-4	6 - 8	S-4: **Same** as S-3	
8				15	16				
9		8	8			S-5	8 - 10	S-5: **Same** as S-4	
10				11	31				
11		50/2						S-6: Reddish-brown **Clayey SILT**, and c+f Gravel	
12	(roller bit)								
13									
14									
15		50/1						S-7: **Same** as S-6	
16									
17								End of Boring @ 15.1 ft	
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 67

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Drop Hammer
Rig Type/Drilling Method: Tripod

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 6/13/2024
End Date: 6/13/2024

Ground Elevation:
Depth to Water Dry
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		6	8			S-1	0 - 2	S-1 (Top 4"): Dk. Gray-brown **Clayey SILT**, with fibrous roots (Topsoil)	
2				9	19			(Bottom 20"): Pale Red-brown **Clayey SILT**, some+ cf Gravel	
3		19	23			S-2	2 - 4	S-2: **Same** as S-1 Bottom	
4				18	26				
5		23	30			S-3	4-6	S-3: **Same**	
6				28	22				
7		23	17			S-4	6-8	S-4: Red-brown **Clayey SILT**, and cf Gravel (fractured shale fragments)	
8				32	50/4				
9								End of Boring @ 8 ft	
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 68

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Drop Hammer
Rig Type/Drilling Method: Tripod

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 6/13/2024
End Date: 6/13/2024

Ground Elevation:
Depth to Water Dry
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		5	6			S-1	0 - 2	S-1 (Top 3"): Dk. Gray-brown **Clayey SILT**, with fibrous roots (Topsoil)	
2				8	6			(Bottom 21"): Brown **Clayey SILT**	
3		8	11			S-2	2 - 4	S-2: Pale Red & Tan **Clayey SILT** (mottled)	
4				11	13				
5		24	36			S-3	4-5.7	S-3: Red-brown **Clayey SILT,** and cf Gravel (fractured shale fragments)	
6				60	50/2				
7								End of Boring @ 5.7 ft	
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 69A
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Drop Hammer
Rig Type/Drilling Method: Tripod

Project#:	PUN00213.05	Ground Elevation:	
Start Date:	6/13/2024	Depth to Water	8 ft
End Date:	6/13/2024	Ground Water Elev:	

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows Casing per ft.	Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		8	8			S-1	0-2	S-1 (Top 2"): Dk. Gray-brown **Clayey SILT**, with fibrous roots (Topsoil)	
2				11	14			(Bottom 22"): Brown **Clayey SILT, little**$^{-}$ cf Gravel	
3		12	20			S-2	2-4	S-2: Pale Red & Lt. Brown **Clayey SILT**	
4				28	24				
5		24	32			S-3	4-6	S-3: **Same** as S-2	
6				29	33				
7		26	22			S-4	6-8	S-4: Reddish-brown **Clayey SILT,** little^{+} cf Gravel (frags of shale)	
8				21	32				
9		29	20			S-5	8-10	S-5: **Same** as S-4	
10				24	30				
11		26	25			S-6	10-12	S-6: **Same**	
12				28	31				
13								End of Boring @ 12 ft	
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B - 69B
Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Drop Hammer
Rig Type/Drilling Method: Tripod
Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 6/13/2024
End Date: 6/13/2024
Ground Elevation:
Depth to Water 8 ft
Ground Water Elev:
Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows Casing per ft.	Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		7	10			S-1	0-2	S-1 (Top 4"): Dk. Gray-brown **Clayey SILT**, with fibrous roots (Topsoil)	
2				15	13			(Bottom 20"): Brown **Clayey SILT,** and cf Gravel	
3		15	28			S-2	2-4	S-2: Pale Red & Lt. Brown **Clayey SILT** (mottled)	
4				40	29				
5		27	54			S-3	4-6	S-3: **Same** as S-2	
6				39	35				
7		30	26			S-4	6-8	S-4: Pale Red-brown **Clayey SILT,** some+ cf Gravel (fractured shale frags)	
8				26	24				
9		27	24			S-5	8-10	S-5: **Same** as S-4	
10				31	40				
11		31	30			S-6	10-12	S-6: **Same**	
12				27	35				
13								End of Boring @ 12 ft	
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B-70

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Drop Hammer
Rig Type/Drilling Method: Tripod

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 6/4/2024
End Date: 6/4/2024

Ground Elevation:
Depth to Water 4 ft
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample: ID	Sample: Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		12	10			S-1	0-2	S-1 (Top 6"): Blue-gray cf **GRAVEL**, and Clayey Silt (Fill)	
2				5	4			(Bottom 18"): Dk. Brown **Clayey SILT**, trace+ mf Gravel	
3		3	3			S-2	2-4	S-2 (Top 18"): Dk. Brown & Dk. Red-brown **Clayey SILT**	
4				4	3			(Bottom 6"): Dk. Gray **Organic SILT**, with fibers and twigs	
5		1	0			S-3	4-6	S-3: Brown **Clayey SILT** (wet)	
6				0	1				
7		7	12			S-4	6-8	S-4: Brown **Clayey SILT,** some+ mf Gravel	
8				15	16				
9		5	14			S-5	8-10	S-5: Dk. Reddish-brown **Clayey SILT**, and+ cf Gravel	
10				19	37				
11		5	7			S-6	10-12	S-6: Brown **Clayey SILT** (Bull's Liver)	
12				8	7				
13									
14									
15		4	6			S-7	15-17	S-7 (Top 18"): Brown **Clayey SILT**, trace+ mf Gravel (Bull's Liver)	
16				8	18			(Bottom 6"): Brown cf **GRAVEL**, little Clayey Silt	
17									
18									
19									
20		14	21			S-8	20-22	S-8: Brown **Clayey SILT**, and+ cf Gravel	
21				26	34				
22									
23									
24									
25		23	28			S-9	25-27	S-9: **Same** as S-8	
26				33	44				
27									
28								End of Boring @ 27 ft	
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

CLARK RESERVOIR IMPROVEMENTS
Township of Clark, Union County, NJ

Sheet: 1 of 1
Boring No.: B-71

Sampler: 2" split spoon
Hammer/Fall: 140lbs/30" Drop Hammer
Rig Type/Drilling Method: Tripod

Location Plan: (See Attached)
Drilling Company: Environmental Technical Drilling, Inc.

Project#: PUN00213.05
Start Date: 7/3/2024
End Date: 7/3/2024

Ground Elevation:
Depth to Water 9.5 ft
Ground Water Elev:

Drilling Inspector: Joseph Sullivan, P.E.
Soils Engineer: Joseph Sullivan, P.E.

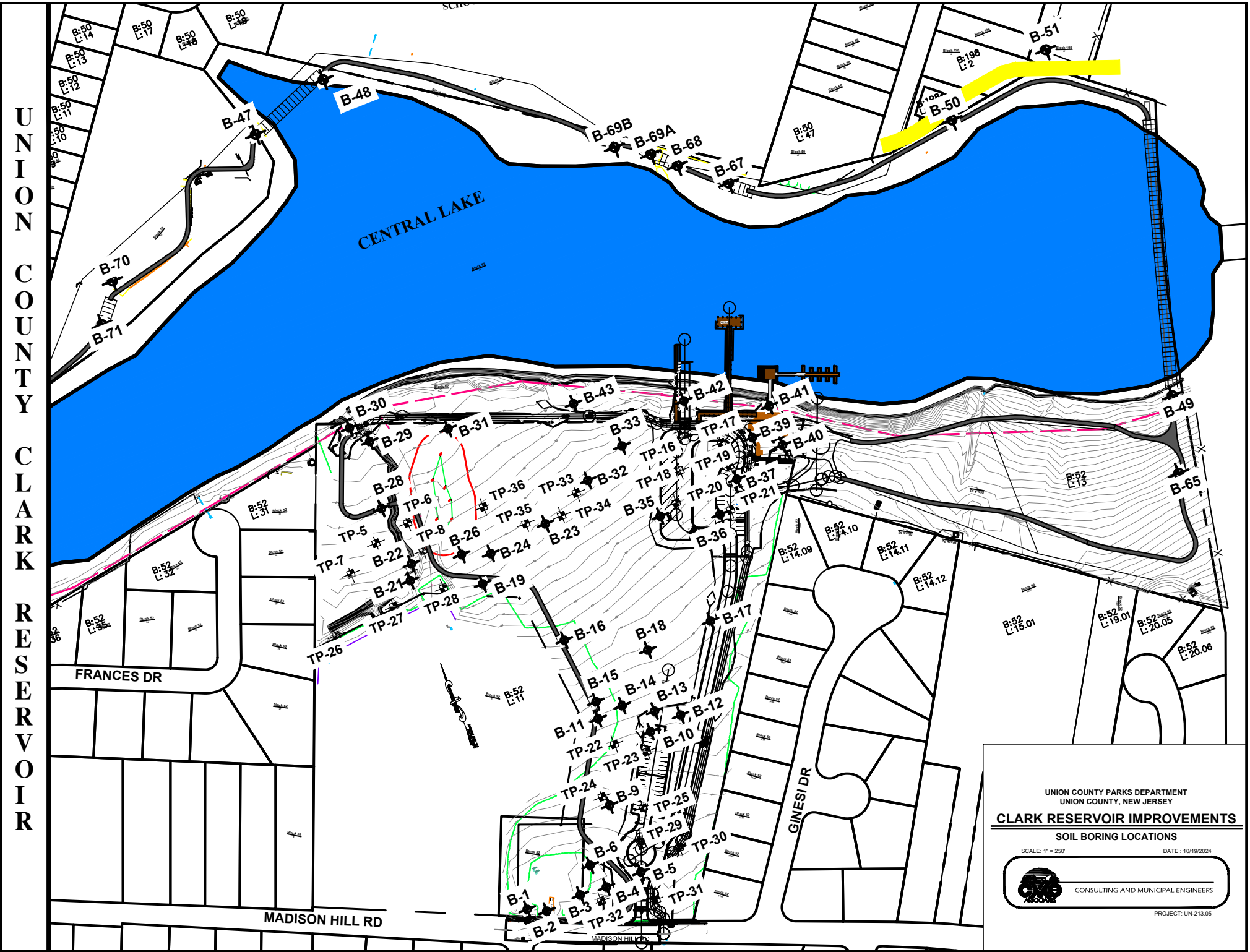
DRAFT

Depth Below Surface (ft)	Blows: Casing per ft.	Blows: Sampler per 6 Inches				Sample ID	Sample Depth (ft)	Identification of Soils/Remarks	Stratigraphy
1		5	7			S-1	0-2	S-1 (Top 4"): Dk. Brown **Clayey SILT** (Topsoil)	
2				9	8			(Bottom 20"): Dk. Brown & Dk. Reddish-brown **Clayey SILT**	
3		7	5			S-2	2-4	S-2: Pale Brown **Clayey SILT**, some $^{+}$ cf Gravel	
4				3	3				
5		2	3			S-3	4-6	S-3 (Top 8"): **Same** as S-2 (wet)	
6				3	3			(Bottom 16"): Reddish-brown **Clayey SILT**, some $^{-}$ cf Gravel (not wet)	
7		17	23			S-4	6-8	S-4: Reddish-brown cf **GRAVEL**, and Clayey Silt	
8				15	16				
9		10	13			S-5	8-10	S-5 (Top 18"): **Same** as S-4	
10				14	13			(Bottom 6"): Reddish-brown **Clayey SILT** (wet)	
11		24	33			S-6	10-12	S-6 (Top 18"): **Same** as S-5 Bottom	
12				36	23			(Bottom 6"): Reddish-brown **Clayey SILT**, some $^{+}$ c $^{+}$ f Gravel	
13		20	22			S-7	12-14	S-7: Reddish-brown **Clayey SILT,** with c Gravel in spoon tip	
14				29	50/5				
15								End of Boring @ 14 ft	
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

VISUAL IDENTIFICATION TERMS USED

	Clayey Soils	@ Ball Moist	Relative Density (Dr) of Granular Soils		Consistency of Clayey Soils (Based on Shearing Strength)		Proportions Used	
Clayey SILT	slight PL	Thread 1/4"	Very Loose	0-15%	soft (S)	0.1-0.5 tsf	trace	1-10%
SILT & CLAY	low PL	Thread 1/8"	Loose	15-35%	firm (F)	0.5-1.0 tsf	little	10-20%
CLAY & SILT	med PL	Thread 1/16"	Medium	35-65%	med hard (MH)	1.0-2.0 tsf	some	20-35%
Silty CLAY	high PL	Thread 1/32"	Dense	65-85%	hard (H)	2.0-4.0 tsf	and	35-50%
CLAY	very high PL	Thread 1/64"	Very Dense	85-100%	very hard (VH)	over 4.0 tsf		

TEST PIT LOGS


UNION COUNTY CLARK RESERVOIR
CENTRAL LAKE
B-1
B-2
B-3
B-4
B-5
B-6
B-9
B-10
B-11
B-12
B-13
B-14
B-15
B-16
B-17
B-18
B-19
B-21
B-22
B-23
B-24
B-26
B-28
B-29
B-30
B-31
B-32
B-33
B-34
B-35
B-36
B-37
B-39
B-40
B-41
B-42
B-43
B-47
B-48
B-49
B-50
B-51
B-65
B-67
B-68
B-69A
B-69B
B-70
B-71
TP-5
TP-6
TP-7
TP-8
TP-16
TP-17
TP-18
TP-19
TP-20
TP-21
TP-22
TP-23
TP-24
TP-25
TP-26
TP-27
TP-28
TP-29
TP-30
TP-31
TP-32
TP-33
TP-34
TP-35
TP-36
FRANCES DR
MADISON HILL RD
GINESI DR
UNION COUNTY PARKS DEPARTMENT
UNION COUNTY, NEW JERSEY
CLARK RESERVOIR IMPROVEMENTS
SOIL BORING LOCATIONS
SCALE: 1" = 250'
DATE : 10/19/2024
CONSULTING AND MUNICIPAL ENGINEERS
PROJECT: UN-213.05

SOIL LOGS

DATE: February 8th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, sunny **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 13" **Current Water Table: 18"** _____

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 5	0" – 2"	Black (5YR 2.5/1)	Organic topsoil loam, moderate, subangular blocky, and friable.
	2" – 12"	Reddish brown (5YR 4/4)	Silt loam, moderate, subangular blocky, and friable, *sample @ 12".
	12" – 22"	Reddish Brown (5YR 5/4) with yellowish red (5YR 5/8) redox	Silt loam, moderate, subangular blocky, and friable. Seasonal high-water table at 13".
	22" – 36"	Dark reddish Brown (5YR 3/4)	Sandy loam, moderate, subangular blocky, and friable, rock fragments.
	36" – 112"	Yellowish red (5YR 4/6)	Sandy loam, 1-inch gravel, shale and boulders (3"-12"), water table also found at 108".

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 8th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, sunny **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 11" Current Water Table: 17"

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 6	0" – 3"	Black (5YR 2.5/1)	Organic loam topsoil, moderate, subangular blocky, and friable.
	3" – 12"	Reddish brown (5YR 5/4) with Light reddish brown (5YR 6/4) redox	Sandy loam, moderate, subangular blocky, and friable, *sample @ 9". Seasonal high-water table at 11".
	12" – 48"	Dark reddish Brown (5YR 3/4) with reddish brown (5YR 5/4) pockets	Sandy loam, moderate, subangular blocky, and friable. Current water table at 17".
	48" – 120"	Dark reddish Brown (5YR 3/4)	Sandy loam, moderate, subangular blocky, and friable, shale and boulders (3"-12").

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 8th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, sunny **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 11" Current Water Table: 14"

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 7	0" – 3"	Black (5YR 2.5/1)	Organic loam topsoil, moderate, subangular blocky, and friable.
	3" – 10"	Dark reddish brown (5YR 3/4)	Silt loam, moderate, subangular blocky, and friable.
	10" – 17"	Yellowish red (5YR 5/6) with yellowish red (5YR 4/8) redox	Silt loam, moderate, subangular blocky, and friable. Seasonal high-water table at 11". Current water table at 14".
	17" – 36"	Dark reddish Brown (5YR 3/4)	Sandy loam, moderate, subangular blocky, and friable, ¼-inc pebbles.
	36" – 117"	Reddish brown (5YR 4/4)	Sandy loam, shale plates, boulders (8"), large boulders 80" (12" – 14"), moderate, subangular blocky, and friable.

SOIL LOGS

DATE: February 8th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, sunny **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 12" **Current Water Table: 23"**

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 8	0" – 9"	Dark reddish grey (5YR 4/2)	Silt loam, moderate, subangular blocky, and friable.
	9" – 12"	Reddish brown (5YR 4/3)	Silt loam, moderate, subangular blocky, and friable, ¼-inch pebbles, *sample taken @ 11".
	12" – 15"	Pinkish grey (5YR 6/2) with reddish yellow (5YR 6/6) redox	Silty clay loam, moderate, subangular blocky, and friable. Seasonal high-water table at 12".
	15" – 34"	Yellowish red (5YR 4/6)	Sandy loam, moderate, subangular blocky, and friable, shale fragments. Current water table at 23".
	34" – 60"	Dark reddish brown (5YR 3/4)	Sandy loam, moderate, subangular blocky, and friable, fractured shale, ¼-inch pebbles, rocks, and boulders.
	60" – 113"	Dark reddish brown (5YR 3/4)	Sandy loam, moderate, subangular blocky, and friable, large shale plates.

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 7th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, sunny **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 16" **Current Water Table: 38"**

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 16	0" – 4"	Dark reddish brown (5YR 3/2)	Silt loam, moderate, subangular blocky, and friable.
	4" – 16"	Yellowish red (5YR 5/6)	Silt loam, moderate, subangular blocky, and friable, sample @ 15".
	16" – 38"	Reddish Brown (5YR 4/4) with Pinkish grey (5YR 6/2) depletions and yellowish red (5YR 4/6) redox	Silt loam, moderate, subangular blocky, and friable. Seasonal high-water table at 16".
	38" – 110"	Dark reddish Brown (5YR 3/4)	Sandy loam, moderate, subangular blocky, and friable, large boulders, shale fragments. Current water table at 38".
		*Refusal @ 110"	

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 7th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, sunny **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 16" Current Water Table: 18"

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 17	0" – 16"	Reddish brown (5YR 4/4)	Silt loam, moderate, subangular blocky, and friable, sample @ 14".
	16" – 27"	Pinkish grey (5YR 6/2) with Yellowish red (5YR 5/8) Redox	Silt loam, moderate, subangular blocky, and friable. Seasonal high-water table at 16". Current water table at 18".
	27" – 97"	Dark reddish Brown (5YR 3/4)	Sandy loam, moderate, subangular blocky, and friable, large shale and boulders (3' – 12").
		*Refusal @ 110"	

SOIL LOGS

DATE: February 7th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, sunny **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 13" Current Water Table: 17"

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 18	0" – 4"	Dark reddish grey (5YR 4/2)	Silt loam, moderate, subangular blocky, and friable.
	4" – 13"	Yellowish red (5YR 4/6)	Silt loam, moderate, subangular blocky, and friable, shale fragments, sample @ 12". Saturated at 13".
	13" – 25"	Reddish Brown (5YR 4/4)	Silt loam, moderate, subangular blocky, and friable. Current water table at 17".
	25" – 100"	Dark reddish Brown (5YR 3/4)	Sandy loam, moderate, subangular blocky, and friable, large shale boulders (3-12")
	100" – 114"	Dark reddish Brown (5YR 3/4)	Coarse sand, weak subangular blocky, and friable. Water table also found at 109".

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 7th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, sunny **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 13" Current Water Table: 21"

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 19	0" – 13"	Reddish brown (5YR 4/4)	Silt loam, moderate, subangular blocky, and friable, sample @ 12". Saturated at 13".
	13" – 21"	Dark reddish brown (5YR 3/4)	Silt loam, moderate, subangular blocky, and friable, shale fragments. Current water table at 21".
	21" – 58"	Dark reddish Brown (5YR 3/4) with reddish brown (5YR 5/3) and yellowish red (5YR 5/6) mottling	Sandy loam, moderate, subangular blocky, and friable, large shale and boulders (3' – 12").
	58" – 112"	Dark reddish Brown (5YR 3/4)	Sandy loam, shale fractures, moderate, subangular blocky, and friable, large boulders, shale fragments, difficult to excavate.
		*Refusal @ 112"	

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 7th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, cloudy **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 12" Current Water Table: 16"

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 20	0" – 12"	Dark reddish brown (5YR 3/3)	Silt loam, moderate, subangular blocky, and friable, Sample @ 11", Saturated @ 12".
	12" – 24"	Reddish brown (5YR 4/4)	Silt loam, moderate, subangular blocky, and friable, shale fragments, no mottling visible. Current water table at 16".
	24" – 80"	Reddish Brown (5YR 3/4)	Sandy loam, moderate, subangular blocky, and friable, no mottling, not saturated, shale fragments, large 5" boulders, large shale frag (2-3 feet, difficult to excavate).
	80" – 105"	Reddish Brown (5YR 3/4) *Refusal @ 105"	Sand, weak, subangular blocky, and friable. Water table also found at @ 99".

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 7th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, cloudy **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 12" **Current Water Table: 17"**

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 21	0" – 12"	Reddish brown (5YR 4/4)	Silt loam, moderate, subangular blocky, and friable, Sample @ 11", Saturated @ 12".
	12" – 30"	Yellowish red (5YR 4/6)	Silt loam, moderate, subangular blocky, and friable, shale fragments. Current water table at 17".
	30" – 110"	Reddish Brown (5YR 3/4)	Sandy loam, moderate, subangular blocky, and friable, large 5" boulders, not saturated.
		*Refusal @ 110"	

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 7th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, cloudy **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 27" **Current Water Table: N/E**

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 22	0" – 12"	Reddish brown (5YR 4/3)	Silt loam, moderate, subangular blocky, and friable.
	12" – 27"	Reddish brown (5YR 4/4)	Silt loam, moderate, subangular blocky, and friable, *Saturated @ 27". *Sample @ 26".
	27" – 30"	Reddish Brown (5YR 4/4) with yellowish red (5YR 5/6) redox and reddish grey (5YR 5/2) depletions	Silt loam, moderate, subangular blocky, and friable.
	30" – 98"	Dark reddish brown (5YR 3/4) with yellowish red (5YR 4/6) redox *Refusal @ 98"	Loam, moderate, subangular blocky, and friable, ¼-icn shale fragments.

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 7th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, cloudy **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 14" **Current Water Table: 18"**

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 23	0" – 12"	Reddish brown (5YR 4/4)	Silt loam, moderate, subangular blocky, and friable.
	12" – 36"	Dark reddish brown (5YR 3/4)	Silt loam, moderate, subangular blocky, and friable, *Sample @ 13", *Saturated @ 14". Current water table at 18".
	36" – 99"	Dark Reddish Brown (5YR 3/4) *Refusal @ 99"	Sandy loam, moderate, subangular blocky, and friable, large boulders, large shale fragments.

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 7th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, cloudy **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 29" Current Water Table: 40"

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 24	0" – 12"	Reddish brown (5YR 4/3)	Silt loam, moderate, subangular blocky, and friable.
	12" – 28"	Reddish brown (5YR 4/4)	Silt loam, moderate, subangular blocky, and friable. Sample at 28".
	28" – 90"	Reddish Brown (5YR 3/4) with yellowish red (5YR 4/6) redox and reddish grey (5YR 5/2) depletions *Refusal @ 90"	Sandy loam, moderate, subangular blocky, and friable, Large 3"-12" boulders. Saturated at 29". Current water table at 40".

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 7th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, cloudy **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 15" Current Water Table: 18"

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 25	0" – 4"	Black (5YR 2.5/1)	Organic loam, moderate, subangular blocky, and friable.
	4" – 18"	Reddish brown (5YR 4/4)	Loam, moderate, subangular blocky, and friable. Saturated at 15" *Sample @ 14". Current water table at 18".
	18" – 98"	Reddish Brown (5YR 4/4) with Dark reddish brown (5YR 3/2) redox. *Refusal @ 98"	Sandy loam, moderate, subangular blocky, and friable, large 12" shale, larger boulders, dry & difficult to dig, *Sample @ 90", no water seepage.

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 8th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, sunny **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 29" Current Water Table: 40"

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 26	0" – 22"	Dark reddish brown (5YR 3/3)	Sandy loam (fill), moderate, subangular blocky, and friable, 1-inch gravel.
	22" – 36"	Dark reddish brown (5YR 3/2)	Sandy loam, moderate, subangular blocky, and friable, 1-inch gravel, *sample @ 28". Saturated at 29".
	36" – 66"	Very dark gray (5YR 3/1)	Silty clay, moderate, subangular blocky, and friable, completely saturated. Current water table at 40".
	66" – 121"	Yellowish red (5YR 4/6)	Sandy loam, moderate, subangular blocky, and friable, shale fragments, boulders.

SOIL LOGS

DATE: February 8th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, sunny **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 37" Current Water Table: 70"

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 27	0" – 9"	Reddish brown (5YR 3/2)	Topsoil/sandy loam (fill), 1-inch pebbles.
	9" – 27"	Reddish brown (5YR 4/3)	Sandy loam (fill), moderate, subangular blocky, and friable, glass, garbage, shale fragments, rocks.
	27" – 80"	Reddish Brown (5YR 4/4) with reddish yellow (5YR 6/6) redox	Sandy loam, moderate, subangular blocky, and friable, *sample @ 36". Seasonal high-water table at 37". Current water table at 70".
	80" – 120"	Dark reddish Brown (5YR 3/4) with reddish yellow (5YR 6/6) and yellowish red (5YR 5/8) redox	Sandy loam moderate, subangular blocky, and friable, shale fragments, boulders (3"-6").

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 8th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, sunny **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 34" Current Water Table: 43"

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 28	0" – 9"	Dark reddish brown (5YR 3/2)	Fill, 1-inch gravel.
	9" – 13"	Light reddish brown (5YR 6/4)	Sand, weak, subangular blocky, and friable (fill).
	13" – 60"	Dark reddish Brown (5YR 3/3)	Sandy loam (fill), moderate, subangular blocky, and friable, *sample @ 33", *saturated @ 34". Current water table at 43".
	60" – 100"	Dark reddish Brown (5YR 3/4)	Sandy loam, moderate, subangular blocky, and friable, boulders, gravel, shale (3-8").

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 7th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, cloudy **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 12" Current Water Table: 16"

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 29	0" – 16"	Reddish Brown (5YR 4/4)	Loam, moderate, subangular blocky, and friable, saturated at 12", *Sample @ 10".
	16" – 48"	Yellowish red (5YR 4/6).	Sandy loam, moderate, subangular blocky, and friable, 3" boulders. Current water table at 16".

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 7th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, cloudy **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 15" Current Water Table: 18"

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 30	0" – 10"	Dark reddish brown (5YR 3/3)	Loam, moderate, subangular blocky, and friable.
	10" – 15"	Reddish brown (5YR 4/4)	Loam, moderate, subangular blocky, and friable, *Sample @ 14". Saturated at 15".
	15" – 31"	Reddish Brown (5YR 4/4) with Dark reddish brown (5YR 3/2) redox.	Loam, moderate, subangular blocky, and friable. Current water table at 18".
	31" – 56"	Yellowish red (5YR 4/6)	Sandy loam, moderate, subangular blocky, and friable, shale, 3"-12" boulders.

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 7th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, cloudy **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 12" **Current Water Table: 23"**

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 31	0" – 12"	Reddish Brown (5YR 4/4)	Loam, moderate, subangular blocky, and friable, *Sample @ 11", *Saturated @ 12".
	12" – 28"	Reddish brown (5YR 4/3)	Loam, moderate, subangular blocky, and friable. Current water table at 23".
	28" – 97"	Yellowish red (5YR 4/6)	Loam, moderate, subangular blocky, and friable.

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 7th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, cloudy **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 29" **Current Water Table: 39"**

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 32	0" – 10"	Strong Brown (7.5YR 4/6)	Loam, moderate, subangular blocky, and friable, large boulders 6".
	10" – 29"	Dark Reddish Brown (5YR 3/4).	Loam, moderate, subangular blocky, and friable, ¼ - 1-inch pebbles.
	29" – 66"	Reddish Brown (5YR 4/4) with Reddish Brown (5YR 5/3) redox.	Loam, moderate, subangular blocky, and friable, fractured shale. Seasonal high-water table at 29". Current water table at 39".
	66" – 99"	Reddish Brown (10YR 5/3) *Refusal @ 99"	Sandy loam, moderate, subangular blocky, and friable, Large rocks 6"-20".

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 8th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, sunny **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 12" **Current Water Table: 13"**

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 33	0" – 3"	Dark reddish brown (5YR 2.5/2)	Organic loam topsoil, moderate, subangular blocky, and friable.
	3" – 16"	Light reddish brown (5YR 6/4)	Silt loam, moderate, subangular blocky, and friable, *sample taken @ 11". Saturated at 12". Current water table at 13".
	16" – 112"	Dark reddish Brown (5YR 3/4)	Sandy loam, moderate, subangular blocky, and friable.

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 7th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, sunny **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 13" Current Water Table: 14"

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 34	0" – 13"	Reddish brown (5YR 4/4)	Silt loam, moderate, subangular blocky, and friable, sample taken @ 12". Saturated at 13".
	13" – 28"	Dark yellowish brown (10 YR 3/4)	Sandy loam moderate, subangular blocky, and friable. Current water table at 14".
	28" – 105"	Dark reddish Brown (5YR 3/4)	Sandy loam, large shale and boulders (3' – 12"). Water table also found at 105".

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 8th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, sunny **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 16" Current Water Table: 23"

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 35	0" – 3"	Dark reddish brown (5YR 2.5/2)	Organic loam topsoil, moderate, subangular blocky, and friable.
	3" – 16"	Yellowish red (5YR 4/6)	Silt loam, moderate, subangular blocky, and friable, *sample taken @ 15".
	16" – 36"	Reddish Brown (5YR 4/4) with gray (5YR 6/1) depletions	Silt loam, moderate, subangular blocky, and friable. Seasonal high-water table at 16". Current water table at 23".
	36" – 114"	Dark reddish Brown (5YR 6/1) and yellowish red (5YR 5/6) pockets	Sandy loam, fractured shale, boulders (3" – 12").

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SOIL LOGS

DATE: February 8th, 2024 **CREW:** A. Bazuk & R. Boyce **FILE #:** PUN00213.05
BLOCK: 52 **LOT: 11.02** **TOWNSHIP:** Clark
LOCATION: Clark Reservoir Improvements **COUNTY:** Union

WEATHER: Cold, sunny **RAINFALL EST. PAST 24 HRS:** > 0.5"
PAST WEEK: > 0.5"

Seasonal High-Water Table: 9" **Current Water Table: 11"**

SOIL SAMPLE	DEPTH	MUNSELL COLOR	USDA TEXTURE
TP 36	0" – 9"	Reddish brown (5YR 4/3)	Silt loam, moderate, subangular blocky, and friable, sample @ 8"
	9" – 18"	Yellowish red (5YR 4/6) with Reddish brown (5YR 4/3) redox	Silt loam, moderate, subangular blocky, and friable. Seasonal high-water table at 9". Current water table at 11".
	18" – 22"	Gray (5YR 6/1) with yellowish red (5YR 5/8) and reddish brown (5YR 4/4) redox	Clay loam, moderate, subangular blocky, and friable.
	22" – 115"	Dark reddish Brown (5YR 3/4)	Sandy loam, moderate, subangular blocky, and friable, boulders, shale fragments

CME ASSOCIATES
Professional Engineers
Planners, Environmental Consultants
Land Surveyors
and Landscape Architects
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

CLARK RESERVOIR SEDIMENT SAMPLES



Legend

Sediment/Water Samples

0 200 400 600 Feet

N
W E
S

SOURCES: ESRI, NJGIN, Union County Parcels, 2020 Aerial Imagery

NOTE: This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not State-authorized.

Sample Location Plan
Clark Reservoir
Block 33, Lot 5;
Block 42, Lots 87, 88.02, 89, & 90;
Block 52, Lots 11.02, 12, & 13; and
Block 53, Lot 35
Township of Clark
Union County, New Jersey

Drawn By: ES	Project No.: PUN00213.03
Checked By: BT	Date Last Updated: 11/10/2021
Approved By: BT	Scale: 1 inch = 600 feet

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
3759 U.S. Highway 1 South, Suite 100
Monmouth Junction, NJ 08852
Phone: 732-951-2101
Fax: 732-951-2106

TABLES

Table 1
Sample Summary
Sediment/Surface Water Characterization
Clark Reservoir
Township of Clark, Union County, New Jersey

Sample ID	Lab ID	Sample Date	Media	Laboratory Analysis
S-1	460-246490-1	11/2/2021	Sediment	TOC, Total Phosphorus, Orthophosphate, Nitrate, Nitrite, EPH, TAL/TCL+30, RCRA Characteristics, Paint Filter, Sieve Analysis, Full TCLP
W-1	460-246490-3		Water	Total Phosphorus, Orthophosphate, Nitrate, Nitrite, Alkalinity, pH, DO
	372118961-1			Fecal Coliform, Algal Count
S-2	460-246490-2	11/2/2021	Sediment	TOC, Total Phosphorus, Orthophosphate, Nitrate, Nitrite, EPH, TAL/TCL+30, RCRA Characteristics, Paint Filter, Sieve Analysis
W-2	460-246490-4		Water	Total Phosphorus, Orthophosphate, Nitrate, Nitrite, Alkalinity, pH, DO
	372118961-2			Fecal Coliform, Algal Count
S-3	460-246230-2	10/29/2021	Sediment	TOC, Total Phosphorus, Orthophosphate, Nitrate, Nitrite, EPH, TAL/TCL+30, RCRA Characteristics, Paint Filter, Sieve Analysis
W-3	460-246230-4		Water	Total Phosphorus, Orthophosphate, Nitrate, Nitrite, Alkalinity, pH, DO
	372118752-2			Fecal Coliform, Algal Count
S-4	460-246230-1	10/29/2021	Sediment	TOC, Total Phosphorus, Orthophosphate, Nitrate, Nitrite, EPH, TAL/TCL+30, RCRA Characteristics, Paint Filter, Sieve Analysis
W-4	460-246230-3		Water	Total Phosphorus, Orthophosphate, Nitrate, Nitrite, Alkalinity, pH, DO
	372118752-1			Fecal Coliform, Algal Count
S-5	460-246153-1	10/28/2021	Sediment	TOC, Total Phosphorus, Orthophosphate, Nitrate, Nitrite, EPH, TAL/TCL+30, RCRA Characteristics, Paint Filter, Sieve Analysis
W-5	460-246153-2		Water	Total Phosphorus, Orthophosphate, Nitrate, Nitrite, Alkalinity, pH, DO
	372118665-1			Fecal Coliform, Algal Count
S-6	460-246012-1	10/27/2021	Sediment	TOC, Total Phosphorus, Orthophosphate, Nitrate, Nitrite, EPH, TAL/TCL+30, RCRA Characteristics, Paint Filter, Sieve Analysis, Full TCLP
W-6	460-246012-2		Water	Total Phosphorus, Orthophosphate, Nitrate, Nitrite, Alkalinity, pH, DO
	372118646-2			Fecal Coliform, Algal Count
S-7	460-246012-3	10/27/2021	Sediment	TOC, Total Phosphorus, Orthophosphate, Nitrate, Nitrite, EPH, TAL/TCL+30, RCRA Characteristics, Paint Filter, Sieve Analysis
W-7	460-246012-4		Water	Total Phosphorus, Orthophosphate, Nitrate, Nitrite, Alkalinity, pH, DO
	372118646-1			Fecal Coliform, Algal Count

Table 1
Sample Summary
Sediment/Surface Water Characterization
Clark Reservoir
Township of Clark, Union County, New Jersey

Sample ID	Lab ID	Sample Date	Media	Laboratory Analysis
S-8	460-246153-3	10/28/2021	Sediment	TOC, Total Phosphorus, Orthophosphate, Nitrate, Nitrite, EPH, TAL/TCL+30, RCRA Characteristics, Paint Filter, Sieve Analysis
W-8	460-246153-4		Water	Total Phosphorus, Orthophosphate, Nitrate, Nitrite, Alkalinity, pH, DO
	372118665-2			Fecal Coliform, Algal Count
S-9	460-246153-5	10/28/2021	Sediment	TOC, Total Phosphorus, Orthophosphate, Nitrate, Nitrite, EPH, TAL/TCL+30, RCRA Characteristics, Paint Filter, Sieve Analysis
W-9	460-246153-6		Water	Total Phosphorus, Orthophosphate, Nitrate, Nitrite, Alkalinity, pH, DO
	372118665-3			Fecal Coliform, Algal Count
S-10	460-246153-7	10/28/2021	Sediment	TOC, Total Phosphorus, Orthophosphate, Nitrate, Nitrite, EPH, TAL/TCL+30, RCRA Characteristics, Paint Filter, Sieve Analysis, Full TCLP
W-10	460-246153-8		Water	Total Phosphorus, Orthophosphate, Nitrate, Nitrite, Alkalinity, pH, DO
	372118665-4			Fecal Coliform, Algal Count
FB102721	460-246012-5	10/27/2021	Water	TOC, Total Phosphorus, Orthophosphate, Nitrate, Nitrite, EPH, TAL/TCL+30, RCRA Characteristics, Alkalinity, pH
TB	460-246012-6	10/27/2021	Water	TCL VOCs
FB102821	460-246153-9	10/28/2021	Water	TOC, Total Phosphorus, Orthophosphate, Nitrate, Nitrite, EPH, TAL/TCL+30, RCRA Characteristics, Alkalinity, pH
TB	460-246153-10	10/28/2021	Water	TCL VOCs
FB102921	460-246230-5	10/29/2021	Water	TOC, Total Phosphorus, Orthophosphate, Nitrate, Nitrite, EPH, TAL/TCL+30, RCRA Characteristics, Alkalinity, pH
FB110221	460-246490-5	11/2/2021	Water	TOC, Total Phosphorus, Orthophosphate, Nitrate, Nitrite, EPH, TAL/TCL+30, RCRA Characteristics, Alkalinity, pH

TOC = total organic carbon
EPH = extractable petroleum hydrocarbons
TAL/TCL+30 = Target Analyte List/Target Compound List + Tentatively Identified Compounds
RCRA = Resource Conservation and Recovery Act (characteristics = Ignitability, Corrosivity, Reactivity)
DO = dissolved oxygen
VOCs = volatile organic compounds
TCLP = Toxicity Characteristic Leaching Procedure

Table 2
Analytical Results of Sediment Samples
Clark Reservoir
Township of Clark, Union County, New Jersey

Field ID	NJDEP Soil Remediation Standards					NJDEP Ecological Screening Criteria					S-1				S-2				S-3				S-4				S-5			
Lab ID	Ingestion-Dermal		Inhalation		Migration to	EPA Ecological	Wildlife Preliminary	Terrestrial Plant	Freshwater Sediment		460-246490-1				460-246490-2				460-246230-2				460-246230-1				460-246153-1			
Sample Date	Residential	Non-Residential	Residential	Non-Residential	Groundwater	Screening Level	Remediation Goal	Toxicological	Lowest Effects	Severe Effects	11/2/2021				11/2/2021				10/29/2021				10/29/2021				10/28/2021			
Media	(ID-R SRS)	(ID-NR SRS)	(Inh-R SRS)	(Inh-NR SRS)	(MGW SRS)	(ESL)	(PRG)	Benchmark	Level (LEL)	Level (SEL)	Sediment				Sediment				Sediment				Sediment				Sediment			
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg				mg/kg				mg/kg				mg/kg				mg/kg			
VOLATILE ORGANICS											Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
1,1,1,2-Tetrachloroethane	NL	NL	NL	NL	NL						ND		0.00040	0.0021	ND		0.00045	0.0024	ND		0.00059	0.0031	ND		0.0012	0.0064	ND		0.00095	0.0050
1,1,1-Trichloroethane [TCA]	160,000	NA	NA	NA	0.20	0.21	29.80		0.21		ND		0.00049	0.0021	ND		0.00055	0.0024	ND		0.00072	0.0031	ND		0.0015	0.0064	ND		0.0012	0.0050
1,1,2,2-Tetrachloroethane	3.5	18	NA	NA	0.0069	0.85	0.127		0.85		ND		0.00045	0.0021	ND		0.00051	0.0024	ND		0.00066	0.0031	ND		0.0014	0.0064	ND		0.0011	0.0050
1,1,2-Trichloro-1,2,2-trifluoroethane	NL	NL	NL	NL	NL						ND		0.00063	0.0021	ND		0.00071	0.0024	ND		0.00093	0.0031	ND		0.0019	0.0064	ND		0.0015	0.0050
1,1,2-Trichloroethane	12	64	NA	NA	0.017	0.518	28.6		0.518		ND		0.00037	0.0021	ND		0.00042	0.0024	ND		0.00055	0.0031	ND		0.0011	0.0064	ND		0.00089	0.0050
1,1-Dichloroethane [1,1-DCA]	120	640	NA	NA	0.24						ND		0.00043	0.0021	ND		0.00049	0.0024	ND		0.00064	0.0031	ND		0.0013	0.0064	ND		0.0010	0.0050
1,1-Dichloroethene [1,1-DCE]	11	180	52	240	0.0069	0.0194	8.28		0.0194		ND		0.00047	0.0021	ND		0.00053	0.0024	ND		0.00070	0.0031	ND		0.0014	0.0064	ND		0.0011	0.0050
1,2,3-Trichlorobenzene	NL	NL	NL	NL	NL		20				ND		0.00038	0.0021	ND		0.00043	0.0024	ND		0.00056	0.0031	ND		0.0012	0.0064	ND		0.00091	0.0050
1,2,4-Trichlorobenzene	780	13,000	94	NA	0.52	5.062	20		5.062		ND		0.00075	0.0021	ND		0.00085	0.0024	ND		0.0011	0.0031	ND		0.0023	0.0064	ND		0.0018	0.0050
1,2-Dibromo-3-chloropropane	0.87	4.5	0.026	0.12	0.005						ND		0.00096	0.0021	ND		0.0011	0.0024	ND		0.0014	0.0031	ND		0.0029	0.0064	ND		0.0023	0.0050
1,2-Dibromoethane [ethylene dibromide]	0.35	1.8	0.085	0.41	0.005						ND		0.00038	0.0021	ND		0.00043	0.0024	ND		0.00056	0.0031	ND		0.0011	0.0064	ND		0.00090	0.0050
1,2-Dichlorobenzene	6,700	110,000	NA	NA	11	0.294	2.96		0.294		ND		0.00076	0.0021	ND		0.00086	0.0024	ND		0.0011	0.0031	ND		0.0023	0.0064	ND		0.0018	0.0050
1,2-Dichloroethane	5.8	30	71	320	0.0095	0.26	21.2		0.26		ND		0.00062	0.0021	ND		0.00070	0.0024	ND		0.00091	0.0031	ND		0.0019	0.0064	ND		0.0015	0.0050
1,2-Dichloroethene (cis)	780	13,000	NA	NA	0.35						ND		0.00075	0.0021	ND		0.00085	0.0024	ND		0.0011	0.0031	ND		0.0023	0.0064	ND		0.0018	0.0050
1,2-Dichloroethene (trans)	1,300	22,000	NA	NA	0.56	0.654	0.784		0.654		ND		0.00051	0.0021	ND		0.00058	0.0024	ND		0.00076	0.0031	ND		0.0016	0.0064	ND		0.0012	0.0050
1,2-Dichloropropane	19	98	5.7	27	0.0058	0.333	32.7		0.333		ND		0.00088	0.0021	ND		0.0010	0.0024	ND		0.0013	0.0031	ND		0.0027	0.0064	ND		0.0021	0.0050
1,3-Dichlorobenzene	6,700	110,000	NA	NA	11	1.315	37.7		1.315		ND		0.00076	0.0021	ND		0.00087	0.0024	ND		0.0011	0.0031	ND		0.0023	0.0064	ND		0.0018	0.0050
1,3-Dichloropropene (cis)	7.0	36	4.8	23	0.0063						ND		0.00057	0.0021	ND		0.00065	0.0024	ND		0.00084	0.0031	ND		0.0017	0.0064	ND		0.0014	0.0050
1,3-Dichloropropene (trans)											ND		0.00056	0.0021	ND		0.00063	0.0024	ND		0.00082	0.0031	ND		0.0017	0.0064	ND		0.0013	0.0050
1,4-Dichlorobenzene	780	13,000	NA	NA	1.4	0.318	20		0.318		ND		0.00047	0.0021	ND		0.00053	0.0024	ND		0.00070	0.0031	ND		0.0014	0.0064	ND		0.0011	0.0050
1,4-Dioxane	7.0	36	45	210	0.067						ND		0.019	0.042	ND		0.022	0.047	0.028	*3	0.028	0.062	ND		0.058	0.13	ND		0.046	0.10
2-Butanone [MEK]	47,000	780,000	NA	NA	0.98						0.016		0.00077	0.010	ND		0.00087	0.012	ND		0.0011	0.015	ND		0.0023	0.032	ND		0.0018	0.025
2-Hexanone	390	6,500	1,000	NA	0.15						ND		0.0036	0.010	ND		0.0041	0.012	ND		0.0053	0.015	ND		0.011	0.032	ND		0.0086	0.025
4-Methyl-2-pentanone [MIBK]	NL	NL	NL	NL	NL						ND		0.0033	0.010	ND		0.0037	0.012	ND		0.0048	0.015	ND		0.0099	0.032	ND		0.0078	0.025
Acetone [2-propanone]	70,000	NA	NA	NA	19						0.052		0.012	0.013	ND		0.014	0.014	ND		0.018	0.019	ND		0.036	0.038	ND		0.029	0.030
Benzene	3.0	16	2.2	11	0.0094						ND		0.00054	0.0021	ND		0.00061	0.0024	ND		0.00080	0.0031	ND		0.0016	0.0064	ND		0.0013	0.0050
Bromo(chloro)methane	NL	NL	NL	NL	NL						ND		0.00059	0.0021	ND		0.00067	0.0024	ND		0.00087	0.0031	ND		0.0018	0.0064	ND		0.0014	0.0050
Bromo(dichloro)methane	11	59	NA	NA	0.005						ND		0.00054	0.0021	ND		0.00061	0.0024	ND		0.00079	0.0031	ND		0.0016	0.0064	ND		0.0013	0.0050
Bromoform	88	460	NA	NA	0.018						ND		0.00089	0.0021	ND		0.0010	0.0024	ND		0.0013	0.0031	ND		0.0027	0.0064	ND		0.0021	0.0050
Bromomethane [Methyl bromide]	110	1,800	18	82	0.043	0.00137	0.235		0.00137		ND		0.0021	0.0042	ND		0.0024	0.0047	ND		0.0031	0.0062	ND		0.0064	0.013	ND		0.0050	0.010
Carbon disulfide	NA	NA	NA	NA	3.7						0.00070	J	0.00056	0.0021	ND		0.00063	0.0024	ND		0.00082	0.0031	0.0035	J	0.0017	0.0064	ND		0.0013	0.0050
Carbon tetrachloride	7.6	40	1.4	6.9	0.0075						ND		0.00081	0.0021	ND		0.00092	0.0024	ND		0.0012	0.0031	ND		0.0025	0.0064	ND		0.0019	0.0050
Chlorobenzene	510	8,400	NA	NA	0.64		40				ND		0.00037	0.0021	ND		0.00042	0.0024	ND		0.00055	0.0031	ND		0.0011	0.0064	ND		0.00089	0.0050
Chloroethane [ethyl chloride]	NL	NL	NL	NL	NL						ND		0.0011	0.0021	ND		0.0012	0.0024	ND		0.0016	0.0031	ND		0.0033	0.0064	ND		0.0026	0.0050
Chloroform	780	13,000	590	NA	0.33						ND		0.0020	0.0021	ND		0.0023	0.0024	ND		0.0030	0.0031	ND		0.0062	0.0064	ND		0.0049	0.0050
Chloromethane [Methyl chloride]	NA	NA	270	1,200	NA						ND		0.00091	0.0021	ND		0.0010	0.0024	ND		0.0013	0.0031	ND		0.0028	0.0064	ND		0.0022	0.0050
Cyclohexane	NL	NL	NL	NL	NL						ND		0.00046	0.0021	ND		0.00052	0.0024	ND		0.00068	0.0031	ND		0.0014	0.0064	ND		0.0011	0.0050
Dibromo(chloro)methane	8.3	43	NA	NA	0.005		2.05				ND		0.00041	0.0021	ND		0.00046	0.0024	ND		0.00060	0.0031	ND		0.0012	0.0064	ND		0.00097	0.0050
Dichlorodifluoromethane [Freon 12]	16,000	260,000	NA	NA	38						ND		0.00071	0.0021	ND	*1	0.00080	0.0024	ND		0.0010	0.0031	ND		0.0021	0.0064	ND		0.0017	0.0050
Ethylbenzene	7,800	130,000	10	48	15	0.175	5.16		1.4		ND		0.00042	0.0021	ND		0.00047	0.0024	ND		0.00062	0.0031	ND		0.0013	0.0064	ND		0.0010	0.0050
Isopropylbenzene	7,800	130,000	NA	NA	22						ND		0.00060	0.0021	ND		0.00068	0.0024	ND		0.00088	0.0031	ND		0.0018	0.0064	ND		0.0014	0.0050
Methyl Acetate	78,000	NA	NA	NA	22						ND		0.0090	0.010	ND		0.010	0.012	ND		0.013	0.015	ND		0.027	0.032	ND		0.022	0.025
Methyl tertiary butyl ether [MTBE]	780	13,000	140	650	0.25						ND		0.0011	0.0021	ND		0.0012	0.0024	ND		0.0016	0.0031	ND		0.0033	0.0064	ND		0.0026	0.0050
Methylcyclohexane	NL	NL	NL	NL	NL						ND		0.0010	0.0021	ND		0.0012	0.0024	ND		0.0015	0.0031	ND		0.0032	0.0064	ND		0.0025	0.0050
Methylene chloride [Dichloromethane]	50	260	1,400	NA	0.013	0.159	4.05		0.159		ND		0.0024	0.0042	ND		0.0027	0.0047	ND		0.0035	0.0062	ND		0.0073	0.013	ND		0.0057	0.010
Styrene	16,000	260,000	NA	NA	2.1	0.254	300	300	0.254		ND		0.00058	0.0021	ND		0.00066	0.0024	ND		0.00086	0.0031	ND		0.0018	0.0064	ND		0.0014	0.0050
Tertiary-Butyl Alcohol [TBA]	1,400	23,000	NA	NA	0.32						ND		0.016	0.021	ND		0.019	0.024	ND		0.024	0.031	ND		0.050	0.064	ND		0.039	0.050
Tetrachloroethene [PCE]	330	1,700	47	NA	0.0086	0.99	9.92		0.45		ND		0.00064	0.0021	ND		0.00072	0.0024	ND		0.00094	0.0031	ND		0.0019	0.0064	ND		0.0015	0.0050
Toluene	6,300	100,000	NA	NA	7.8	1.22	200	200	2.5		ND		0.00049	0.0021	ND		0.00056	0.0024	ND		0.00072	0.0031	ND		0.0015	0.0064	ND		0.0012	0.0050
Trichloroethene [TCE]	15	79	3.0	14	0.0065	0.112	12.4		1.6		ND		0.00067	0.0021	ND		0.00076	0.0024	ND		0.00099	0.0031	ND		0.0020	0.0064	ND		0.0016	0.0050
Trichlorofluoromethane [Freon 11]	23,000	390,000	NA	NA	29						ND		0.00085	0.0021	ND		0.00096	0.0024	ND		0.0013	0.0031	ND		0.0026	0.0064	ND		0.0020	0.0050
Vinyl chloride	0.97	5.0	1.4	6.4	0.0067	0.202	0.646		0.202		ND		0.0011	0.0021	ND		0.0013	0.0024	ND		0.0017	0.0031	ND		0.0035	0.0064	ND		0.0027	0.0050
m-Xylene & p-Xylene	12,000	190,000	NA	NA	19	0.433	10		>0.12		ND		0.00036	0.0021	ND		0.00041	0.0024	ND		0.00054	0.0031	ND		0.0011	0.0064	ND		0.00087	0.0050
o-Xylene											ND		0.00041	0.0021	ND		0.00046	0.0024	ND		0.00060	0.0031	ND		0.0012	0.0064	ND		0.00097	0.0050
Total VOCs	NL	NL	NL	NL	NL						0.0687				0.0				0.0				0.0035				0.0			
Total TICs (Estimated)	NL	NL	NL	NL	NL						0.0*T				0.0*T				0.0*T				0.0*T				0.0*T			

Bold & Outlined = exceeds residential or non-residential ingestion-dermal soil remediation standard (ID-R SRS or ID-NR SRS)

Red & Outlined = exceeds residential or non-residential inhalation soil remediation standard (Inh-R SRS or Inh-NR SRS)

Italics & Outlined = exceeds Migration to Groundwater (MGW) SRS

Highlighted = exceeds one or more ESC for soil and/or sediment

NL = remediation standard not listed

NA = not applicable

ND = not detected above listed method detection limit (MDL)

*1 = LCS/LCSD RPD exceeds control limits.

*+ = LCS and/or LCSD is outside acceptance limits, high biased.

*3 = ISTD response or retention time outside acceptable limits.

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Table 2
Analytical Results of Sediment Samples
Clark Reservoir
Township of Clark, Union County, New Jersey

Field ID	NJDEP Soil Remediation Standards					NJDEP Ecological Screening Criteria					S-6				S-7				S-8				S-9				S-10			
Lab ID	Ingestion-Dermal		Inhalation		Migration to	EPA Ecological	Wildlife Preliminary	Terrestrial Plant	Freshwater Sediment		460-246012-1				460-246012-3				460-246153-3				460-246153-5				460-246153-7			
Sample Date	Residential	Non-Residential	Residential	Non-Residential	Groundwater	Screening Level	Remediation Goal	Toxicological	Lowest Effects	Severe Effects	10/27/2021				10/27/2021				10/28/2021				10/28/2021				10/28/2021			
Media	(ID-R SRS)	(ID-NR SRS)	(Inh-R SRS)	(Inh-NR SRS)	(MGW SRS)	(ESL)	(PRG)	Benchmark	Level (LEL)	Level (SEL)	Sediment				Sediment				Sediment				Sediment				Sediment			
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg				mg/kg				mg/kg				mg/kg				mg/kg			
VOLATILE ORGANICS											Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
1,1,1,2-Tetrachloroethane	NL	NL	NL	NL	NL						ND		0.0014	0.0076	ND		0.0016	0.0086	ND		0.0020	0.010	ND		0.0016	0.0083	ND		0.0025	0.013
1,1,1-Trichloroethane [TCA]	160,000	NA	NA	NA	0.20	0.21	29.80		0.21		ND		0.0018	0.0076	ND		0.0020	0.0086	ND		0.0024	0.010	ND		0.0019	0.0083	ND		0.0030	0.013
1,1,2,2-Tetrachloroethane	3.5	18	NA	NA	0.0069	0.85	0.127		0.85		ND		0.0016	0.0076	ND		0.0018	0.0086	ND		0.0022	0.010	ND		0.0018	0.0083	ND		0.0028	0.013
1,1,2-Trichloro-1,2,2-trifluoroethane	NL	NL	NL	NL	NL						ND		0.0023	0.0076	ND		0.0026	0.0086	ND		0.0031	0.010	ND		0.0025	0.0083	ND		0.0039	0.013
1,1,2-Trichloroethane	12	64	NA	NA	0.017	0.518	28.6		0.518		ND		0.0014	0.0076	ND		0.0015	0.0086	ND		0.0018	0.010	ND		0.0015	0.0083	ND		0.0023	0.013
1,1-Dichloroethane [1,1-DCA]	120	640	NA	NA	0.24						ND		0.0016	0.0076	ND		0.0018	0.0086	ND		0.0021	0.010	ND		0.0017	0.0083	ND		0.0027	0.013
1,1-Dichloroethene [1,1-DCE]	11	180	52	240	0.0069	0.0194	8.28		0.0194		ND		0.0017	0.0076	ND		0.0019	0.0086	ND		0.0023	0.010	ND		0.0019	0.0083	ND		0.0029	0.013
1,2,3-Trichlorobenzene	NL	NL	NL	NL	NL		20				ND		0.0014	0.0076	ND		0.0016	0.0086	ND		0.0019	0.010	ND		0.0015	0.0083	ND		0.0023	0.013
1,2,4-Trichlorobenzene	780	13,000	94	NA	0.52	5.062	20		5.062		ND		0.0027	0.0076	ND		0.0031	0.0086	ND		0.0037	0.010	ND		0.0030	0.0083	ND		0.0046	0.013
1,2-Dibromo-3-chloropropane	0.87	4.5	0.026	0.12	0.005						ND		0.0035	0.0076	ND		0.0040	0.0086	ND		0.0047	0.010	ND		0.0038	0.0083	ND		0.0060	0.013
1,2-Dibromoethane [ethylene dibromide]	0.35	1.8	0.085	0.41	0.005						ND		0.0014	0.0076	ND		0.0016	0.0086	ND		0.0019	0.010	ND		0.0015	0.0083	ND		0.0023	0.013
1,2-Dichlorobenzene	6,700	110,000	NA	NA	11	0.294	2.96		0.294		ND		0.0028	0.0076	ND		0.0031	0.0086	ND		0.0037	0.010	ND		0.0030	0.0083	ND		0.0047	0.013
1,2-Dichloroethane	5.8	30	71	320	0.0095	0.26	21.2		0.26		ND		0.0023	0.0076	ND		0.0026	0.0086	ND		0.0030	0.010	ND		0.0025	0.0083	ND		0.0038	0.013
1,2-Dichloroethene (cis)	780	13,000	NA	NA	0.35						ND		0.0027	0.0076	ND		0.0031	0.0086	ND		0.0037	0.010	ND		0.0030	0.0083	ND		0.0046	0.013
1,2-Dichloroethene (trans)	1,300	22,000	NA	NA	0.56	0.654	0.784		0.654		ND		0.0019	0.0076	ND		0.0021	0.0086	ND		0.0025	0.010	ND		0.0020	0.0083	ND		0.0032	0.013
1,2-Dichloropropane	19	98	5.7	27	0.0058	0.333	32.7		0.333		ND		0.0032	0.0076	ND		0.0036	0.0086	ND		0.0044	0.010	ND		0.0035	0.0083	ND		0.0055	0.013
1,3-Dichlorobenzene	6,700	110,000	NA	NA	11	1.315	37.7		1.315		ND		0.0028	0.0076	ND		0.0031	0.0086	ND		0.0038	0.010	ND		0.0030	0.0083	ND		0.0047	0.013
1,3-Dichloropropene (cis)	7.0	36	4.8	23	0.0063						ND		0.0021	0.0076	ND		0.0024	0.0086	ND		0.0028	0.010	ND		0.0023	0.0083	ND		0.0035	0.013
1,3-Dichloropropene (trans)											ND		0.0020	0.0076	ND		0.0023	0.0086	ND		0.0027	0.010	ND		0.0022	0.0083	ND		0.0035	0.013
1,4-Dichlorobenzene	780	13,000	NA	NA	1.4	0.318	20		0.318		ND		0.0017	0.0076	ND		0.0019	0.0086	ND		0.0023	0.010	ND		0.0019	0.0083	ND		0.0029	0.013
1,4-Dioxane	7.0	36	45	210	0.067						ND		0.070	0.15	ND		0.079	0.17	ND		0.094	0.21	ND		0.076	0.17	ND		0.12	0.26
2-Butanone [MEK]	47,000	780,000	NA	NA	0.98						ND		0.0028	0.038	ND		0.0032	0.043	ND		0.0038	0.051	ND		0.0031	0.041	ND		0.0048	0.065
2-Hexanone	390	6,500	1,000	NA	0.15						ND		0.013	0.038	ND		0.015	0.043	ND		0.018	0.051	ND		0.014	0.041	ND		0.022	0.065
4-Methyl-2-pentanone [MIBK]	NL	NL	NL	NL	NL						ND		0.012	0.038	ND		0.013	0.043	ND		0.016	0.051	ND		0.013	0.041	ND		0.020	0.065
Acetone [2-propanone]	70,000	NA	NA	NA	19						ND		0.044	0.046	0.083		0.049	0.052	ND		0.059	0.062	0.089		0.047	0.050	0.13		0.074	0.078
Benzene	3.0	16	2.2	11	0.0094						ND		0.0020	0.0076	ND		0.0022	0.0086	ND		0.0027	0.010	ND		0.0021	0.0083	ND		0.0033	0.013
Bromo(chloro)methane	NL	NL	NL	NL	NL						ND		0.0021	0.0076	ND		0.0024	0.0086	ND		0.0029	0.010	ND		0.0023	0.0083	ND		0.0036	0.013
Bromo(dichloro)methane	11	59	NA	NA	0.005						ND		0.0020	0.0076	ND		0.0022	0.0086	ND		0.0026	0.010	ND		0.0021	0.0083	ND		0.0033	0.013
Bromoform	88	460	NA	NA	0.018						ND		0.0032	0.0076	ND		0.0037	0.0086	ND		0.0044	0.010	ND		0.0035	0.0083	ND		0.0055	0.013
Bromomethane [Methyl bromide]	110	1,800	18	82	0.043	0.00137	0.235		0.00137		ND		0.0076	0.015	ND		0.0086	0.017	ND		0.010	0.021	ND		0.0083	0.017	ND		0.013	0.026
Carbon disulfide	NA	NA	NA	NA	3.7						ND		0.0020	0.0076	ND		0.0023	0.0086	ND		0.0027	0.010	ND		0.0022	0.0083	ND		0.0035	0.013
Carbon tetrachloride	7.6	40	1.4	6.9	0.0075						ND		0.0030	0.0076	ND		0.0033	0.0086	ND		0.0040	0.010	ND		0.0032	0.0083	ND		0.0050	0.013
Chlorobenzene	510	8,400	NA	NA	0.64		40				ND		0.0014	0.0076	ND		0.0015	0.0086	ND		0.0018	0.010	ND		0.0015	0.0083	ND		0.0023	0.013
Chloroethane [ethyl chloride]	NL	NL	NL	NL	NL						ND		0.0040	0.0076	ND		0.0045	0.0086	ND		0.0054	0.010	ND		0.0043	0.0083	ND		0.0068	0.013
Chloroform	780	13,000	590	NA	0.33						ND		0.0074	0.0076	ND		0.0084	0.0086	ND		0.010	0.010	ND		0.0081	0.0083	ND		0.013	0.013
Chloromethane [Methyl chloride]	NA	NA	270	1,200	NA						ND		0.0033	0.0076	ND		0.0038	0.0086	ND		0.0045	0.010	ND		0.0036	0.0083	ND		0.0056	0.013
Cyclohexane	NL	NL	NL	NL	NL						ND		0.0017	0.0076	ND		0.0019	0.0086	ND		0.0023	0.010	ND		0.0018	0.0083	ND		0.0029	0.013
Dibromo(chloro)methane	8.3	43	NA	NA	0.005		2.05				ND		0.0015	0.0076	ND		0.0017	0.0086	ND		0.0020	0.010	ND		0.0016	0.0083	ND		0.0025	0.013
Dichlorodifluoromethane [Freon 12]	16,000	260,000	NA	NA	38						ND		0.0026	0.0076	ND		0.0029	0.0086	ND		0.0035	0.010	ND		0.0028	0.0083	ND		0.0044	0.013
Ethylbenzene	7,800	130,000	10	48	15	0.175	5.16		1.4		ND		0.0015	0.0076	ND		0.0017	0.0086	ND		0.0020	0.010	ND		0.0017	0.0083	ND		0.0026	0.013
Isopropylbenzene	7,800	130,000	NA	NA	22						ND		0.0022	0.0076	ND		0.0025	0.0086	ND		0.0029	0.010	ND		0.0024	0.0083	ND		0.0037	0.013
Methyl Acetate	78,000	NA	NA	NA	22						ND	*+	0.033	0.038	ND	*+	0.037	0.043	ND		0.044	0.051	ND		0.036	0.041	ND		0.056	0.065
Methyl tertiary butyl ether [MTBE]	780	13,000	140	650	0.25						ND		0.0039	0.0076	ND		0.0044	0.0086	ND		0.0053	0.010	ND		0.0042	0.0083	ND		0.0066	0.013
Methylcyclohexane	NL	NL	NL	NL	NL						ND		0.0038	0.0076	ND		0.0043	0.0086	ND		0.0051	0.010	ND		0.0041	0.0083	ND		0.0065	0.013
Methylene chloride [Dichloromethane]	50	260	1,400	NA	0.013	0.159	4.05		0.159		ND		0.0087	0.015	ND		0.0099	0.017	ND		0.012	0.021	ND		0.0095	0.017	ND		0.015	0.026
Styrene	16,000	260,000	NA	NA	2.1	0.254	300	300	0.254		ND		0.0021	0.0076	ND		0.0024	0.0086	ND		0.0029	0.010	ND		0.0023	0.0083	ND		0.0036	0.013
Tertiary-Butyl Alcohol [TBA]	1,400	23,000	NA	NA	0.32						ND		0.060	0.076	ND		0.068	0.086	ND		0.081	0.10	ND		0.065	0.083	ND		0.10	0.13
Tetrachloroethene [PCE]	330	1,700	47	NA	0.0086	0.99	9.92		0.45		ND		0.0023	0.0076	ND		0.0026	0.0086	ND		0.0031	0.010	ND		0.0025	0.0083	ND		0.0040	0.013
Toluene	6,300	100,000	NA	NA	7.8	1.22	200	200	2.5		ND		0.0018	0.0076	ND		0.0020	0.0086	ND		0.0024	0.010	ND		0.0019	0.0083	ND		0.0030	0.013
Trichloroethene [TCE]	15	79	3.0	14	0.0065	0.112	12.4		1.6		ND		0.0024	0.0076	ND		0.0028	0.0086	ND		0.0033	0.010	ND		0.0027	0.0083	ND		0.0042	0.013
Trichlorofluoromethane [Freon 11]	23,000	390,000	NA	NA	29						ND		0.0031	0.0076	ND		0.0035	0.0086	ND		0.0042	0.010	ND		0.0034	0.0083	ND		0.0053	0.013
Vinyl chloride	0.97	5.0	1.4	6.4	0.0067	0.202	0.646		0.202		ND		0.0042	0.0076	ND		0.0047	0.0086	ND		0.0056	0.010	ND		0.0045	0.0083	ND		0.0071	0.013
m-Xylene & p-Xylene	12,000	190,000	NA	NA	19	0.433	10		>0.12		ND		0.0013	0.0076	ND		0.0015	0.0086	ND		0.0018	0.010	ND		0.0014	0.0083	ND		0.0023	0.013
o-Xylene											ND		0.0015	0.0076	ND		0.0017	0.0086	ND		0.0020	0.010	ND		0.0016	0.0083	ND		0.0025	0.013
Total VOCs	NL	NL	NL	NL	NL						0.0				0.083				0.0				0.089				0.13			
Total TICs (Estimated)	NL	NL	NL	NL	NL						0.0*T				0.0*T				0.0*T				0.0*T				0.0*T			

Bold & Outlined = exceeds residential or non-residential ingestion-dermal soil remediation standard (ID-R SRS or ID-NR SRS)

Red & Outlined = exceeds residential or non-residential inhalation soil remediation standard (Inh-R SRS or Inh-NR SRS)

Italics & Outlined = exceeds Migration to Groundwater (MGW) SRS

Highlighted = exceeds one or more ESC for soil and/or sediment

NL = remediation standard not listed

NA = not applicable

ND = not detected above listed method detection limit (MDL)

*1 = LCS/LCSD RPD exceeds control limits.

*+ = LCS and/or LCSD is outside acceptance limits, high biased.

*3 = ISTD response or retention time outside acceptable limits.

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Table 2
Analytical Results of Sediment Samples
Clark Reservoir
Township of Clark, Union County, New Jersey

Field ID	NJDEP Soil Remediation Standards					NJDEP Ecological Screening Criteria					S-1				S-2				S-3				S-4				S-5			
Lab ID	Ingestion-Dermal		Inhalation		Migration to Groundwater (MGW SRS)	EPA Ecological Screening Level (ESL)	Wildlife Preliminary Remediation Goal (PRG)	Terrestrial Plant Toxicological Benchmark	Freshwater Sediment		460-246490-1				460-246490-2				460-246230-2				460-246230-1				460-246153-1			
Sample Date	Residential (ID-R SRS)	Non-Residential (ID-NR SRS)	Residential (Inh-R SRS)	Non-Residential (Inh-NR SRS)					Lowest Effects Level (LEL)	Severe Effects Level (SEL)	11/2/2021				11/2/2021				10/29/2021				10/29/2021				10/28/2021			
Media											Sediment				Sediment				Sediment				Sediment				Sediment			
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg				mg/kg				mg/kg				mg/kg				mg/kg			
SEMI-VOLATILE ORGANICS											Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
1,1'-Biphenyl [diphenyl]	87	450	NA	NA	NA		60				ND		0.0081	0.61	ND		0.0083	0.62	ND		0.0099	0.75	0.020	J	0.017	1.3	ND		0.014	1.0
1,2,4,5-Tetrachlorobenzene	23	390	NA	NA	NA	1.252	2.02		1.252		ND		0.019	0.61	ND		0.019	0.62	ND		0.023	0.75	ND		0.040	1.3	ND		0.032	1.0
1,2-diphenylhydrazine	NL	NL	NL	NL	NL						ND		0.024	0.61	ND		0.025	0.62	ND		0.029	0.75	ND		0.051	1.3	ND		0.041	1.0
2,2'-oxybis(1-chloropropane)	3,100	52,000	NA	NA	1.9						ND		0.011	0.61	ND		0.011	0.62	ND	*-	0.014	0.75	ND	*-	0.023	1.3	ND		0.019	1.0
2,3,4,6-Tetrachlorophenol	1,900	27,000	NA	NA	26						ND		0.042	0.61	ND		0.042	0.62	ND		0.051	0.75	ND		0.088	1.3	ND		0.071	1.0
2,4,5-Trichlorophenol	6,300	91,000	NA	NA	68		9	4			ND		0.062	0.61	ND		0.064	0.62	ND		0.076	0.75	ND		0.13	1.3	ND		0.11	1.0
2,4,6-Trichlorophenol	49	230	NA	NA	0.86	0.208	4		0.208		ND		0.079	0.25	ND		0.080	0.25	ND		0.096	0.30	ND		0.17	0.52	ND		0.13	0.42
2,4-Dichlorophenol	190	2,700	NA	NA	0.19	0.0817	87.5		0.0817		ND		0.039	0.25	ND		0.040	0.25	ND		0.048	0.30	ND		0.083	0.52	ND		0.067	0.42
2,4-Dimethylphenol	1,300	18,000	NA	NA	2.3		0.01		0.304		ND		0.027	0.61	ND		0.028	0.62	ND		0.033	0.75	ND		0.057	1.3	ND		0.046	1.0
2,4-Dinitrophenol	130	1,800	NA	NA	0.33	0.00621	20	20	0.00621		ND		0.30	0.49	ND		0.31	0.50	ND		0.37	0.60	ND		0.64	1.0	ND		0.51	0.84
2,4-Dinitrotoluene	0.80	3.8	NA	NA	0.27	0.0144	1.28		0.0144		ND		0.066	0.12	ND		0.067	0.13	ND		0.080	0.15	ND		0.14	0.26	ND		0.11	0.21
2,6-Dinitrotoluene											ND		0.044	0.12	ND		0.045	0.13	ND		0.054	0.15	ND		0.094	0.26	ND		0.075	0.21
2-Chloronaphthalene	4,800	67,000	NA	NA	NL						ND		0.028	0.61	ND		0.029	0.62	ND		0.035	0.75	ND		0.060	1.3	ND		0.048	1.0
2-Chlorophenol	390	6,500	NA	NA	0.76						ND		0.022	0.61	ND		0.022	0.62	ND		0.027	0.75	ND		0.046	1.3	ND		0.037	1.0
2-Methylnaphthalene	240	3,300	NA	NA	3.1	0.0202	3.24		0.07	0.67	0.032	J	0.017	0.61	0.023	J	0.017	0.62	ND		0.021	0.75	0.056	J	0.036	1.3	ND		0.029	1.0
2-Methylphenol [o-cresol]	320	4,600	NA	NA	0.77						ND		0.023	0.61	ND		0.023	0.62	ND		0.028	0.75	ND		0.048	1.3	ND		0.039	1.0
2-Nitroaniline	NL	NL	NL	NL	NL						ND		0.023	0.61	ND		0.023	0.62	ND		0.028	0.75	ND		0.048	1.3	ND		0.039	1.0
2-Nitrophenol	NL	NL	NL	NL	NL						ND		0.061	0.61	ND		0.063	0.62	ND		0.075	0.75	ND		0.13	1.3	ND		0.10	1.0
3,3'-Dichlorobenzidine	1.2	5.7	NA	NA	3.9	0.127	0.646		0.127		ND		0.093	0.25	ND		0.094	0.25	ND	*-	0.11	0.30	ND	*-	0.20	0.52	ND	*-	0.16	0.42
3-Nitroaniline	NL	NL	NL	NL	NL						ND		0.069	0.61	ND		0.070	0.62	ND		0.084	0.75	ND		0.15	1.3	ND		0.12	1.0
4,6-Dinitro-2-methylphenol	NL	NL	NL	NL	NL						ND		0.25	0.49	ND		0.26	0.50	ND		0.30	0.60	ND		0.53	1.0	ND		0.43	0.84
4-Bromophenyl phenyl ether	NL	NL	NL	NL	NL						ND		0.024	0.61	ND		0.025	0.62	ND		0.030	0.75	ND		0.051	1.3	ND		0.041	1.0
4-Chloro-3-methylphenol	NL	NL	NL	NL	NL						ND		0.034	0.61	ND		0.035	0.62	ND		0.042	0.75	ND		0.073	1.3	ND		0.058	1.0
4-Chloroaniline	2.7	13	NA	NA	0.23						ND		0.11	0.61	ND		0.11	0.62	ND		0.13	0.75	ND		0.23	1.3	ND		0.18	1.0
4-Chlorophenyl phenyl ether	NL	NL	NL	NL	NL						ND		0.022	0.61	ND		0.022	0.62	ND		0.026	0.75	ND		0.046	1.3	ND		0.037	1.0
4-Methylphenol [p-cresol]	630	9,100	NA	NA	0.75						0.054	J	0.038	0.61	ND		0.039	0.62	ND		0.047	0.75	ND		0.081	1.3	ND		0.065	1.0
4-Nitroaniline	27	130	NA	NA	NA						ND		0.070	0.61	ND		0.072	0.62	ND		0.086	0.75	ND		0.15	1.3	ND		0.12	1.0
4-Nitrophenol	NL	NL	NL	NL	NL	0.0133	7		0.0133		ND		0.10	1.2	ND		0.10	1.3	ND		0.12	1.5	ND		0.21	2.6	ND		0.17	2.1
Acenaphthene	3,600	50,000	NA	NA	NA		20				0.12	J	0.017	0.61	0.039	J	0.018	0.62	ND		0.021	0.75	0.092	J	0.037	1.3	ND		0.030	1.0
Acenaphthylene	NL	NL	NL	NL	NL						0.049	J	0.0062	0.61	0.028	J	0.0063	0.62	0.050	J	0.0075	0.75	0.17	J	0.013	1.3	0.032	J	0.010	1.0
Acetophenone	7,800	130,000	NA	NA	3.6						ND		0.030	0.61	ND		0.031	0.62	ND		0.037	0.75	ND		0.064	1.3	ND		0.051	1.0
Anthracene	18,000	250,000	NA	NA	NA						0.31	J	0.019	0.61	0.097	J	0.019	0.62	0.083	J	0.023	0.75	0.36	J	0.039	1.3	0.089	J	0.032	1.0
Atrazine	220	3,200	NA	NA	0.33						0.036	U *+	0.036	0.25	0.037	U *+	0.037	0.25	ND		0.044	0.30	ND		0.076	0.52	ND	*+	0.061	0.42
Benzaldehyde	170	910	NA	NA	NA						ND		0.10	0.61	ND		0.10	0.62	ND		0.12	0.75	ND		0.21	1.3	ND		0.17	1.0
Benzidine	NL	NL	NL	NL	NL						ND		0.061	0.61	ND		0.062	0.62	ND		0.074	0.75	ND		0.13	1.3	ND		0.10	1.0
Benzo(a)anthracene	5.1	23	78,000	370,000	0.71						*1.0*		0.021	0.061	0.71		0.022	0.062	0.48		0.026	0.075	*1.9*		0.045	0.13	0.44		0.036	0.10
Benzo(a)pyrene [BaP]	0.51	2.3	3,500	16,000	NL						**0.88**		0.016	0.061	**0.71**		0.017	0.062	**0.61**		0.020	0.075	**2.0**		0.035	0.13	0.50		0.028	0.10
Benzo(b)fluoranthene	5.1	23	78,000	370,000	NA						1.4		0.016	0.061	1.2		0.016	0.062	1.3		0.019	0.075	3.2		0.034	0.13	0.88		0.027	0.10
Benzo(g,h,i)perylene	NL	NL	NL	NL	NL						0.52	J	0.018	0.61	0.50	J	0.018	0.62	0.58	J	0.022	0.75	1.5		0.038	1.3	0.27	J	0.031	1.0
Benzo(k)fluoranthene	51	230	780,000	NA	NA						0.66		0.012	0.061	0.60		0.012	0.062	0.38		0.015	0.075	1.2		0.025	0.13	0.39		0.020	0.10
Benzyl alcohol	NL	NL	NL	NL	NL						ND		0.054	0.61	ND		0.055	0.62	ND		0.066	0.75	ND		0.11	1.3	ND		0.092	1.0
Bis(2-chloroethoxy)methane	190	2,700	NA	NA	NA						ND		0.048	0.61	ND		0.049	0.62	ND		0.058	0.75	ND		0.10	1.3	ND		0.081	1.0
Bis(2-chloroethyl)ether	0.63	3.3	NA	NA	0.33						ND		0.021	0.061	ND		0.022	0.062	ND		0.026	0.075	ND		0.045	0.13	ND		0.036	0.10
Bis(2-ethylhexyl) phthalate	39	180	NA	NA	14						0.45	J	0.032	0.61	0.40	J	0.033	0.62	0.76		0.039	0.75	0.97	J	0.068	1.3	0.22	J	0.055	1.0
Butyl benzyl phthalate	290	1,300	NA	NA	29						0.072	J	0.029	0.61	ND		0.029	0.62	ND		0.035	0.75	ND		0.061	1.3	ND		0.049	1.0
Caprolactam	32,000	460,000	290	1,300	16						ND		0.095	0.61	ND		0.097	0.62	ND		0.12	0.75	ND		0.20	1.3	ND		0.16	1.0
Carbazole	NL	NL	NL	NL	NL						0.070	J	0.023	0.61	0.10	J	0.024	0.62	0.053	J	0.028	0.75	0.18	J	0.049	1.3	0.053	J	0.040	1.0
Chrysene	510	2,300	NA	NA	NA						1.2		0.010	0.61	0.99		0.011	0.62	0.89		0.013	0.75	2.6		0.022	1.3	0.62	J	0.018	1.0
Dibenz(a,h)anthracene	0.51	2.3	7,800	37,000	NA	0.033	18.4		0.06	130	0.098		0.027	0.061	0.090		0.027	0.062	0.12		0.032	0.075	0.41		0.056	0.13	0.048	J	0.045	0.10
Dibenzofuran	NL	NL	NL	NL	NL						0.058	J	0.0086	0.61	0.021	J	0.0088	0.62	0.018	J	0.010	0.75	0.083	J	0.018	1.3	ND		0.015	1.0
Diethyl phthalate	51,000	730,000	NA	NA	44	0.295	100		0.295		ND		0.0089	0.61	0.0093	J	0.0091	0.62	ND		0.011	0.75	ND		0.019	1.3	ND		0.015	1.0
Dimethyl phthalate	NL	NL	NL	NL	NL						ND		0.14	0.61	ND		0.14	0.62	ND		0.17	0.75	ND		0.29	1.3	ND		0.24	1.0
Di-n-butyl phthalate	6,300	91,000	NA	NA	NA	1.114	200		1.114	0.11	ND		0.023	0.61	ND		0.024	0.62	ND		0.028	0.75	ND		0.049	1.3	ND		0.039	1.0
Di-n-octyl phthalate	630	9,100	NA	NA	NA						ND		0.032	0.61	ND		0.033	0.62	ND		0.040	0.75	ND		0.069	1.3	ND		0.055	1.0
Fluoranthene	2,400	33,000	NA	NA	NA	0.423	122		0.75	1020	2.8		0.021	0.61	2.0		0.022	0.62	1.5		0.026	0.75	4.8		0.045	1.3	1.0		0.036	1.0
Fluorene	2,400	33,000	NA	NA	NA	0.0774	122		0.19	160	0.17	J	0.0083	0.61	0.059	J	0.0085	0.62	0.043	J	0.010	0.75	0.22	J	0.018	1.3	ND		0.014	1.0
Hexachlorobenzene	0.43	2.3	NA	NA	0.17		0.199		0.02	24	ND		0.029	0.061	ND		0.030	0.062	ND		0.035	0.075	ND		0.062	0.13	ND		0.050	0.10
Hexachloro-1,3-butadiene	8.9	47	NA	NA	0.17	0.0265	0.0398		0.0265		ND		0.013	0.12	ND		0.013	0.13	ND		0.016	0.15	ND		0.028	0.26	ND		0.022	0.21
Hexachlorocyclopentadiene	470	7,800	2.7	NA	2.5	0.901	10		0.901		ND		0.054	0.61	ND		0.055	0.62	ND		0.066	0.75	ND		0.11	1.3	ND		0.091	1.0
Hexachloroethane	17	91	NA	NA	0.17	0.584	0.596		0.584		ND		0.021	0.061	ND		0.021	0.062	ND		0.026	0.075	ND		0.044	0.13	ND		0.036	0.10
Indeno(1,2,3-cd)pyrene	5.1	23	78,000	370,000	NL		109		0.2	320	0.77		0.024	0.061	0.72		0.024	0.062	0.66		0.029	0.075	1.7		0.051	0.13	0.45		0.041	0.10
Isophorone	570	2,700	NA	NA	0.23	0.432	139		0.432		ND		0.18	0.25	ND		0.18	0.25	ND		0.22	0.30	ND		0.37	0.52	ND		0.30	0.42
Naphthalene	2,500	34,000	5.7	27	19	0.176	0.0994		0.16	2.1	0.033	J	0.011	0.61	0.015	J	0.011	0.62	0.030	J	0.013	0.75	0.099	J	0.022	1.3	0.026	J	0.018	1.0
Nitrobenzene	160	2,600	7.5	36	0.17	0.145	1.31		0.145		ND		0.015	0.061	ND		0.015	0.062	ND		0.018	0.075	ND		0.031	0.13	ND		0.025	0.10
N-Nitroso-di-methylamine	NL	NL	NL	NL	NL		0.0000321				ND		0.057	0.61	ND		0.058	0.62	ND		0.069	0.75	ND		0.12	1.3	ND		0.096	1.0
N-Nitroso-di-n-propylamine	0.17	0.36	NA	NA	0.17						ND		0.045	0.061	ND		0.045	0.062	ND		0.054	0.075	ND		0.094	0.13	ND		0.076	0.10
N-Nitroso-di-phenylamine	110	520	NA	NA	1.1		0.545				ND		0.050	0.61	ND		0.051	0.62	ND		0.061	0.75	ND		0.11	1.3	ND		0.086	1.0
Pentachlorophenol [PCP]	1.0	4.4	NA	NA	0.33	23	3	3	23		ND		0.13	0.49	ND		0.13	0.50	ND		0.15	0.60	ND		0.27	1.0	ND		0.21	0.84
Phenanthrene	NL	NL	NL	NL	NL	0.204	45.7		0.56	950	1.6		0.011	0.61	0.84		0.011	0.62	0.41	J	0.013	0.75	2.1		0.023	1.3	0.34	J	0.018	1.0
Phenol	19,000	270,000	39,000	NA	21	0.0491	30		0.0491	0.048	ND		0.023	0.61	ND		0.023	0.62	ND		0.027	0.75	ND		0.048	1.3	ND		0.038	1.0
Pyrene	1,800	25,000	NA	NA	NA	0.195	78.5		0.49	850	2.3		0.015	0.61	1.6		0.016	0.62	1.1		0.019	0.75	4.1		0.032	1.3	0.84	J	0.026	1.0
Total SVOCs	NL	NL	NL	NL	NL						14.646				10.7513				9.067				27.76				6.198			
Total TICs (Estimated)	NL	NL	NL	NL	NL						25.24				28.45				24.73				74.9				20.71			

Bold & Outlined = exceeds residential or non-residential ingestion-dermal soil remediation standard (ID-R SRS or ID-NR SRS)

Red & Outlined = exceeds residential or non-residential inhalation soil remediation standard (Inh-R SRS or Inh-NR SRS)

Italics & Outlined = exceeds Migration to Groundwater (MGW) SRS

Highlighted = exceeds one or more ESC for soil and/or sediment

NL = remediation standard not listed

NA = not applicable

ND = not detected above listed method detection limit (MDL)

*+ = LCS and/or LCSD is outside acceptance limits, high biased.

*- = LCS and/or LCSD is outside acceptance limits, low biased.

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Table 2
Analytical Results of Sediment Samples
Clark Reservoir
Township of Clark, Union County, New Jersey

Field ID	NJDEP Soil Remediation Standards					NJDEP Ecological Screening Criteria					S-6				S-7				S-8				S-9				S-10			
Lab ID	Ingestion-Dermal		Inhalation		Migration to Groundwater (MGW SRS)	EPA Ecological Screening Level (ESL)	Wildlife Preliminary Remediation Goal (PRG)	Terrestrial Plant Toxicological Benchmark	Freshwater Sediment		460-246012-1				460-246012-3				460-246153-3				460-246153-5				460-246153-7			
Sample Date	Residential (ID-R SRS)	Non-Residential (ID-NR SRS)	Residential (Inh-R SRS)	Non-Residential (Inh-NR SRS)					Lowest Effects Level (LEL)	Severe Effects Level (SEL)	10/27/2021				10/27/2021				10/28/2021				10/28/2021				10/28/2021			
Media											Sediment				Sediment				Sediment				Sediment				Sediment			
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg				mg/kg				mg/kg				mg/kg				mg/kg			
SEMI-VOLATILE ORGANICS											Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
1,1'-Biphenyl [diphenyl]	87	450	NA	NA	NA		60				ND		0.019	1.4	ND		0.019	1.4	ND		0.022	1.7	ND		0.019	1.4	ND		0.027	2.0
1,2,4,5-Tetrachlorobenzene	23	390	NA	NA	NA	1.252	2.02		1.252		ND		0.045	1.4	ND		0.044	1.4	ND		0.052	1.7	ND		0.045	1.4	ND		0.063	2.0
1,2-diphenylhydrazine	NL	NL	NL	NL	NL						ND		0.056	1.4	ND		0.056	1.4	ND		0.065	1.7	ND		0.056	1.4	ND		0.079	2.0
2,2'-oxybis(1-chloropropane)	3,100	52,000	NA	NA	1.9						ND		0.026	1.4	ND		0.026	1.4	ND		0.030	1.7	ND		0.026	1.4	ND		0.036	2.0
2,3,4,6-Tetrachlorophenol	1,900	27,000	NA	NA	26						ND		0.097	1.4	ND		0.097	1.4	ND		0.11	1.7	ND		0.097	1.4	ND		0.14	2.0
2,4,5-Trichlorophenol	6,300	91,000	NA	NA	68		9	4			ND		0.15	1.4	ND		0.15	1.4	ND		0.17	1.7	ND		0.15	1.4	ND		0.20	2.0
2,4,6-Trichlorophenol	49	230	NA	NA	0.86	0.208	4		0.208		ND		0.18	0.58	ND		0.18	0.57	ND		0.21	0.67	ND		0.18	0.58	ND		0.26	0.81
2,4-Dichlorophenol	190	2,700	NA	NA	0.19	0.0817	87.5		0.0817		ND		0.092	0.58	ND		0.091	0.57	ND		0.11	0.67	ND		0.092	0.58	ND		0.13	0.81
2,4-Dimethylphenol	1,300	18,000	NA	NA	2.3		0.01		0.304		ND		0.063	1.4	ND		0.063	1.4	ND		0.073	1.7	ND		0.063	1.4	ND		0.088	2.0
2,4-Dinitrophenol	130	1,800	NA	NA	0.33	0.00621	20	20	0.00621		ND		0.71	1.2	ND		0.70	1.1	ND		0.82	1.3	ND		0.71	1.2	ND		0.99	1.6
2,4-Dinitrotoluene	0.80	3.8	NA	NA	0.27	0.0144	1.28		0.0144		ND		0.15	0.29	ND		0.15	0.29	ND		0.18	0.34	ND		0.15	0.29	ND		0.22	0.41
2,6-Dinitrotoluene											ND		0.10	0.29	ND		0.10	0.29	ND		0.12	0.34	ND		0.10	0.29	ND		0.15	0.41
2-Chloronaphthalene	4,800	67,000	NA	NA	NL						ND		0.067	1.4	ND		0.066	1.4	ND		0.077	1.7	ND		0.067	1.4	ND		0.093	2.0
2-Chlorophenol	390	6,500	NA	NA	0.76						ND		0.051	1.4	ND		0.051	1.4	ND		0.059	1.7	ND		0.051	1.4	ND		0.071	2.0
2-Methylnaphthalene	240	3,300	NA	NA	3.1	0.0202	3.24		0.07	0.67	ND		0.040	1.4	ND		0.040	1.4	ND		0.046	1.7	ND		0.040	1.4	ND		0.056	2.0
2-Methylphenol [o-cresol]	320	4,600	NA	NA	0.77						ND		0.054	1.4	ND		0.053	1.4	ND		0.062	1.7	ND		0.054	1.4	ND		0.075	2.0
2-Nitroaniline	NL	NL	NL	NL	NL						ND		0.054	1.4	ND		0.053	1.4	ND		0.062	1.7	ND		0.054	1.4	ND		0.075	2.0
2-Nitrophenol	NL	NL	NL	NL	NL						ND		0.14	1.4	ND		0.14	1.4	ND		0.17	1.7	ND		0.14	1.4	ND		0.20	2.0
3,3'-Dichlorobenzidine	1.2	5.7	NA	NA	3.9	0.127	0.646		0.127		ND	*-	0.22	0.58	ND	*-	0.22	0.57	ND	*-	0.25	0.67	ND	*-	0.22	0.58	ND	*-	0.30	0.81
3-Nitroaniline	NL	NL	NL	NL	NL						ND		0.16	1.4	ND		0.16	1.4	ND		0.19	1.7	ND		0.16	1.4	ND		0.23	2.0
4,6-Dinitro-2-methylphenol	NL	NL	NL	NL	NL						ND		0.59	1.2	ND		0.58	1.1	ND		0.68	1.3	ND		0.59	1.2	ND		0.82	1.6
4-Bromophenyl phenyl ether	NL	NL	NL	NL	NL						ND		0.057	1.4	ND		0.057	1.4	ND		0.066	1.7	ND		0.057	1.4	ND		0.080	2.0
4-Chloro-3-methylphenol	NL	NL	NL	NL	NL						ND		0.081	1.4	ND		0.080	1.4	ND		0.093	1.7	ND		0.081	1.4	ND		0.11	2.0
4-Chloroaniline	2.7	13	NA	NA	0.23						ND		0.26	1.4	ND		0.25	1.4	ND		0.29	1.7	ND		0.26	1.4	ND		0.36	2.0
4-Chlorophenyl phenyl ether	NL	NL	NL	NL	NL						ND		0.051	1.4	ND		0.050	1.4	ND		0.059	1.7	ND		0.051	1.4	ND		0.071	2.0
4-Methylphenol [p-cresol]	630	9,100	NA	NA	0.75						ND		0.090	1.4	ND		0.089	1.4	ND		0.10	1.7	ND		0.090	1.4	ND		0.13	2.0
4-Nitroaniline	27	130	NA	NA	NA						ND		0.17	1.4	ND		0.16	1.4	ND		0.19	1.7	ND		0.17	1.4	ND		0.23	2.0
4-Nitrophenol	NL	NL	NL	NL	NL	0.0133	7		0.0133		ND		0.23	2.9	ND		0.23	2.9	ND		0.27	3.4	ND		0.23	2.9	ND		0.33	4.1
Acenaphthene	3,600	50,000	NA	NA	NA		20				0.044	J*	0.041	1.4	ND	*-	0.041	1.4	ND		0.047	1.7	ND		0.041	1.4	ND		0.057	2.0
Acenaphthylene	NL	NL	NL	NL	NL						0.11	J	0.014	1.4	0.097	J	0.014	1.4	0.023	J	0.017	1.7	ND		0.014	1.4	0.039	J	0.020	2.0
Acetophenone	7,800	130,000	NA	NA	3.6						ND		0.071	1.4	ND		0.070	1.4	ND		0.082	1.7	ND		0.071	1.4	ND		0.099	2.0
Anthracene	18,000	250,000	NA	NA	NA						0.23	J	0.044	1.4	0.15	J	0.043	1.4	ND		0.051	1.7	ND		0.044	1.4	ND		0.061	2.0
Atrazine	220	3,200	NA	NA	0.33						ND	*+	0.085	0.58	ND	*+	0.084	0.57	ND	*+	0.098	0.67	ND	*+	0.085	0.58	ND	*+	0.12	0.81
Benzaldehyde	170	910	NA	NA	NA						ND		0.24	1.4	ND		0.24	1.4	ND		0.27	1.7	ND		0.24	1.4	ND		0.33	2.0
Benzidine	NL	NL	NL	NL	NL						ND		0.14	1.4	ND		0.14	1.4	ND		0.16	1.7	ND		0.14	1.4	ND		0.20	2.0
Benzo(a)anthracene	5.1	23	78,000	370,000	0.71						*1.5*		0.050	0.14	*0.83*		0.050	0.14	0.18		0.058	0.17	0.16		0.050	0.14	0.27		0.070	0.20
Benzo(a)pyrene [BaP]	0.51	2.3	3,500	16,000	NL						**1.8**		0.038	0.14	**1.1**		0.038	0.14	0.19		0.044	0.17	0.18		0.038	0.14	0.28		0.054	0.20
Benzo(b)fluoranthene	5.1	23	78,000	370,000	NA						2.7		0.037	0.14	1.9		0.037	0.14	0.33		0.043	0.17	0.28		0.037	0.14	0.50		0.052	0.20
Benzo(g,h,i)perylene	NL	NL	NL	NL	NL						1.1	J	0.042	1.4	0.79	J	0.042	1.4	0.16	J	0.049	1.7	0.10	J	0.042	1.4	0.18	J	0.059	2.0
Benzo(k)fluoranthene	51	230	780,000	NA	NA						1.0		0.028	0.14	0.63		0.028	0.14	0.12	J	0.033	0.17	0.10	J	0.028	0.14	0.22		0.039	0.20
Benzyl alcohol	NL	NL	NL	NL	NL						ND		0.13	1.4	ND		0.13	1.4	ND		0.15	1.7	ND		0.13	1.4	ND		0.18	2.0
Bis(2-chloroethoxy)methane	190	2,700	NA	NA	NA						ND		0.11	1.4	ND		0.11	1.4	ND		0.13	1.7	ND		0.11	1.4	ND		0.16	2.0
Bis(2-chloroethyl)ether	0.63	3.3	NA	NA	0.33						ND		0.050	0.14	ND		0.050	0.14	ND		0.058	0.17	ND		0.050	0.14	ND		0.070	0.20
Bis(2-ethylhexyl) phthalate	39	180	NA	NA	14						0.46	J	0.076	1.4	0.80	J	0.075	1.4	0.12	J	0.088	1.7	0.11	J	0.076	1.4	0.19	J	0.11	2.0
Butyl benzyl phthalate	290	1,300	NA	NA	29						ND		0.067	1.4	0.078	J	0.067	1.4	ND		0.078	1.7	ND		0.067	1.4	ND		0.094	2.0
Caprolactam	32,000	460,000	290	1,300	16						ND		0.22	1.4	ND		0.22	1.4	ND		0.26	1.7	ND		0.22	1.4	ND		0.31	2.0
Carbazole	NL	NL	NL	NL	NL						0.18	J	0.055	1.4	0.092	J	0.054	1.4	ND		0.063	1.7	ND		0.055	1.4	ND		0.076	2.0
Chrysene	510	2,300	NA	NA	NA						2.0		0.024	1.4	1.4		0.024	1.4	0.21	J	0.028	1.7	0.19	J	0.024	1.4	0.38	J	0.034	2.0
Dibenz(a,h)anthracene	0.51	2.3	7,800	37,000	NA	0.033	18.4		0.06	130	0.33		0.062	0.14	0.23		0.062	0.14	ND		0.072	0.17	ND		0.062	0.14	ND		0.087	0.20
Dibenzofuran	NL	NL	NL	NL	NL						0.039	J	0.020	1.4	0.030	J	0.020	1.4	ND		0.023	1.7	ND		0.020	1.4	ND		0.028	2.0
Diethyl phthalate	51,000	730,000	NA	NA	44	0.295	100		0.295		ND		0.021	1.4	ND		0.021	1.4	ND		0.024	1.7	ND		0.021	1.4	ND		0.029	2.0
Dimethyl phthalate	NL	NL	NL	NL	NL						ND		0.33	1.4	ND		0.32	1.4	ND		0.38	1.7	ND		0.33	1.4	ND		0.46	2.0
Di-n-butyl phthalate	6,300	91,000	NA	NA	NA	1.114	200		1.114	0.11	ND		0.054	1.4	ND		0.054	1.4	ND		0.063	1.7	ND		0.054	1.4	ND		0.076	2.0
Di-n-octyl phthalate	630	9,100	NA	NA	NA						ND		0.076	1.4	ND		0.076	1.4	ND		0.088	1.7	ND		0.076	1.4	ND		0.11	2.0
Fluoranthene	2,400	33,000	NA	NA	NA	0.423	122		0.75	1020	3.5		0.050	1.4	2.3		0.050	1.4	0.34	J	0.058	1.7	0.32	J	0.050	1.4	0.60	J	0.070	2.0
Fluorene	2,400	33,000	NA	NA	NA	0.0774	122		0.19	160	0.078	J	0.020	1.4	0.079	J	0.019	1.4	ND		0.023	1.7	ND		0.020	1.4	ND		0.027	2.0
Hexachlorobenzene	0.43	2.3	NA	NA	0.17		0.199		0.02	24	ND		0.068	0.14	ND		0.068	0.14	ND		0.079	0.17	ND		0.068	0.14	ND		0.095	0.20
Hexachloro-1,3-butadiene	8.9	47	NA	NA	0.17	0.0265	0.0398		0.0265		ND		0.031	0.29	ND		0.030	0.29	ND		0.035	0.34	ND		0.031	0.29	ND		0.043	0.41
Hexachlorocyclopentadiene	470	7,800	2.7	NA	2.5	0.901	10		0.901		ND		0.13	1.4	ND		0.13	1.4	ND		0.15	1.7	ND		0.13	1.4	ND		0.18	2.0
Hexachloroethane	17	91	NA	NA	0.17	0.584	0.596		0.584		ND		0.049	0.14	ND		0.049	0.14	ND		0.057	0.17	ND		0.049	0.14	ND		0.069	0.20
Indeno(1,2,3-cd)pyrene	5.1	23	78,000	370,000	NL		109		0.2	320	1.3		0.056	0.14	0.84		0.056	0.14	0.30		0.065	0.17	0.22		0.056	0.14	0.37		0.078	0.20
Isophorone	570	2,700	NA	NA	0.23	0.432	139		0.432		ND		0.42	0.58	ND		0.41	0.57	ND		0.48	0.67	ND		0.42	0.58	ND		0.58	0.81
Naphthalene	2,500	34,000	5.7	27	19	0.176	0.0994		0.16	2.1	0.038	J	0.025	1.4	0.050	J	0.025	1.4	ND		0.029	1.7	ND		0.025	1.4	ND		0.035	2.0
Nitrobenzene	160	2,600	7.5	36	0.17	0.145	1.31		0.145		ND		0.035	0.14	ND		0.034	0.14	ND		0.040	0.17	ND		0.035	0.14	ND		0.048	0.20
N-Nitroso-di-methylamine	NL	NL	NL	NL	NL		0.0000321				ND		0.13	1.4	ND		0.13	1.4	ND		0.15	1.7	ND		0.13	1.4	ND		0.19	2.0
N-Nitroso-di-n-propylamine	0.17	0.36	NA	NA	0.17						ND		0.10	0.14	ND		0.10	0.14	ND		0.12	0.17	ND		0.10	0.14	ND		0.15	0.20
N-Nitroso-di-phenylamine	110	520	NA	NA	1.1		0.545				ND		0.12	1.4	ND		0.12	1.4	ND		0.14	1.7	ND		0.12	1.4	ND		0.17	2.0
Pentachlorophenol [PCP]	1.0	4.4	NA	NA	0.33	23	3	3	23		ND		0.29	1.2	ND		0.29	1.1	ND		0.34	1.3	ND		0.29	1.2	ND		0.41	1.6
Phenanthrene	NL	NL	NL	NL	NL	0.204	45.7		0.56	950	1.3	J	0.025	1.4	0.73	J	0.025	1.4	0.11	J	0.029	1.7	0.11	J	0.025	1.4	0.22	J	0.035	2.0
Phenol	19,000	270,000	39,000	NL	21	0.0491	30		0.0491	0.048	ND		0.053	1.4	ND		0.052	1.4	ND		0.061	1.7	ND		0.053	1.4	ND		0.074	2.0
Pyrene	1,800	25,000	NA	NA	NA	0.195	78.5		0.49	850	2.9		0.036	1.4	2.0		0.035	1.4	0.28	J	0.041	1.7	0.26	J	0.036	1.4	0.49	J	0.050	2.0
Total SVOCs	NL	NL	NL	NL	NL						20.609				14.126				2.363				2.03				3.739			
Total TICs (Estimated)	NL	NL	NL	NL	NL						44.5				36.9				5.1				4.7				26.9			

Bold & Outlined = exceeds residential or non-residential ingestion-dermal soil remediation standard (ID-R SRS or ID-NR SRS)

Red & Outlined = exceeds residential or non-residential inhalation soil remediation standard (Inh-R SRS or Inh-NR SRS)

Italics & Outlined = exceeds Migration to Groundwater (MGW) SRS

Highlighted = exceeds one or more ESC for soil and/or sediment

NL = remediation standard not listed

NA = not applicable

ND = not detected above listed method detection limit (MDL)

*+ = LCS and/or LCSD is outside acceptance limits, high biased.

*- = LCS and/or LCSD is outside acceptance limits, low biased.

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Table 2
Analytical Results of Sediment Samples
Clark Reservoir
Township of Clark, Union County, New Jersey

Field ID	NJDEP Soil Remediation Standards					NJDEP Ecological Screening Criteria					S-1				S-2				S-3				S-4				S-5			
Lab ID	Ingestion-Dermal		Inhalation		Migration to	EPA Ecological	Wildlife Preliminary	Terrestrial Plant	Freshwater Sediment		460-246490-1				460-246490-2				460-246230-2				460-246230-1				460-246153-1			
Sample Date	Residential	Non-Residential	Residential	Non-Residential	Groundwater	Screening Level	Remediation Goal	Toxicological	Lowest Effects	Severe Effects	11/2/2021				11/2/2021				10/29/2021				10/29/2021				10/28/2021			
Media	(ID-R SRS)	(ID-NR SRS)	(Inh-R SRS)	(Inh-NR SRS)	(MGW SRS)	(ESL)	(PRG)	Benchmark	Level (LEL)	Level (SEL)	Sediment				Sediment				Sediment				Sediment				Sediment			
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg				mg/kg				mg/kg				mg/kg				mg/kg			
PETROLEUM HYDROCARBONS											Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
Total EPH (C9-C40)	sample-specific	sample-specific	NA	NA	NA						700		2.0	2.0	450		2.0	2.0	72		2.0	2.0	190		2.0	2.0	ND		2.0	2.0
PESTICIDES											Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
4,4'-DDD	2.3	11	NA	NA	0.47	0.00488	0.758		0.008	6	0.026		0.0021	0.012	0.0047	J p	0.0022	0.013	ND		0.0026	0.015	ND		0.0045	0.026	0.0098	J	0.0036	0.021
4,4'-DDE	2.0	11	NA	NA	0.47	0.00316	0.596		0.005	19	ND		0.0015	0.012	0.0042	J p	0.0015	0.013	ND		0.0018	0.015	ND		0.0031	0.026	ND		0.0025	0.021
4,4'-DDT	1.9	9.5	NA	NA	0.67	0.00416	0.0035		0.008	71	ND		0.0023	0.012	ND		0.0023	0.013	ND		0.0028	0.015	ND		0.0048	0.026	ND		0.0039	0.021
DDT (total)									0.007	12																				
Aldrin	0.041	0.21	NA	NA	0.13						ND		0.0019	0.012	ND		0.0019	0.013	ND		0.0023	0.015	ND		0.0040	0.026	ND		0.0032	0.021
Alpha-BHC	0.086	0.41	NA	NA	0.0023						ND		0.0013	0.0037	ND		0.0013	0.0038	ND		0.0015	0.0045	ND		0.0027	0.0078	ND		0.0021	0.0063
beta-BHC	0.30	1.4	NA	NA	0.0046						ND		0.0014	0.0037	ND		0.0014	0.0038	ND		0.0017	0.0045	ND		0.0029	0.0078	ND		0.0024	0.0063
Chlordane	0.27	1.4	NA	NA	1.4						*2.1*		0.030	0.12	0.13		0.031	0.13	ND		0.037	0.15	ND		0.063	0.26	ND		0.051	0.21
delta-BHC	NL	NL	NL	NL	NL						ND		0.00076	0.0037	ND		0.00078	0.0038	ND		0.00093	0.0045	ND		0.0016	0.0078	ND		0.0013	0.0063
Dieldrin	0.034	0.16	NA	NA	0.024	0.0019	0.00238		0.002	91	ND		0.0016	0.0037	ND		0.0016	0.0038	ND		0.0020	0.0045	ND		0.0034	0.0078	ND		0.0027	0.0063
Endosulfan I	470	7,800	NA	NA	NA						ND		0.0019	0.012	ND		0.0019	0.013	ND		0.0023	0.015	ND		0.0040	0.026	ND		0.0032	0.021
Endosulfan II											ND		0.0032	0.012	ND		0.0033	0.013	ND		0.0039	0.015	ND		0.0067	0.026	ND		0.0054	0.021
Endosulfan Sulfate	NL	NL	NL	NL	NL	0.0346	0.0358		0.0346		ND		0.0016	0.012	ND		0.0016	0.013	ND		0.0019	0.015	ND		0.0033	0.026	ND		0.0026	0.021
Endrin	19	270	NA	NA	1.6	0.00222	0.0101		0.003	130	ND		0.0018	0.012	ND		0.0018	0.013	ND		0.0022	0.015	ND		0.0038	0.026	ND		0.0030	0.021
Endrin Aldehyde	NL	NL	NL	NL	NL		0.0105		0.48		ND		0.0029	0.012	ND		0.0030	0.013	ND		0.0036	0.015	ND		0.0062	0.026	ND		0.0050	0.021
Endrin Ketone	NL	NL	NL	NL	NL						ND		0.0024	0.012	ND		0.0025	0.013	ND		0.0029	0.015	ND		0.0051	0.026	ND		0.0041	0.021
gamma-BHC [Lindane]	0.57	2.8	NA	NA	0.0035						ND		0.0011	0.0037	ND		0.0012	0.0038	ND		0.0014	0.0045	ND		0.0024	0.0078	ND		0.0020	0.0063
Heptachlor	0.15	0.81	NA	NA	0.083		0.00598		0.0006	0.01	ND		0.0015	0.012	ND		0.0015	0.013	ND		0.0018	0.015	ND		0.0031	0.026	ND		0.0025	0.021
Heptachlor Epoxide	0.076	0.40	NA	NA	0.081	0.00247	0.152		0.005	5	ND		0.0019	0.012	ND		0.0019	0.013	ND		0.0023	0.015	ND		0.0039	0.026	ND		0.0032	0.021
Methoxychlor	320	4,600	NA	NA	NA	0.0136	0.0199		0.0136		ND		0.0028	0.012	ND		0.0029	0.013	ND		0.0035	0.015	ND		0.0060	0.026	ND		0.0048	0.021
Toxaphene	0.49	2.3	NA	NA	6.2	0.000077	0.119		0.000077		ND		0.045	0.12	ND		0.046	0.13	ND		0.055	0.15	ND		0.095	0.26	ND		0.076	0.21
POLYCHLORINATED BIPHENYLS											Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
PCB-1016	NL	NL	NL	NL	NL				0.007	53	ND		0.033	0.12	ND		0.034	0.13	ND		0.040	0.15	ND		0.070	0.26	ND		0.056	0.21
PCB-1221	NL	NL	NL	NL	NL						ND		0.033	0.12	ND		0.034	0.13	ND		0.040	0.15	ND		0.070	0.26	ND		0.056	0.21
PCB-1232	NL	NL	NL	NL	NL						ND		0.033	0.12	ND		0.034	0.13	ND		0.040	0.15	ND		0.070	0.26	ND		0.056	0.21
PCB-1242	NL	NL	NL	NL	NL						ND		0.033	0.12	ND		0.034	0.13	ND		0.040	0.15	ND		0.070	0.26	ND		0.056	0.21
PCB-1248	NL	NL	NL	NL	NL				0.03	150	ND		0.033	0.12	ND		0.034	0.13	ND		0.040	0.15	ND		0.070	0.26	ND		0.056	0.21
PCB-1254	NL	NL	NL	NL	NL				0.06	34	ND		0.033	0.12	ND		0.034	0.13	ND		0.040	0.15	ND		0.070	0.26	ND		0.056	0.21
PCB-1260	NL	NL	NL	NL	NL				0.005	24	ND		0.033	0.12	ND		0.034	0.13	ND		0.040	0.15	ND		0.070	0.26	ND		0.056	0.21
PCB-1262	NL	NL	NL	NL	NL						ND		0.033	0.12	ND		0.034	0.13	ND		0.040	0.15	ND		0.070	0.26	ND		0.056	0.21
PCB-1268	NL	NL	NL	NL	NL						ND		0.033	0.12	ND		0.034	0.13	ND		0.040	0.15	ND		0.070	0.26	ND		0.056	0.21
Total PCBs	0.25	1.1	NA	NA	1.6	0.0598	0.371	40	0.07	530	ND		0.033	0.12	ND		0.034	0.13	ND		0.040	0.15	ND		0.070	0.26	ND		0.056	0.21
INORGANICS											Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
Cyanide (total)	47	780	NA	NA	20	0.0001	1.33		0.0001		ND		0.20	0.36	ND		0.21	0.38	ND		0.26	0.47	ND		0.49	0.90	ND		0.41	0.76
METALS											Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
Aluminum	78,000	NA	NA	NA	NA			50			7830		9.7	35.3	10600		9.8	35.7	6430		9.7	35.3	12900		17.1	62.2	12000		16.8	61.2
Antimony	31	520	NA	NA	5.4		5	5			0.64	J	0.26	1.8	0.50	J	0.26	1.8	0.53	J	0.26	1.8	1.7	J	0.45	3.1	0.56	J	0.45	3.1
Arsenic	19	19	1,100	5,200	19		9.9	10			4.3		0.18	1.8	4.8		0.18	1.8	3.2		0.18	1.8	5.8		0.32	3.1	4.9		0.32	3.1
Barium	16,000	260,000	870,000	NA	2,100		283	500			97.5		0.26	3.5	88.0		0.26	3.6	84.6		0.26	3.5	128		0.45	6.2	151		0.44	6.1
Beryllium	160	2,600	2,000	9,300	0.70		10	10			0.53	J	0.10	0.71	0.59	J	0.10	0.71	0.36	J	0.10	0.71	0.55	J	0.18	1.2	0.56	J	0.17	1.2
Cadmium	71	1,100	2,600	12,000	1.9		4	4			1.8		0.20	1.8	0.75	J	0.20	1.8	0.75	J	0.20	1.8	1.6	J	0.35	3.1	0.98	J	0.35	3.1
Calcium	NL	NL	NL	NL	NL						2900		31.2	176	3140		31.6	178	2840		31.3	177	5150		55.0	311	6010		54.2	306
Chromium (total)	120,000; 240	NL; 6,100	NL; 270	NL; 20	site-specific		0.4	1			18.6		0.47	3.5	23.7		0.48	3.6	16.8		0.47	3.5	41.8		0.83	6.2	29.7		0.82	6.1
Cobalt	23	390	520	2,500	90		20	20			6.8		0.26	3.5	8.2		0.26	3.6	5.5		0.26	3.5	10.5		0.46	6.2	9.4		0.45	6.1
Copper	3,100	52,000	NA	NA	910		60	100			69.4		0.65	3.5	55.7		0.66	3.6	47.5		0.65	3.5	128		1.1	6.2	91.3		1.1	6.1
Iron	NL	NL	NL	NL	NL						13500		35.7	106	16300		36.0	107	10800		35.7	106	18100		62.8	187	19100		61.8	184
Lead	400	800	NA	NA	90	35.8	40.5	50	31	250	*292*		0.35	1.1	*101*		0.36	1.1	68.0		0.35	1.1	*92.2*		0.62	1.9	85.2		0.61	1.8
Magnesium	NL	NL	NL	NL	NL						2630		18.0	176	3490		18.2	178	2290		18.0	177	4660		31.7	311	4460		31.2	306
Manganese	1,900	31,000	87,000	400,000	NL			500	630	1100	187		0.71	7.1	206		0.72	7.1	154		0.71	7.1	250		1.3	12.4	292		1.2	12.2
Mercury	23	390	520,000	NA	0.10	0.174	0.00051	0.3	0.2	2	*0.21*		0.014	0.030	*0.14*		0.014	0.030	*0.11*		0.017	0.035	*0.18*		0.031	0.066	*0.18*		0.024	0.050
Nickel	1,600	26,000	20,000	93,000	48	23	30	30	16	75	18.1		0.83	3.5	20.7		0.84	3.6	12.9		0.83	3.5	26.6		1.5	6.2	22.5		1.4	6.1
Potassium	NL	NL	NL	NL	NL						746		21.4	176	923		21.6	178	653		21.4	177	1130		37.6	311	1190		37.0	306
Selenium	390	6,500	NA	NA	11	1	0.21	1			0.80	JB	0.23	2.2	0.63	JB	0.23	2.2	0.41	J	0.23	2.2	0.95	J	0.40	3.9	0.79	J	0.39	3.8
Silver	390	6,500	NA	NA	0.50	0.5	2	2	1	3.7	*4.7*		0.16	1.8	*3.8*		0.16	1.8	*0.68*	J	0.16	1.8	*1.3*	J	0.28	3.1	*0.91*	J	0.27	3.1
Sodium	NL	NL	NL	NL	NL						151	J	80.7	176	460		81.5	178	144	J	80.8	177	517		142	311	364		140	306
Thallium	NL	NL	NL	NL	NL		1	1			0.11	J	0.072	0.71	0.13	J	0.073	0.71	0.076	J	0.072	0.71	0.15	J	0.13	1.2	ND		0.13	1.2
Vanadium	390	6,500	170,000	800,000	NA		2	2			27.8		0.36	3.5	28.9		0.37	3.6	21.3		0.36	3.5	43.4		0.64	6.2	35.1		0.63	6.1
Zinc	23,000	390,000	NA	NA	930	121	8.5	50	120	820	248		5.4	14.1	174		5.4	14.3	191		5.4	14.1	477		9.5	24.9	293		9.3	24.5

Bold & Outlined = exceeds residential or non-residential ingestion-dermal soil remediation standard (ID-R SRS or ID-NR SRS)

Red & Outlined = exceeds residential or non-residential inhalation soil remediation standard (Inh-R SRS or Inh-NR SRS)

Italics & Outlined = exceeds Migration to Groundwater (MGW) SRS

Highlighted = exceeds one or more ESC for soil and/or sediment

NL = remediation standard not listed

NA = not applicable

ND = not detected above listed method detection limit (MDL)

B = compound was found in the blank and the sample

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

p = The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.

Note: Chromium SRS values listed for trivalent; hexavalent forms

Table 2
Analytical Results of Sediment Samples
Clark Reservoir
Township of Clark, Union County, New Jersey

Field ID	NJDEP Soil Remediation Standards					NJDEP Ecological Screening Criteria					S-6				S-7				S-8				S-9				S-10			
Lab ID	Ingestion-Dermal		Inhalation		Migration to Groundwater (MGW SRS)	EPA Ecological Screening Level (ESL)	Wildlife Preliminary Remediation Goal (PRG)	Terrestrial Plant Toxicological Benchmark	Freshwater Sediment		460-246012-1				460-246012-3				460-246153-3				460-246153-5				460-246153-7			
Sample Date	Residential (ID-R SRS)	Non-Residential (ID-NR SRS)	Residential (Inh-R SRS)	Non-Residential (Inh-NR SRS)					Lowest Effects Level (LEL)	Severe Effects Level (SEL)	10/27/2021				10/27/2021				10/28/2021				10/28/2021				10/28/2021			
Media											Sediment				Sediment				Sediment				Sediment				Sediment			
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg				mg/kg				mg/kg				mg/kg				mg/kg			
PETROLEUM HYDROCARBONS											Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
Total EPH (C9-C40)	sample-specific	sample-specific	NA	NA	NA						2800		2.0	2.0	520		2.0	2.0	ND		2.0	2.0	ND		2.0	2.0	ND		2.0	2.0
PESTICIDES											Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
4,4'-DDD	2.3	11	NA	NA	0.47	0.00488	0.758		0.008	6	ND		0.0050	0.029	ND		0.0049	0.029	ND		0.0057	0.034	ND		0.0050	0.029	0.015	J	0.0069	0.041
4,4'-DDE	2.0	11	NA	NA	0.47	0.00316	0.596		0.005	19	ND		0.0034	0.029	ND		0.0034	0.029	ND		0.0040	0.034	ND		0.0034	0.029	ND		0.0048	0.041
4,4'-DDT	1.9	9.5	NA	NA	0.67	0.00416	0.0035		0.008	71	ND		0.0053	0.029	ND		0.0053	0.029	ND		0.0062	0.034	ND		0.0053	0.029	0.015	J	0.0075	0.041
DDT (total)									0.007	12																				
Aldrin	0.041	0.21	NA	NA	0.13						ND		0.0044	0.029	ND		0.0044	0.029	ND		0.0051	0.034	ND		0.0044	0.029	ND		0.0061	0.041
Alpha-BHC	0.086	0.41	NA	NA	0.0023						ND		0.0030	0.0087	ND		0.0029	0.0086	ND		0.0034	0.010	ND		0.0030	0.0087	ND		0.0041	0.012
beta-BHC	0.30	1.4	NA	NA	0.0046						ND		0.0033	0.0087	ND		0.0032	0.0086	ND		0.0038	0.010	ND		0.0033	0.0087	ND		0.0046	0.012
Chlordane	0.27	1.4	NA	NA	1.4						ND		0.070	0.29	ND		0.070	0.29	ND		0.081	0.34	ND		0.070	0.29	ND		0.098	0.41
delta-BHC	NL	NL	NL	NL	NL						ND		0.0018	0.0087	ND		0.0018	0.0086	ND		0.0021	0.010	ND		0.0018	0.0087	ND		0.0025	0.012
Dieldrin	0.034	0.16	NA	NA	0.024	0.0019	0.00238		0.002	91	ND		0.0038	0.0087	ND		0.0038	0.0086	ND		0.0044	0.010	ND		0.0038	0.0087	ND		0.0053	0.012
Endosulfan I	470	7,800	NA	NA	NA						ND		0.0044	0.029	ND		0.0044	0.029	ND		0.0051	0.034	ND		0.0044	0.029	ND		0.0062	0.041
Endosulfan II											ND		0.0075	0.029	ND		0.0074	0.029	ND		0.0086	0.034	ND		0.0075	0.029	ND		0.010	0.041
Endosulfan Sulfate	NL	NL	NL	NL	NL	0.0346	0.0358		0.0346		ND		0.0037	0.029	ND		0.0036	0.029	ND		0.0042	0.034	ND		0.0037	0.029	ND		0.0051	0.041
Endrin	19	270	NA	NA	1.6	0.00222	0.0101		0.003	130	ND		0.0042	0.029	ND		0.0041	0.029	ND		0.0048	0.034	ND		0.0042	0.029	ND		0.0058	0.041
Endrin Aldehyde	NL	NL	NL	NL	NL		0.0105		0.48		ND		0.0069	0.029	ND		0.0068	0.029	ND		0.0079	0.034	ND		0.0069	0.029	ND		0.0096	0.041
Endrin Ketone	NL	NL	NL	NL	NL						ND		0.0057	0.029	ND		0.0056	0.029	ND		0.0065	0.034	ND		0.0057	0.029	ND		0.0079	0.041
gamma-BHC [Lindane]	0.57	2.8	NA	NA	0.0035						ND		0.0027	0.0087	ND		0.0027	0.0086	ND		0.0031	0.010	ND		0.0027	0.0087	ND		0.0038	0.012
Heptachlor	0.15	0.81	NA	NA	0.083		0.00598		0.0006	0.01	ND		0.0034	0.029	ND		0.0034	0.029	ND		0.0040	0.034	ND		0.0034	0.029	ND		0.0048	0.041
Heptachlor Epoxide	0.076	0.40	NA	NA	0.081	0.00247	0.152		0.005	5	ND		0.0043	0.029	ND		0.0043	0.029	ND		0.0050	0.034	ND		0.0043	0.029	ND		0.0061	0.041
Methoxychlor	320	4,600	NA	NA	NA	0.0136	0.0199		0.0136		ND		0.0067	0.029	ND		0.0066	0.029	ND		0.0077	0.034	ND		0.0067	0.029	ND		0.0093	0.041
Toxaphene	0.49	2.3	NA	NA	6.2	0.000077	0.119		0.000077		ND		0.11	0.29	ND		0.10	0.29	ND		0.12	0.34	ND		0.11	0.29	ND		0.15	0.41
POLYCHLORINATED BIPHENYLS											Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
PCB-1016	NL	NL	NL	NL	NL				0.007	53	ND		0.077	0.29	ND		0.077	0.29	ND		0.089	0.34	ND		0.077	0.29	ND		0.11	0.41
PCB-1221	NL	NL	NL	NL	NL						ND		0.077	0.29	ND		0.077	0.29	ND		0.089	0.34	ND		0.077	0.29	ND		0.11	0.41
PCB-1232	NL	NL	NL	NL	NL						ND		0.077	0.29	ND		0.077	0.29	ND		0.089	0.34	ND		0.077	0.29	ND		0.11	0.41
PCB-1242	NL	NL	NL	NL	NL						ND		0.077	0.29	ND		0.077	0.29	ND		0.089	0.34	ND		0.077	0.29	ND		0.11	0.41
PCB-1248	NL	NL	NL	NL	NL				0.03	150	ND		0.077	0.29	ND		0.077	0.29	ND		0.089	0.34	ND		0.077	0.29	ND		0.11	0.41
PCB-1254	NL	NL	NL	NL	NL				0.06	34	ND		0.077	0.29	ND		0.077	0.29	ND		0.089	0.34	ND		0.077	0.29	ND		0.11	0.41
PCB-1260	NL	NL	NL	NL	NL				0.005	24	ND		0.077	0.29	ND		0.077	0.29	ND		0.089	0.34	ND		0.077	0.29	ND		0.11	0.41
PCB-1262	NL	NL	NL	NL	NL						ND		0.077	0.29	ND		0.077	0.29	ND		0.089	0.34	ND		0.077	0.29	ND		0.11	0.41
PCB-1268	NL	NL	NL	NL	NL						ND		0.077	0.29	ND		0.077	0.29	ND		0.089	0.34	ND		0.077	0.29	ND		0.11	0.41
Total PCBs	0.25	1.1	NA	NA	1.6	0.0598	0.371	40	0.07	530	ND		0.077	0.29	ND		0.077	0.29	ND		0.089	0.34	ND		0.077	0.29	ND		0.11	0.41
INORGANICS											Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
Cyanide (total)	47	780	NA	NA	20	0.0001	1.33		0.0001		ND		0.49	0.90	0.77	J	0.56	1.0	ND		0.57	1.0	0.59	J	0.55	1.0	ND		0.76	1.4
METALS											Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
Aluminum	78,000	NA	NA	NA	NA			50			15300		22.3	81.3	25600		22.1	80.6	19300		26.5	96.5	17300		22.3	81.3	22400		31.4	115
Antimony	31	520	NA	NA	5.4		5	5			1.0	J	0.59	4.1	1.4	J	0.59	4.0	1.1	J	0.70	4.8	0.95	J	0.59	4.1	1.4	J	0.84	5.7
Arsenic	19	19	1,100	5,200	19		9.9	10			7.2		0.42	4.1	11.1		0.42	4.0	8.7		0.50	4.8	9.7		0.42	4.1	13.3		0.59	5.7
Barium	16,000	260,000	870,000	NA	2,100		283	500			195		0.59	8.1	312		0.58	8.1	205		0.70	9.7	183		0.59	8.1	229		0.83	11.5
Beryllium	160	2,600	2,000	9,300	0.70		10	10			*0.80*	J	0.23	1.6	*1.2*	J	0.23	1.6	*0.82*	J	0.28	1.9	*0.80*	J	0.23	1.6	*1.0*	J	0.33	2.3
Cadmium	71	1,100	2,600	12,000	1.9		4	4			1.6	J	0.46	4.1	*2.4*	J	0.46	4.0	1.6	J	0.55	4.8	1.3	J	0.46	4.1	1.8	J	0.65	5.7
Calcium	NL	NL	NL	NL	NL						10500		71.9	406	8710		71.3	403	6980		85.4	483	5250		71.9	406	6820		101	573
Chromium (total)	120,000; 240	NL; 6,100	NL; 270	NL; 20	site-specific		0.4	1			42.2		1.1	8.1	61.3		1.1	8.1	46.4		1.3	9.7	38.2		1.1	8.1	50.6		1.5	11.5
Cobalt	23	390	520	2,500	90		20	20			13.1		0.60	8.1	17.8		0.60	8.1	12.4		0.71	9.7	11.8		0.60	8.1	14.5		0.85	11.5
Copper	3,100	52,000	NA	NA	910		60	100			118		1.5	8.1	189		1.5	8.1	131		1.8	9.7	110		1.5	8.1	146		2.1	11.5
Iron	NL	NL	NL	NL	NL						26500		82.1	244	40100		81.4	242	30600		97.5	290	26700		82.1	244	34000		116	344
Lead	400	800	NA	NA	90	35.8	40.5	50	31	250	*124*		0.81	2.4	*185*		0.81	2.4	*124*		0.97	2.9	*112*		0.81	2.4	*147*		1.1	3.4
Magnesium	NL	NL	NL	NL	NL						5590		41.4	406	8450		41.1	403	6340		49.2	483	5380		41.4	406	6990		58.4	573
Manganese	1,900	31,000	87,000	400,000	NL			500	630	1100	460		1.6	16.3	706		1.6	16.1	623		1.9	19.3	574		1.6	16.3	656		2.3	22.9
Mercury	23	390	520,000	NA	0.10	0.174	0.00051	0.3	0.2	2	*2.5*		0.033	0.070	*0.31*		0.033	0.070	*0.28*		0.040	0.085	*0.21*		0.034	0.072	*0.22*		0.044	0.094
Nickel	1,600	26,000	20,000	93,000	48	23	30	30	16	75	30.8		1.9	8.1	44.8		1.9	8.1	31.1		2.3	9.7	27.6		1.9	8.1	36.6		2.7	11.5
Potassium	NL	NL	NL	NL	NL						1550		49.2	406	2420		48.8	403	1790		58.4	483	1610		49.2	406	2090		69.3	573
Selenium	390	6,500	NA	NA	11	1	0.21	1			1.3	J	0.52	5.1	1.7	J	0.52	5.0	1.2	J	0.62	6.0	1.6	J	0.52	5.1	1.9	J	0.73	7.2
Silver	390	6,500	NA	NA	0.50	0.5	2	2	1	3.7	*1.3*	J	0.36	4.1	*3.0*	J	0.36	4.0	*2.1*	J	0.43	4.8	*1.8*	J	0.36	4.1	*2.8*	J	0.51	5.7
Sodium	NL	NL	NL	NL	NL						449		186	406	917		184	403	633		221	483	507		186	406	709		262	573
Thallium	NL	NL	NL	NL	NL		1	1			ND		0.17	1.6	0.26	J	0.17	1.6	ND		0.20	1.9	ND		0.17	1.6	ND		0.23	2.3
Vanadium	390	6,500	170,000	800,000	NA		2	2			49.3		0.84	8.1	76.2		0.83	8.1	56.1		0.99	9.7	52.0		0.84	8.1	66.2		1.2	11.5
Zinc	23,000	390,000	NA	NA	930	121	8.5	50	120	820	403		12.4	32.5	606		12.3	32.2	402		14.7	38.6	327		12.4	32.5	433		17.5	45.8

Bold & Outlined = exceeds residential or non-residential ingestion-dermal soil remediation standard (ID-R SRS or ID-NR SRS)

Red & Outlined = exceeds residential or non-residential inhalation soil remediation standard (Inh-R SRS or Inh-NR SRS)

Italics & Outlined = exceeds Migration to Groundwater (MGW) SRS

Highlighted = exceeds one or more ESC for soil and/or sediment

NL = remediation standard not listed

NA = not applicable

ND = not detected above listed method detection limit (MDL)

B = compound was found in the blank and the sample

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

p = The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.

Note: Chromium SRS values listed for trivalent; hexavalent forms

Table 2
Analytical Results of Sediment Samples
Clark Reservoir
Township of Clark, Union County, New Jersey

Field ID	USEPA Hazardous Waste Regulatory Level	S-1				S-2				S-3				S-4				S-5			
Lab ID		460-246490-1				460-246490-2				460-246230-2				460-246230-1				460-246153-1			
Sample Date		11/2/2021				11/2/2021				10/29/2021				10/29/2021				10/28/2021			
Media		Sediment				Sediment				Sediment				Sediment				Sediment			
RCRA Characteristics		Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
Ignitability (mm/sec)	≤ 140°F (60°C)	ND		2.20	2.20	ND		2.20	2.20	ND		2.20	2.20	ND		2.20	2.20	ND		2.20	2.20
Corrosivity (su)	pH ≤2 or ≥12.5	7.0	HF			6.9	HF			6.9	HF			6.8	HF			6.9	HF		
Cyanide, reactive (mg/kg)	500	ND		25.0	25.0	ND		25.0	25.0	ND		25.0	25.0	ND		25.0	25.0	ND		25.0	25.0
Sulfide, reactive (mg/kg)	500	130		20.0	20.0	92.3		20.0	20.0	130		20.0	20.0	130		20.0	20.0	123		20.0	20.0
GENERAL CHEMISTRY		Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
Free Liquid (mL/100g)	-	ND		0.500	0.500	ND		0.500	0.500	2.50		0.500	0.500	0.500		0.500	0.500	ND		0.500	0.500

Field ID	USEPA Hazardous Waste Regulatory Level	S-6				S-7				S-8				S-9				S-10			
Lab ID		460-246012-1				460-246012-3				460-246153-3				460-246153-5				460-246153-7			
Sample Date		10/27/2021				10/27/2021				10/28/2021				10/28/2021				10/28/2021			
Media		Sediment				Sediment				Sediment				Sediment				Sediment			
RCRA Characteristics		Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
Ignitability (mm/sec)	≤ 140°F (60°C)	ND		2.20	2.20	ND		2.20	2.20	ND		2.20	2.20	ND		2.20	2.20	ND		2.20	2.20
Corrosivity (su)	pH ≤2 or ≥12.5	7.0	HF			6.7	HF			7.0	HF			6.9	HF			6.9	HF		
Cyanide, reactive (mg/kg)	500	ND		25.0	25.0	ND		25.0	25.0	ND		25.0	25.0	ND		25.0	25.0	ND		25.0	25.0
Sulfide, reactive (mg/kg)	500	152		20.0	20.0	137		20.0	20.0	130		20.0	20.0	183		20.0	20.0	153		20.0	20.0
GENERAL CHEMISTRY		Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
Free Liquid (mL/100g)	-	1.50		0.500	0.500	ND		0.500	0.500	ND		0.500	0.500	ND		0.500	0.500	2.50		0.500	0.500

Bold & Outlined = exceeds USEPA Regulatory Level for Hazardous Waste
NL = remediation standard not listed
NA = not analyzed for listed parameter
ND = not detected above listed method detection limit (MDL)
HF = Field parameter with a holding time of 15 minutes; test performed by laboratory at client's request.
B = compound was found in the blank and the sample
* = recovery or RPD exceeds control limits
J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Table 2
Analytical Results of Sediment Samples
Clark Reservoir
Township of Clark, Union County, New Jersey

Field ID	USEPA Hazardous Waste Regulatory Level	S-1				S-6				S-10			
Lab ID		460-246490-1				460-246012-1				460-246153-7			
Sample Date		11/2/2021				10/27/2021				10/28/2021			
Media		TCLP Extract				TCLP Extract				TCLP Extract			
Units	mg/L	mg/L				mg/L				mg/L			
TCLP VOLATILE ORGANICS		Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
1,1-Dichloroethene (1,1-DCE)	0.7	ND		0.0026	0.010	ND	H	0.0026	0.010	ND	H	0.0026	0.010
1,2-Dichloroethane (1,2-DCA)	0.5	ND		0.0043	0.010	ND	H	0.0043	0.010	ND	H	0.0043	0.010
1,4-Dichlorobenzene	7.5	ND		0.0033	0.010	ND	H	0.0033	0.010	ND	H	0.0033	0.010
2-Butanone (MEK)	200	ND		0.019	0.050	ND	H	0.019	0.050	ND	H	0.019	0.050
Benzene	0.5	ND		0.0020	0.010	ND	H	0.0020	0.010	ND	H	0.0020	0.010
Carbon tetrachloride	0.5	ND		0.0021	0.010	ND	H	0.0021	0.010	ND	H	0.0021	0.010
Chlorobenzene	100	ND		0.0038	0.010	ND	H	0.0038	0.010	ND	H	0.0038	0.010
Chloroform	6	0.0044	JB	0.0033	0.010	0.0047	JHB	0.0033	0.010	0.0046	JHB	0.0033	0.010
Tetrachloroethene (PCE)	0.7	ND		0.0025	0.010	ND	H	0.0025	0.010	ND	H	0.0025	0.010
Trichloroethene (TCE)	0.5	ND		0.0031	0.010	ND	H	0.0031	0.010	ND	H	0.0031	0.010
Vinyl chloride	0.2	ND		0.0017	0.010	ND	H	0.0017	0.010	ND	H	0.0017	0.010
TCLP SEMI-VOLATILE ORGANICS		Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
1,4-Dichlorobenzene	7.5	ND		0.00044	0.010	ND	H	0.00044	0.010	ND	H	0.00044	0.010
2,4,5-Trichlorophenol	400	ND		0.00088	0.010	ND	H	0.00088	0.010	ND	H	0.00088	0.010
2,4,6-Trichlorophenol	2	ND		0.00086	0.010	ND	H	0.00086	0.010	ND	H	0.00086	0.010
2,4-Dinitrotoluene	0.13	ND		0.0010	0.0020	ND	H	0.0010	0.0020	ND	H	0.0010	0.0020
2-Methylphenol (o-cresol)	200	ND		0.00067	0.010	ND	H	0.00067	0.010	ND	H	0.00067	0.010
3-Methylphenol (m-cresol)	200	ND		0.00064	0.010	ND	H	0.00064	0.010	ND	H	0.00064	0.010
4-Methylphenol (p-cresol)	200												
Cresols (total)	200	ND				ND				ND			
Hexachlorobenzene	0.13	ND		0.00040	0.0010	ND	H	0.00040	0.0010	ND	H	0.00040	0.0010
Hexachloro-1,3-butadiene	0.5	ND		0.00078	0.0020	ND	H	0.00078	0.0020	ND	H	0.00078	0.0020
Hexachloroethane	3	ND		0.00080	0.0020	ND	H	0.00080	0.0020	ND	H	0.00080	0.0020
Nitrobenzene	2	ND		0.00057	0.0010	ND	H	0.00057	0.0010	ND	H	0.00057	0.0010
Pentachlorophenol	100	ND		0.0014	0.030	ND	H	0.0014	0.030	ND	H	0.0014	0.030
Pyridine	5	ND		0.0019	0.010	ND	H	0.0019	0.010	ND	H	0.0019	0.010
TCLP PESTICIDES		Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
Chlordane	0.03	ND		0.000055	0.0050	ND	H	0.000055	0.0050	ND	H	0.000055	0.0050
Endrin	0.02	ND		0.0000040	0.00050	ND	H	0.0000040	0.00050	ND	H	0.0000040	0.00050
gamma-BHC (Lindane)	0.4	ND		0.000012	0.00050	ND	H	0.000012	0.00050	ND	H	0.000012	0.00050
Heptachlor	0.008	ND		0.0000030	0.00050	ND	H	0.0000030	0.00050	ND	H	0.0000030	0.00050
Heptachlor Epoxide	0.008	ND		0.0000050	0.00050	ND	H	0.0000050	0.00050	ND	H	0.0000050	0.00050
Methoxychlor	10	0.00011	J	0.0000040	0.00050	ND	H	0.0000040	0.00050	ND	H	0.0000040	0.00050
Toxaphene	0.5	ND		0.00011	0.0050	ND	H	0.00011	0.0050	ND	H	0.00011	0.0050
TCLP HERBICIDES		Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
2,4-Dichlorophenoxyacetic acid (2,4-D)	10	ND		0.0050	0.083	ND	H	0.0050	0.083	ND	H	0.0050	0.083
2,4,5-TP (Silvex)	1	ND		0.0040	0.083	ND	H	0.0040	0.083	ND	H	0.0040	0.083
TCLP METALS		Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
Arsenic	5	0.0356	J	0.0248	0.075	ND		0.0248	0.075	0.0253	J	0.0248	0.075
Barium	100	0.476	J	0.14	1	0.512	J	0.14	1	0.602	J	0.14	1
Cadmium	1	0.0086	J	0.0018	0.02	0.0032	J	0.0018	0.02	0.0051	J	0.0018	0.02
Chromium (total)	5	ND		0.0249	0.05	ND		0.0249	0.05	ND		0.0249	0.05
Lead	5	0.277		0.0128	0.05	0.0382	J	0.0128	0.05	0.0509		0.0128	0.05
Mercury	0.2	ND		0.000091	0.0002	ND		0.000091	0.0002	ND		0.000091	0.0002
Selenium	1	ND		0.0351	0.1	ND		0.0351	0.1	ND		0.0351	0.1
Silver	5	ND		0.0159	0.05	ND		0.0159	0.05	ND		0.0159	0.05

Bold & Outlined = exceeds USEPA Regulatory Level for Hazardous Waste
NL = remediation standard not listed
NA = not analyzed for listed parameter
ND = not detected above listed method detection limit (MDL)
HF = Field parameter with a holding time of 15 minutes; test performed by laboratory at client's request.
B = compound was found in the blank and the sample
* = recovery or RPD exceeds control limits
J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Table 2
Analytical Results of Sediment Samples
Clark Reservoir
Township of Clark, Union County, New Jersey

Field ID	S-1				S-2				S-3				S-4				S-5			
Lab ID	460-246490-1				460-246490-2				460-246230-2				460-246230-1				460-246153-1			
Sample Date	11/2/2021				11/2/2021				10/29/2021				10/29/2021				10/28/2021			
Media	Sediment				Sediment				Sediment				Sediment				Sediment			
Units	mg/kg				mg/kg				mg/kg				mg/kg				mg/kg			
GENERAL CHEMISTRY	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
Total Organic Carbon	49200		151	185	43200		154	189	47100		184	226	65300		318	392	62000		256	315
Orthophosphate as P	0.81		0.28	0.60	1.4		0.28	0.60	ND		0.28	0.60	ND		0.28	0.60	0.31	J	0.28	0.60
Phosphorus as P	458		18.5	55.6	361		9.4	28.4	550		28.2	84.8	774		48.9	147	915		31.5	94.5
Phosphorus as PO4	1400		18.5	55.6	1110		9.4	28.4	1690		28.2	84.8	2370		48.9	147	2810		31.5	94.5
Nitrate as N, Dissolved	2.61	J	1.73	2.97	2.65	J	1.76	3.02	ND		2.11	3.62	ND		3.65	6.27	4.63	J	2.93	5.04
Nitrate Nitrite as N, Dissolved	4.09		1.73	2.97	4.15		1.76	3.02	ND		2.11	3.62	ND		3.65	6.27	4.63	J	2.93	5.04
Nitrite as N, Dissolved	1.48	J	0.46	2.97	1.49	J	0.47	3.02	ND		0.57	3.62	ND		0.98	6.27	ND		0.79	5.04

Field ID	S-6				S-7				S-8				S-9				S-10			
Lab ID	460-246012-1				460-246012-3				460-246153-3				460-246153-5				460-246153-7			
Sample Date	10/27/2021				10/27/2021				10/28/2021				10/28/2021				10/28/2021			
Media	Sediment				Sediment				Sediment				Sediment				Sediment			
Units	mg/kg				mg/kg				mg/kg				mg/kg				mg/kg			
GENERAL CHEMISTRY	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
Total Organic Carbon	139000		354	435	94800		351	431	71400		408	502	64900		353	435	89800		494	607
Orthophosphate as P	0.50	J	0.28	0.60	0.50	J	0.28	0.60	0.78		0.28	0.60	0.28	J	0.28	0.60	ND		0.28	0.60
Phosphorus as P	1510		43.4	130	1430		43.0	129	656		5.0	15.1	1180		43.4	130	1870		60.6	182
Phosphorus as PO4	4640		43.4	130	4370		43.0	129	2010		5.0	15.1	3620		43.4	130	5730		60.6	182
Nitrate as N, Dissolved	6.37	J	4.05	6.96	6.32	J	4.01	6.90	7.23	J	4.67	8.03	6.33	J	4.05	6.96	8.71	J	5.65	9.71
Nitrate Nitrite as N, Dissolved	10.4		4.05	6.96	6.32	J	4.01	6.90	7.23	J	4.67	8.03	6.33	J	4.05	6.96	8.71	J	5.65	9.71
Nitrite as N, Dissolved	4.08	J	1.09	6.96	ND		1.08	6.90	ND		1.26	8.03	ND		1.09	6.96	ND		1.52	9.71

ND = not detected above listed method detection limit (MDL)
J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Table 2
Analytical Results of Sediment Samples
Clark Reservoir
Township of Clark, Union County, New Jersey

Field ID	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10
Lab ID	460-246490-1	460-246490-2	460-246230-2	460-246230-1	460-246153-1	460-246012-1	460-246012-3	460-246153-3	460-246153-5	460-246153-7
Sample Date	11/2/2021	11/2/2021	10/29/2021	10/29/2021	10/28/2021	10/27/2021	10/27/2021	10/28/2021	10/28/2021	10/28/2021
Media	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
Units	percent (%)	percent (%)	percent (%)	percent (%)	percent (%)	percent (%)	percent (%)	percent (%)	percent (%)	percent (%)
GRAIN SIZE ANALYSIS	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Sieve Size 3 inch (% Finer)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sieve Size 2 inch (% Finer)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sieve Size 1.5 inch (% Finer)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sieve Size 1 inch (% Finer)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sieve Size 0.75 inch (% Finer)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sieve Size 0.375 inch (% Finer)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sieve Size #4 (% Finer)	97.4	92.5	97.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sieve Size #10 (% Finer)	95.4	87.3	95.0	98.9	98.4	98.0	99.7	98.9	99.3	98.3
Sieve Size #20 (% Finer)	94.3	82.3	92.4	97.7	97.3	96.6	99.5	96.6	98.5	96.1
Sieve Size #40 (% Finer)	90.2	74.8	88.2	95.7	95.6	95.5	98.9	93.6	96.8	93.6
Sieve Size #60 (% Finer)	82.0	66.3	78.7	94.3	94.4	94.1	98.5	91.7	95.7	91.9
Sieve Size #80 (% Finer)	75.3	61.1	71.5	93.5	93.6	92.7	98.3	90.1	95.1	90.5
Sieve Size #100 (% Finer)	68.9	56.5	64.7	91.6	91.7	91.2	97.6	88.9	93.4	89.6
Sieve Size #200 (% Finer)	53.0	46.8	50.9	88.5	85.9	78.9	96.3	87.2	91.4	88.1
Hydrometer Reading 1 (% Finer)	31.5	27.5	17.6	32.2	29.0	35.5	53.6	86.5	76.9	74.4
Hydrometer Reading 2 (% Finer)	27.8	25.5	14.8	26.6	24.4	19.0	37.2	47.4	45.1	35.1
Hydrometer Reading 3 (% Finer)	22.3	21.5	10.2	21.0	18.4	13.1	31.1	34.3	35.8	28.2
Hydrometer Reading 4 (% Finer)	18.6	17.5	9.3	15.3	13.9	10.8	29.0	29.1	30.2	23.5
Hydrometer Reading 5 (% Finer)	14.9	14.2	6.6	11.6	10.8	8.4	18.8	23.9	24.6	18.9
Hydrometer Reading 6 (% Finer)	9.4	10.1	4.7	7.8	7.8	6.1	16.7	16.1	17.1	14.3
Hydrometer Reading 7 (% Finer)	5.7	6.8	2.9	5.9	4.8	4.9	14.7	10.9	13.4	9.6
Gravel (percent)	2.6	7.5	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sand (percent)	44.4	45.7	46.1	11.5	14.1	21.1	3.7	12.8	8.6	11.9
Silt (percent)	38.1	32.6	44.3	76.9	75.1	70.5	77.5	63.3	66.8	69.2
Clay (percent)	14.9	14.2	6.6	11.6	10.8	8.4	18.8	23.9	24.6	18.9
Coarse Sand (percent)	2.0	5.2	2.0	1.1	1.6	2.0	0.3	1.1	0.7	1.7
Medium Sand (percent)	5.2	12.5	6.8	3.2	2.8	2.5	0.8	5.3	2.5	4.7
Fine Sand (percent)	37.2	28.0	37.3	7.2	9.7	16.6	2.6	6.4	5.4	5.5

Table 3
Analytical Results of Water Samples
Clark Reservoir
Township of Clark, Union County, New Jersey

Field ID	NJDEP Surface Water Quality Standards (SWQS) for FW2-NT Streams	W-1				W-2				W-3				W-4				W-5			
Lab ID		460-246490-3				460-246490-4				460-246230-4				460-246230-3				460-246153-2			
Sample Date		11/2/2021				11/2/2021				10/29/2021				10/29/2021				10/28/2021			
Media		Sediment				Sediment				Sediment				Sediment				Sediment			
Units		mg/L				mg/L				mg/L				mg/L				mg/L			
GENERAL CHEMISTRY		Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
pH (su)	6.5-8.5	7.8	HF			7.7	HF			7.4	HF			7.5	HF			7.7	HF		
Oxygen, Dissolved	24-hr avg ≥ 5.0 mg/L, but not less than 4.0 mg/L at any time	5.4	H H3	1.0	1.0	6.6	H H3	1.0	1.0	4.7	H	1.0	1.0	4.0	H	1.0	1.0	**3.8**	H	1.0	1.0
Alkalinity	NL	107		5.0	5.0	99.1		5.0	5.0	61.8		5.0	5.0	55.1		5.0	5.0	42.7		5.0	5.0
Bicarbonate Alkalinity as CaCO3	NL	107		5.0	5.0	99.1		5.0	5.0	61.8		5.0	5.0	55.1		5.0	5.0	42.7		5.0	5.0
Carbonate Alkalinity as CaCO3	NL	ND		5.0	5.0	ND		5.0	5.0	ND		5.0	5.0	ND		5.0	5.0	ND		5.0	5.0
Hydroxide Alkalinity	NL	ND		5.0	5.0	ND		5.0	5.0	ND		5.0	5.0	ND		5.0	5.0	ND		5.0	5.0
Orthophosphate as P	NL	0.095		0.0050	0.030	0.074		0.0050	0.030	0.15		0.0050	0.030	0.20		0.0050	0.030	0.14		0.0050	0.030
Phosphorus as P	0.05 mg/L (lakes); 0.1 mg/L (streams)	**0.18**		0.023	0.030	**0.32**		0.023	0.030	**0.22**		0.023	0.030	**0.25**		0.023	0.030	**0.22**		0.023	0.030
Phosphorus as PO4	NL	0.55		0.071	0.090	0.99		0.071	0.090	0.66		0.071	0.090	0.77		0.071	0.090	0.66		0.071	0.090
Nitrate as N	10 mg/L	0.59		0.019	0.16	0.33		0.019	0.16	0.28		0.021	0.10	0.26		0.021	0.10	0.29		0.021	0.10
Nitrite as N	NL	ND		0.023	0.16	ND		0.023	0.16	0.018	J	0.018	0.10	ND		0.018	0.10	ND		0.018	0.10

Field ID	NJDEP Surface Water Quality Standards (SWQS) for FW2-NT Streams	W-6				W-7				W-8				W-9				W-10			
Lab ID		460-246012-2				460-246012-4				460-246153-4				460-246153-6				460-246153-8			
Sample Date		10/27/2021				10/27/2021				10/28/2021				10/28/2021				10/28/2021			
Media		Sediment				Sediment				Sediment				Sediment				Sediment			
Units		mg/L				mg/L				mg/L				mg/L				mg/L			
GENERAL CHEMISTRY		Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL	Result	Q	MDL	RL
pH (su)	6.5-8.5	7.6	HF			7.7	HF			7.7	HF			7.6	HF			7.7	HF		
Oxygen, Dissolved	24-hr avg ≥ 5.0 mg/L, but not less than 4.0 mg/L at any time	5.4	H	1.0	1.0	5.8	H	1.0	1.0	4.4	H	1.0	1.0	4.5	H	1.0	1.0	4.7	H	1.0	1.0
Alkalinity	NL	33.4		5.0	5.0	33.2		5.0	5.0	36.4		5.0	5.0	34.1		5.0	5.0	32.6		5.0	5.0
Bicarbonate Alkalinity as CaCO3	NL	33.4		5.0	5.0	33.2		5.0	5.0	36.4		5.0	5.0	34.1		5.0	5.0	32.6		5.0	5.0
Carbonate Alkalinity as CaCO3	NL	ND		5.0	5.0	ND		5.0	5.0	ND		5.0	5.0	ND		5.0	5.0	ND		5.0	5.0
Hydroxide Alkalinity	NL	ND		5.0	5.0	ND		5.0	5.0	ND		5.0	5.0	ND		5.0	5.0	ND		5.0	5.0
Orthophosphate as P	NL	0.15		0.0050	0.030	0.13		0.0050	0.030	0.13		0.0050	0.030	0.13		0.0050	0.030	0.13		0.0050	0.030
Phosphorus as P	0.05 mg/L (lakes); 0.1 mg/L (streams)	**0.2**		0.023	0.030	**0.19**		0.023	0.030	**0.25**		0.023	0.030	**0.27**		0.023	0.030	**0.22**		0.023	0.030
Phosphorus as PO4	NL	0.61	F1	0.071	0.090	0.59		0.071	0.090	0.77		0.071	0.090	0.83		0.071	0.090	0.68		0.071	0.090
Nitrate as N	10 mg/L	0.35		0.021	0.10	0.37		0.021	0.10	0.31		0.021	0.10	0.33		0.021	0.10	0.34		0.021	0.10
Nitrite as N	NL	0.018	J	0.018	0.10	0.018	J	0.018	0.10	ND		0.018	0.10	ND		0.018	0.10	0.019	J	0.018	0.10

Bold & Outlined = exceeds SWQS for FW2-NT streams

NL = SWQS not listed

ND = not detected above listed method detection limit (MDL)

HF = Field parameter with a holding time of 15 minutes; test performed by laboratory at client's request.

H = Sample was prepped or analyzed beyond the specified holding time

H3 = Sample was received and analyzed past holding time.

F1 = MS and/or MSD Recovery is outside acceptance limits

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Table 3
Analytical Results of Water Samples
Clark Reservoir
Township of Clark, Union County, New Jersey

Field ID	W-1	W-2	W-3	W-4	W-5
Lab ID	372118961-1	372118961-2	372118752-2	372118752-1	372118665-1
Sample Date	11/2/2021	11/2/2021	10/29/2021	10/29/2021	10/28/2021
Media	Sediment	Sediment	Sediment	Sediment	Sediment
MICROBIOLOGY	CFU/100mL	CFU/100mL	CFU/100mL	CFU/100mL	CFU/100mL
Fecal Coliform	136	570	900	1,300	2,400
Phytoplankton ID & Enumeration	Cells/Colonies per mL	Cells/Colonies per mL	Cells/Colonies per mL	Cells/Colonies per mL	Cells/Colonies per mL
Blue-Green	0.28	3.41	-	0.25	1.42
Green	0.57	-	0.57	3.41	1.14
Golden	-	-	-	0.28	0.28
Diatom	17.06	89.29	25.87	43.79	22.75
Algal Count Total	18.00	102.93	26.44	47.77	25.59

Field ID	W-6	W-7	W-8	W-9	W-10
Lab ID	372118646-2	372118646-1	372118665-2	372118665-3	372118665-4
Sample Date	10/27/2021	10/27/2021	10/28/2021	10/28/2021	10/28/2021
Media	Sediment	Sediment	Sediment	Sediment	Sediment
MICROBIOLOGY	CFU/100mL	CFU/100mL	CFU/100mL	CFU/100mL	CFU/100mL
Fecal Coliform	14,000	10,000	6,200	6,900	9,900
Phytoplankton ID & Enumeration	Cells/Colonies per mL	Cells/Colonies per mL	Cells/Colonies per mL	Cells/Colonies per mL	Cells/Colonies per mL
Blue-Green	0.57	0.28	0.57	0.57	-
Green	1.14	4.27	5.4	7.95	6.54
Golden	0.28	1.14	0.28	-	0.85
Diatom	21.89	24.17	23.31	25.59	30.7
Algal Count Total	23.88	29.86	29.57	34.12	38.10

CFU = colony-forming units

COUNTY OF UNION
BOARD OF COUNTY COMMISSIONERS
PLANS FOR

CLARK RESERVOIR IMPROVEMENTS

LOCATED IN
TOWNSHIP OF CLARK
UNION COUNTY NEW JERSEY

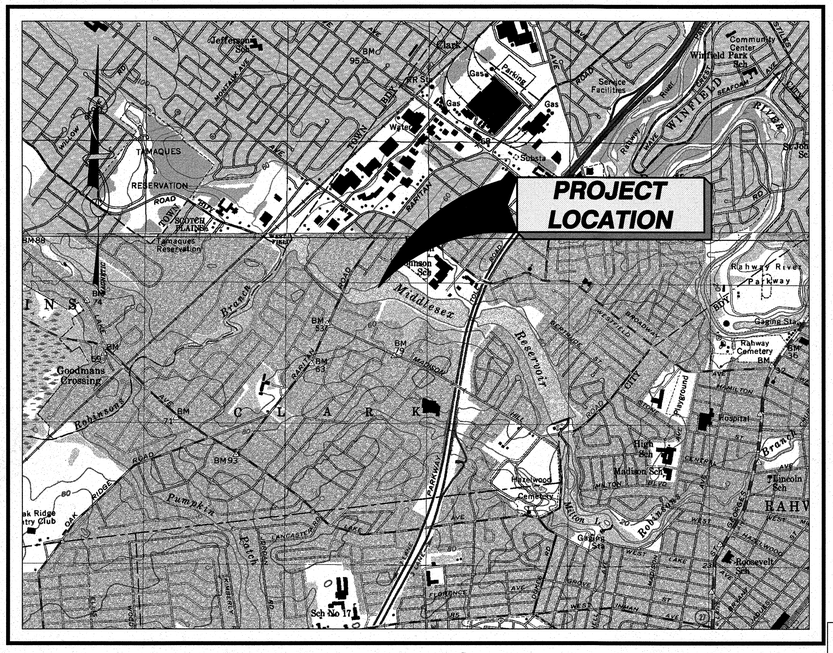
OCTOBER 2024
REVISED JANUARY 2025
REVISED APRIL 2025

PREPARED BY: CME ASSOCIATES OF PARLIN, NJ

INDEX OF DRAWINGS

DESCRIPTION

INDEX	
TITLE	SHEET No.
TITLE SHEET	1
ESTIMATE – DISTRIBUTION OF QUANTITIES	2–5
LEGEND AND GENERAL NOTES	6
SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS	7–8
DREDGING IMPROVEMENTS	
OVERALL PLAN AND KEYMAP	9
HEAD WATERS CLARK RESERVOIR (ROBINSON BRANCH)	
DREDGING PLAN	10
RESERVOIR PROFILE	11
RESERVOIR CROSS SECTIONS	12–15
WEST LAKE	
DREDGING PLAN	16
RESERVOIR PROFILE	17
RESERVOIR CROSS SECTIONS	18–21
CENTRAL LAKE	
DREDGING PLANS	22–23
RESERVOIR PROFILES	24–25
RESERVOIR CROSS SECTIONS	26–40
CENTRAL LAKE ACCESS ROAD PLAN	41
PARK & TRAIL IMPROVEMENTS	
OVERALL KEY MAP	42
CENTRAL LAKE PARK KEY MAP	43
OVERALL SITE GRADING PLAN	44
CENTRAL LAKE PARK CONSTRUCTION & SOIL EROSION AND SEDIMENT CONTROL PLANS	45–49
CENTRAL LAKE TRAIL CONSTRUCTION & SOIL EROSION AND SEDIMENT CONTROL PLANS	50–60
DRAINAGE AND STABILIZATION PLANS	61–65
STORM SEWER PROFILES	66–67
CROSS SECTIONS – ENTRANCE ROADWAY	68
CROSS SECTIONS – ACCESS ROAD	69–71
CROSS SECTIONS – CENTRAL LAKE SOUTH TRAIL	72–75
CROSS SECTIONS – CENTRAL LAKE NORTH TRAIL	76–79
PROFILE – CENTRAL LAKE PARK BOAT RAMP	80
PROFILE – CENTRAL LAKE FLOATING DOCK	81
FLOATING DOCK ACCESS GRADING PLAN	82
CURB RAMP DETAILS	83
LANDSCAPE PLANS	84–86
LANDSCAPE DETAILS	87–88
IRRIGATION PLAN AND DETAILS	89
GENERAL ELECTRICAL DESIGN NOTES	90
ELECTRICAL SITE PLANS	91–92
SINGLE LINE DIAGRAM	93
ELECTRICAL DETAILS	94
LIGHTING PLANS	95
LIGHTING DETAILS	96
CONSTRUCTION DETAILS	97–115
CONSTRUCTION STAGING PLAN	116
GENERAL STRUCTURAL DESIGN NOTES	117–120
PEDESTRIAN BRIDGE CONSTRUCTION PLANS, PROFILES, AND DETAILS	121–134
DPW WALL PLANS AND DETAILS	135–136
STRUCTURAL PLANS, SECTIONS AND DETAILS FOR PIERS AND BOATRAMPS	137–139



KEY MAP
N.T.S.

NEW JERSEY DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OF 2019 AND ALL AMENDMENTS IN THE UNION COUNTY FORMAT THERETO SHALL GOVERN.
THE HEADING OF THE ARTICLES CONTAINED HEREIN CONFORM TO THE NEW JERSEY DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, DATED 2019 AND ALL ADDENDA THERETO, WHICH IS TO BE USED IN THE EXECUTION OF THIS CONTACT.
THE NEW JERSEY DEPARTMENT OF TRANSPORTATION "STANDARD ROADWAY CONSTRUCTION/TRAFFIC CONTROL/BRIDGE CONSTRUCTION DETAILS" BOOKLET DATED OCTOBER 2016 TO GOVERN, EXCEPT FOR THOSE DETAILS CONTAINED HEREIN.

UNION COUNTY
BOARD OF COUNTY COMMISSIONERS

LOURDES M. LEON	CHAIRWOMAN
JOSEPH BODEK	VICE CHAIRMAN
JAMES E. BAKER, JR.	COMMISSIONER
MICHÈLE S. DELISFORT	COMMISSIONER
SERGIO GRANADOS	COMMISSIONER
BETTE JANE KOWALSKI	COMMISSIONER
ALEXANDER MIRABELLA	COMMISSIONER
KIMBERLY PALMIERI-MOUDED	COMMISSIONER
REBECCA WILLIAMS	COMMISSIONER

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28069900

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468
Date 4.4.25

APPROVALS

DATE _____

DATE _____

DATE _____

DATE _____

PUN00213.05

| ITEM NO. | DESCRIPTION | UNIT | CONTRACT QUANTITY | PLAN SHEET TOTALS | IF AND WHERE DIRECTED | DISTRIBUTION: PLAN SHEET QUANTITY | | |

| | | | | | | DISTRIBUTION: PLAN SHEET QUANTITY | | | | | |

| ITEM NO. | DESCRIPTION | UNIT | CONTRACT QUANTITY | PLAN SHEET TOTALS | IF AND WHERE DIRECTED | DISTRIBUTION: PLAN SHEET QUANTITY | | |

| ITEM NO. | DESCRIPTION | UNIT | CONTRACT QUANTITY | PLAN SHEET TOTALS | IF AND WHERE DIRECTED | DISTRIBUTION: PLAN SHEET QUANTITY | | |

Linear Features

Existing	PROPOSED	
(Size and Type) (Over 30" - Draw to scale)	(SIZE & TYPE)	Storm Drains
(Size and Type) (Over 30" - Draw to scale)	(SIZE & TYPE)	Sanitary Sewers
		Pavements (Concrete or Asphalt)
		Shoulders
		Curbs
5+00 ℄	5+00 ℄	Baseline
		Township, City or County Lines
Existing R.O.W. Line	PROPOSED R.O.W. LINE	Right of Way Lines (Access Permitted)
℄ (Existing Property Line)		Property Line
		Wetland Limit Line
		50' Wetlands Transition Area
		Top of Bank
		50' Riparian Zone Line
FHA FHA FHA		NJDEP Revised Flood Hazard Elevation Line
		Silt Fence
		Floating Turbidity Barrier Type 1
		NJDEP Floodway Delineation Line
	PRESERVE EXISTING VEGETATION	Tree Line

Abbreviations

AH., BK.	AHEAD, BACK	RCCP, R.C.C.P.	REINFORCED CONCRETE CULVERT PIPE
\, B.L.	BASELINE	RCP, R.C.P.	REINFORCED CONCRETE PIPE
B.M.	BENCH MARK	RMC, R.M.C.	RIGID METALLIC CONDUIT
B.T.	BELL TELEPHONE	RNMC, R.N.M.C.	RIGID NON-METALLIC CONDUIT
BIT., BITUM.	BITUMINOUS	ROW, R.O.W.	RIGHT OF WAY
BLDG.	BUILDING	R.R.	RAILROAD
, C.L.	CENTERLINE	RTE., RT.	ROUTE
C.I.P.	CAST IRON PIPE	SAN.	SANITARY
D.I.P.	DUCTILE IRON PIPE	SDWK.	SIDEWALK
C.V.C.	CONCRETE VERTICAL CURB	S.H.D.	STATE HIGHWAY DEPARTMENT
CONC.	CONCRETE	SHLD.	SHOULDER
CULV.	CULVERT	, S.L.	SURVEY LINE
D, DIA.	DIAMETER	S.O.D.	SUBBASE OUTLET DRAIN
D.C.	DROP CURB	STY.	STORY
DE	DITCH EXCAVATION	T	TANGENT
DEP., DP	DEPRESSED CURB	TBA	TO BE ABANDONED
DH	DRILL HOLE	TBR	TO BE REMOVED
DWY	DRIVEWAY	TEL.	TELEPHONE
E.B., W.B., N.B., S.B.	EASTBOUND, WESTBOUND NORTHBOUND, SOUTHBOUND	TEMP.	TEMPORARY
		THK., TH.	THICK
EL., ELEV.	ELEVATION	TYP.	TYPICAL
EXIST.	EXISTING	U.D.	UNDERDRAIN
GR.	GRATE	UP, U.P.	UTILITY POLE
HT.	HEIGHT	VAR.	VARIABLE, VARIES
H.W.	HEADWALL	WM	WATER METER
HYD.	HYDRANT		
INV.	INVERT		
IP	IRON PIN	(12)	CURVE NUMBER
J.B.	JUNCTION BOX		
LT., RT.	LEFT, RIGHT	1)	DEED COURSE NUMBER
L.O.P.	LIMIT OF PAVEMENT (PAVING)	(m)	MEASURED
L.O.M.	LIMIT OF MILLING	(c)	CALCULATED
M.B.	MAILBOX	(*)	MORE OR LESS
M.P.	MILE POST	(D)	DEED DATA
MAX.	MAXIMUM	PM	PARKING METER
MIN.	MINIMUM	IP	IRON PIN
MUP	MULTI-USE PATH	(SV)	SURVEY DATA
NO.	NUMBER	D.A.	DEED AREA
N.T.S.	NOT TO SCALE	(FM)	FILED MAP
PAVT.	PAVEMENT	(TM)	TAX MAP
PC	POINT OF CURVATURE	(S)	SCALED
PCC	POINT OF COMPOUND CURVATURE	(L)	LEASE
PERF.	PERFORATED	(ET)	ENTIRE TRACT
PI	POINT OF INTERSECTION	94	TAX MAP BLOCK NO.
P.G.L.	PROFILE GRADE LINE	94	FILED MAP BLOCK NO.
℄, P.L.	PROPERTY LINE, PROFILE LINE	21	TAX MAP LOT NO.
PK	PARKER KAYLON MASONRY NAIL	21	FILED MAP LOT NO.
POC, P.O.C.	POINT ON CURVE	6987 / 586	DEED BOOK / PAGE
POL, P.O.L.	POINT ON LINE		
POT, P.O.T.	POINT ON TANGENT		
PRC, P.R.C.	POINT OF REVERSE CURVE		
PROP.	PROPOSED		
PT, P.T.	POINT OF TANGENCY		
PVC, P.V.C.	POLYVINYL CHLORIDE PIPE, POINT OF VERTICAL CURVATURE		
PVI, P.V.I.	POINT OF VERTICAL INTERSECTION		
PVT, P.V.T.	POINT OF VERTICAL TANGENCY, PAVEMENT		
R	RADIUS		

LEGEND

Area to be Milled 3" or Less and Receive 3" Hot Mix Asphalt 9.5M64 Surface Course	Area to be Excavated and Receive 2" Thick Quarry Process Crushed Stone NJ DOT No. 10 Screenings Surface Course, 4" Thick Quarry Process Course Clean Aggregate NJ DOT Type 57 Base Course, And Subsurface Geotextile Fabric
Area to be Excavated and Receive 2" Hot Mix Asphalt 9.5M64 Surface Course, 4" Hot Mix Asphalt 19M64 Base Course, and 6" Dense Graded Aggregate Base Course	Denotes Boardwalks and Fixed Piers
Area to be Excavated and Receive 2" Hot Mix Asphalt 9.5M64 Surface Course, 6" Hot Mix Asphalt 19M64 Base Course, and 6" Dense Graded Aggregate Base Course	Denotes Aluminum Gangways
Denotes Proposed Concrete Sidewalk	Denotes Floating Docks
Denotes Proposed Concrete Driveway Apron, 10" Thick	Area to be Excavated, Graded, Compacted and Top Dressed with NJ DOT No. 57 Type Stone, up to 4" Thick
Denotes Proposed Grass Paver Walking Trail and Maintenance Access Road With Grass Paver Grids	Denotes Topsoil Stabilization, Type 1 Mat
Denotes Riprap Stone Slope/Channel Protection	

Existing	PROPOSED	
		Inlets (Label Type)
		Inlets (Type ES)
		Manholes (Label Type or Utility)
		R.C. End Section or C.M. Headwall
		Headwall
		Inlet Siltation Protection
		Direction of Flow
WV		Water Valve Cover
		Hydrant
GV		Gas Gate Valves
		Utility Pole (Type & Number)
Mon.		Monuments
		Tree (Size, Kind)
36.12	36.12	Grades
D1		State Open Waters Location
47	47	Contour Labels

North Point To Be Used On Standard Construction Sheets Where Bearings Refer to N.J. Plane Coordinate System

GENERAL CONSTRUCTION NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS NECESSARY FOR CONSTRUCTION IN ACCORDANCE WITH EXISTING LOCAL, COUNTY, OR STATE REGULATIONS, OR ANY OTHER AGENCY HAVING JURISDICTION IN THESE MATTERS.
2. THE CONTRACTOR IS RESPONSIBLE FOR AND SHALL VERIFY ALL DIMENSIONS AND DETAILS BEFORE PROCEEDING WITH WORK. ANY DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER.
3. THE CONTRACTOR SHALL CONTINUOUSLY DEWATER ALL EXCAVATIONS UNTIL BACKFILLING OPERATIONS HAVE BEEN COMPLETED. PRIOR TO DISCHARGE TO STREAMS, SILT SHALL BE SETTLED OUT IN AN APPROVED SETTLING BASIN.
4. ALL REGRADED AREAS AT THE SITE WHICH ARE NOT DESIGNATED AS PAVED OR GRAVEL AREAS SHALL BE TOPSOILED AND SEEDED AND SHALL BE STABILIZED IN ACCORDANCE WITH STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY AND THE CONTRACT SPECIFICATIONS.
5. ALL GRADING OPERATIONS SHALL PROVIDE FOR POSITIVE DRAINAGE AWAY FROM ALL BUILDINGS AND STRUCTURES AND SHALL ELIMINATE PONDING AREAS.
6. THE CONTRACTOR SHALL MAINTAIN THE FLOW OF ALL STREAMS, DRAINAGE DITCHES, STORM SEWERS, AND SANITARY SEWERS AT ALL TIMES BY A MEANS ACCEPTABLE TO THE ENGINEER AND ALL THE RESPONSIBLE AGENCIES.
7. THE CONTRACTOR SHALL MAINTAIN ALL UTILITY SERVICE FLOWS AND PRESSURES UNLESS WRITTEN APPROVAL BY THE RESPONSIBLE UTILITY COMPANY PERMITS HIM TO DO OTHERWISE.
8. INFORMATION AS TO THE LOCATION OF EXISTING UTILITIES HAS BEEN COLLECTED FROM VARIOUS SOURCES. THE RESULTS OF SUCH INVESTIGATIONS ARE SHOWN ON THE CONTRACT DRAWINGS AND ARE NOT GUARANTEED AS TO ACCURACY. THE CONTRACTOR IS PARTICULARLY DIRECTED TO THE FACT THAT UNDERGROUND OBJECTS OR MATERIAL LOCATION, ELEVATION, OR TYPE IS NOT WARRANTED TO BE APPROXIMATELY CORRECT (NOR CAN THEY BE ASSUMED TO BE THE ONLY SUBSURFACE OBJECTS OR MATERIAL WHICH MAY BE ENCOUNTERED IN THE WORK.) THE CONTRACTOR SHALL MAKE ALL NECESSARY INVESTIGATIONS TO SATISFY HIMSELF AS TO THE EXISTING CONDITIONS PRIOR TO BIDDING WORK.
9. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE THE LOCATION OF THE UTILITIES WITH THE UTILITY DEPARTMENTS PRIOR TO CONSTRUCTION.
10. THE COORDINATION OF THE LOCATION OR RELOCATION WHERE REQUIRED OF TELEPHONE, CABLE, ELECTRIC, GAS, AND WATER FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR AND SAME SHALL BE COORDINATED TO INSURE COMPLETION WITHIN THE TIME PERMITTED.
11. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN MEANS OF INGRESS AND EGRESS TO RESIDENTS THROUGHOUT THE COURSE OF THE WORK TO PROVIDE ADEQUATE MAINTENANCE AND PROTECTION OF TRAFFIC AND PEDESTRIANS.
12. THE CONTRACTOR'S LICENSED SURVEYOR SHALL PROVIDE THE CONSTRUCTION STAKEOUT FOR THE PROJECT.
13. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE STATE OF NEW JERSEY WORKER HEALTH AND SAFETY ACT (N.J.A.C. 12:110 ET SEQ) AS AMENDED AND THE UNITED STATES OCCUPATIONAL SAFETY & HEALTH ACT (OSHA) (29 CFR 1910.), AS AMENDED WITH REGARD TO WORKER AND JOBSITE SAFETY.
14. THE CONTRACTOR IS HEREIN ADVISED THAT ALL WORK TO BE PERFORMED SHALL BE GOVERNED BY THE LOCAL MUNICIPAL ORDINANCES. THIS SHALL INCLUDE THE PROVISIONS IN THEIR CODES WHICH SET FORTH PERMITTED HOURS OF CONSTRUCTION WITHIN THE MUNICIPALITY.
15. THE CONTRACTOR IS HEREIN ADVISED THAT PERMITS FROM VARIOUS AGENCIES ARE PENDING FOR THE CONSTRUCTION OF THIS PROJECT AS SHOWN IN THE SPECIAL PROVISIONS OF THE SPECIFICATIONS. THE CONTRACTOR WILL BE REQUIRED TO COMPLY WITH THE CONSTRUCTION, TRAFFIC PROTECTION, SAFETY AND NOTIFICATION PROVISIONS OF THESE PERMITS.
16. THE CONTRACTOR IS ADVISED THAT THEY ARE RESPONSIBLE TO PAY FOR, ACQUIRE AND COMPLY WITH ANY ROAD OPENING PERMITS IF REQUIRED IN CONJUNCTION WITH THE PROPOSED IMPROVEMENTS.
17. THE CONTRACTOR SHOULD COMPLY WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES BY THE U.S.D.O.T.
18. THE CONTRACTOR IS ADVISED THAT THEY MUST MAINTAIN A MINIMUM OF TWO LANES OF TRAFFIC IN EACH DIRECTION AT ALL TIMES AND MUST COMPLETELY BACKFILL ALL TRENCHES PRIOR TO NON-DAYLIGHT HOURS.
19. IN ORDER TO MAINTAIN TWO LANES OF TRAFFIC IN EACH DIRECTION, THE CONTRACTOR MAY FIND IT NECESSARY TO UTILIZE STEEL PLATES OVER TRENCHES AT NO ADDITIONAL COST TO THE OWNER/COUNTY. STEEL PLATES MUST BE REMOVED AND TRENCHES BACKFILLED AND TOPPED WITH ASPHALT IF SNOW HAS BEEN FORECASTED.
20. ALL WORK BY THE CONTRACTOR SHALL BE DONE IN ACCORDANCE WITH THE PROVISIONS OF THE NEW JERSEY STATUTE KNOWN AS CHAPTER 249 OF THE LAWS OF 1948, BEING SECTIONS 34:6-47.1 TO 47.9, INCLUSIVE OF THE REVISED STATUTES OF NEW JERSEY, 1937, AND IN ACCORDANCE WITH THE RULES AND REGULATIONS CONCERNING PRECAUTIONS TO BE TAKEN IN THE PROXIMITY OF HIGH-VOLTAGE LINES FOR THE PREVENTION OF ACCIDENTS PROMULGATED BY THE COMMISSIONER OF THE DEPARTMENT OF LABOR AND INDUSTRY OF THE STATE OF NEW JERSEY, EFFECTIVE DECEMBER 28, 1948, ALL AS AMENDED AND SUPPLEMENTED, AND IN ACCORDANCE WITH THE PROVISIONS OF THE FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND OF SUBPART N, PARAGRAPH 1926.550 OF THE RULES AND REGULATIONS ISSUED UNDER SAID ACT.
21. WHEN DISTURBING, REMOVING AND/OR DISPOSING OF ASBESTOS CEMENT PIPE, THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REQUIREMENTS INCLUDING BUT NOT LIMITED TO: CURRENT USEPA REGULATIONS (NESHAP, 40 CFR 61 SUBPART M);OSHA REGULATIONS (29 CFR 192658);THE CURRENT NEW JERSEY ASBESTOS HAZARD ABATEMENT SUBCODE (N.J.A.C. 5:23-8); THE CURRENT NJDEP REGULATIONS (N.J.A.C. 7:26-1 ET. SEQ.) AND NOTIFICATION REGULATIONS (N.J.A.C. 5:23-8.6, 40 CFR 61 SUBPART M, AND N.J.A.C. 7:26-2:12).
22. AT CERTAIN TIMES THE SITE MAY BE OCCUPIED BY SEVERAL CONTRACTORS AND IT IS THEREFORE REQUIRED FOR ANY AND ALL CONTRACTORS OCCUPYING THE SITE TO COOPERATE WITH ONE ANOTHER. NO DELAYS RESULTING FROM MULTIPLE CONTRACTORS WORKING ON THE SITE WILL BE CONSIDERED.
23. THE SOMERSET / UNION SOIL CONSERVATION DISTRICT GOVERNS SOIL EROSION AND SEDIMENT CONTROL MEASURES WITHIN THE PROJECT AREA. ACCORDINGLY ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED AS PER THE REQUIREMENTS OF THE SOMERSET / UNION SOIL CONSERVATION DISTRICT AND AS DIRECTED BY THE ENGINEER.
24. THE CONTRACTOR WILL NOT BE PERMITTED TO STOCKPILE EXCAVATED MATERIALS OVER ANY UTILITY LINES. THE STOCKPILED MATERIALS SHOULD BE PLACED SUFFICIENTLY AWAY FROM THE EDGE OF ANY EXCAVATION TO PREVENT CAVING OF THE TRENCH WALL AND TO PERMIT ADEQUATE ACCESS ALONG THE TRENCH. WITH SHEETED TRENCHES, A MINIMUM OF FIVE (5) FEET FROM THE EDGE OF SHEETING TO TOE OF SPOIL BANK MUST BE MAINTAINED.
25. THE CONTRACTOR SHALL TAKE EVERY PRECAUTION NECESSARY TO PRECLUDE DAMAGE TO EXISTING STRUCTURES, FACILITIES, AND UTILITIES DUE TO LOSS OF LATERAL SUPPORT AND/OR CONSTRUCTION LOADINGS.
26. THE CONTRACTOR SHALL LOCATE ALL RESIDENTIAL SPRINKLER HEADS AND PIPING AND PROTECT THE SAME FROM DAMAGE DURING THE PERFORMANCE OF THE WORK. DAMAGE TO SPRINKLER SYSTEMS SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE OWNER.
27. ALL MAILBOXES REQUIRING RELOCATION SHALL BE DONE SO IN ACCORDANCE WITH LOCAL POSTAL AUTHORITY REGULATIONS.
28. ALL TREES TO BE REMOVED SHALL BE DONE SO BY PERSONS CERTIFIED IN NEW JERSEY TO WORK ADJACENT TO OVERHEAD ELECTRICAL LINES.
29. PROPOSED SIGNS SHALL BE WITH BREAKAWAY STEEL U-POST IN ACCORDANCE WITH NJDOT STANDARD DETAILS.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

LEGEND AND GENERAL NOTES

REGISTER NO.

FILE NO. 115.UN00213.P05

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO/PB	
CHECKED BY: PB	SHEET: 6 of 139	

TEMPORARY SEEDING SPECIFICATIONS

- APPLY 10-20-10 FERTILIZER AT A RATE OF 500 LBS. PER ACRE OR 11 LBS. PER 1,000 SQ. FEET.

  APPLY GROUND LIMESTONE ACCORDING TO SOIL TEST RECOMMENDATIONS SUCH AS OFFERED BY RUTGERS COOPERATIVE EXTENSION OFFICES.
- APPLY SEED UNIFORMLY BY HAND, CYCLONE (CENTRIFUGAL) SEEDER, DROP SEEDER, DRILL OR CULTIPACKER SEEDER. EXCEPT FOR DRILLED, HYDROSEEDED OR CULTIPACKED SEEDINGS, SEED SHALL BE INCORPORATED INTO THE SOIL WITHIN 24 HOURS OF SEEDBED PREPARATION TO A DEPTH OF 1/4 TO 1/2 INCH, BY RAKING OR DRAGGING. HYDROSEEDING SHALL NOT BE ALLOWED IN SEED APPLICATION. DEPTH OF SEED PLACEMENT MAY BE 1/4 INCH DEEPER ON COARSE TEXTURED SOIL.
- APPLY PERENNIAL RYEGRASS AT A RATE OF 100 LBS. PER ACRE OR 1 LB. PER 1,000 SQ. FT. OPTIMUM SEEDING DATES 3/1 - 5/15 AND 8/15 - 10/1
- APPLY MULCH AT A RATE OF 1.5 TO 2 TONS PER ACRE OR 70 TO 90 LBS. PER 1,000 SQ. FT.
- USE LIQUID MULCH BINDER TO ANCHOR MULCH AND PREVENT MULCH FROM BLOWING.

SITE PREPARATION AND SEEDBED PREPARATION FOR TEMPORARY SOIL STABILIZATION

1. SITE PREPARATION

   A. GRADE AS NEEDED AND FEASIBLE TO PERMIT THE USE OF CONVENTIONAL EQUIPMENT FOR SEEDBED PREPARATION, SEEDING, MULCH APPLICATION, AND MULCH ANCHORING. ALL GRADING SHOULD BE DONE IN ACCORDANCE WITH STANDARDS FOR LAND GRADING, PG. 19-1.

   B. INSTALL NEEDED EROSION CONTROL PRACTICES OR FACILITIES SUCH AS DIVERSIONS, GRADE STABILIZATION STRUCTURES, CHANNEL STABILIZATION MEASURES, SEDIMENT BASINS, AND WATERWAYS. SEE STANDARDS 11 THROUGH 42.

   C. IMMEDIATELY PRIOR TO SEEDING, THE SURFACE SHOULD BE SCARIFIED 6" TO 12" WHERE THERE HAS BEEN SOIL COMPACTION. THIS PRACTICE IS PERMISSIBLE ONLY WHERE THERE IS NO DANGER TO UNDERGROUND UTILITIES (CABLES, IRRIGATION SYSTEMS, ETC.)

2. SEEDBED PREPARATION

   A. UNIFORMLY APPLY GROUND LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST RECOMMENDATIONS SUCH AS OFFERED BY RUTGERS CO-OPERATIVE EXTENSION. SOIL SAMPLE MAILERS ARE AVAILABLE FROM THE LOCAL RUTGERS CO-OPERATIVE EXTENSION OFFICES. FERTILIZER SHALL BE APPLIED AT THE RATE OF 500 POUNDS PER ACRE OR 11 POUNDS PER 1,000 SQUARE FEET OF 10-20-10 OR EQUIVALENT WITH 50% WATER INSOLUBLE NITROGEN UNLESS A SOIL TEST INDICATES OTHERWISE AND INCORPORATED INTO THE SURFACE 4 INCHES. IF FERTILIZER IS NOT INCORPORATED, APPLY 1/2 THE RATE DESCRIBED ABOVE DURING SEEDBED PREPARATION AND REPEAT ANOTHER 1/2 RATE APPLICATION OF THE SAME FERTILIZER WITHIN 3 TO 5 WEEKS AFTER SEEDING. CALCIUM CARBONATE IS THE EQUIVALENT AND STANDARD FOR MEASURING THE ABILITY OF LIMING MATERIALS TO NEUTRALIZE SOIL ACIDITY AND SUPPLY CALCIUM AND MAGNESIUM TO GRASSES AND LEGUMES.

   B. WORK LIME AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH A DISC, SPRINGTOOTH HARROW, OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OR DISKING OPERATION SHOULD BE ON THE GENERAL CONTOUR. CONTINUE TILLAGE UNTIL A REASONABLE UNIFORM SEEDBED IS PREPARED.

   C. INSPECT SEEDBED JUST BEFORE SEEDING. IF TRAFFIC HAS LEFT THE SOIL COMPACTED, THE AREA MUST BE RETILLED IN ACCORDANCE WITH THE ABOVE.

   D. SOILS HIGH IN SULFIDES OR HAVING A pH OF 4 OR LESS REFER TO STANDARD FOR MANAGEMENT OF HIGH ACID PRODUCING SOIL, PG. 1-1

SITE PREPARATION AND SEEDBED PREPARATION FOR PERMANENT SOIL STABILIZATION

1. SITE PREPARATION

   A. GRADE AS NEEDED AND FEASIBLE TO PERMIT THE USE OF CONVENTIONAL EQUIPMENT FOR SEEDBED PREPARATION, SEEDING, MULCH APPLICATION, AND MULCH ANCHORING. ALL GRADING SHOULD BE DONE IN ACCORDANCE WITH STANDARDS FOR LAND GRADING, PG. 19-1.

   B. IMMEDIATELY PRIOR TO SEEDING AND TOPSOIL APPLICATION, THE SUBSOIL SHALL BE EVALUATED FOR COMPACTION IN ACCORDANCE WITH THE STANDARD FOR LAND GRADING.

   C. TOPSOIL SHOULD BE HANDLED ONLY WHEN IT IS DRY ENOUGH TO WORK WITHOUT DAMAGING THE SOIL STRUCTURE. A UNIFORM APPLICATION TO A DEPTH OF 6 INCHES (UNSETTLED) IS REQUIRED ON ALL SITES. TOPSOIL SHALL BE AMENDED WITH ORGANIC MATTER, AS NEEDED, IN ACCORDANCE WITH THE STANDARD FOR TOPSOILING.

   D. INSTALL NEEDED EROSION CONTROL PRACTICES OR FACILITIES SUCH AS DIVERSIONS, GRADE-STABILIZATION STRUCTURES, CHANNEL STABILIZATION MEASURES, SEDIMENT BASINS, AND WATERWAYS.

2. SEEDBED PREPARATION

   A. UNIFORMLY APPLY GROUND LIMESTONE AND FERTILIZER TO TOPSOIL WHICH HAS BEEN SPREAD AND FIRMED, ACCORDING TO SOIL TEST RECOMMENDATIONS SUCH AS OFFERED BY RUTGERS COOPERATIVE EXTENSION. SOIL SAMPLE MAILERS ARE AVAILABLE FROM THE LOCAL RUTGERS COOPERATIVE EXTENSION OFFICES (http://njaes.rutgers.edu/county/). FERTILIZER SHALL BE APPLIED AT A RATE OF 500 POUNDS PER ACRE OR 11 POUNDS PER 1,000 SQUARE FEET OF 10-10-10 OR EQUIVALENT WITH 50% WATER INSOLUBLE NITROGEN UNLESS A SOIL TEST INDICATES OTHERWISE AND INCORPORATED INTO THE SURFACE 4 INCHES. IF FERTILIZER IS NOT INCORPORATED, APPLY ONE-HALF THE RATE DESCRIBED ABOVE DURING SEEDBED PREPARATION AND REPEAT ANOTHER ONE-HALF RATE APPLICATION OF THE SAME FERTILIZER WITHIN 3 TO 5 WEEKS AFTER SEEDING. CALCIUM CARBONATE IS THE EQUIVALENT AND STANDARD FOR MEASURING THE ABILITY OF LIMING MATERIALS TO NEUTRALIZE SOIL ACIDITY AND SUPPLY CALCIUM AND MAGNESIUM TO GRASSES AND LEGUMES. IF AND WHERE ORDERED BY THE GOLF ARCHITECT, FERTILIZER TO TOPSOIL SHALL BE TWO POUNDS (2#) OF SLOW-RELEASE STARTER FERTILIZER 18-24-12 OR EQUIVALENT AMOUNT OF A SIMILAR N-P-K RATIO FERTILIZER ARE TO BE SPREAD PER 1,000 SQUARE FEET. THIS MATERIAL IS NOT TO BE SPREAD MORE THAN 2 DAYS (48 HOURS) BEFORE SEEDING OR SODDING. A SECOND APPLICATION OF THE SAME FERTILIZER SHALL BE APPLIED AT THE SAME RATE APPROXIMATELY 2-5 WEEKS AFTER SEEDING.

   B. WORK LIME AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH A DISC, SPRINGTOOTH HARROW, OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OR DISKING OPERATION SHOULD BE ON THE GENERAL CONTOUR. CONTINUE TILLAGE UNTIL A REASONABLE UNIFORM SEEDBED IS PREPARED. UTILIZE A HARLEY POWER RAKE WITH TEETHED ROLLER TO REMOVE ROCKS AND LOOSEN THE SOIL.

   C. HIGH ACID PRODUCING SOIL. SOILS HAVING A pH OF 4 OR LESS OR CONTAINING IRON SULFIDE SHALL BE COVERED WITH MINIMUM OF 12 INCHES OF SOIL HAVING A pH OF 5 OR MORE BEFORE INITIATING SEEDBED REPARATION. SEE STANDARD FOR MANAGEMENT OF HIGH ACID-PRODUCING SOILS FOR SPECIFIC REQUIREMENTS.

   D. AREAS SHALL BE SEEDED WITH THE PRIMARY OR SECONDARY ROUGH MIXTURE AS SPECIFIED VIA A BRILLION STYLE DROP SEEDER (OR EQUAL), OR WITH A CALIBRATED HYDRO SEEDER. THE SEED SHALL BE COVERED WITH WOOD FIBER HYDRO-MULCH MATERIAL AT THE MANUFACTURER'S RECOMMENDED RATE.

PERMANENT SEEDING SPECIFICATIONS

- UNIFORMLY APPLY GROUND LIMESTONE AND FERTILIZER TO TOPSOIL WHICH HAS BEEN SPREAD AND FIRMED, ACCORDING TO SOIL TEST RECOMMENDATIONS SUCH AS OFFERED BY RUTGERS COOPERATIVE EXTENSION OFFICES. FERTILIZER SHALL BE APPLIED AT A RATE OF 500 POUNDS PER ACRE OR 11 POUNDS PER 1,000 SQUARE FEET OF 10-10-10 OR EQUIVALENT WITH 50% WATER INSOLUBLE NITROGEN UNLESS A SOIL TEST INDICATES OTHERWISE.
- APPLY SEED UNIFORMLY BY HAND, CYCLONE (CENTRIFUGAL) SEEDER, DROP SEEDER, DRILL OR CULTIPACKER SEEDER. EXCEPT FOR DRILLED, HYDROSEEDED OR CULTIPACKED SEEDINGS, SEED SHALL BE INCORPORATED INTO THE SOIL WITHIN 24 HOURS OF SEEDBED PREPARATION TO A DEPTH OF 1/4 TO 1/2 INCH, BY RAKING OR DRAGGING. HYDROSEEDING SHALL NOT BE ALLOWED IN SEED APPLICATION. DEPTH OF SEED PLACEMENT MAY BE 1/4 INCH DEEPER ON COARSE TEXTURED SOIL.
- APPLY THE FOLLOWING SEED MIXTURE AT THE SPECIFIED RATES. OPTIMAL PLANTING PERIOD 3/1 TO 4/30 AND 8/15 TO 11/15. ACCEPTABLE PLANTING PERIOD 5/1 TO 8/14.

  TURF-TYPE TALL FESCUE..... 1.10 LBS/1000 S.F.
  RED TOP OR..... 0.10 LBS/1000 S.F.
  PERENNIAL RYEGRASS..... 0.10 LBS/1000 S.F.
  BIRDSFOOT TREFOIL OR..... 0.25 LBS/1000 S.F.
  WHITE CLOVER..... 0.10 LBS/1000 S.F.

  PRIMARY ROUGH MIXTURE
  SEEDING RATE: 175 LB./ACRE

SEED VARIETY	% BY WEIGHT
RUGBY II KENTUCKY BLUEGRASS	20
NUGLADE KENTUCKY BLUEGRASS	20
RELIANT IV HARD FESCUE	10
JAMESTOWN II CHEWINGS FESCUE	25
FLYER CREEPING RED FESCUE	15
CADDIESHACK PERENNIAL RYEGRASS	10

  SECONDARY ROUGH MIXTURE
  SEEDING RATE: 150 LB./ACRE

SEED VARIETY	% BY WEIGHT
RELIANT IV HARD FESCUE	50
FLYER CREEPING RED FESCUE	20
JAMESTOWN II CHEWINGS FESCUE	20
AZURE BLUE FESCUE	10

- APPLY MULCH AND MULCH ANCHORING AS SPECIFIED IN THE MULCHING FOR PERMANENT VEGETATIVE COVER SPECIFICATIONS.

MULCHING FOR PERMANENT VEGETATIVE COVER

MULCHING IS REQUIRED ON ALL SEEDING

A. MULCH MATERIALS SHALL BE UNROTTED SMALL GRAIN STRAW, HAY FREE OF SEEDS, OR SALT HAY TO BE APPLIED AT THE RATE OF 1-1/2 TO 2 TONS PER ACRE (70-90 POUNDS PER 1000 SQUARE FEET) EXCEPT THAT WHERE A CRIMPER IS USED INSTEAD OF A LIQUID MULCH-BINDER (TACKIFYING OR ADHESIVE AGENT), THE RATE OF APPLICATION MUST BE DOUBLE THE LOWER RATE. MULCH CHOPPER-BLOWERS MUST NOT GRIND THE MATERIAL.

B. SPREAD UNIFORMLY BY HAND OR MECHANICALLY SO THAT AT LEAST 85% OF THE SOIL SURFACE IS COVERED. FOR UNIFORM DISTRIBUTION OF HAND-SPREAD MULCH, DIVIDE THE AREA INTO APPROXIMATELY 1000 SQUARE FOOT SECTIONS AND DISTRIBUTE 70-90 POUNDS WITHIN EACH SECTION.

C. MULCH ANCHORING SHALL BE ACCOMPLISHED IMMEDIATELY AFTER PLACEMENT TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS, DEPENDING UPON THE SIZE OF THE AREA, STEEPNESS OF THE SLOPES, AND COSTS.

1. PEG AND TWINE - DRIVE 8-10 INCH WOODEN PEGS TO WITHIN 2-3 INCHES OF THE SOIL SURFACE EVERY 4 FEET IN ALL DIRECTIONS. STAKES MAY BE DRIVEN BEFORE OR AFTER APPLYING MULCH. SECURE MULCH TO SOIL SURFACE BY STRETCHING TWINE BETWEEN PEGS IN A CRISS-CROSS AND A SQUARE PATTERN. SECURE TWINE AROUND EACH PEG WITH TWO OR MORE ROUND TURNS.

2. MULCH NETTING - STAPLE PAPER, JUTE, COTTON, OR PLASTIC NETTINGS OVER MULCH TO THE SOIL SURFACE USE A DEGRADABLE NETTING IN AREAS TO BE MOWED.

3. CRIMPER (MULCH ANCHORING COULTER TOOL) - A TRACTOR-DRAWN IMPLEMENT SOMEWHAT LIKE A DISC-HARROW, ESPECIALLY DESIGNED TO PUSH OR CUT SOME OF THE BROADCAST LONG FIBER MULCH 3-4 INCHES INTO THE SOIL SO AS TO ANCHOR IT AND LEAVE PART STANDING UPRIGHT THIS TECHNIQUE IS LIMITED TO AREAS TRAVERSABLE BY A TRACTOR, WHICH MUST OPERATE ON THE CONTOURS OF SLOPES. STRAW MULCH RATE MUST BE 3 TONS PER ACRE. NO TACKIFYING OR ADHESIVE AGENT IS REQUIRED.

4. LIQUID MULCH-BINDERS - MAY BE USED TO ANCHOR SALT HAY, HAY OR STRAW MULCHES

   a. APPLICATIONS SHALL BE HEAVIER AT EDGES WHERE WIND MAY CATCH THE MULCH, IN VALLEYS, AND AT CRESTS OF BANKS. REMAINDER OF AREA SHALL BE UNIFORM IN APPEARANCE.

   b. USE THE FOLLOWING:

   (1) SYNTHETIC OR ORGANIC AND VEGETABLE BASED BINDERS - BINDERS SUCH AS CURASOL, DCA-70, PETRO-SET, AND TERRA-TACK MAY BE USED AT RATES RECOMMENDED BY THE MANUFACTURER TO ANCHOR MULCH MATERIALS.

   NOTE: ALL NAMES GIVEN ABOVE ARE REGISTERED TRADE NAMES. THIS DOES NOT CONSTITUTE A RECOMMENDATION OF THESE PRODUCTS TO THE EXCLUSION OF OTHER PRODUCTS.

D. WOOD-FIBER OR PAPER-FIBER MULCH SHALL BE MADE FROM WOOD, PLANT FIBERS OR PAPER CONTAINING NO GROWTH OR GERMINATION INHIBITING MATERIALS, USED AT THE RATE OF 1500 POUNDS PER ACRE MAY BE APPLIED BY A HYDROSEEDER. THIS MULCH SHALL NOT BE MIXED IN THE TANK WITH SEED. USE IS LIMITED TO FLATTER SLOPES AND DURING OPTIMUM SEEDING PERIODS IN SPRING AND FALL.

Soil Erosion and Sediment Control measures shall be installed as deemed necessary by the Engineer and the Somerset / Union Soil Conservation District.

This plan to be used for Soil Erosion and Sediment Control purposes only.

STANDARD FOR STABILIZATION WITH MULCH ONLY

THIS MULCHING PRACTICE IS APPLICABLE TO AREAS SUBJECT TO EROSION, WHERE THE SEASON AND OTHER CONDITIONS MAY NOT BE SUITABLE FOR GROWING AN EROSION-RESISTANT COVER OR WHERE STABILIZATION IS NEEDED FOR A SHORT PERIOD UNTIL MORE SUITABLE PROTECTION CAN BE APPLIED.

METHODS AND MATERIALS

1. SITE PREPARATION

   A. GRADE AS NEEDED AND FEASIBLE TO PERMIT THE USE OF CONVENTIONAL EQUIPMENT FOR SEEDBED PREPARATION, SEEDING, MULCH APPLICATION, AND MULCH ANCHORING. ALL GRADING SHOULD BE DONE IN ACCORDANCE WITH STANDARDS FOR LAND GRADING, PG. 19-1, STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY.

   B. INSTALL NEEDED EROSION CONTROL PRACTICES OR FACILITIES SUCH AS DIVERSIONS, GRADE STABILIZATION STRUCTURES, CHANNEL STABILIZATION MEASURES, SEDIMENT BASINS, AND WATERWAYS. SEE STANDARDS 11 THROUGH 42, STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY.

2. PROTECTIVE MATERIALS

   A. UNROTTED SMALL-GRAIN STRAW, AT 2.0 TO 2.5 TONS PER ACRE, IS SPREAD UNIFORMLY AT 90 TO 115 POUNDS PER 1,000 SQUARE FEET AND ANCHORED WITH A MULCH ANCHORING TOOL, LIQUID MULCH BINDERS, OR NETTING TIE DOWN. OTHER SUITABLE MATERIALS MAY BE USED IF APPROVED BY THE SOIL CONSERVATION DISTRICT. THE APPROVED RATES ABOVE HAVE BEEN MET WHEN THE MULCH COVERS THE GROUND COMPLETELY AS VIEWED FROM VISUAL INSPECTION, I.E., THE SOIL CANNOT BE SEEN BELOW THE MULCH.

   B. SYNTHETIC OR ORGANIC SOIL STABILIZERS MAY BE USED UNDER SUITABLE CONDITIONS AND IN QUANTITIES AS RECOMMENDED BY THE MANUFACTURER.

   C. WOOD-FIBER OR PAPER-FIBER MULCH AT THE RATE OF 1,500 POUNDS PER ACRE (OR ACCORDINGLY TO THE MANUFACTURER'S REQUIREMENTS) MAY BE APPLIED BY A HYDROSEEDER.

   D. MULCH NETTING, SUCH AS PAPER JUTE, EXCELSIOR, COTTON, OR PLASTIC MAY BE USED.

   E. WOODCHIPS APPLIED UNIFORMLY TO A MINIMUM DEPTH OF 2 INCHES MAY BE USED. WOODCHIPS WILL NOT BE USED ON AREAS WHERE FLOWING WATER COULD WASH THEM INTO AN INLET AND PLUG IT.

   F. GRAVEL, CRUSHED STONE, OR SLAG AT THE RATE OF 9 CUBIC YARDS PER 1,000 SQ. FT. APPLIED UNIFORMLY TO A MINIMUM DEPTH OF 3 INCHES MAY BE USED. SIZE 2 OR 3 (ASTM C-33) IS RECOMMENDED.

3. MULCH ANCHORING - SHOULD BE ACCOMPLISHED IMMEDIATELY AFTER PLACEMENT OF HAY OR STRAW MULCH TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS, DEPENDING UPON THE SIZE OF THE AREA AND STEEPNESS OF SLOPES.

   A. PEG AND TWINE - DRIVE 8 TO 10 INCH WOODEN PEGS TO WITHIN 2 TO 3 INCHES OF THE SOIL SURFACE EVERY 4 FEET IN ALL DIRECTIONS. STAKES MAY BE DRIVEN BEFORE OR AFTER APPLYING MULCH. SECURE MULCH TO SOIL SURFACE BY STRETCHING TWINE BETWEEN PEGS IN A CRIS-CROSS AND A SQUARE PATTERN. SECURE TWINE AROUND EACH PEG WITH TWO OR MORE ROUND TURNS.

   B. MULCH NETTINGS - STAPLE PAPER, COTTON, OR PLASTIC NETTINGS OVER MULCH. USE A DEGRADABLE NETTING IN AREAS TO BE MOWED. NETTING IS USUALLY AVAILABLE IN ROLLS 4 FEET WIDE AND UP TO 300 FEET LONG.

   C. CRIMPER MULCH ANCHORING COULTER TOOL - A TRACTOR-DRAWN IMPLEMENT ESPECIALLY DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE. THIS PRACTICE AFFORDS MAXIMUM EROSION CONTROL, BUT ITS USE IS LIMITED TO THOSE SLOPES UPON WHICH THE TRACTOR CAN OPERATE SAFELY. SOIL PENETRATION SHOULD BE ABOUT 3 TO 4 INCHES. ON SLOPING LAND, THE OPERATION SHOULD BE ON THE CONTOUR.

   D. LIQUID MULCH-BINDERS

   1. APPLICATIONS SHOULD BE HEAVIER AT EDGES WHERE WIND CATCHES THE MULCH, IN VALLEYS, AND AT CRESTS OF BANKS. REMAINDER OF AREA SHOULD BE UNIFORM IN APPEARANCE.

   2. USE ONE OF THE FOLLOWING:

   a. ORGANIC AND VEGETABLE BASED BINDERS - NATURALLY OCCURRING, POWDER BASED, HYDROPHILIC MATERIALS THAT MIXED WITH WATER FORMULATES A GEL AND WHEN APPLIED TO MULCH UNDER SATISFACTORY CURING CONDITIONS WILL FORM MEMBRANE NETWORKS OF INSOLUBLE POLYMERS. THE VEGETABLE GEL SHALL BE PHYSIOLOGICALLY HARMLESS AND NOT RESULT IN A PHYTO-TOXIC EFFECT OR IMPEDE GROWTH OF TURFGRASS. VEGETABLE BASED GELS SHALL BE APPLIED AT RATES AND WEATHER CONDITIONS RECOMMENDED BY THE MANUFACTURER.

   b. SYNTHETIC BINDERS - HIGH POLYMER SYNTHETIC EMULSION, MISCIBLE WITH WATER WHEN DILUTED AND FOLLOWING APPLICATION TO MULCH, DRYING AND CURING SHALL NO LONGER BE SOLUBLE OR DISPERSIBLE IN WATER. IT SHALL BE APPLIED AT RATES AND WEATHER CONDITIONS RECOMMENDED BY THE MANUFACTURER AND REMAIN TACKY UNTIL GERMINATION OF GRASS.

SOIL EROSION AND SEDIMENT CONTROL NOTES:

1. ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCES, OR IN THEIR PROPER SEQUENCE AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
2. ANY DISTURBED AREAS THAT WILL BE LEFT EXPOSED MORE THAN 30 DAYS AND NOT SUBJECT TO CONSTRUCTION TRAFFIC, WILL IMMEDIATELY RECEIVE A TEMPORARY SEEDING. IF THE SEASON PREVENTS THE ESTABLISHMENT OF A TEMPORARY COVER, THE DISTURBED AREAS WILL BE MULCHED WITH STRAW, OR EQUIVALENT MATERIAL, AT A RATE OF TWO (2) TONS PER ACRE, ACCORDING TO NJ STATE STANDARDS.
3. PERMANENT VEGETATION SHALL BE SEEDED OR SODDED ON ALL EXPOSED AREAS WITHIN TEN (10) DAYS AFTER FINAL GRADING. MULCH WILL BE USED FOR PROTECTION UNTIL SEEDING IS ESTABLISHED.
4. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE NJ STATE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH/ EDITION LAST REVISED JANUARY 2014.
5. A SUB-BASE COURSE WILL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING AND INSTALLATION OF IMPROVEMENTS IN ORDER TO STABILIZE STREETS, ROADS, DRIVEWAYS AND PARKING AREAS. IN AREAS WHERE NO UTILITIES ARE PRESENT, THE SUB-BASE SHALL BE INSTALLED WITHIN 15 DAYS OR PRELIMINARY GRADING.
6. IMMEDIATELY FOLLOWING INITIAL DISTURBANCE OR ROUGH GRADING ALL CRITICAL AREAS SUBJECT TO EROSION (I.E.: STEEP SLOPES, ROADWAY EMBANKMENTS) WILL RECEIVE A TEMPORARY SEEDING IN COMBINATION WITH STRAW MULCH OR A SUITABLE EQUIVALENT, AT A RATE OF TWO (2) TONS PER ACRE, ACCORDING TO THE NJ STATE STANDARDS.
7. ANY STEEP SLOPES RECEIVING PIPELINE INSTALLATION WILL BE BACKFILLED AND STABILIZED DAILY, AS THE INSTALLATION PROCEEDS (I.E.: SLOPES GREATER THAT 3:1).
8. TRAFFIC CONTROL STANDARDS REQUIRE THE INSTALLATION OF A 50'X30'X6"PAD OF 1 1/2" OR 2" STONE, AT ALL CONSTRUCTION DRIVEWAYS, IMMEDIATELY AFTER INITIAL SITE DISTURBANCE.
9. THE SOMERSET-UNION SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED IN WRITING 48 HOURS IN ADVANCE OF ANY LAND DISTURBING ACTIVITY.
10. AT THE TIME WHEN THE SITE PREPARATION FOR PERMANENT VEGETATIVE STABILIZATION IS GOING TO BE ACCOMPLISHED, ANY SOIL THAT WILL NOT PROVIDE A SUITABLE ENVIRONMENT TO SUPPORT ADEQUATE VEGETATIVE GROUND COVER, SHALL BE REMOVED OR TREATED IN SUCH A WAY THAT WILL PERMANENTLY ADJUST THE SOIL CONDITIONS AND RENDER IT SUITABLE FOR VEGETATIVE GROUND COVER. IF THE REMOVAL OR TREATMENT OF THE SOIL WILL NOT PROVIDE SUITABLE CONDITIONS, NON-VEGETATIVE MEANS OF PERMANENT GROUND STABILIZATION WILL HAVE TO BE EMPLOYED. TOPSOIL SHOULD BE HANDLED ONLY WHEN IT IS DRY ENOUGH TO WORK WITHOUT DAMAGING THE SOIL STRUCTURE. A UNIFORM APPLICATION TO A DEPTH OF 5 INCHES (UNSETTLED) IS REQUIRED ON ALL SITES.
11. IN THAT NJSA 4:24-39 ET SEQ., REQUIRES THAT NO CERTIFICATE OF OCCUPANCY BE ISSUED BEFORE THE PROVISIONS OF THE CERTIFIED PLAN FOR SOIL EROSION AND SEDIMENT CONTROL HAVE BEEN COMPLIED WITH FOR PERMANENT MEASURES, ALL SITE WORK FOR SITE PLANS AND ALL WORK AROUND INDIVIDUAL LOTS IN SUBDIVISIONS, WILL HAVE TO BE COMPLETED PRIOR TO THE DISTRICT ISSUING A REPORT OF COMPLIANCE FOR THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY BY THE MUNICIPALITY.
12. CONDUIT OUTLET PROTECTION MUST BE INSTALLED AT ALL REQUIRED OUTFALLS PRIOR TO THE DRAINAGE SYSTEM BECOMING OPERATIONAL.
13. ANY CHANGES TO THE CERTIFIED SOIL EROSION AND SEDIMENT CONTROL PLAN WILL REQUIRE THE SUBMISSION OF REVISED SOIL EROSION AND SEDIMENT CONTROL PLANS TO THE DISTRICT FOR RE-CERTIFICATION. THE REVISED PLANS MUST MEET ALL CURRENT NJ STATE SOIL EROSION & SEDIMENT CONTROL STANDARDS.
14. THE SOMERSET-UNION SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED OF ANY CHANGES IN OWNERSHIP.
15. MULCHING TO THE NJ STANDARDS IS REQUIRED FOR OBTAINING A CONDITIONAL REPORT OF COMPLIANCE. CONDITIONALS ARE ONLY ISSUED WHEN THE SEASON PROHIBITS SEEDING.
16. CONTRACTOR IS RESPONSIBLE FOR KEEPING ALL ADJACENT ROADS CLEAN DURING LIFE OF CONSTRUCTION PROJECT.
17. THE DEVELOPER SHALL BE RESPONSIBLE FOR REMEDIATING ANY EROSION OR SEDIMENT PROBLEMS THAT ARISE AS A RESULT OF ONGOING CONSTRUCTION AT THE REQUEST OF THE SOMERSET-UNION SOIL CONSERVATION DISTRICT.
18. HYDRO SEEDING IS A TWO- STEP PROCESS. THE FIRST STEP INCLUDES SEED, FERTILIZER, LIME, ETC., ALONG WITH MINIMAL AMOUNTS OF MULCH TO PROMOTE CONSISTENCY, GOOD SEED TO SOIL CONTACT, AND GIVE A VISUAL INDICATION OF COVERAGE. UPON COMPLETION OF SEEDING OPERATION, HYDRO-MULCH SHOULD BE APPLIED AT A RATE OF 1500 LBS. PER ACRE IN SECOND STEP. THE USE OF HYDRO-MULCH, AS OPPOSED TO STRAW, IS LIMITED TO OPTIMUM SEEDING DATES AS LISTED IN THE NJ STANDARDS.

SEQUENCE OF CONSTRUCTION:

THIS PROJECT SHALL CONSIST ESSENTIALLY OF THE SEDIMENT REMOVAL AND DISPOSAL, CONSTRUCTION OF AGGREGATE TRAIL AND CONSTRUCTION OF AMENITIES AT CLARK RESERVOIR. THE CONSTRUCTION SHOULD PROCEED IN THE FOLLOWING MANNER:

		DURATION
1.	INSTALLATION OF ALL SEDIMENT AND EROSION CONTROL DEVICES THAT CAN BE PLACED PRIOR TO ANY MAJOR SOIL DISTURBANCES.	5 DAYS
2.	FISH COLLECTION.	15 DAYS
3.	WATER LOWERING OF CLARK RESERVOIR, CREATE AND MAINTAIN TEMPORARY FLOW DIVERSION CHANNEL, EXCAVATE BOTTOM OF POND AS PER PLAN AND DISPOSE SEDIMENT.	12 MONTHS
4.	CLEAR AND REMOVE ALL EXISTING VEGETATION IN THOSE AREAS WHERE NECESSARY. ALL REMAINING VEGETATION TO BE PROPERLY PROTECTED AND TO REMAIN IN ITS NATURAL STATE.	2 MONTHS
5.	IMMEDIATE INSTALLATION OF ALL REMAINING SEDIMENT AND EROSION CONTROL DEVICES.	7 DAYS
6.	CONSTRUCTION OF AGGREGATE TRAIL, PROPOSED BRIDGES, PIERS, DOCKS AND ACCESS ROAD.	12 MONTHS
5.	TOP COURSE AND STRIPING.	10 DAYS
6.	FINE-GRADE REMAINDER OF SITE AND STABILIZE WITH PERMANENT VEGETATIVE COVER AND LANDSCAPING.	30 DAYS
7.	REMOVE ALL SEDIMENT AND EROSION CONTROL DEVICES.	5 DAYS

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

SOIL EROSION AND SEDIMENT CONTROL NOTES

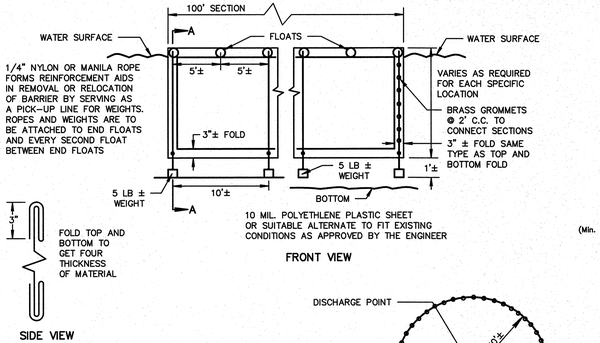
REGISTER NO.

CVE ASSOCIATES
(732) 727 8000 CONSULTING AND MUNICIPAL ENGINEERS (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 7 of 139	

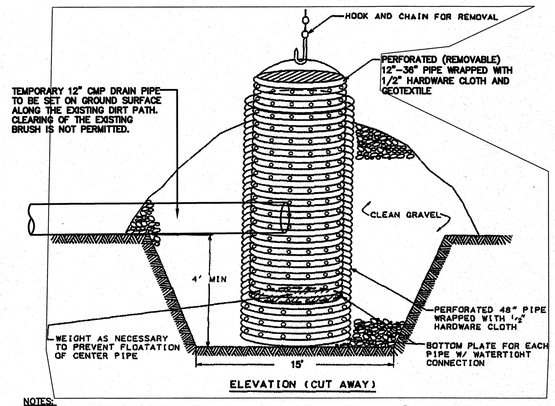


NOTES:

1. AT SHALLOW WATER LOCATIONS THE PLASTIC SHEET OR SUITABLE ALTERNATE MAY BE FASTENED TO STAKES DRIVEN INTO THE BOTTOM IN LIEU OF FLOATS AND WEIGHTS.
2. BARRIER WILL BE SET ON A 50' RADIUS FROM THE POINT OF DISCHARGE WHEN DISCHARGING THROUGH A CONDUIT. IF THE RADIUS CANNOT BE ACCOMMODATED, BARRIER SHALL BE PLACED IN ACCORDANCE WITH NOTE NO. 4 BELOW.
3. BARRIER WILL EXTEND PARALLEL TO THE CHANNEL BANK(S) FOR THE FULL LENGTH OF THE WORK AREA FOR SHORELINE DISTURBANCES.
4. BARRIER WILL EXTEND ACROSS THE ENTIRE CHANNEL WHEN WORK IS PERFORMED WITHIN THE CHANNEL.
5. SILT BARRIER TO PREVENT DRIFTING OF SILT CAUSED BY DISCHARGE OF STORM SEWERS DURING CONSTRUCTION, DREDGING OR FILLING OPERATIONS.
6. EXACT PLACEMENT OF SILT BARRIER SHALL BE SO AS TO EFFECTIVELY CONTROL SILT DISPERSION UNDER THE CONDITIONS PRESENT ON A PARTICULAR PROJECT.
7. THE DETAILS SHOWN ON THIS SHEET ARE SUGGESTED METHODS ONLY. ALTERNATE SOLUTIONS AND USAGE OF MATERIALS MAY BE USED AS APPROVED BY THE ENGINEER.

FLOATING TURBIDITY BARRIER

N.T.S.



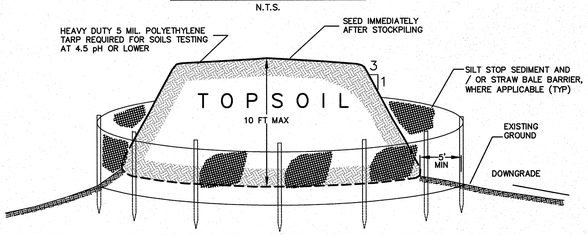
ELEVATION (CUT AWAY)

NOTES:

1. THE OUTER PIPE SHOULD BE 48" DIA. OR SHALL, IN ANY CASE, BE AT LEAST 4" GREATER IN DIAMETER THAN THE CENTER PIPE. THE OUTER PIPE SHALL BE WRAPPED WITH 1/2" HARDWARE CLOTH TO PREVENT BACKFILL MATERIAL FROM ENTERING THE PERFORATIONS.
2. AFTER INSTALLING THE OUTER PIPE, BACKFILL AROUND OUTER PIPE WITH 2" AGGREGATE OR CLEAN GRAVEL.
3. THE INSIDE STAND PIPE (CENTER PIPE) SHOULD BE CONSTRUCTED BY PERFORATING A CORRUGATED OR PVC PIPE BETWEEN 12" AND 36" IN DIAMETER. THE PERFORATIONS SHALL BE 1/2" x 6" SLITS OR 1" DIAMETER HOLES 6" ON CENTER. THE CENTER PIPE SHALL BE WRAPPED WITH 1/2" HARDWARE CLOTH FIRST, THEN WRAPPED AGAIN WITH GEOTEXTILE CLASS E.
4. THE CENTER PIPE SHOULD EXTEND 12" TO 18" ABOVE THE ANTICIPATED WATER SURFACE ELEVATION OR RISER CREST ELEVATION WHEN DEWATERING A BASIN..

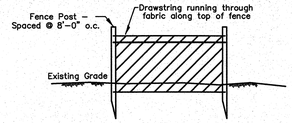
SEDIMENT FILTER STATION

N.T.S.

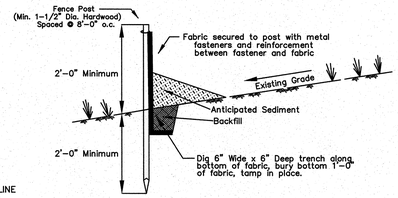


TEMPORARY TOPSOIL STOCKPILE

N.T.S.

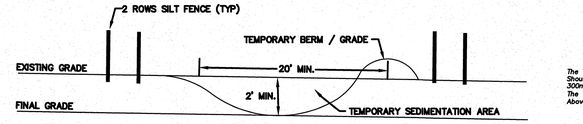


Notes:
1. Propex silt stop to be used as filter barrier around perimeter of any temporary stockpiled soils
2. Propex silt stop to remain until slope has an established cover crop.



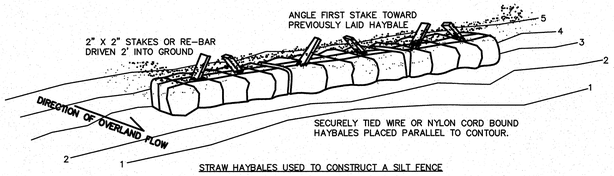
SILT FENCE SEDIMENT BARRIER DETAIL

N.T.S.



TYPICAL SEDIMENTATION AREA CROSS SECTION

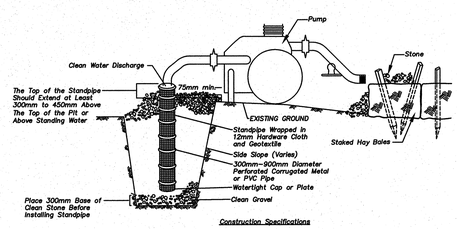
N.T.S.



STRAW HAYBALES USED TO CONSTRUCT A SILT FENCE

STRAW HAYBALE DETAILS

N.T.S.

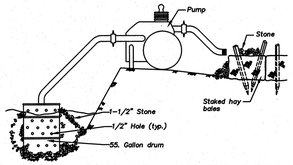


Construction Specifications

1. *Pit dimensions are variable with the minimum diameter being 2 times the standpipe diameter.*
2. *The standpipe should be constructed by perforating a 300mm to 600mm diameter corrugated or PVC pipe. Then wrapping with the 12mm hardware slits or 25mm diameter holes.*
3. *A base filter material consisting of clean gravel or ASTM C 33 stone should be placed in the pit to a depth of 300mm. After installing the standpipe, the pit surrounding the standpipe should then be backfilled with the same filter material.*
4. *The standpipe should extend 300mm to 450mm above the lip of the pit or the riser crest elevation (basin dewatering only) and the filter material should extend 75mm minimum above the anticipated standing water elevation.*

DEEP DEWATERING DETAIL

N.T.S.



SHALLOW DEWATERING DETAIL

N.T.S.

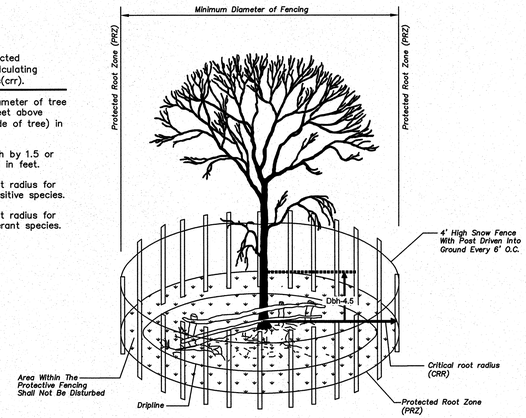
Estimate a tree's Protected Root Zone (PRZ) by calculating the Critical Root Radius(crr).

1. Measure the dbh (diameter of tree at breast height, 4.5 feet above ground on the uphill side of tree) in inches.

2. Multiply measured dbh by 1.5 or 1.0. Express the result in feet.

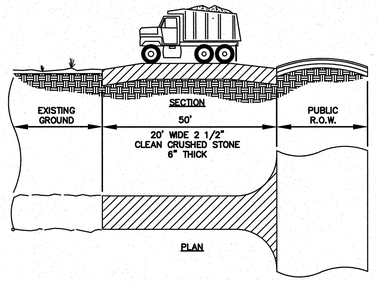
Dbh x 1.5: Critical root radius for older, unhealthy, or sensitive species.

Dbh x 1.0: Critical root radius for younger, healthy or tolerant species.



TREE / ROOT PROTECTION DETAIL

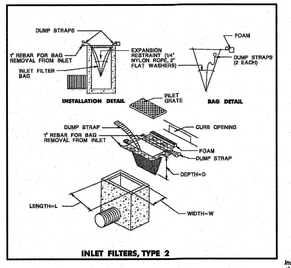
N.T.S.



INLET FILTERS, TYPE 1

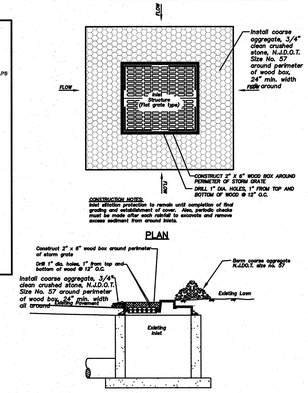
STABILIZED CONSTRUCTION ENTRANCE

N.T.S.



INLET FILTERS, TYPE 2

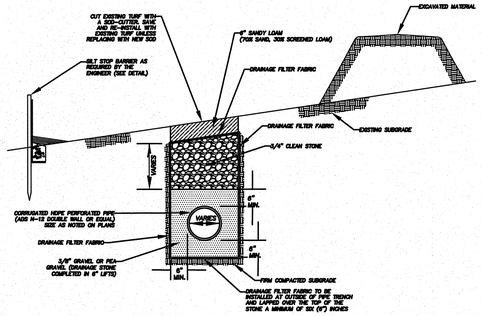
NOTE:
THE CONTRACTOR IS HEREIN ADVISED THAT SELECTION OF THE TYPE OF INLET SILTATION PROTECTION SHALL RECEIVE FINAL APPROVAL FROM THE ENGINEER AND FREEHOLD SOIL CONSERVATION DISTRICT PRIOR TO INSTALLATION. THE TYPE OF INLET PROTECTION DESIGN SELECTED MAY VARY DEPENDING ON THE LOCATION AND SURROUNDING CONDITIONS OF STORM SEWER INLETS ENCOUNTERED WITHIN THE PROJECT LIMITS. THE METHOD OF INLET PROTECTION SHALL INSURE THAT TRAFFIC WILL NOT DESTROY OR CAUSE CONSTANT MAINTENANCE, A TRAFFIC HAZARD WILL NOT BE CREATED OR A FLOODING PROBLEM WILL NOT BE CREATED.



STONE INLET FILTER

INLET SILTATION PROTECTION DETAILS

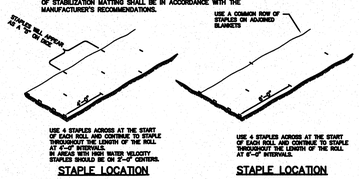
N.T.S.



TYPICAL PIPE BEDDING / BACKFILL TRENCHING DETAIL

N.T.S.

SOIL / SLOPE STABILIZATION MATTING SHALL BE REQUIRED FOR ALL DISTURBED AREAS WHERE THE GRADIENT IS 3 TO 1 OR GREATER, OR WHERE SAME IS DEEMED NECESSARY BY THE ENGINEER AND SOMERSET / UNION SOIL CONSERVATION DISTRICT REPRESENTATIVES DURING THE COURSE OF CONSTRUCTION. THE MATTING SHALL BE AS MANUFACTURED BY AMERICAN EXCELSIOR COMPANY, KNOWN AS AMOCO "CURLEX" EROSION CONTROL BLANKETS OR APPROVED EQUAL. INSTALLATION AND SECURING OF STABILIZATION MATTING SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.



EXCELSIOR MATTING FOR SOIL STABILIZATION

N.T.S.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVISED
1.	REVISED FOR RE-BID	04/02/2025	TEDK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

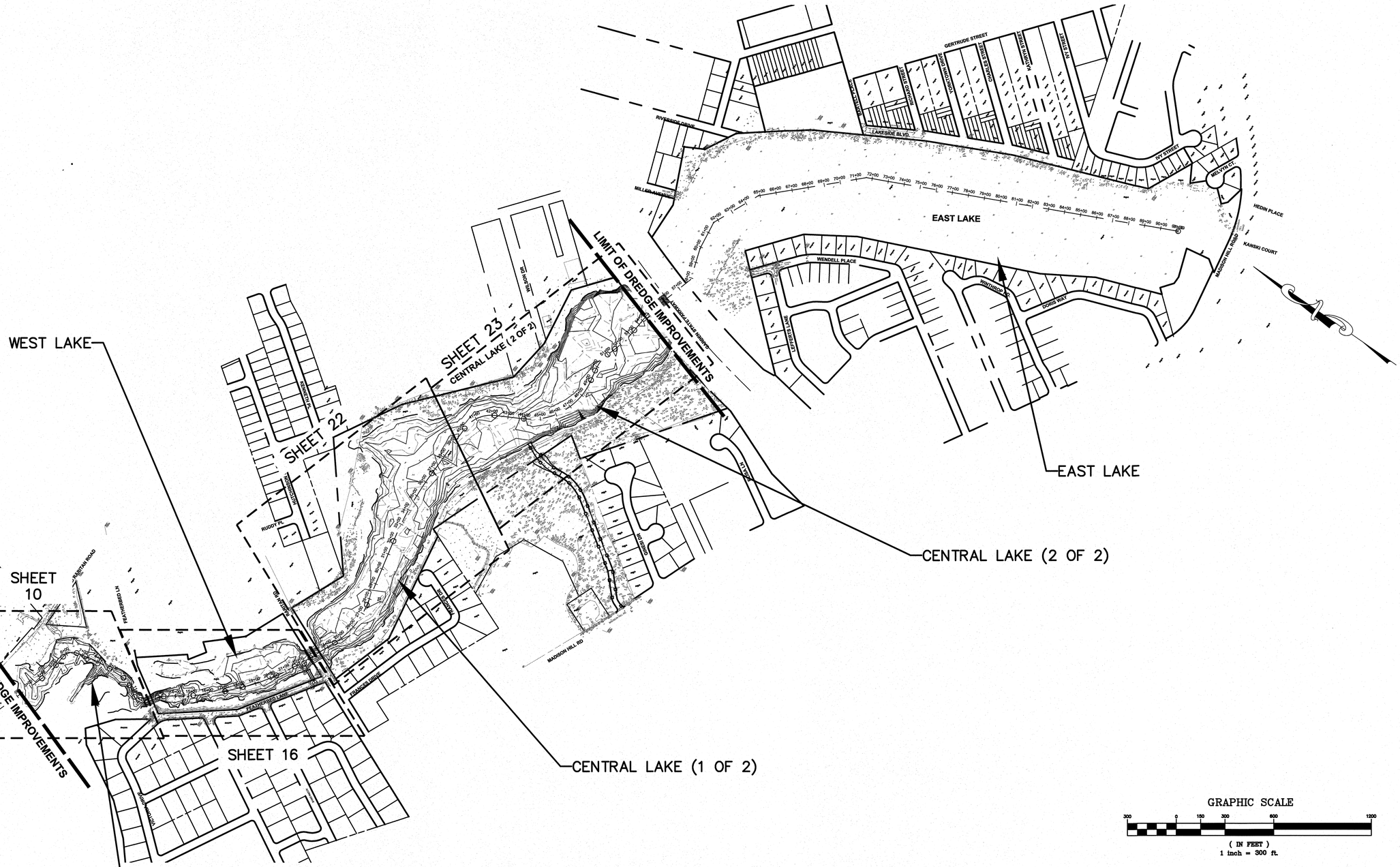
SOIL EROSION AND SEDIMENT CONTROL DETAILS

CME ASSOCIATES
(732) 727 8000 CONSULTING AND MUNICIPAL ENGINEERS (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO. FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 8 of 139	



GRAPHIC SCALE

300 0 150 300 600 1200

(IN FEET)
1 inch = 300 ft.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	APPROVED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

OVERALL PLAN AND KEYMAP

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 9 of 139	

REGISTER NO.

FILE NO. 115.UN00213.P05

GENERAL NOTES:

1. THE COORDINATION OF THE LOCATION OR RELOCATION WHERE REQUIRED OF TELEPHONE, ELECTRIC, CABLE TELEVISION, GAS, AND WATER FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR AND SAME SHALL BE COORDINATED TO INSURE COMPLETION WITHIN THE TIME PERMITTED.

2. ALL WORK TO BE PERFORMED SHALL BE IN ACCORDANCE WITH NJAC 7:13-12.15 'REQUIREMENTS FOR SEDIMENT AND DEBRIS REMOVAL'.

3. STOCKPILING OF DREDGE MATERIALS WILL NOT BE PERMITTED OUTSIDE OF PROJECT'S LIMIT OF DISTURBANCE.

4. SEDIMENT MUST BE PREVENTED FROM TRAVELING DOWNSTREAM AND ENTERING EAST LAKE (GARDEN STATE PARKWAY TO MADISON HILL ROAD) OR A PREVIOUSLY DREDGED PORTION OF THE HEADWATERS, WEST LAKE, OR CENTRAL LAKE DURING DREDGING OPERATIONS.

5. ADDITIONAL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AS DEEMED NECESSARY BY THE SOIL CONSERVATION DISTRICT OR ENGINEER.

6. SITE LOCATION: CLARK RESERVOIR, CLARK NJ, 07066, BLOCK: 33, LOT: 5
   OWNER: UNION COUNTY, 10 ELIZABETHTOWN PLAZA, ELIZABETH NJ, 07202

7. EXISTING HARD BOTTOM AND TOP OF SEDIMENT ELEVATIONS ARE BASED ON BATHYMETRY DATED JUNE 2023. EXCAVATION DATA IS ESTIMATED AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY AND CONFIRM REQUIRED EXCAVATION PRIOR TO BIDDING. THE CONTRACTOR CAN CONTACT THE BOROUGH ENGINEERS DEPARTMENT IN ORDER TO SCHEDULE ACCESS THE LAKE TO CONFIRM ANY DATA PRIOR TO BIDDING.

8. APPROXIMATELY 154,000 CUBIC YARDS OF SEDIMENT MATERIAL ARE TO BE REMOVED FROM THE RESERVOIR. THE VOLUME OF SEDIMENT MATERIAL IS BASED ON CROSS SECTION AVERAGE END AREA METHOD AND EXCLUDING ANY SWELL AND SHRINKAGE ADJUSTMENT FACTOR.

9. THE LIMITS OF THE FLOODWAY FOR THE CLARK RESERVOIR WERE OBTAINED FROM THE FLOOD INSURANCE RATE MAPS, MAP #34039C0031F, MAP #34039C0042F, AND MAP #34039C0043F, EFFECTIVE DATE SEPTEMBER 20, 2006.

10. THE THE LIMIT OF THE FLOOD HAZARD AREA FOR THE CLARK RESERVOIR WAS DETERMINED BY METHOD 3 (FEMA FLUVIAL METHOD) AS DESCRIBED AT N.J.A.C. 7:13-3.4(e). FEMA 1% CHANCE (100-YEAR) WATER SURFACE ELEVATIONS WERE OBTAINED FROM THE FLOOD PROFILES FOR ROBINSONS BRANCH INCLUDED IN VOLUME 2 OF 2 OF THE EFFECTIVE FLOOD INSURANCE STUDY FOR UNION COUNTY, NEW JERSEY, EFFECTIVE DATE SEPTEMBER 20, 2006. THE FLOOD HAZARD AREA FLOOD ELEVATION IS EQUAL TO THREE FEET ABOVE THE FEMA 1% CHANCE (100-YEAR) FLOOD ELEVATION.

- FEMA WATER ELEVATION FOR 100 YEAR STORM = 48.3
- FLOOD HAZARD AREA FLOOD ELEVATION = 51.3

11. SPOILS FROM LAKE EXCAVATION SHALL BE TRUCKED OFF SITE AND ARE THE RESPONSIBILITY OF THE CONTRACTOR TO DISPOSE OF IN ACCORDANCE WITH ANY STATE REGULATIONS.

12. FISH SALVAGING AND REPLENISHMENT DURING DEWATERING AND CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH THE NEW JERSEY DIVISION OF FISH AND WILDLIFE AND IN ACCORDANCE WITH THE LAKE LOWERING PERMIT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SALVAGING AND REPLENISHMENT OPERATIONS.

REFERENCE:

ALL LOCATIONS AND TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

SEED MIXTURE FOR STREAMBANK STABILIZATION

1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVE STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

NOTE:

DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

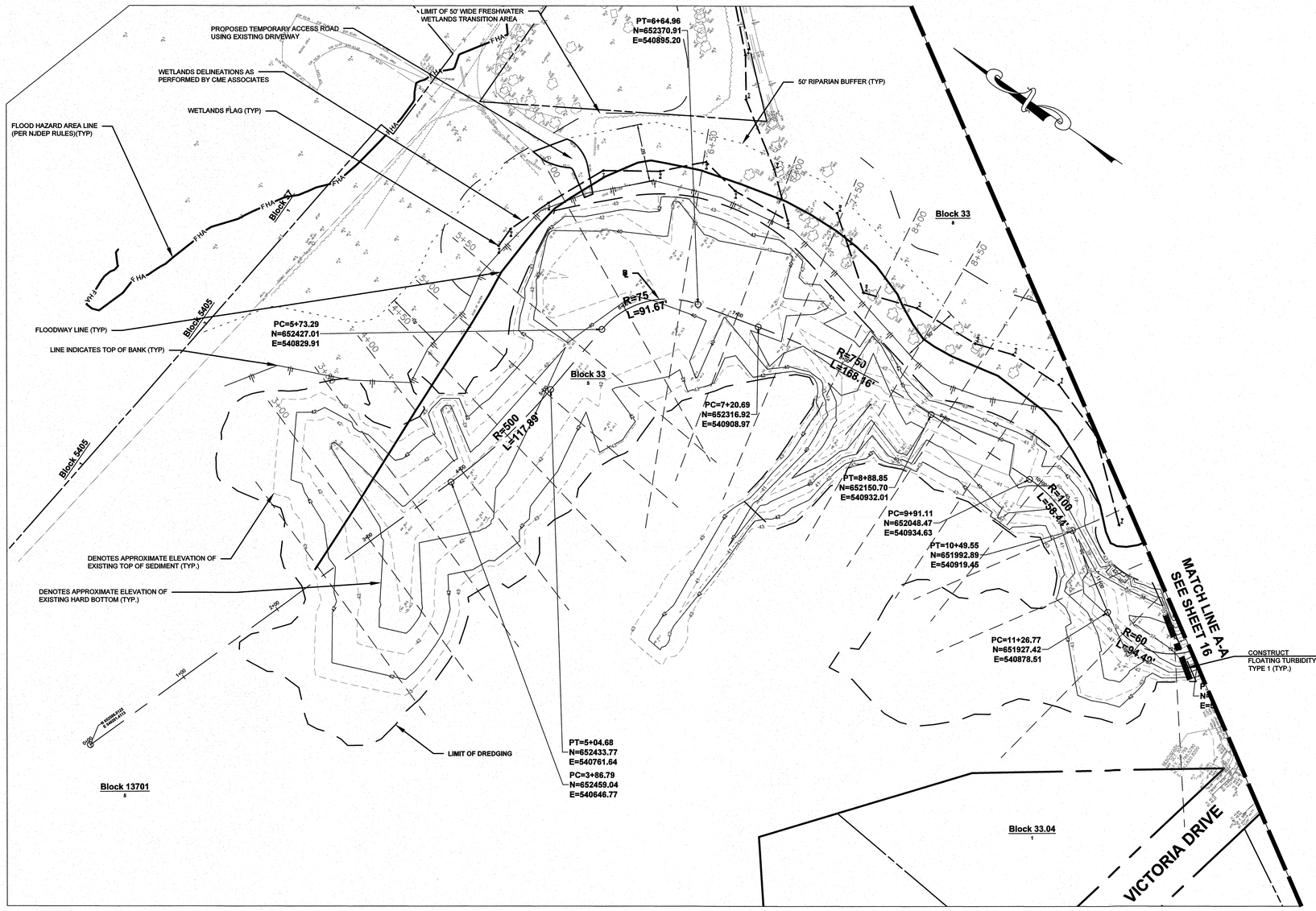
NOTE:

SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

SEDIMENT LEGEND

- - - - - - - - - DENOTES APPROXIMATE ELEVATION OF EXISTING TOP OF SEDIMENT

——————— DENOTES APPROXIMATE ELEVATION OF EXISTING HARD BOTTOM



GRAPHIC SCALE

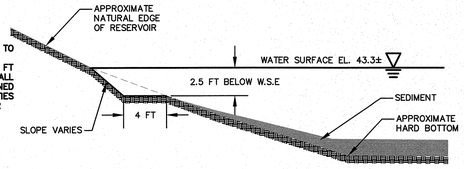
50 0 25 50 100 200

(IN FEET)

1 inch = 50 ft.

NOTE:

- UPPER LEDGE OMITTED DUE TO RIPARIAN IMPACTS
- SAFETY LEDGE, 4 FT WIDE, 2.5 FT BELOW W.S.E. SAFETY LEDGE SHALL BE CONSTRUCTED AND MAINTAINED ADJACENT TO LAND AND PROPERTIES AROUND PERIMETER OF RESERVOIR



TYPICAL RESERVOIR CROSS SECTION DETAIL

N.T.S.

HEAD WATERS CLARK RESERVOIR (ROBINSON BRANCH) DREDGING PLANS

Pay Item Number	To Be Constructed	Unit	Plan Quantity
6	Floating turbidity barrier, type 1	LF	61
27	Fish Collection, Relocation, and Restocking	LS	LS
28	Lake excavation including lake lowering, dewatering, and transportation and disposal of dredge spoils	CY	4719
29	Maintenance of Temporary Flow Diversion Channel	LS	LS

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVIEWED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

HEAD WATERS CLARK RESERVOIR (ROBINSON BRANCH)

DREDGING PLAN

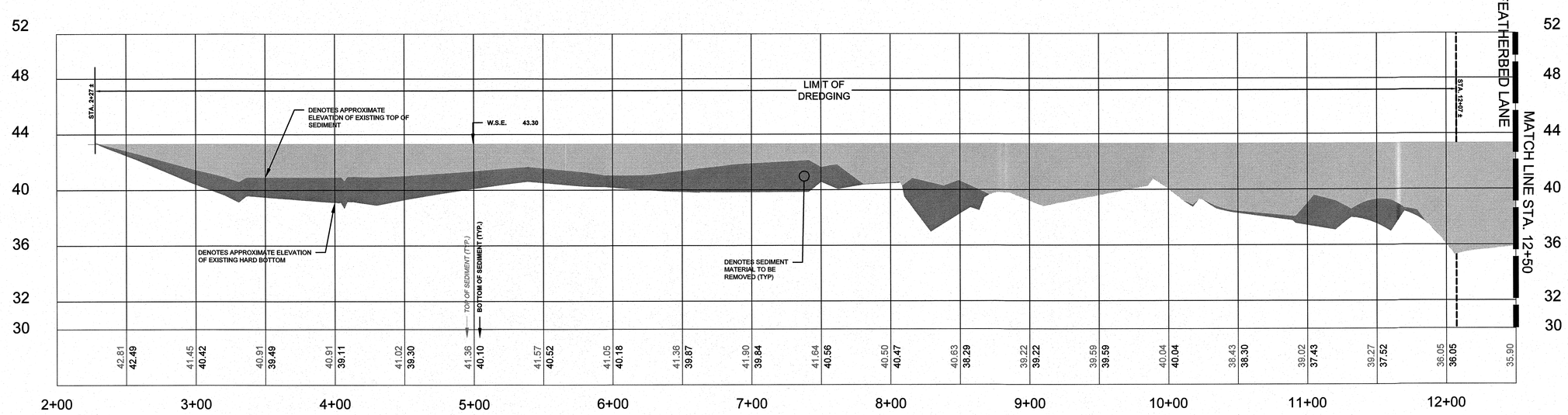
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

REGISTER NO.

FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY	DESIGNED BY	
TE	GO / PB	
CHECKED BY	SHEET	
PB	10 of 139	



HEAD WATERS CLARK RESERVOIR (ROBINSON BRANCH) RESERVOIR PROFILE ALONG B.L.

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=40' (HORZ.)
1"=4' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	APPROVED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

HEAD WATERS CLARK RESERVOIR (ROBINSON BRANCH) RESERVOIR PROFILE

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

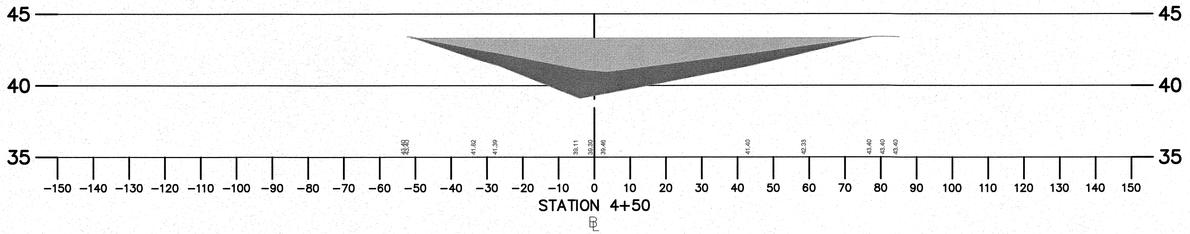
11.1.24

SCALE	DATE
As Shown	October 2024
DRAWN BY: TE	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 11 of 139

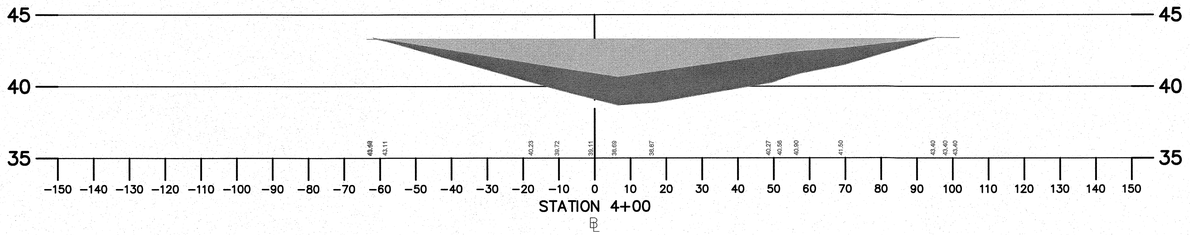
DRAWING NUMBER

REGISTER NO.

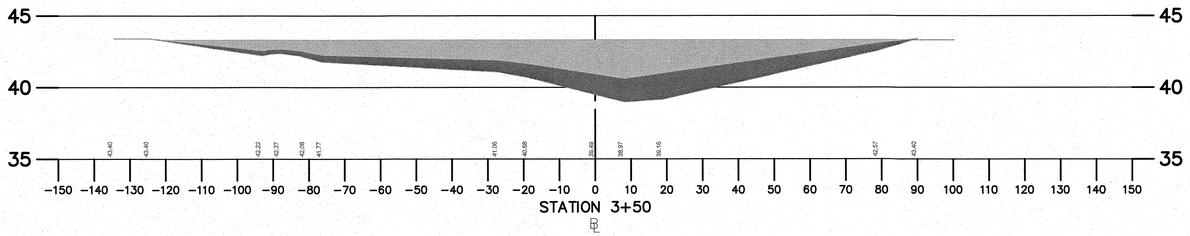
FILE NO. 115.UN00213.P05



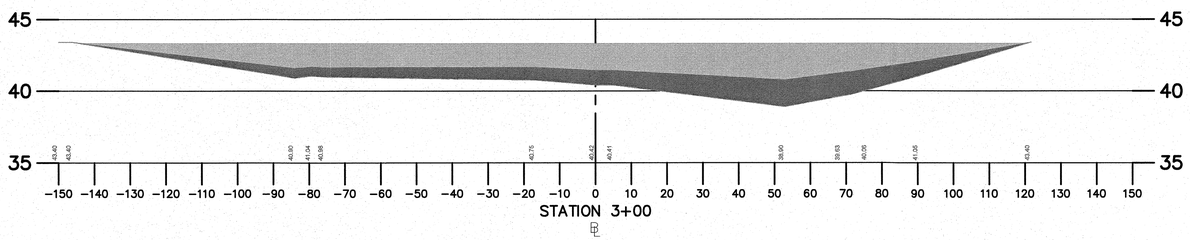
STATION 4+50



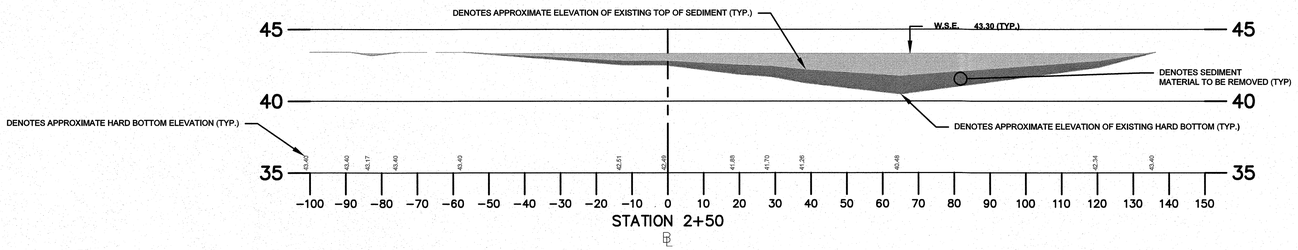
STATION 4+00



STATION 3+50



STATION 3+00



STATION 2+50

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

HEAD WATERS CLARK RESERVOIR (ROBINSON BRANCH) CROSS SECTIONS

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	APPROVED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

HEAD WATERS CLARK RESERVOIR (ROBINSON BRANCH)

RESERVOIR CROSS SECTIONS (1 OF 4) STA. 2+50 TO 4+50

CVE ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

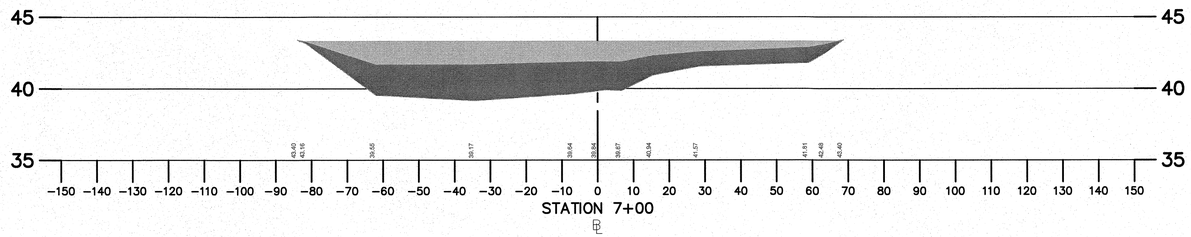
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY: TE	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 12 of 139

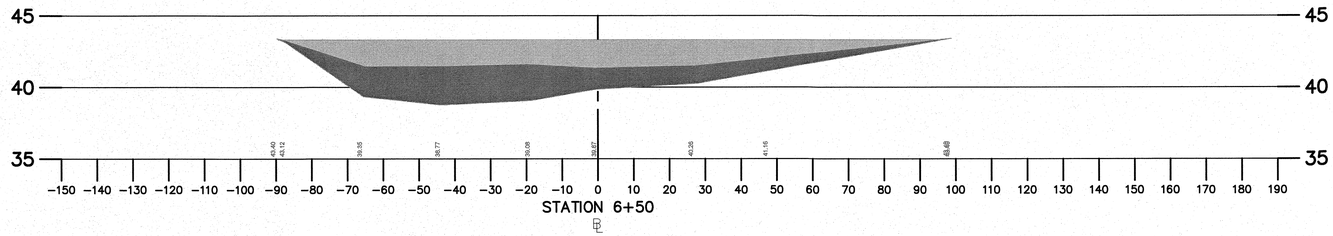
DRAWING NUMBER

REGISTER NO.

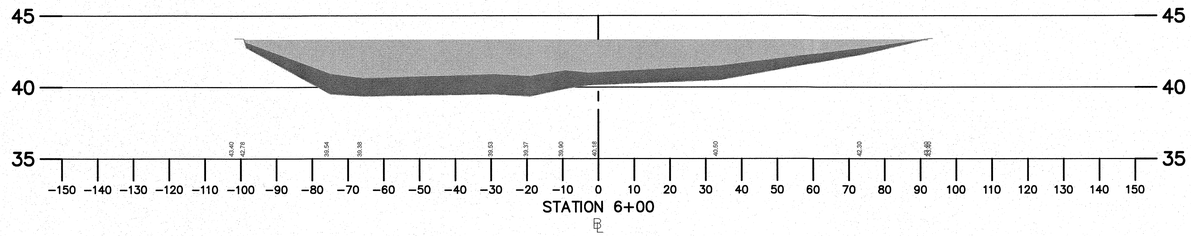
FILE NO. 115.UN00213.P05



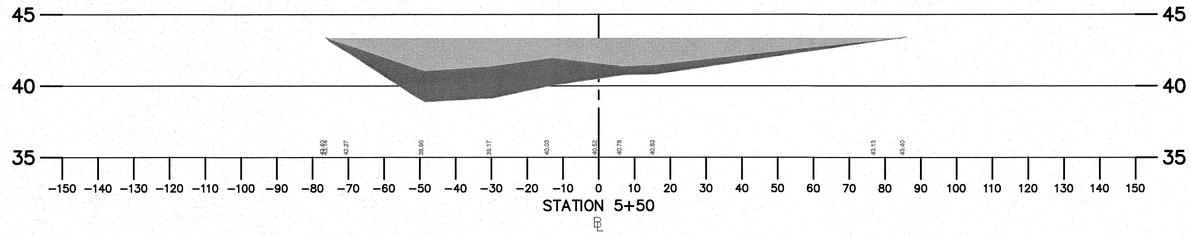
STATION 7+00



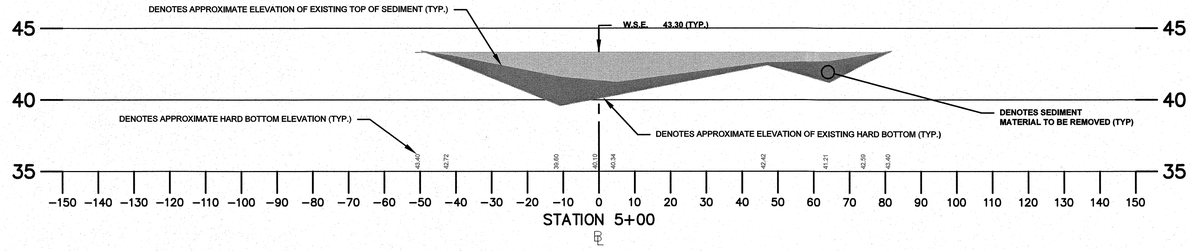
STATION 6+50



STATION 6+00



STATION 5+50



STATION 5+00

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

HEAD WATERS CLARK RESERVOIR (ROBINSON BRANCH) CROSS SECTIONS

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	APPROVED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

HEAD WATERS CLARK RESERVOIR (ROBINSON BRANCH) RESERVOIR CROSS SECTIONS (2 OF 4) STA. 5+00 TO 7+00

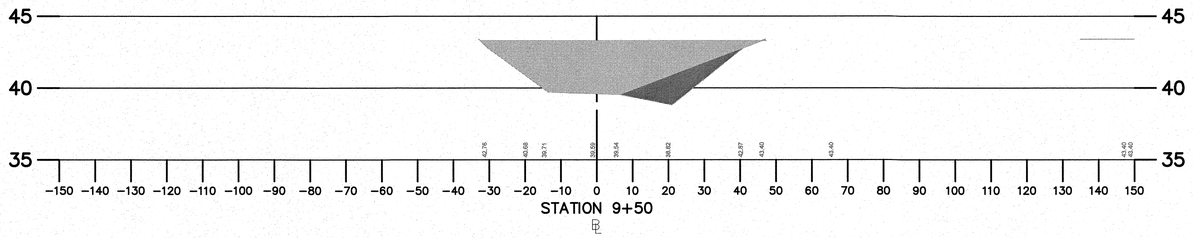
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

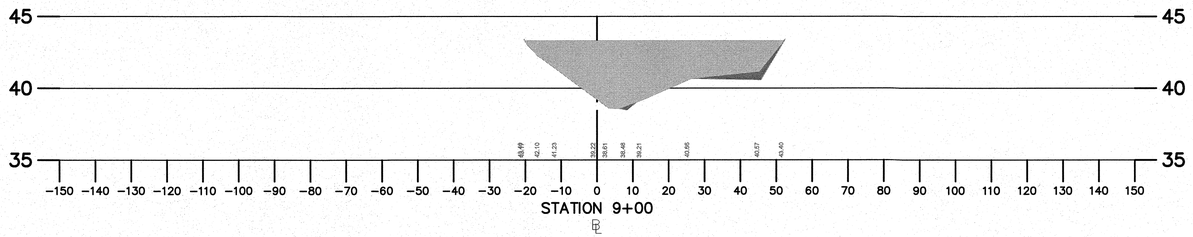
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

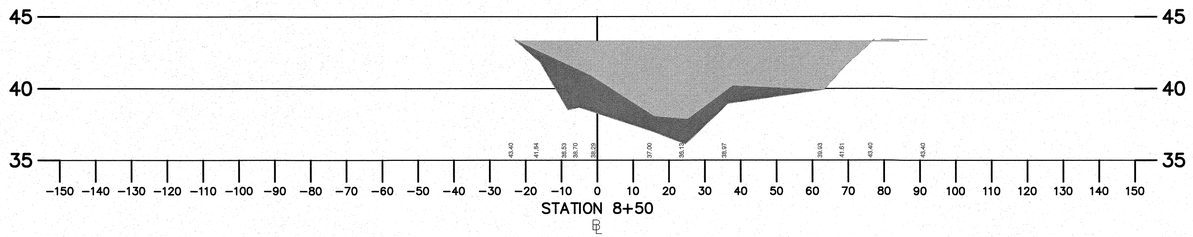
SCALE	DATE
As Shown	October 2024
DRAWN BY: TE	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 13 of 139

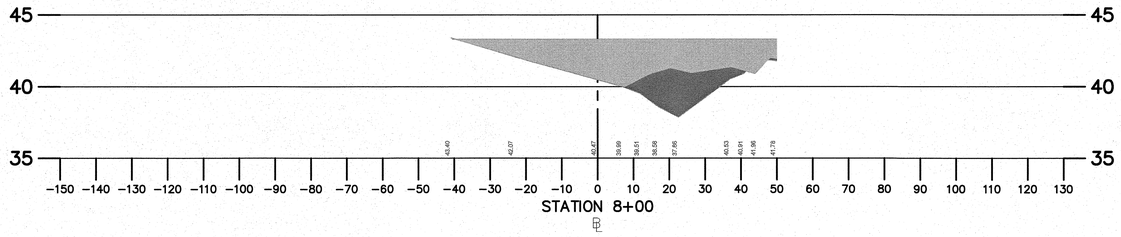
DRAWING NUMBER

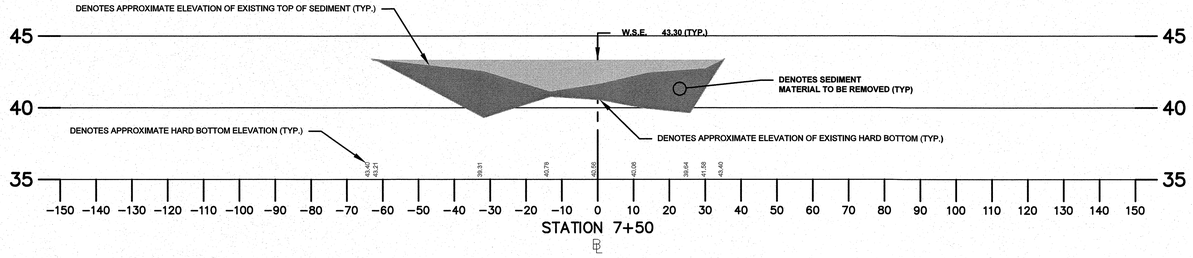
PROJECT NO. 115.UN00213.P05











LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

HEAD WATERS CLARK RESERVOIR (ROBINSON BRANCH) CROSS SECTIONS

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVISIONS
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

HEAD WATERS CLARK RESERVOIR (ROBINSON BRANCH) RESERVOIR CROSS SECTIONS (3 OF 4) STA. 7+50 TO 9+50

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

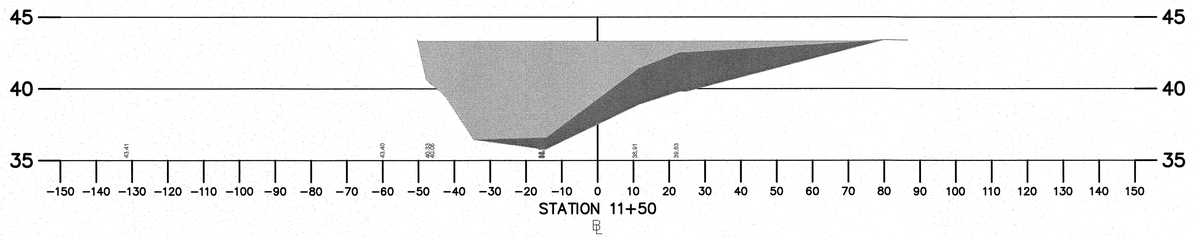
REGISTRATION NO.

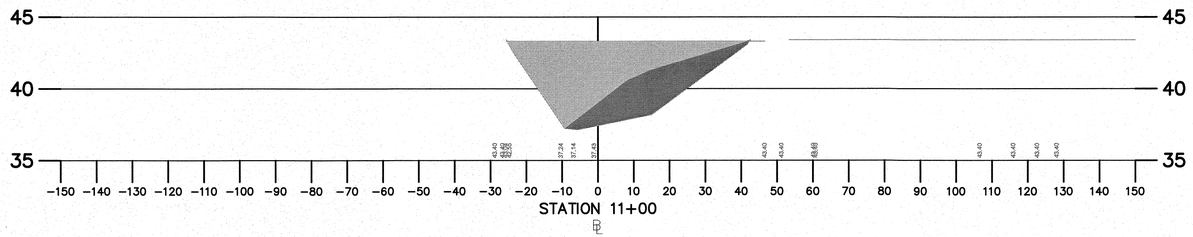
FILE NO. 115.UN00213.P05

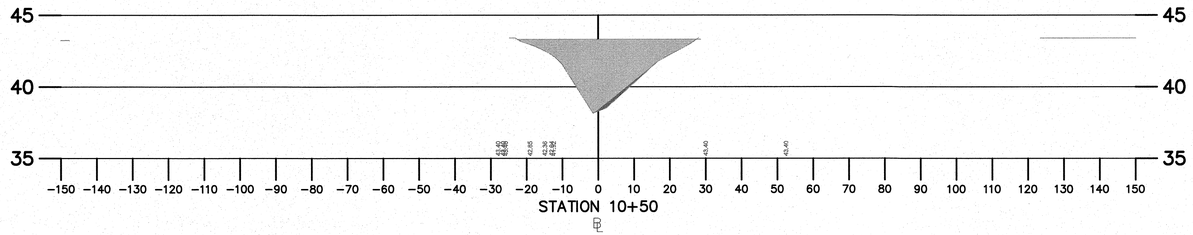
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

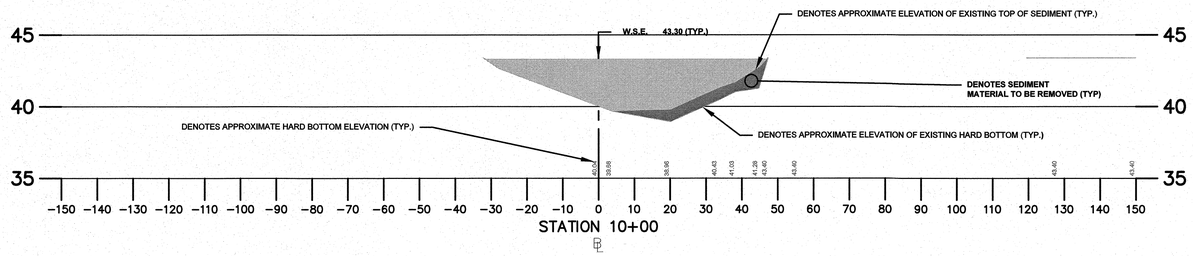
SCALE	DATE
As Shown	October 2024
DRAWN BY	DESIGNED BY
TE	GO / PB
CHECKED BY	SHEET
PB	14 of 139

DRAWING NUMBER









HEAD WATERS CLARK RESERVOIR (ROBINSON BRANCH) CROSS SECTIONS

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

HEAD WATERS CLARK RESERVOIR (ROBINSON BRANCH)

RESERVOIR CROSS SECTIONS (4 OF 4) STA. 10+50 TO 11+50

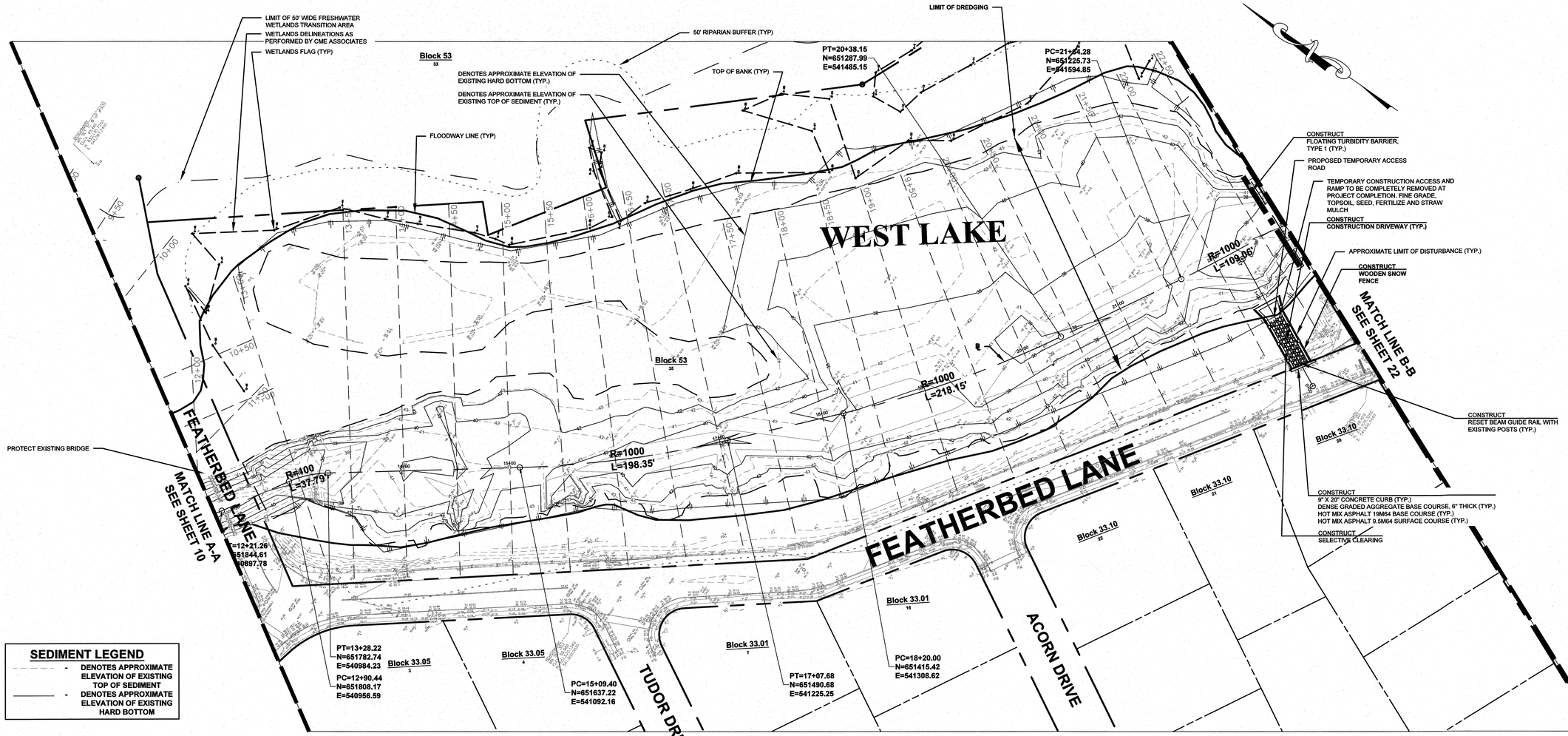
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28339000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 15 of 139	

REGISTER NO.

FILE NO. 115.UN00213.P05



SEDIMENT LEGEND

- - - - - - - DENOTES APPROXIMATE ELEVATION OF EXISTING TOP OF SEDIMENT
——— DENOTES APPROXIMATE ELEVATION OF EXISTING HARD BOTTOM

GENERAL NOTES:

1. THE COORDINATION OF THE LOCATION OR RELOCATION WHERE REQUIRED OF TELEPHONE, ELECTRIC, CABLE TELEVISION, GAS, AND WATER FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR AND SAME SHALL BE COORDINATED TO INSURE COMPLETION WITHIN THE TIME PERMITTED.
2. ALL WORK TO BE PERFORMED SHALL BE IN ACCORDANCE WITH NJAC 7:13-12.15 'REQUIREMENTS FOR SEDIMENT AND DEBRIS REMOVAL'.
3. STOCKPILING OF DREDGE MATERIALS WILL NOT BE PERMITTED OUTSIDE OF THE PROJECT'S LIMIT OF DISTURBANCE.
4. SEDIMENT MUST BE PREVENTED FROM TRAVELING DOWNSTREAM AND ENTERING EAST LAKE (GARDEN STATE PARKWAY TO MADISON HILL ROAD) OR A PREVIOUSLY DREDGED PORTION OF THE HEADWATERS, WEST LAKE, OR CENTRAL LAKE DURING DREDGING OPERATIONS.
5. ADDITIONAL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AS DEEMED NECESSARY BY THE SOIL CONSERVATION DISTRICT OR ENGINEER.
6. SITE LOCATION: CLARK RESERVOIR, CLARK NJ, 07066, BLOCK: 53, LOT: 35 — OWNER: UNION COUNTY, 10 ELIZABETHTOWN PLAZA, ELIZABETH NJ, 07202
7. EXISTING HARD BOTTOM AND TOP OF SEDIMENT ELEVATIONS ARE BASED ON BATHYMETRY DATED JUNE 2023. EXCAVATION DATA IS ESTIMATED AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY AND CONFIRM REQUIRED EXCAVATION PRIOR TO BIDDING. THE CONTRACTOR CAN CONTACT THE BOROUGH ENGINEERS DEPARTMENT IN ORDER TO SCHEDULE ACCESS THE LAKE TO CONFIRM ANY DATA PRIOR TO BIDDING.
8. APPROXIMATELY 154,000 CUBIC YARDS OF SEDIMENT MATERIAL ARE TO BE REMOVED FROM THE RESERVOIR. THE VOLUME OF SEDIMENT MATERIAL IS BASED ON CROSS SECTION AVERAGE END AREA METHOD AND EXCLUDING ANY SWELL AND SHRINKAGE ADJUSTMENT FACTOR.
9. THE LIMITS OF THE FLOODWAY FOR THE CLARK RESERVOIR WERE OBTAINED FROM THE FLOOD INSURANCE RATE MAPS, MAP #34039C0031F, MAP #34039C0042F, AND MAP #34039C0043F, EFFECTIVE DATE SEPTEMBER 20, 2006.
10. THE THE LIMIT OF THE FLOOD HAZARD AREA FOR THE CLARK RESERVOIR WAS DETERMINED BY METHOD 3 (FEMA FLUVIAL METHOD) AS DESCRIBED AT N.J.A.C. 7:13-3.4(e). FEMA 1% CHANCE (100-YEAR) WATER SURFACE ELEVATIONS WERE OBTAINED FROM THE FLOOD PROFILES FOR ROBINSONS BRANCH INCLUDED IN VOLUME 2 OF 2 OF THE EFFECTIVE FLOOD INSURANCE STUDY FOR UNION COUNTY, NEW JERSEY, EFFECTIVE DATE SEPTEMBER 20, 2006. THE FLOOD HAZARD AREA FLOOD ELEVATION IS EQUAL TO THREE FEET ABOVE THE FEMA 1% CHANCE (100-YEAR) FLOOD ELEVATION.
    - FEMA WATER ELEVATION FOR 100 YEAR STORM = 47.4
    - FLOOD HAZARD AREA FLOOD ELEVATION = 50.4
11. SPOILS FROM LAKE EXCAVATION SHALL BE TRUCKED OFF SITE AND ARE THE RESPONSIBILITY OF THE CONTRACTOR TO DISPOSE OF IN ACCORDANCE WITH ANY STATE REGULATIONS.
12. FISH SALVAGING AND REPLENISHMENT DURING DEWATERING AND CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH THE NEW JERSEY DIVISION OF FISH AND WILDLIFE AND IN ACCORDANCE WITH THE LAKE LOWERING PERMIT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SALVAGING AND REPLENISHMENT OPERATIONS.

REFERENCE:
ALL LOCATIONS AND TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

NOTE:
SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

NOTE:
THE CONTRACTOR IS ADVISED THAT THE PROPOSED WOODEN SNOW FENCE SHALL BE INSTALLED AT THE DRIPLINE OF THE EXISTING TREES TO BE PROTECTED ADJACENT TO THE THE PROPOSED ACCESS ROADWAY.

NOTE:
AREA OF SILT ON NORTH SIDE OF WEST LAKE FROM APPROXIMATE STA. 13+50 TO 17+00 IS APPROXIMATE ONLY SINCE ACCESS TO THIS AREA AT THE TIME OF FIELD SURVEY WAS NOT POSSIBLE. QUANTITY FOR DREDGING IN THIS AREA WILL BE BASED ON IN PLACE MEASUREMENT BY THE COUNTY DURING CONSTRUCTION.

SEED MIXTURE FOR STREAMBANK STABILIZATION

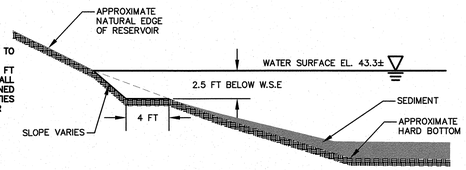
1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVE STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

NOTE:
DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

WEST LAKE DREDGING PLANS

Pay Item Number	To Be Constructed	Unit	Plan Quantity
6	Floating Turbidity Barrier, Type 1	LF	100
7	Construction Driveway	TON	35
27	Fish Collection, Relocation, and Restocking	LS	LS
28	Lake Excavation including Lake Lowering, Dewatering, and Transportation and Disposal of Dredge Spoils	CY	11936
29	Maintenance of Temporary Flow Diversion Channel	LS	LS
33	Dense Graded Aggregate Base Course	CY	1
38	Hot Mix Asphalt 9.5M64 Surface Course	TON	1
39	Hot Mix Asphalt 19M64 Base Course	TON	2
144	Wooden Snow Fence	LF	134
153	9"x20" Concrete Vertical Curb	LF	25
156	Reset Beam Guide Rail with Existing Posts	LF	45
231	Selective Clearing	SY	103

NOTE:
- UPPER LEDGE OMITTED DUE TO RIPARIAN IMPACTS
- SAFETY LEDGE, 4 FT WIDE, 2.5 FT BELOW W.S.E; SAFETY LEDGE SHALL BE CONSTRUCTED AND MAINTAINED ADJACENT TO LAND AND PROPERTIES AROUND PERIMETER OF RESERVOIR



TYPICAL RESERVOIR CROSS SECTION DETAIL

N.T.S.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVIEWED
1.	REVISED FOR RE-BID	04/02/2026	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

WEST LAKE — DREDGING PLAN

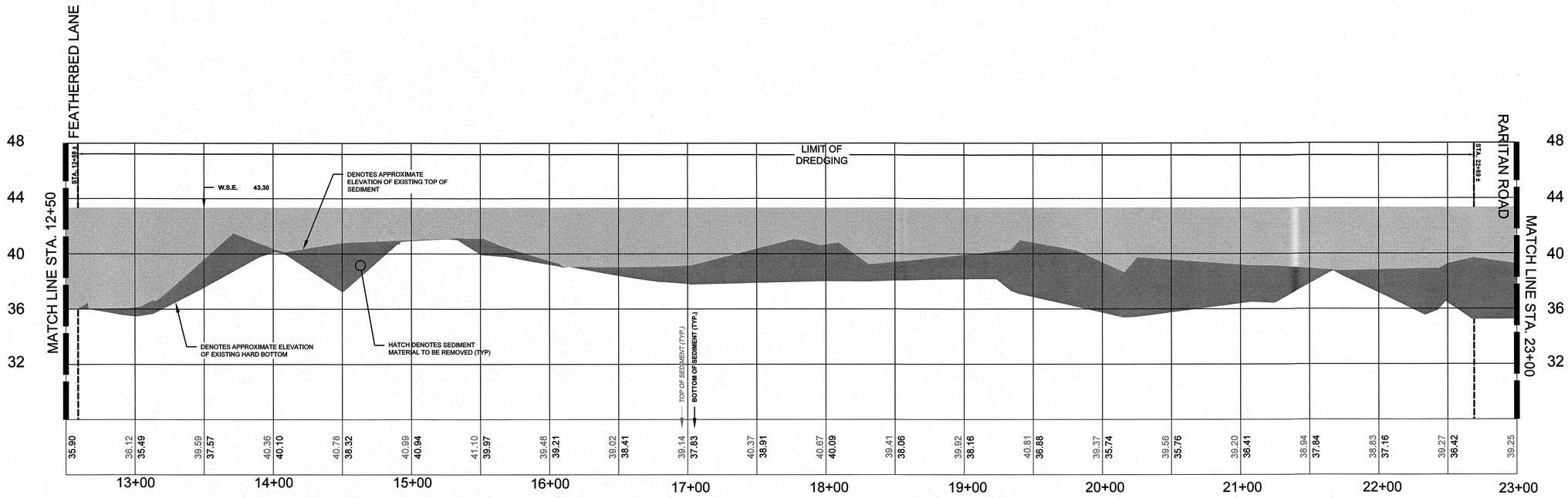
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28059000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY: TE	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 16 of 139

DRAWING NUMBER

REGISTER NO.

FILE NO. 115.UN00213.P05



WEST LAKE
RESERVOIR PROFILE
ALONG B.L.

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=40' (HORZ.)
1"=4' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REMARKS
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

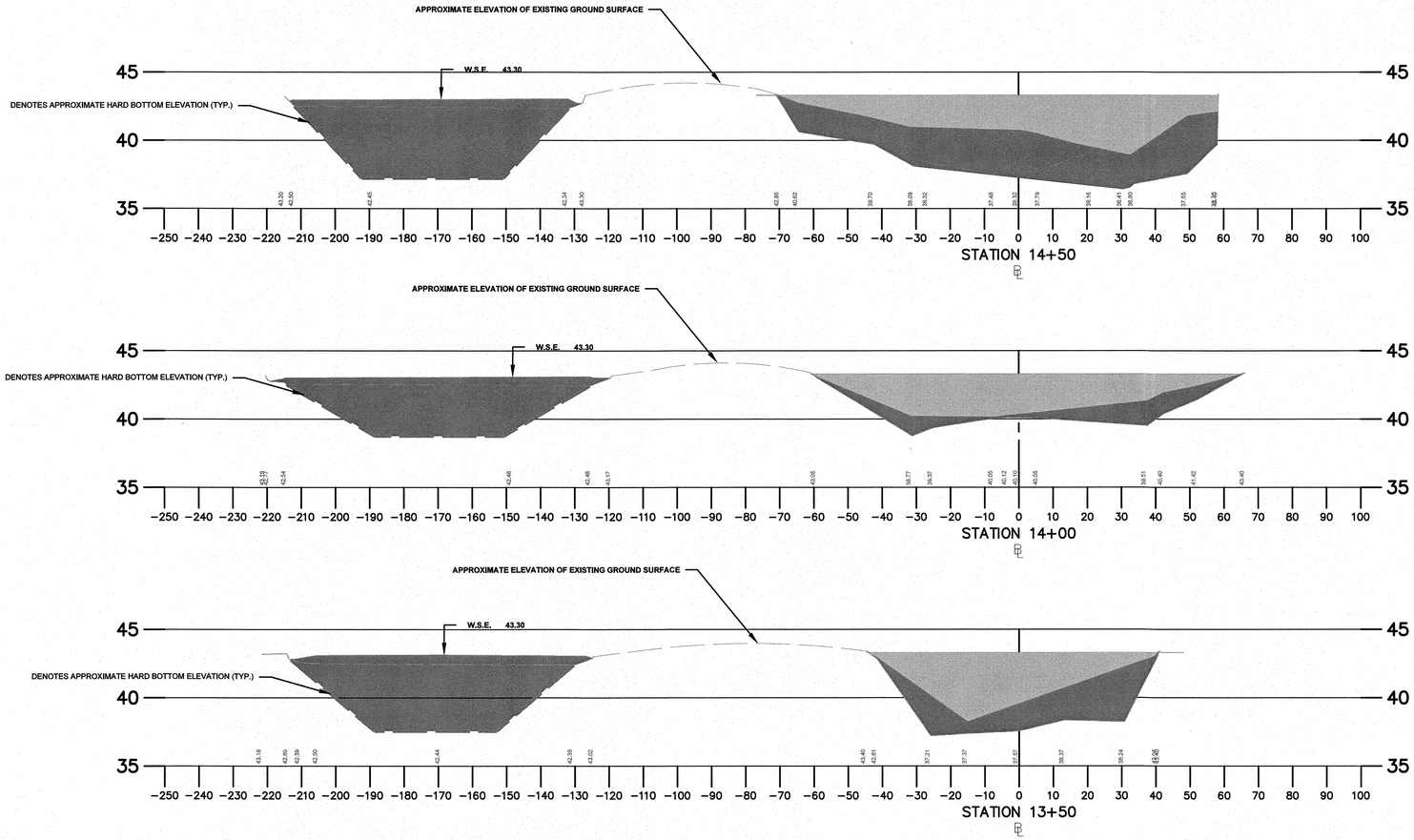
WEST LAKE RESERVOIR PROFILE

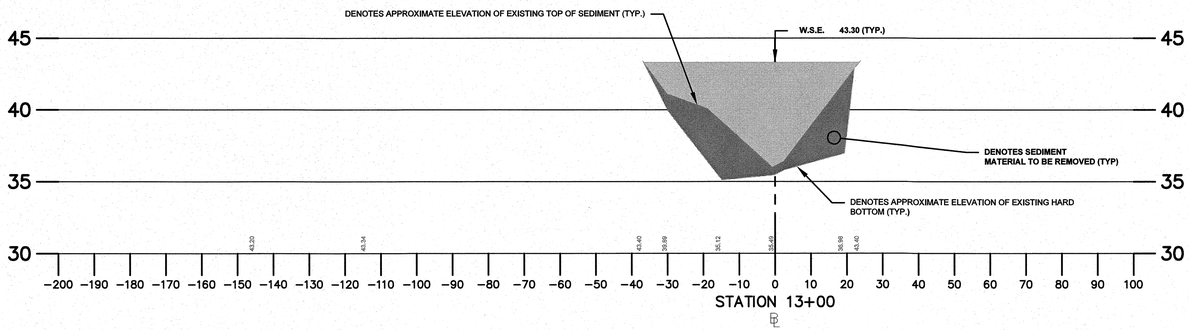
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY	DESIGNED BY
TE	GO / PB
CHECKED BY	SHEET
PB	17 of 139

REGISTER NO.
FILE NO. 115.UN00213.P05
DRAWING NUMBER





WEST LAKE CROSS SECTIONS

NOTE:
AREA OF SILT ON NORTH SIDE OF WEST LAKE FROM APPROXIMATE STA. 13+50 TO 17+00 IS APPROXIMATE ONLY SINCE ACCESS TO THIS AREA AT THE TIME OF FIELD SURVEY WAS NOT POSSIBLE. QUANTITY FOR DREDGING IN THIS AREA WILL BE BASED ON IN PLACE MEASUREMENT BY THE COUNTY DURING CONSTRUCTION.

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

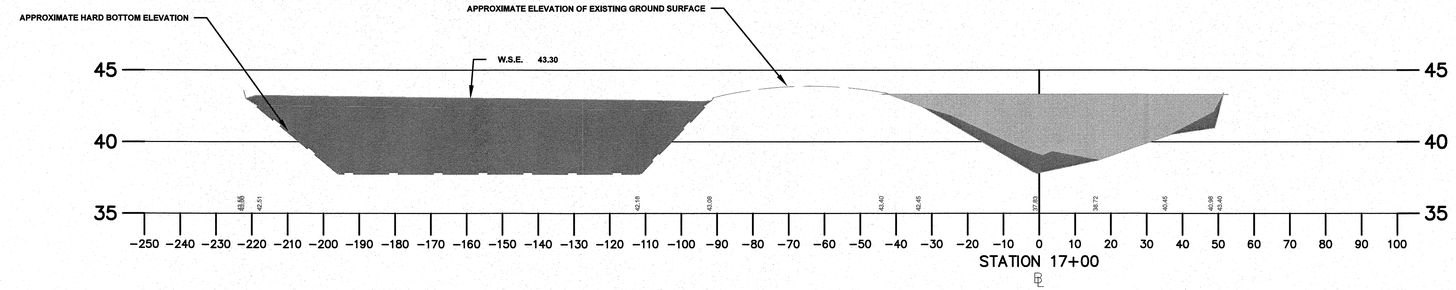
WEST LAKE RESERVOIR CROSS SECTIONS (1 OF 4) STA. 13+00 TO 14+50

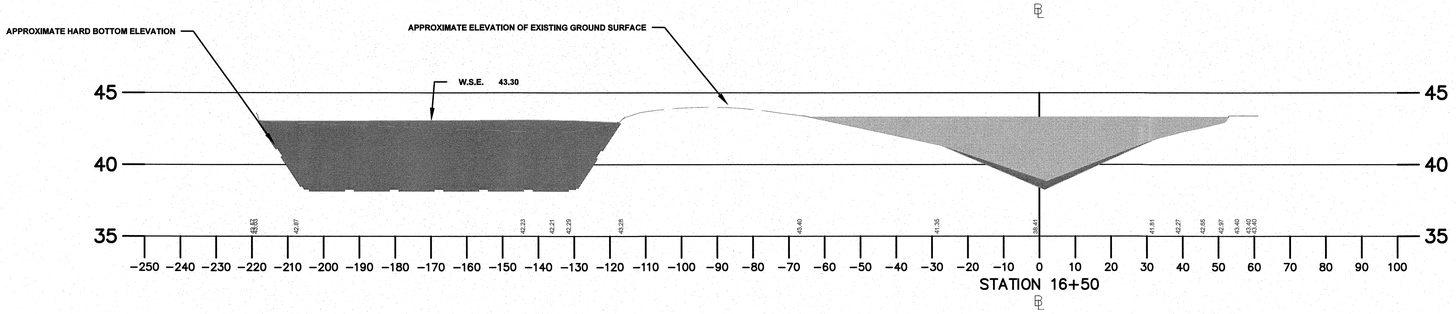
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

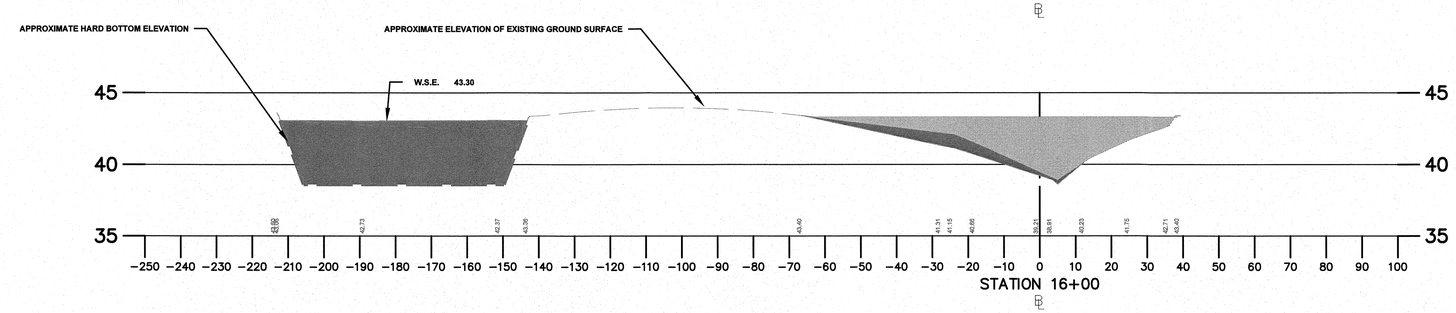
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

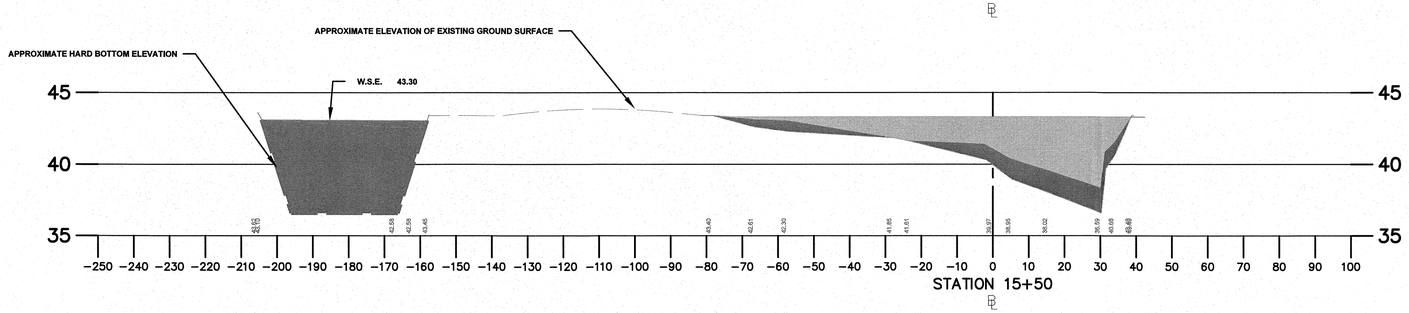
SCALE	As Shown
DATE	October 2024
DRAWN BY	TE
DESIGNED BY	GO / PB
CHECKED BY	PB
SHEET	18 of 139

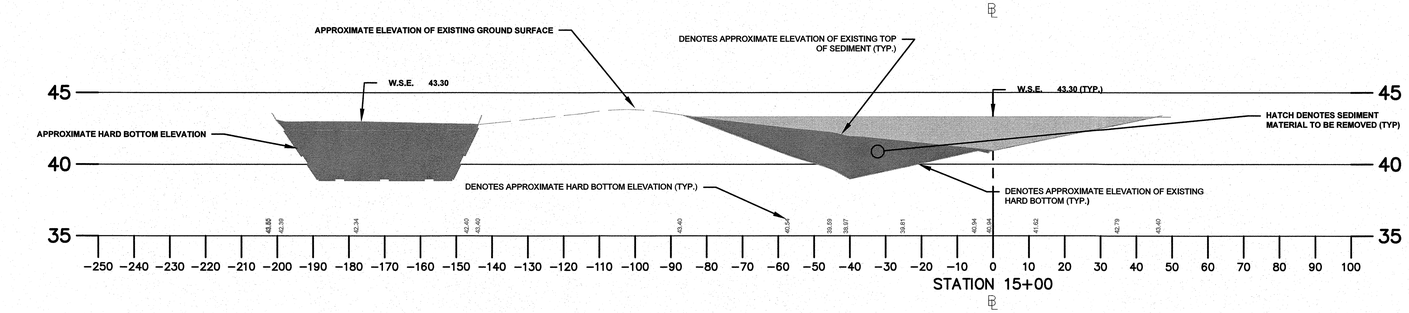
REGISTER NO. 115.UN00213.P05
FILE NO.
DRAWING NUMBER











WEST LAKE
CROSS SECTIONS

NOTE:
AREA OF SILT ON NORTH SIDE OF WEST LAKE FROM APPROXIMATE STA. 13+50 TO 17+00 IS APPROXIMATE ONLY SINCE ACCESS TO THIS AREA AT THE TIME OF FIELD SURVEY WAS NOT POSSIBLE. QUANTITY FOR DREDGING IN THIS AREA WILL BE BASED ON IN PLACE MEASUREMENT BY THE COUNTY DURING CONSTRUCTION.

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

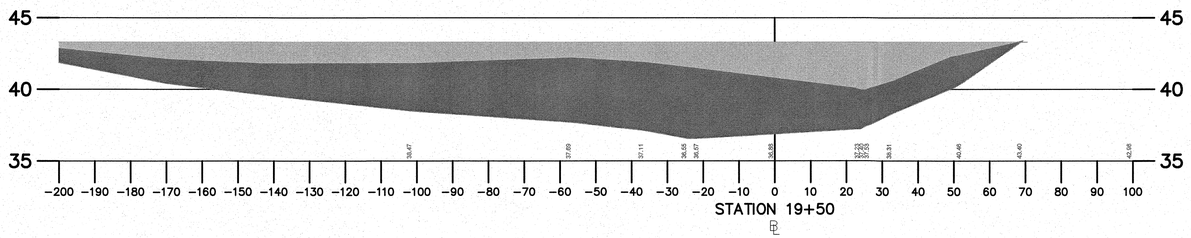
WEST LAKE RESERVOIR CROSS SECTIONS (2 OF 4) STA. 15+00 TO 17+00

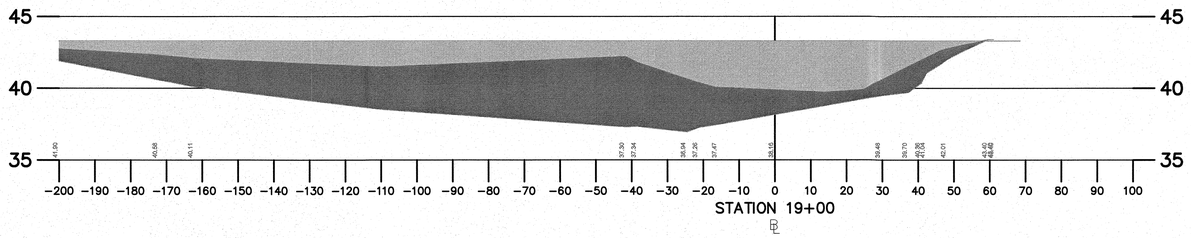
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

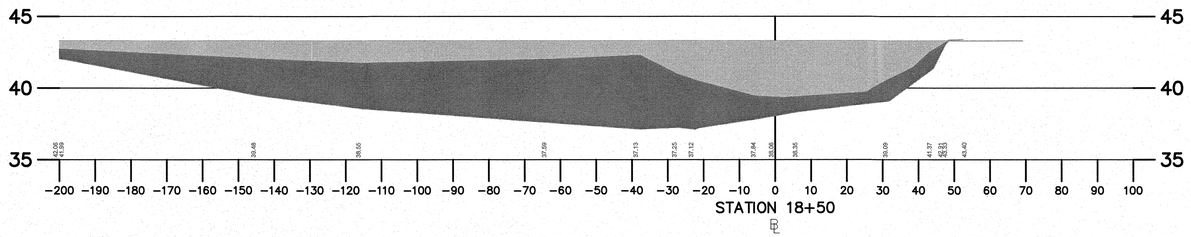
REGISTRY NO.
FILE NO. 115.UN00213.P05

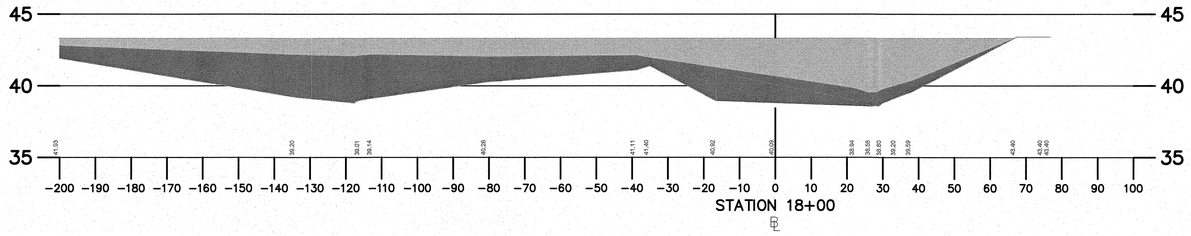
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

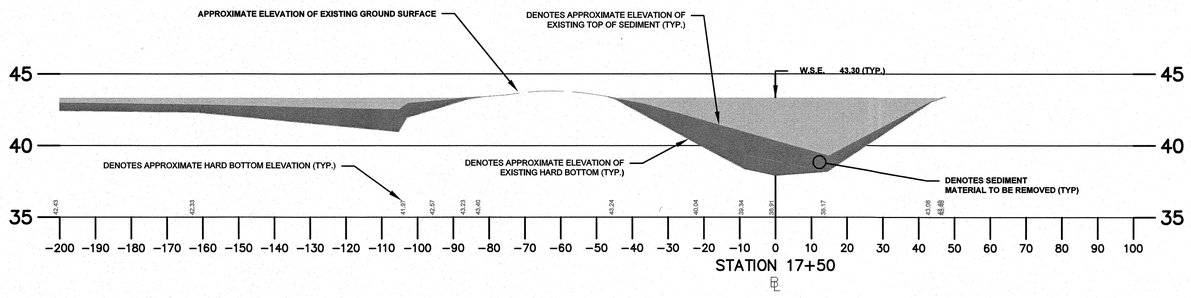
SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 19 of 139	











WEST LAKE
CROSS SECTIONS

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVIEWED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

WEST LAKE RESERVOIR CROSS SECTIONS (3 OF 4) STA. 17+50 TO 19+50

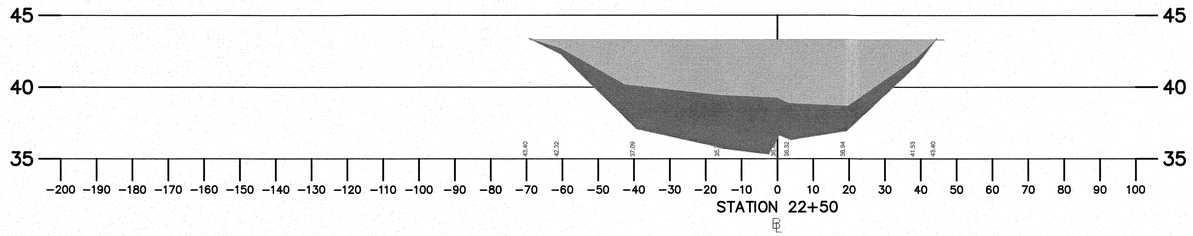
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000

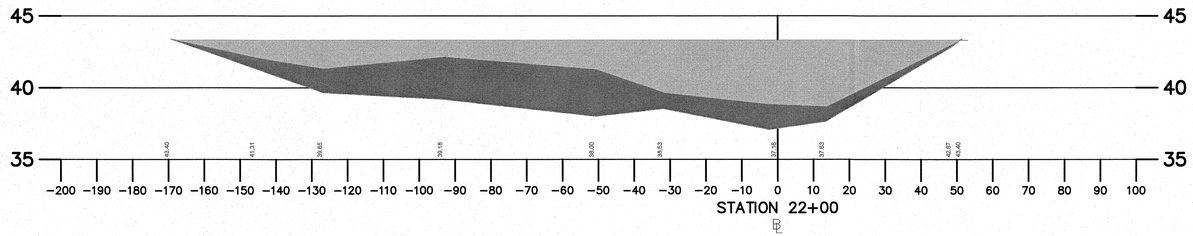
REGISTER NO. FILE NO. 115.UN00213.P05

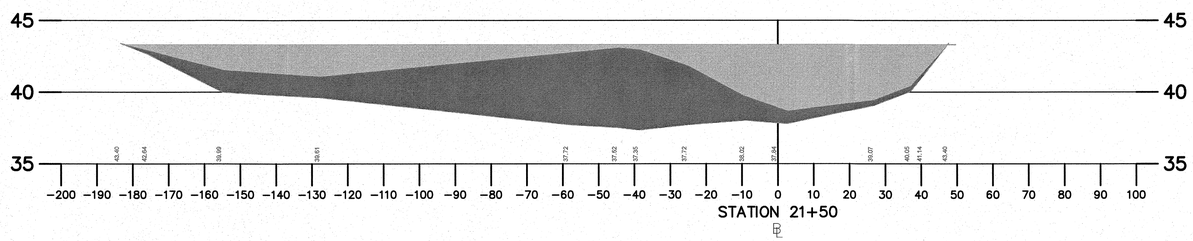
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

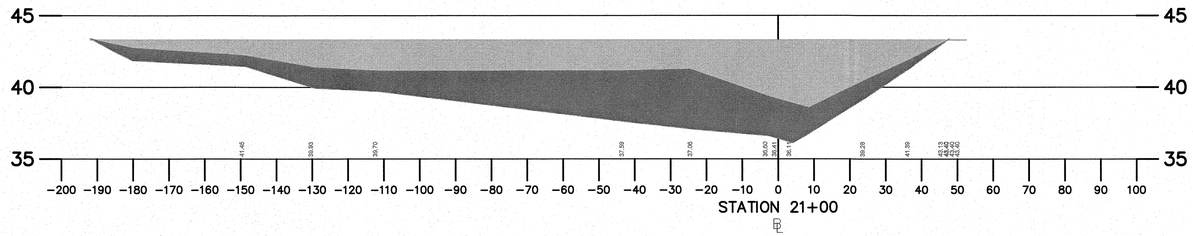
SCALE	DATE
As Shown	October 2024
DRAWN BY	DESIGNED BY
TE	GO / PB
CHECKED BY	SHEET
PB	20 of 139

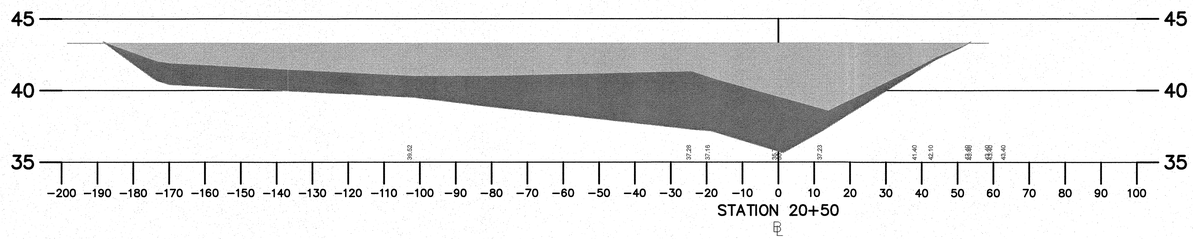
DRAWING NUMBER

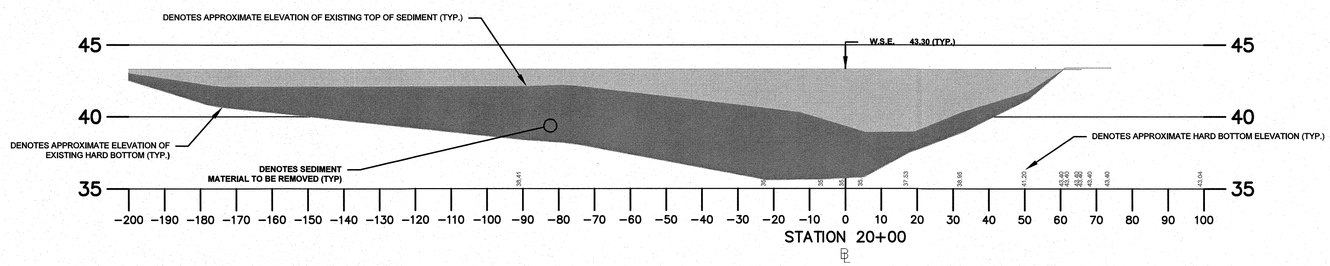












LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

WEST LAKE CROSS SECTIONS

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVISED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

WEST LAKE RESERVOIR CROSS SECTIONS (4 OF 4) STA. 20+00 TO 22+50

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY: TE	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 21 of 139

REGISTRY NO. 115.UN00213.P05
FILE NO.
DRAWING NUMBER

GENERAL NOTES:

1. THE COORDINATION OF THE LOCATION OR RELOCATION WHERE REQUIRED OF TELEPHONE, ELECTRIC, CABLE TELEVISION, GAS, AND WATER FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR AND SAME SHALL BE COORDINATED TO INSURE COMPLETION WITHIN THE TIME PERMITTED.

2. ALL WORK TO BE PERFORMED SHALL BE IN ACCORDANCE WITH NJAC 7:13-12.15 'REQUIREMENTS FOR SEDIMENT AND DEBRIS REMOVAL'.

3. STOCKPILING OF DREDGE MATERIALS WILL NOT BE PERMITTED OUTSIDE OF PROJECT'S LIMIT OF DISTURBANCE.

4. SEDIMENT MUST BE PREVENTED FROM TRAVELING DOWNSTREAM AND ENTERING EAST LAKE (GARDEN STATE PARKWAY TO MADISON HILL ROAD) OR A PREVIOUSLY DREDGED PORTION OF THE HEADWATERS, WEST LAKE, OR CENTRAL LAKE DURING DREDGING OPERATIONS.

5. ADDITIONAL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AS DEEMED NECESSARY BY THE SOIL CONSERVATION DISTRICT OR ENGINEER.

6. SITE LOCATION: CLARK RESERVOIR, CLARK NJ, 07066, BLOCK: 52, LOT: 13 — OWNER: UNION COUNTY, 10 ELIZABETHTOWN PLAZA, ELIZABETH NJ, 07202

7. EXISTING HARD BOTTOM AND TOP OF SEDIMENT ELEVATIONS ARE BASED ON BATHYMETRY DATED JUNE 2023. EXCAVATION DATA IS ESTIMATED AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY AND CONFIRM REQUIRED EXCAVATION PRIOR TO BIDDING. THE CONTRACTOR CAN CONTACT THE BOROUGH ENGINEERS DEPARTMENT IN ORDER TO SCHEDULE ACCESS THE LAKE TO CONFIRM ANY DATA PRIOR TO BIDDING.

8. APPROXIMATELY 154,000 CUBIC YARDS OF SEDIMENT MATERIAL ARE TO BE REMOVED FROM THE RESERVOIR. THE VOLUME OF SEDIMENT MATERIAL IS BASED ON CROSS SECTION AVERAGE END AREA METHOD AND EXCLUDING ANY SWELL AND SHRINKAGE ADJUSTMENT FACTOR.

9. THE LIMITS OF THE FLOODWAY FOR THE CLARK RESERVOIR WERE OBTAINED FROM THE FLOOD INSURANCE RATE MAPS, MAP #34039C0031F, MAP #34039C0042F, AND MAP #34039C0043F, EFFECTIVE DATE SEPTEMBER 20, 2006.

10. THE THE LIMIT OF THE FLOOD HAZARD AREA FOR THE CLARK RESERVOIR WAS DETERMINED BY METHOD 3 (FEMA FLUVIAL METHOD) AS DESCRIBED AT N.J.A.C. 7:13-3.4(e). FEMA 1% CHANCE (100-YEAR) WATER SURFACE ELEVATIONS WERE OBTAINED FROM THE FLOOD PROFILES FOR ROBINSONS BRANCH INCLUDED IN VOLUME 2 OF 2 OF THE EFFECTIVE FLOOD INSURANCE STUDY FOR UNION COUNTY, NEW JERSEY, EFFECTIVE DATE SEPTEMBER 20, 2006. THE FLOOD HAZARD AREA FLOOD ELEVATION IS EQUAL TO THREE FEET ABOVE THE FEMA 1% CHANCE (100-YEAR) FLOOD ELEVATION.

- FEMA WATER ELEVATION FOR 100 YEAR STORM = 47.1
- FLOOD HAZARD AREA FLOOD ELEVATION = 50.1

11. SPOILS FROM LAKE EXCAVATION SHALL BE TRUCKED OFF SITE AND ARE THE RESPONSIBILITY OF THE CONTRACTOR TO DISPOSE OF IN ACCORDANCE WITH ANY STATE REGULATIONS.

12. FISH SALVAGING AND REPLENISHMENT DURING DEWATERING AND CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH THE NEW JERSEY DIVISION OF FISH AND WILDLIFE AND IN ACCORDANCE WITH THE LAKE LOWERING PERMIT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SALVAGING AND REPLENISHMENT OPERATIONS.

REFERENCE:

ALL LOCATIONS AND TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

SEED MIXTURE FOR STREAMBANK STABILIZATION

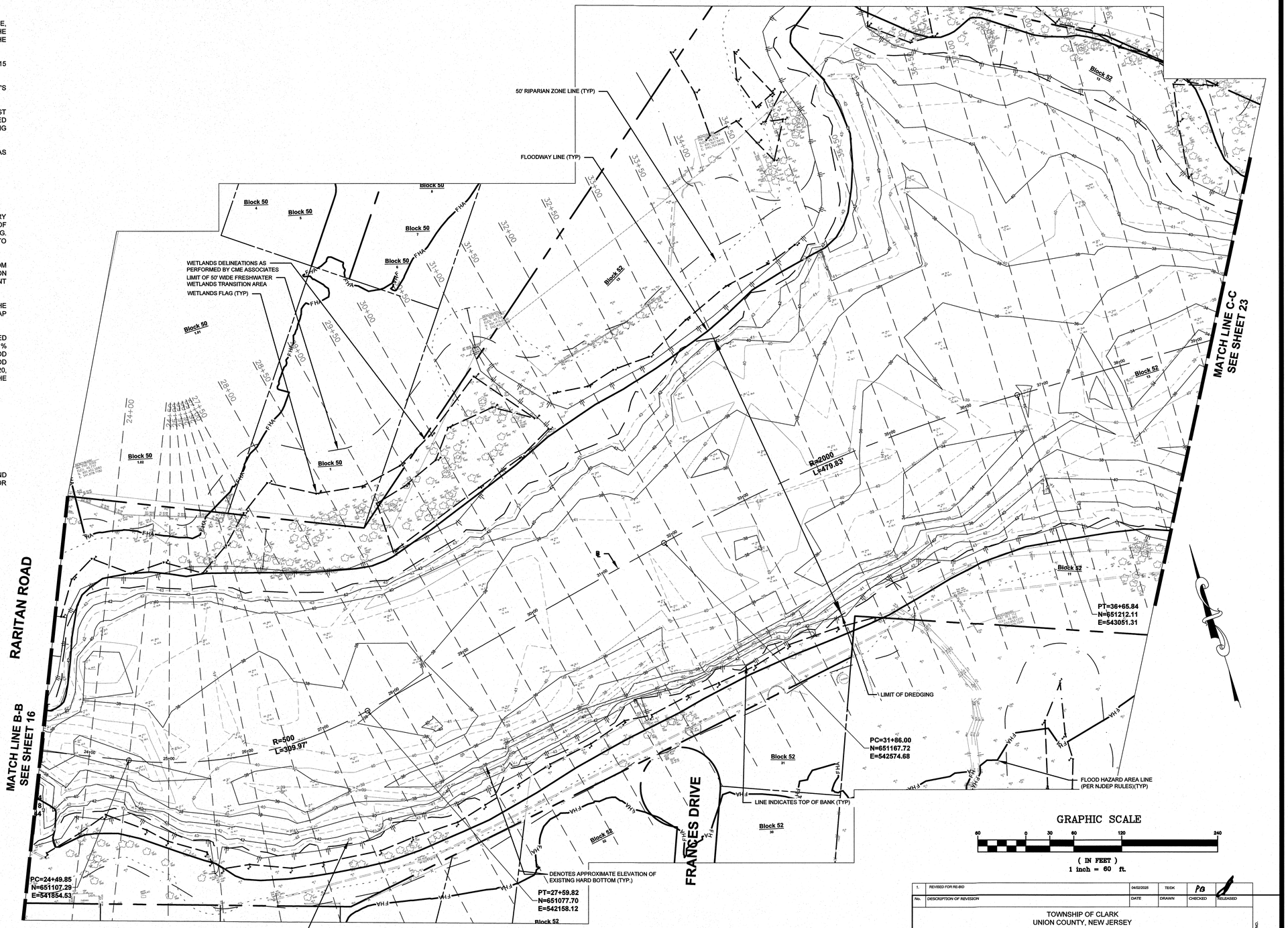
1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVE STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

NOTE:

DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

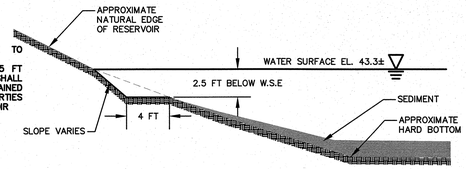
NOTE:

SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS



NOTE:

- UPPER LEDGE OMITTED DUE TO RIPARIAN IMPACTS
- SAFETY LEDGE, 4 FT WIDE, 2.5 FT BELOW W.S.E; SAFETY LEDGE SHALL BE CONSTRUCTED AND MAINTAINED ADJACENT TO LAND AND PROPERTIES AROUND PERIMETER OF RESERVOIR



TYPICAL RESERVOIR CROSS SECTION DETAIL

N.T.S.

CENTRAL LAKE DREDGING PLANS

Pay Item Number	To Be Constructed	Unit	Plan Quantity
27	Fish collection, relocation, and restocking	LS	LS
28	Lake excavation including lake lowering, dewatering, and transportation and disposal of dredge spoils	CY	55727
29	Maintenance of Temporary Flow Diversion Channel	LS	LS

SEDIMENT LEGEND

- - - - - - DENOTES APPROXIMATE ELEVATION OF EXISTING TOP OF SEDIMENT
——— DENOTES APPROXIMATE ELEVATION OF EXISTING HARD BOTTOM

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

CENTRAL LAKE (1 OF 2) — DREDGING PLAN

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28399000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO. FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468
DATE 4.1.24

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 22 of 139	

SEED MIXTURE FOR STREAMBANK STABILIZATION

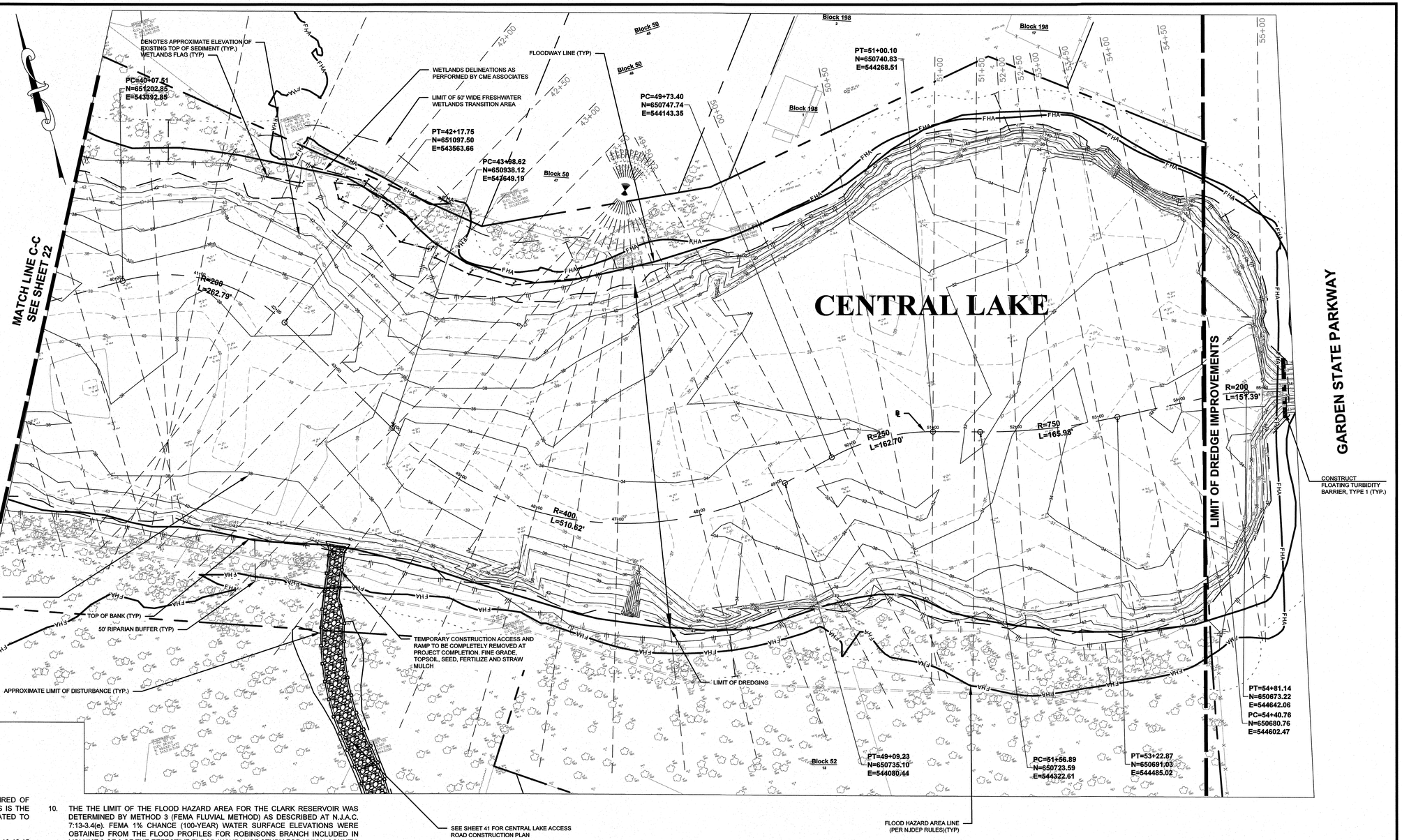
1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVE STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

NOTE:

DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

NOTE:

SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS



GENERAL NOTES:

1. THE COORDINATION OF THE LOCATION OR RELOCATION WHERE REQUIRED OF TELEPHONE, ELECTRIC, CABLE TELEVISION, GAS, AND WATER FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR AND SAME SHALL BE COORDINATED TO INSURE COMPLETION WITHIN THE TIME PERMITTED.
2. ALL WORK TO BE PERFORMED SHALL BE IN ACCORDANCE WITH NJAC 7:13-12.15 'REQUIREMENTS FOR SEDIMENT AND DEBRIS REMOVAL'.
3. STOCKPILING OF DREDGE MATERIALS WILL NOT BE PERMITTED OUTSIDE OF PROJECT'S LIMIT OF DISTURBANCE.
4. SEDIMENT MUST BE PREVENTED FROM TRAVELING DOWNSTREAM AND ENTERING EAST LAKE (GARDEN STATE PARKWAY TO MADISON HILL ROAD) OR A PREVIOUSLY DREDGED PORTION OF THE HEADWATERS, WEST LAKE, OR CENTRAL LAKE DURING DREDGING OPERATIONS.
5. ADDITIONAL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AS DEEMED NECESSARY BY THE SOIL CONSERVATION DISTRICT OR ENGINEER.
6. SITE LOCATION: CLARK RESERVOIR, CLARK NJ, 07066, BLOCK: 52, LOT: 13 — OWNER: UNION COUNTY, 10 ELIZABETHTOWN PLAZA, ELIZABETH NJ, 07202
7. EXISTING HARD BOTTOM AND TOP OF SEDIMENT ELEVATIONS ARE BASED ON BATHYMETRY DATED JUNE 2023. EXCAVATION DATA IS ESTIMATED AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY AND CONFIRM REQUIRED EXCAVATION PRIOR TO BIDDING. THE CONTRACTOR CAN CONTACT THE BOROUGH ENGINEERS DEPARTMENT IN ORDER TO SCHEDULE ACCESS THE LAKE TO CONFIRM ANY DATA PRIOR TO BIDDING.
8. APPROXIMATELY 154,000 CUBIC YARDS OF SEDIMENT MATERIAL ARE TO BE REMOVED FROM THE RESERVOIR. THE VOLUME OF SEDIMENT MATERIAL IS BASED ON CROSS SECTION AVERAGE END AREA METHOD AND EXCLUDING ANY SWELL AND SHRINKAGE ADJUSTMENT FACTOR.
9. THE LIMITS OF THE FLOODWAY FOR THE CLARK RESERVOIR WERE OBTAINED FROM THE FLOOD INSURANCE RATE MAPS, MAP #34039C0031F, MAP #34039C0042F, AND MAP #34039C0043F, EFFECTIVE DATE SEPTEMBER 20, 2006.
10. THE THE LIMIT OF THE FLOOD HAZARD AREA FOR THE CLARK RESERVOIR WAS DETERMINED BY METHOD 3 (FEMA FLUVIAL METHOD) AS DESCRIBED AT N.J.A.C. 7:13-3.4(e). FEMA 1% CHANCE (100-YEAR) WATER SURFACE ELEVATIONS WERE OBTAINED FROM THE FLOOD PROFILES FOR ROBINSONS BRANCH INCLUDED IN VOLUME 2 OF 2 OF THE EFFECTIVE FLOOD INSURANCE STUDY FOR UNION COUNTY, NEW JERSEY, EFFECTIVE DATE SEPTEMBER 20, 2006. THE FLOOD HAZARD AREA FLOOD ELEVATION IS EQUAL TO THREE FEET ABOVE THE FEMA 1% CHANCE (100-YEAR) FLOOD ELEVATION.
    - FEMA WATER ELEVATION FOR 100 YEAR STORM = 47.1
    - FLOOD HAZARD AREA FLOOD ELEVATION = 50.1
11. SPOILS FROM LAKE EXCAVATION SHALL BE TRUCKED OFF SITE AND ARE THE RESPONSIBILITY OF THE CONTRACTOR TO DISPOSE OF IN ACCORDANCE WITH ANY STATE REGULATIONS.
12. FISH SALVAGING AND REPLENISHMENT DURING DEWATERING AND CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH THE NEW JERSEY DIVISION OF FISH AND WILDLIFE AND IN ACCORDANCE WITH THE LAKE LOWERING PERMIT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SALVAGING AND REPLENISHMENT OPERATIONS.

SEDIMENT LEGEND

- DENOTES APPROXIMATE ELEVATION OF EXISTING TOP OF SEDIMENT
- DENOTES APPROXIMATE ELEVATION OF EXISTING HARD BOTTOM

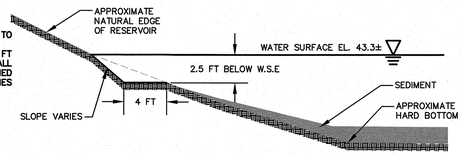
REFERENCE:

ALL LOCATIONS AND TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

CENTRAL LAKE DREDGING PLANS

Pay Item Number	To Be Constructed	Unit	Plan Quantity
6	Floating turbidity barrier, type 1	LF	72
27	Fish collection, relocation, and restocking	LS	LS
28	Lake excavation including lake lowering, dewatering, and transportation and disposal of dredge spoils	CY	66223
29	Maintenance of Temporary Flow Diversion Channel	LS	LS

NOTE:
- UPPER LEDGE OMITTED DUE TO RIPARIAN IMPACTS
- SAFETY LEDGE, 4 FT WIDE, 2.5 FT BELOW W.S.E. SAFETY LEDGE SHALL BE CONSTRUCTED AND MAINTAINED ADJACENT TO LAND AND PROPERTIES AROUND PERIMETER OF RESERVOIR



TYPICAL RESERVOIR CROSS SECTION DETAIL

N.T.S.

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/22/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

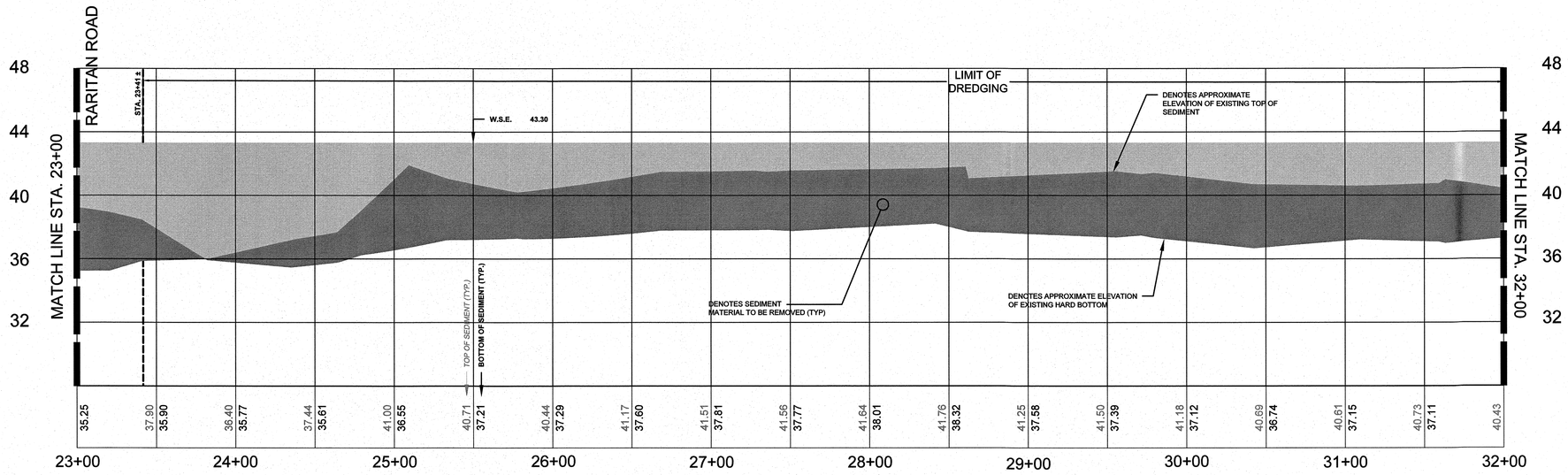
CENTRAL LAKE (2 OF 2) — DREDGING PLAN

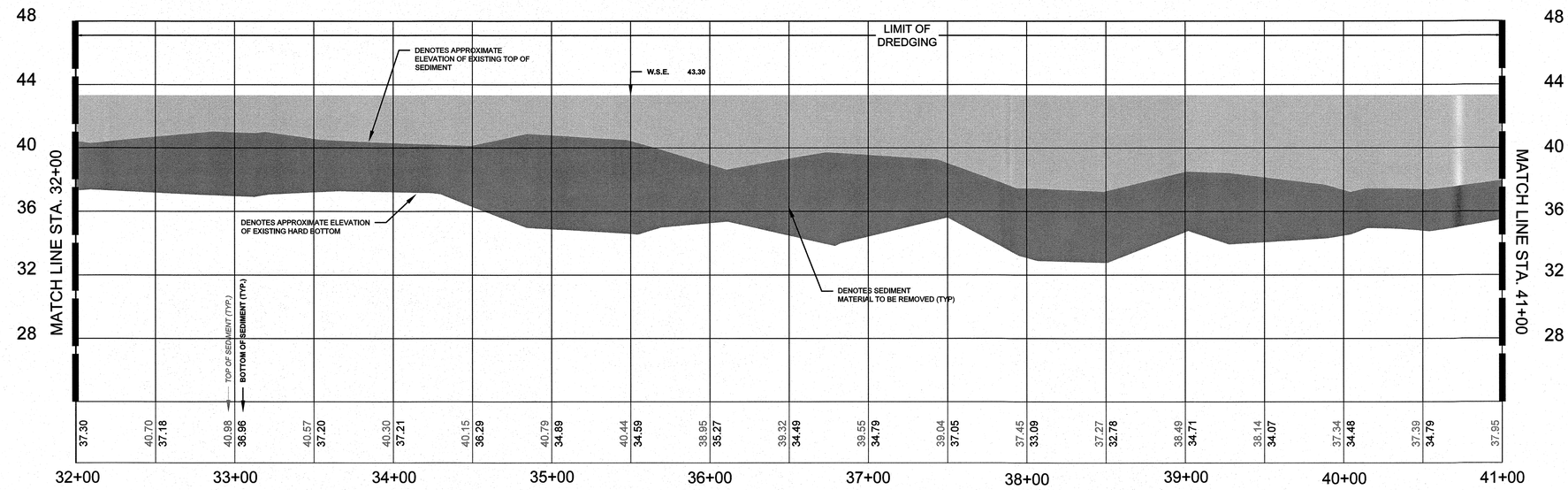
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 23 of 139	

REGISTER NO.
FILE NO. 115.UN00213.P05





CENTRAL LAKE RESERVOIR PROFILE ALONG B.L.

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=40' (HORZ.)
1"=4' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVISIONS
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

CENTRAL LAKE RESERVOIR PROFILE (1 OF 2)

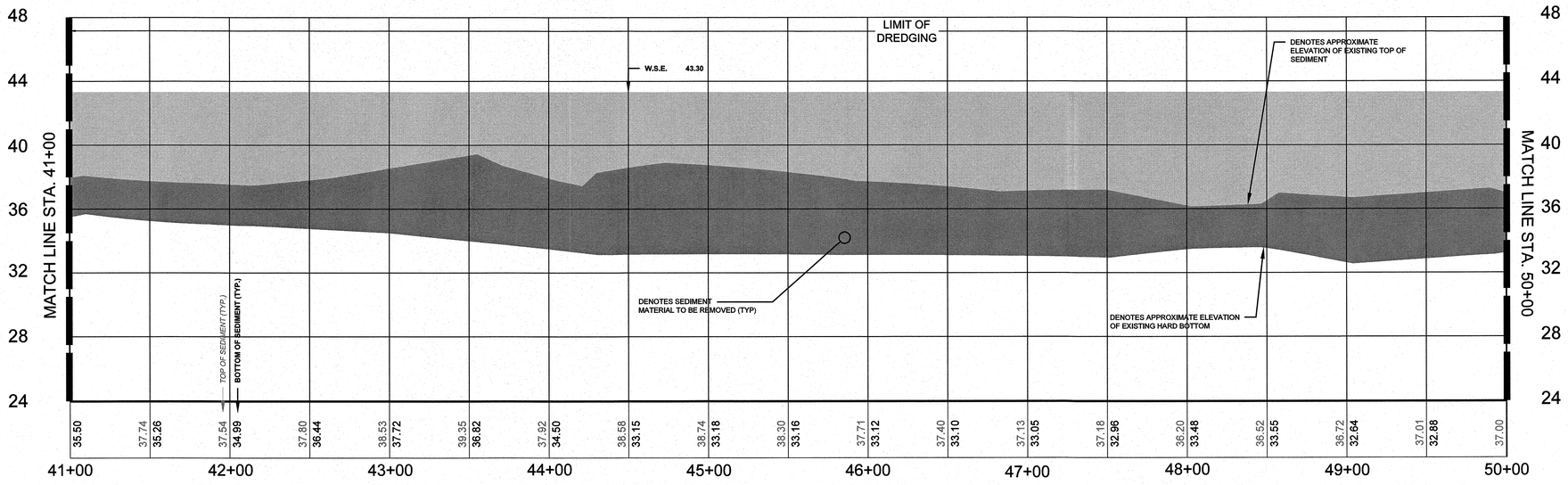
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

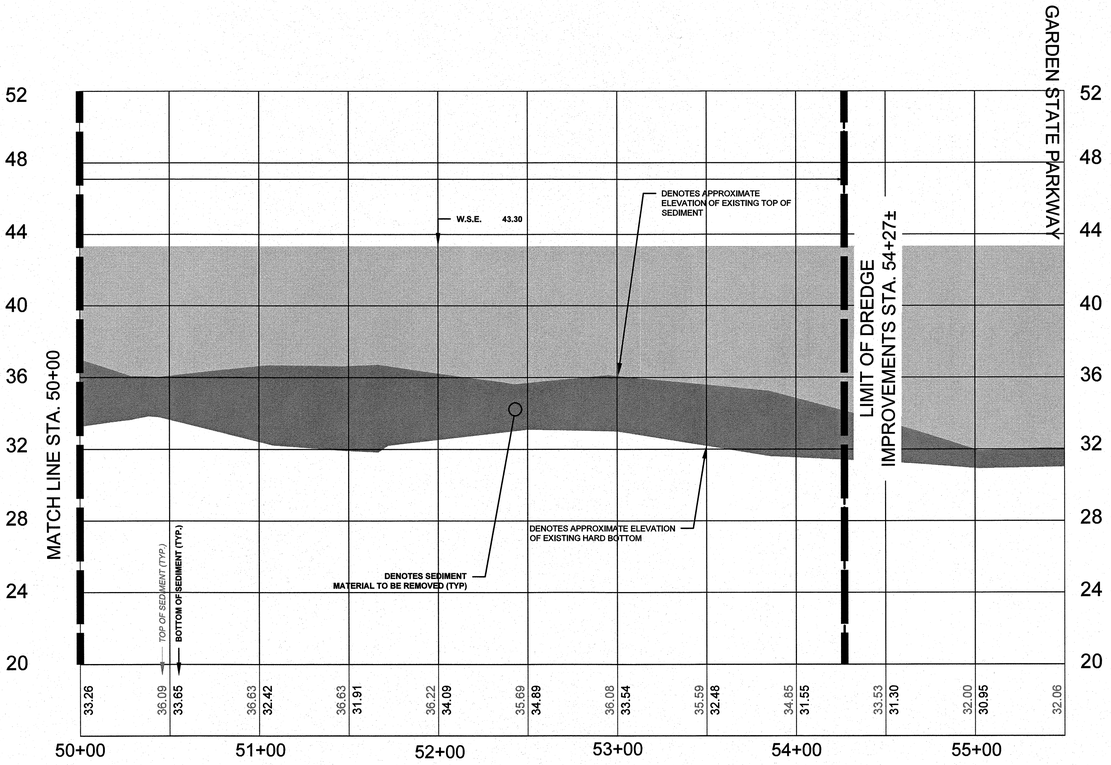
REGISTER NO.

FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468
DATE 11.6.24

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 24 of 139	





CENTRAL LAKE RESERVOIR PROFILE ALONG B.L.

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=40' (HORZ.)
1"=4' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	ISSUED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB.	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

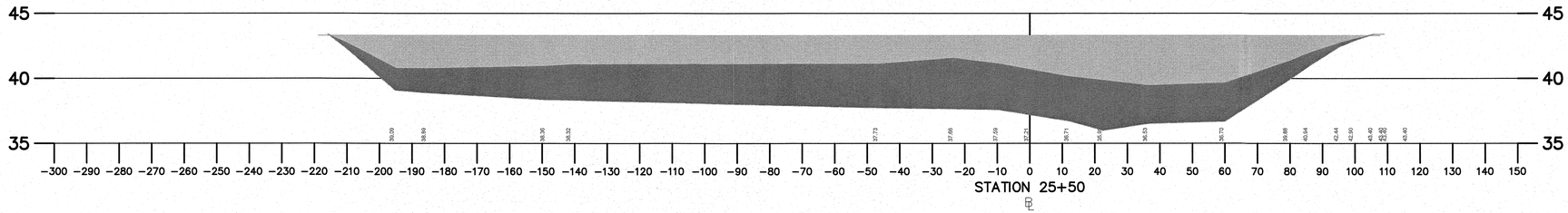
CENTRAL LAKE RESERVOIR PROFILE (2 OF 2)

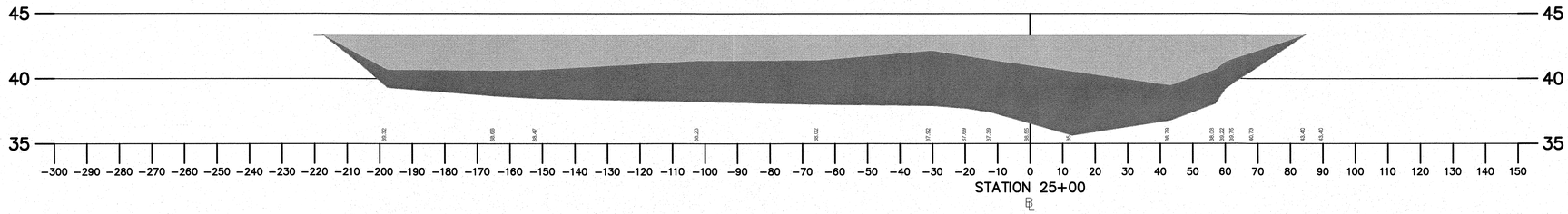
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

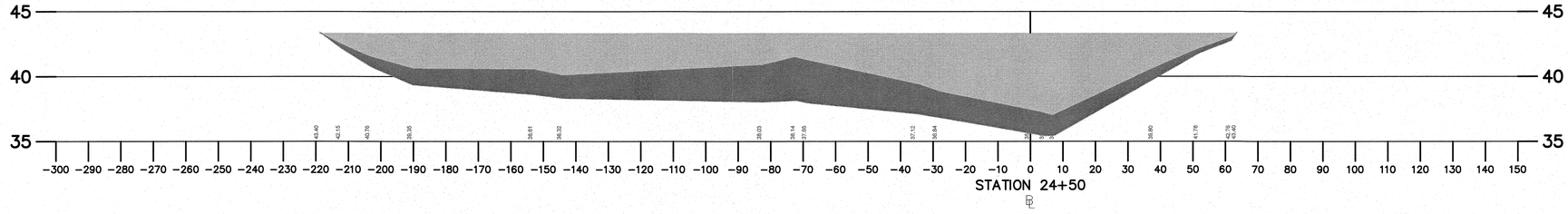
REGISTER NO.
FILE NO. 115.UN00213.P05

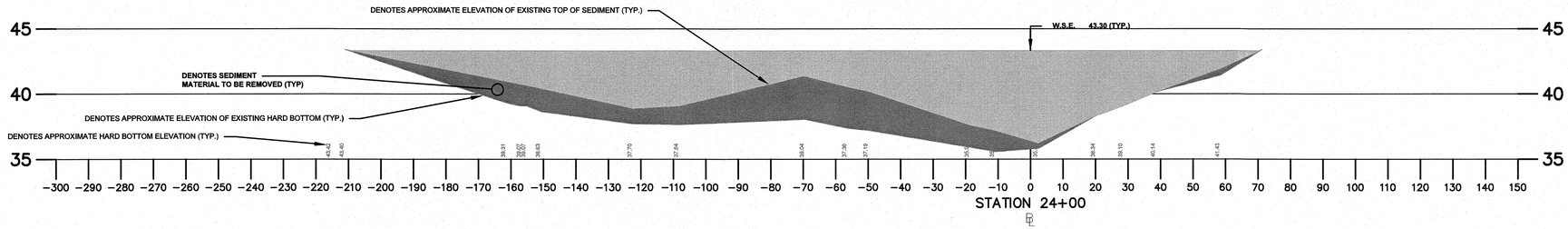
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY	DESIGNED BY	
TE	GO / PB	
CHECKED BY	SHEET	
PB	25 of 139	









LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

CENTRAL LAKE CROSS SECTIONS

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

CENTRAL LAKE RESERVOIR CROSS SECTIONS
(1 OF 15) STA. 24+00 TO 25+50

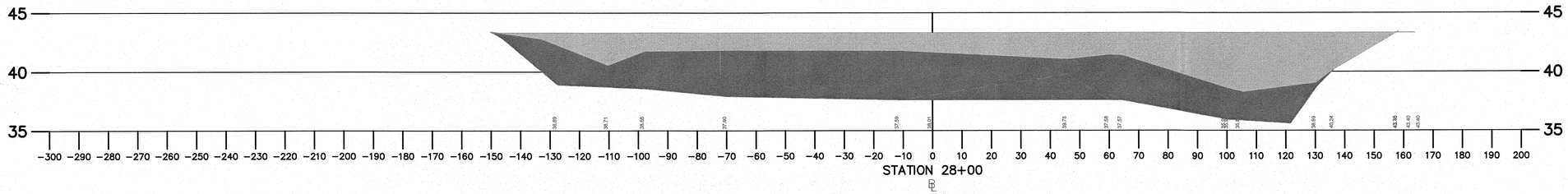
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

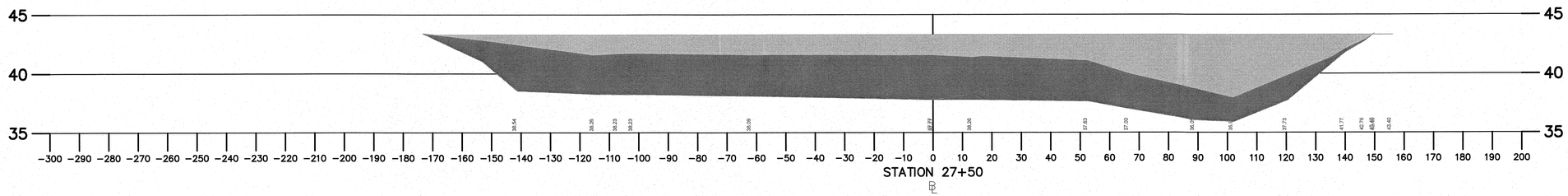
REGISTRY NO. 115.UN00213.P05
FILE NO.

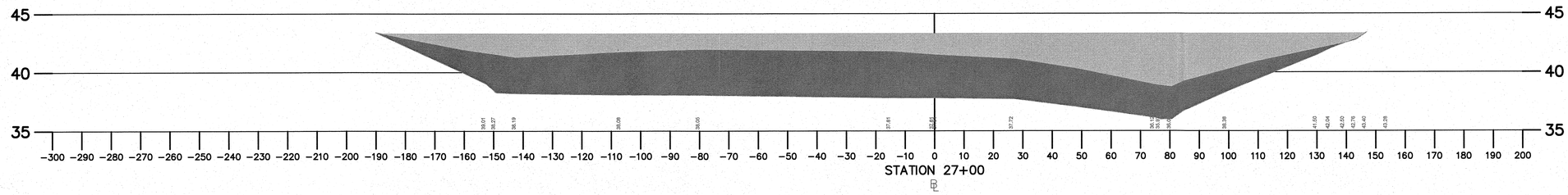
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468
DATE 11/26

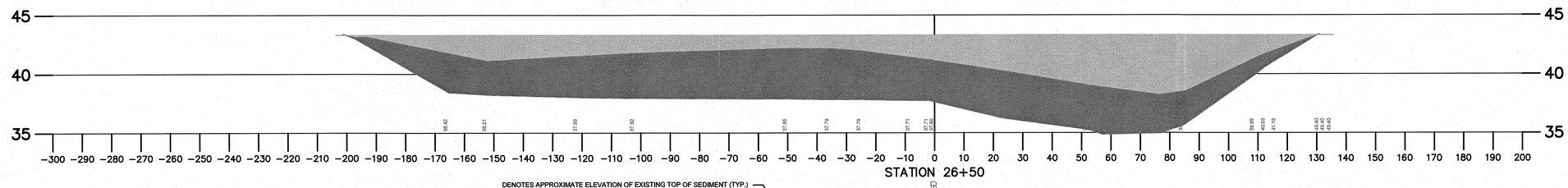
SCALE	DATE
As Shown	October 2024
DRAWN BY	DESIGNED BY
TE	GO / PB
CHECKED BY	SHEET
PB	26 of 139

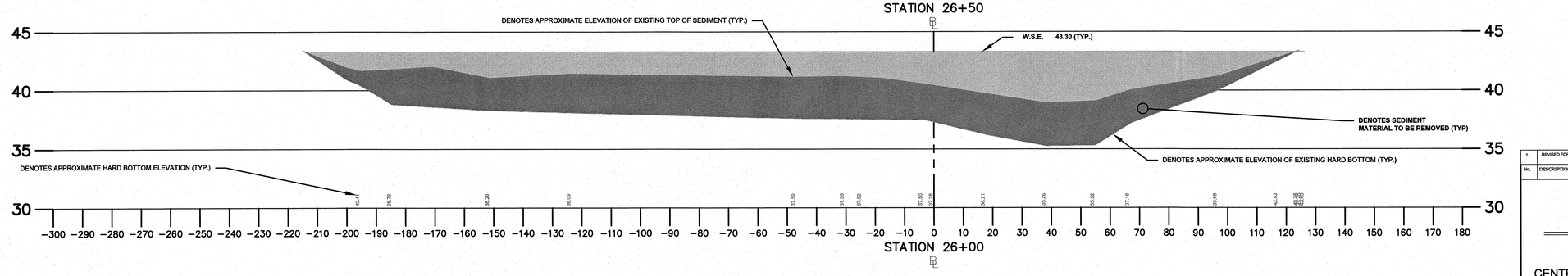
DRAWING NUMBER











CENTRAL LAKE
CROSS SECTIONS

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVIEWED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

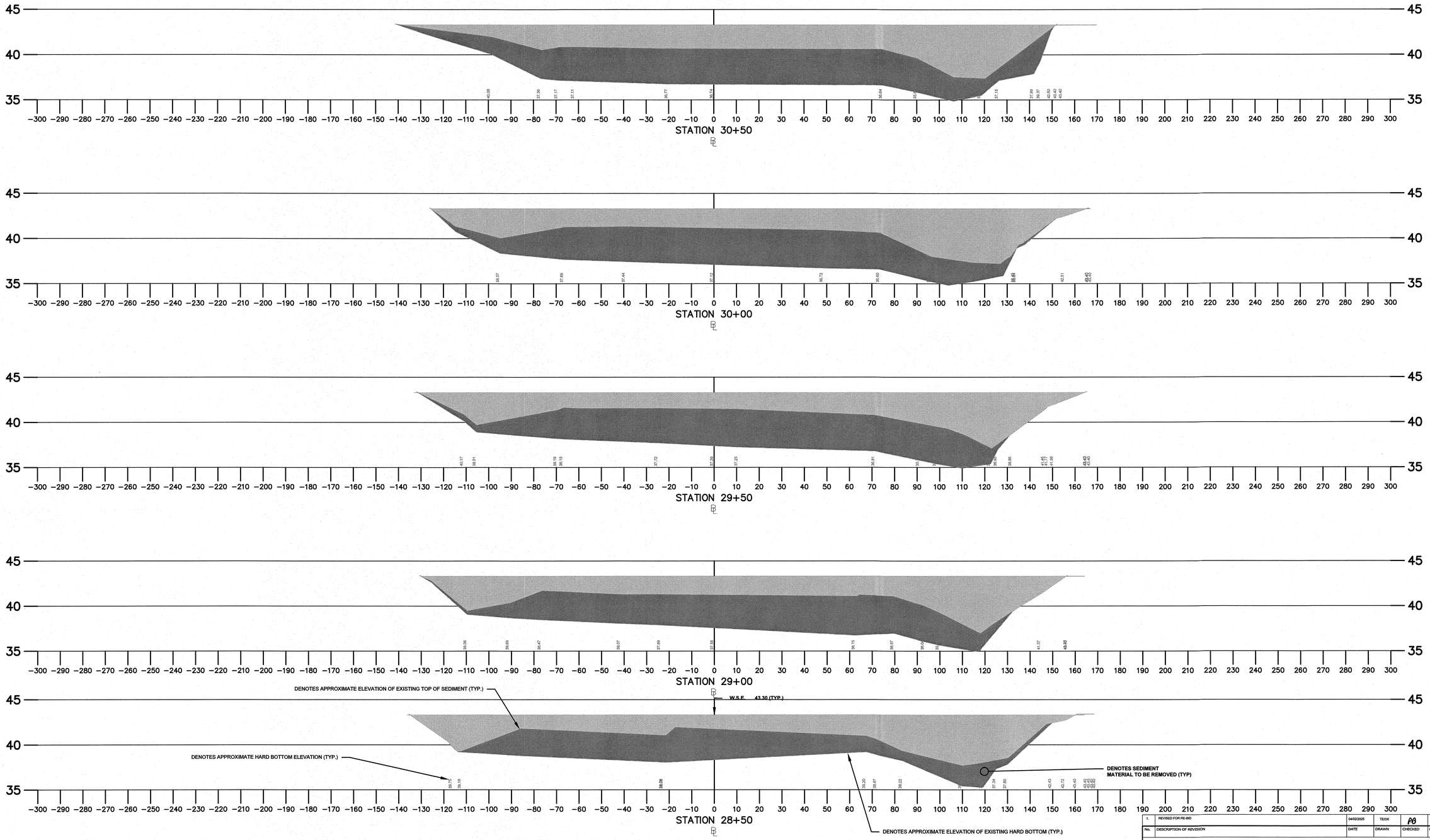
CENTRAL LAKE RESERVOIR CROSS SECTIONS (2 OF 15) STA. 26+00 TO 28+00

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY: TE	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 27 of 139

REGISTER NO.
FILE NO. 115.UN00213.P05
DRAWING NUMBER



CENTRAL LAKE CROSS SECTIONS

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

CENTRAL LAKE RESERVOIR CROSS SECTIONS (3 OF 15) STA. 28+50 TO 30+50

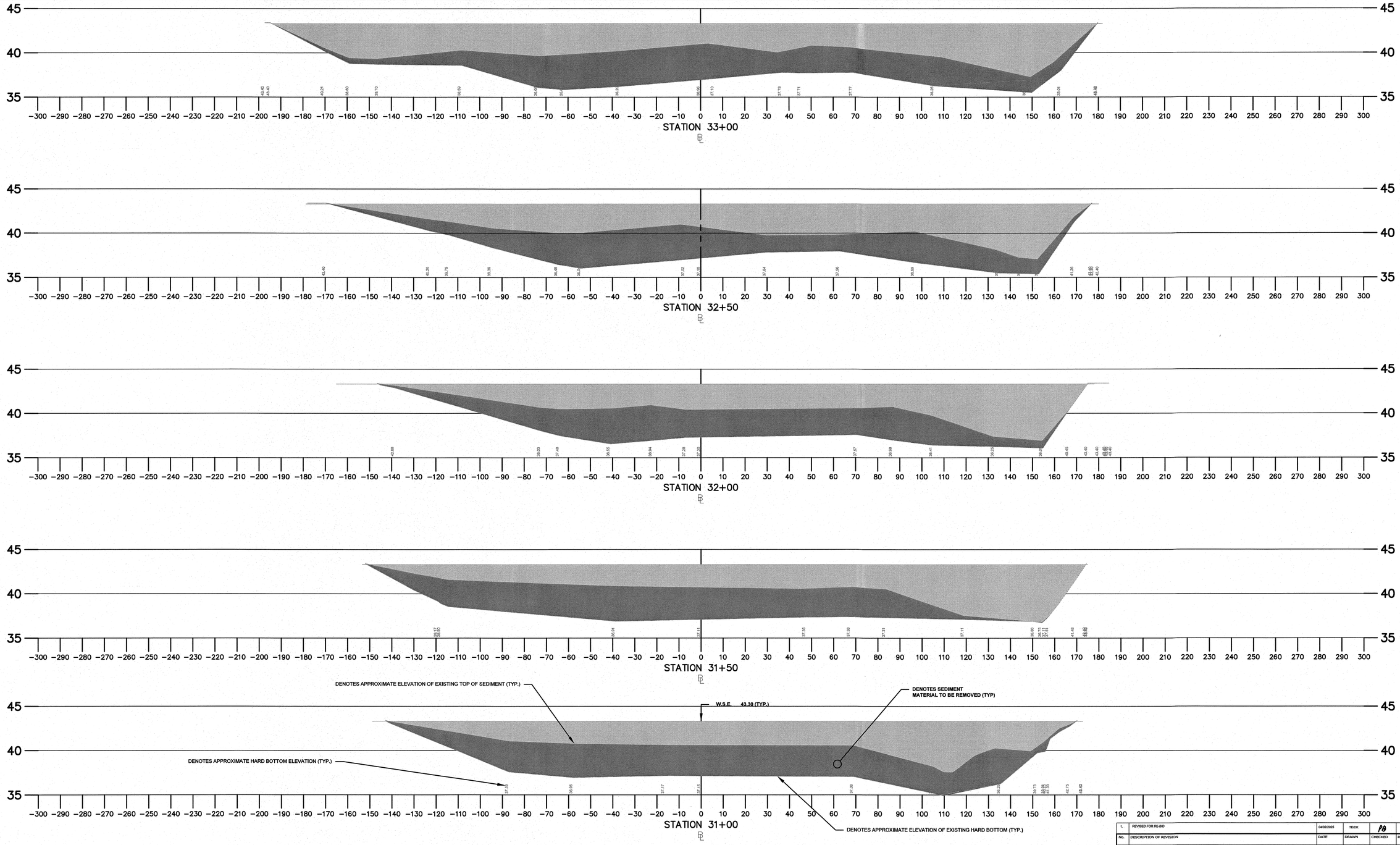
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 28 of 139	

REGISTER NO.

FILE NO. 115.UN00213.P05



LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

CENTRAL LAKE
CROSS SECTIONS

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVISED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS
DREDGING IMPROVEMENTS

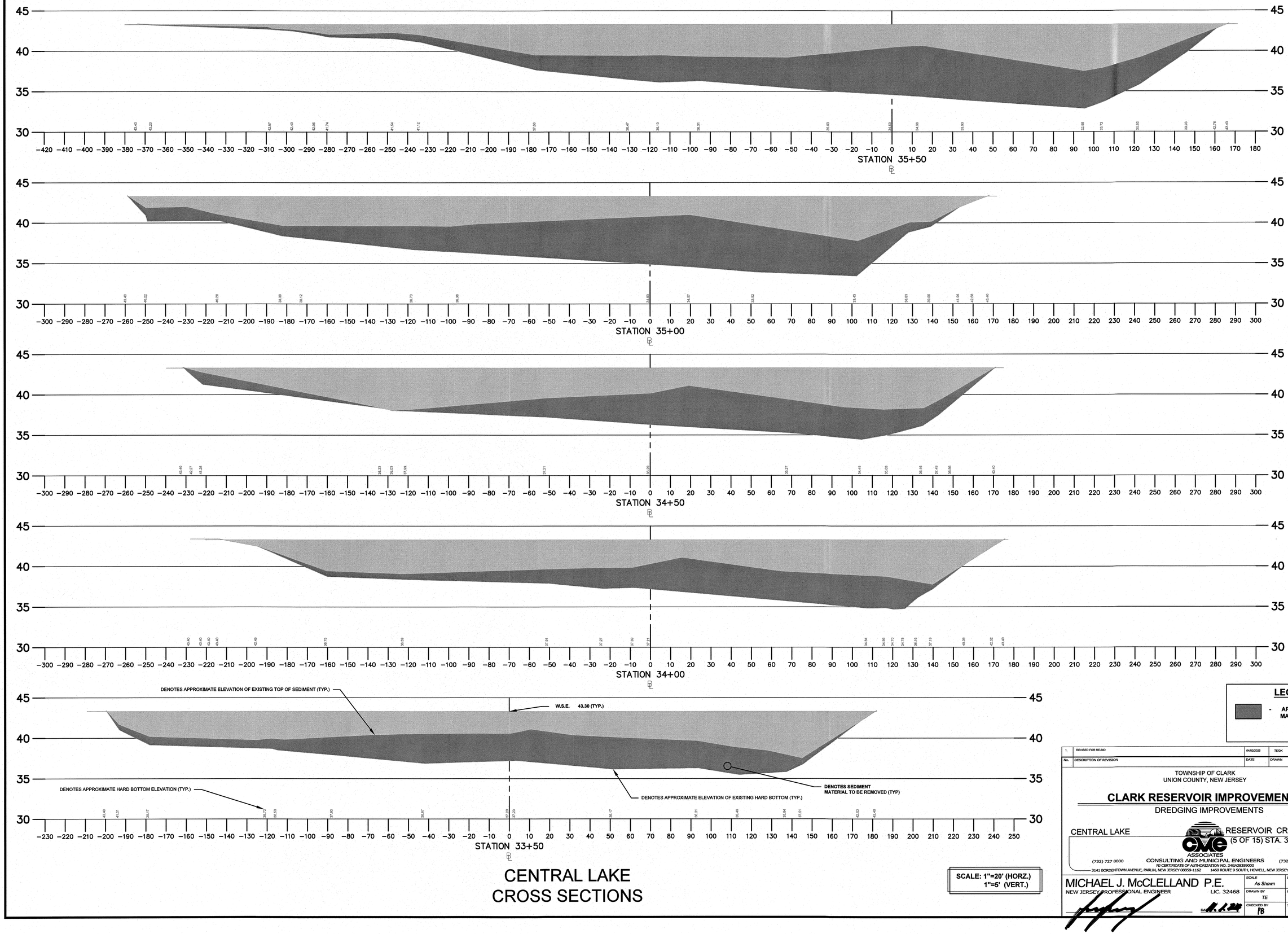
CENTRAL LAKE RESERVOIR CROSS SECTIONS
(4 OF 15) STA. 31+00 TO 33+00

CVE ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162
(732) 462 7400 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468
4.4.24

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 29 of 139	

REGISTER NO.
FILE NO. 115.UN00213.P05



LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

CENTRAL LAKE CROSS SECTIONS

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVIEWED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

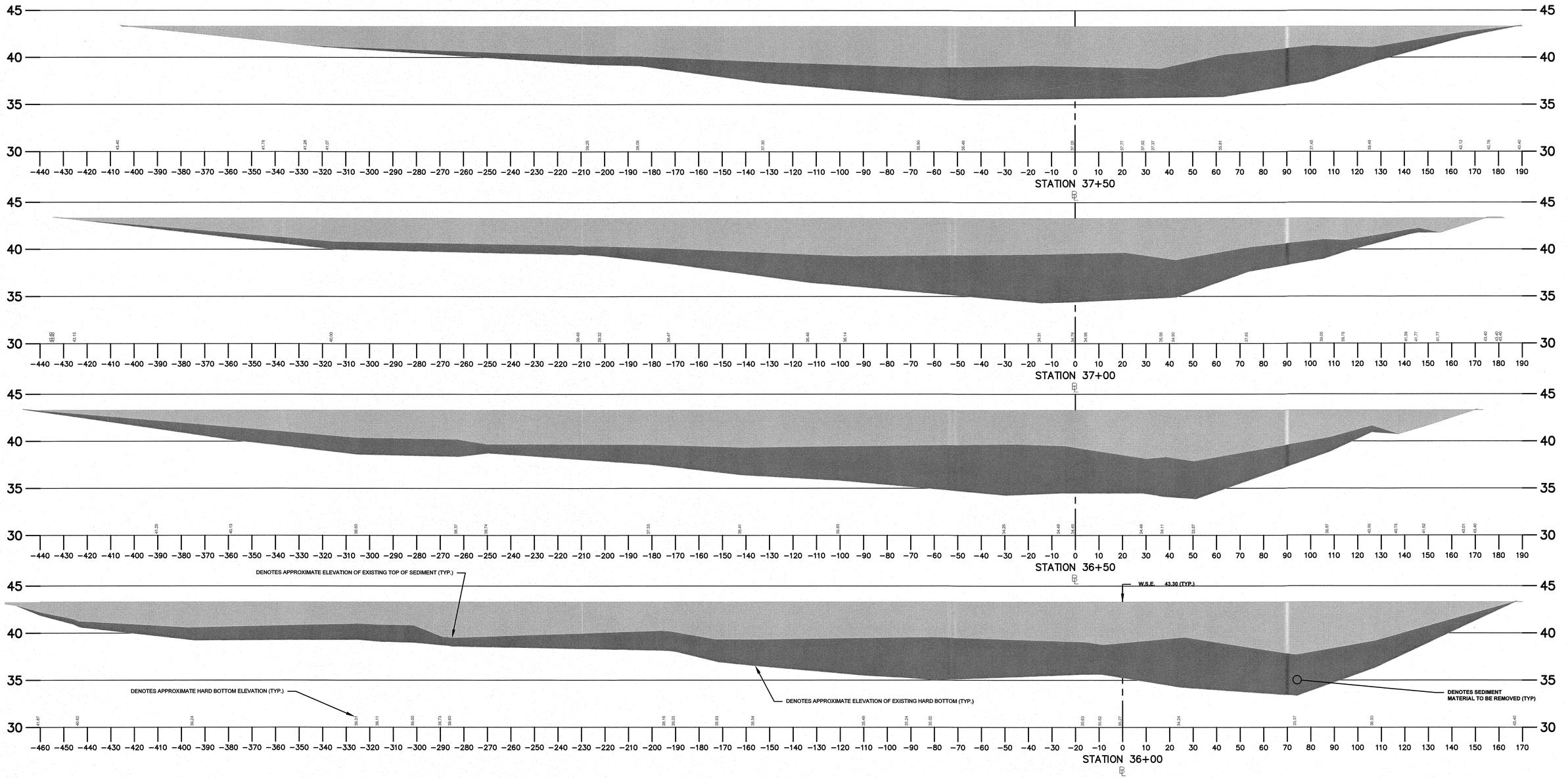
CENTRAL LAKE RESERVOIR CROSS SECTIONS (5 OF 15) STA. 33+50 TO 35+50

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY	DESIGNED BY
TE	GO / PB
CHECKED BY	SHEET
PB	30 of 139

REGISTER NO.
FILE NO. 115.UN00213.P05
DRAWING NUMBER



CENTRAL LAKE CROSS SECTIONS

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVIEWED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

CENTRAL LAKE RESERVOIR CROSS SECTIONS (6 OF 15) STA. 36+00 TO 37+50

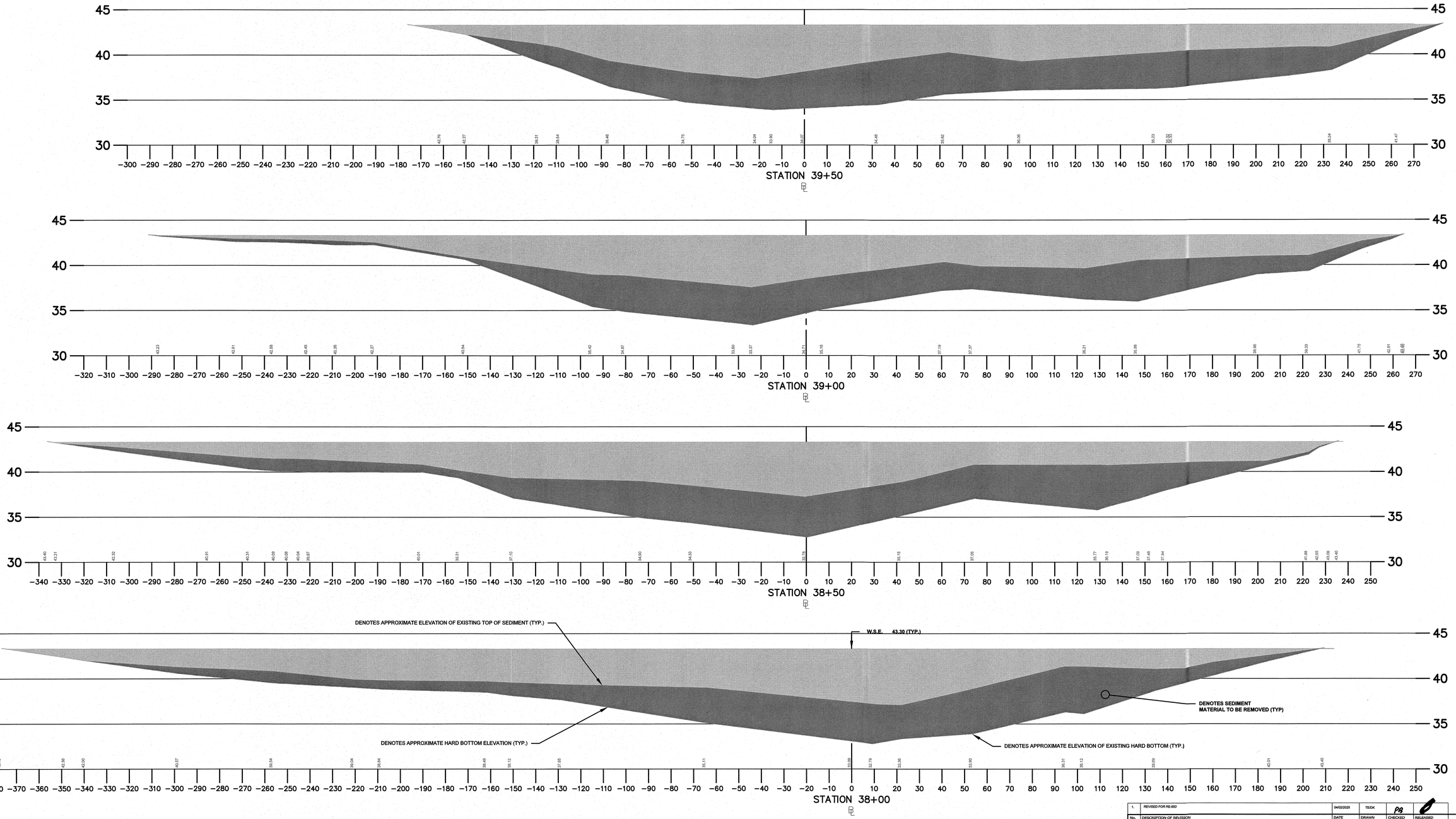
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO.

FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468
11.1.24

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 31 of 139	



CENTRAL LAKE
CROSS SECTIONS

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

CENTRAL LAKE RESERVOIR CROSS SECTIONS
(7 OF 15) STA. 38+00 TO 39+50

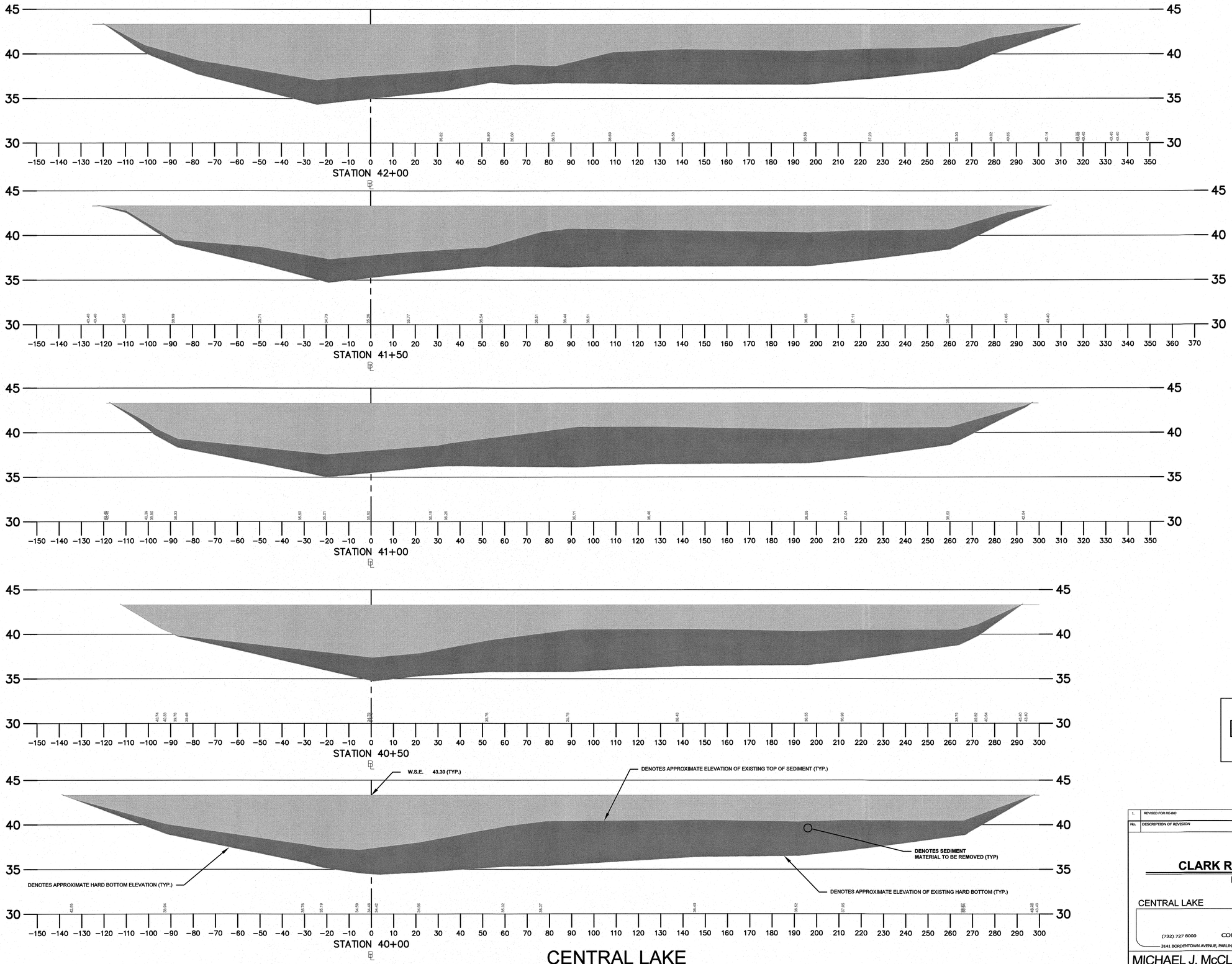
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 32 of 139	

REGISTER NO.

FILE NO. 115.UN00213.P05



CENTRAL LAKE CROSS SECTIONS

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVISED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

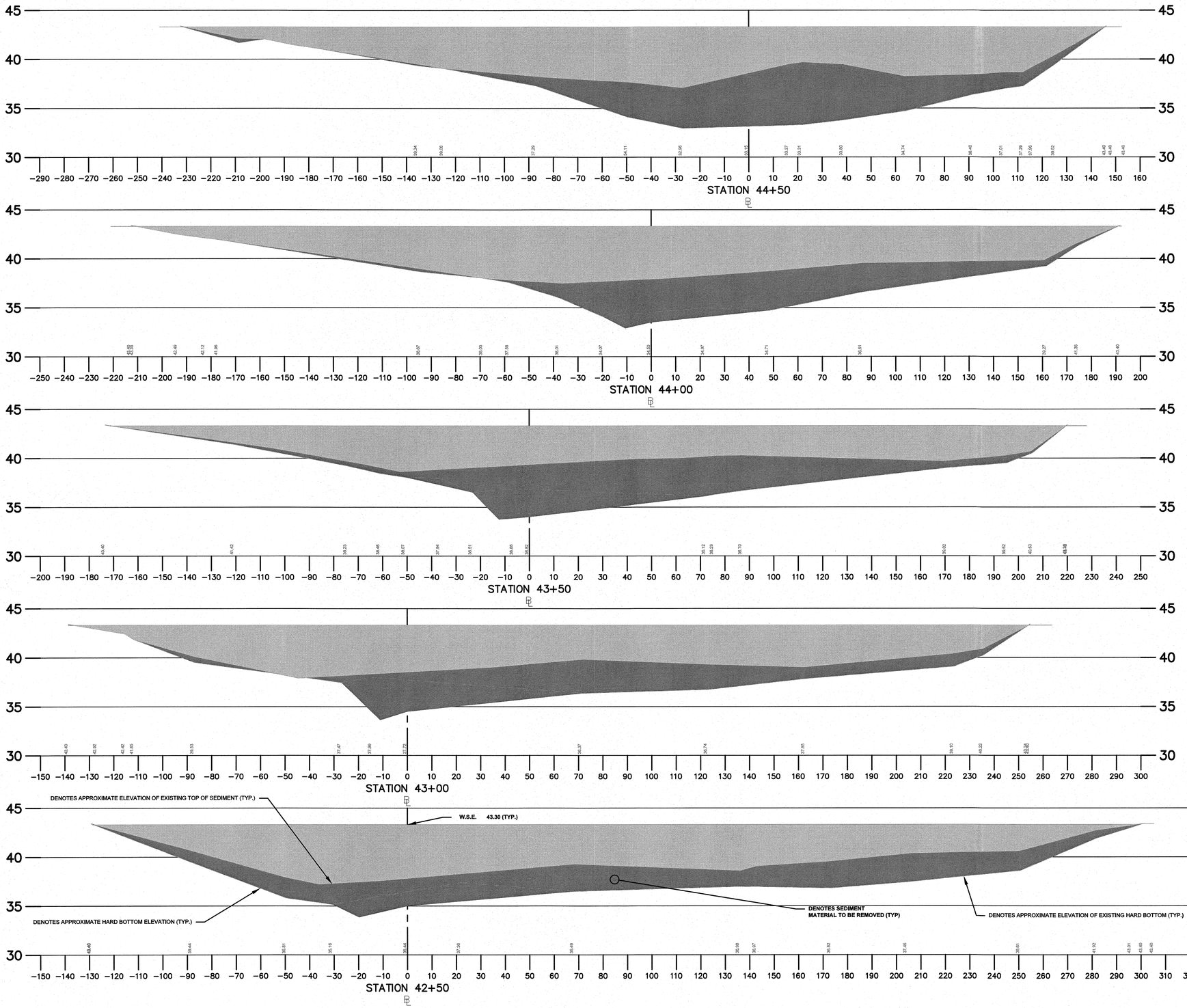
CENTRAL LAKE RESERVOIR CROSS SECTIONS (8 OF 15) STA. 40+00 TO 42+00

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28039000

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 33 of 139	

REGISTER NO. 115.UN00213.P05



CENTRAL LAKE
CROSS SECTIONS

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVISED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

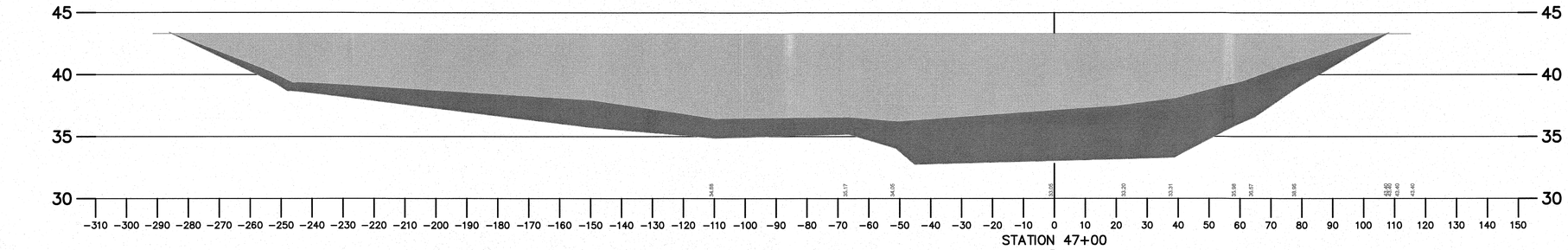
CENTRAL LAKE RESERVOIR CROSS SECTIONS
(9 OF 15) STA. 42+50 TO 44+50

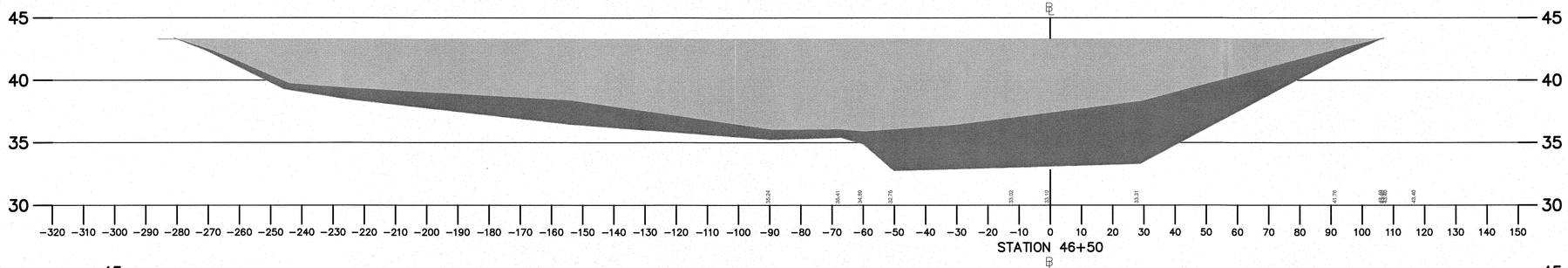
CVE ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

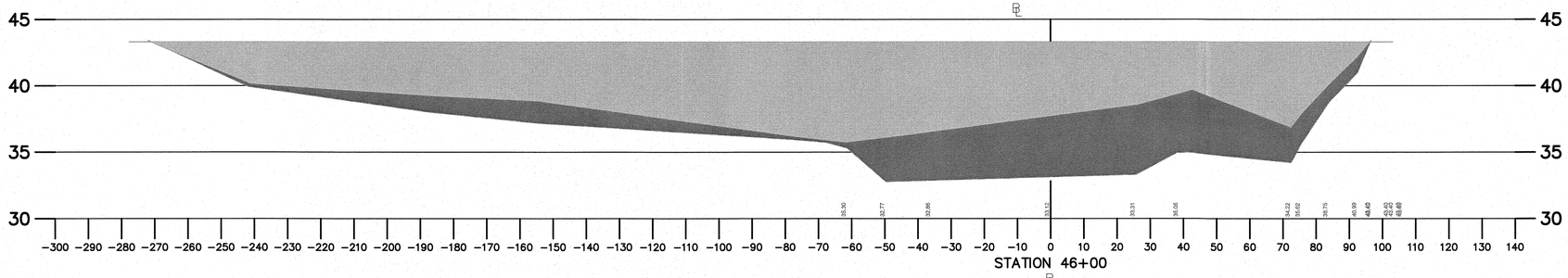
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

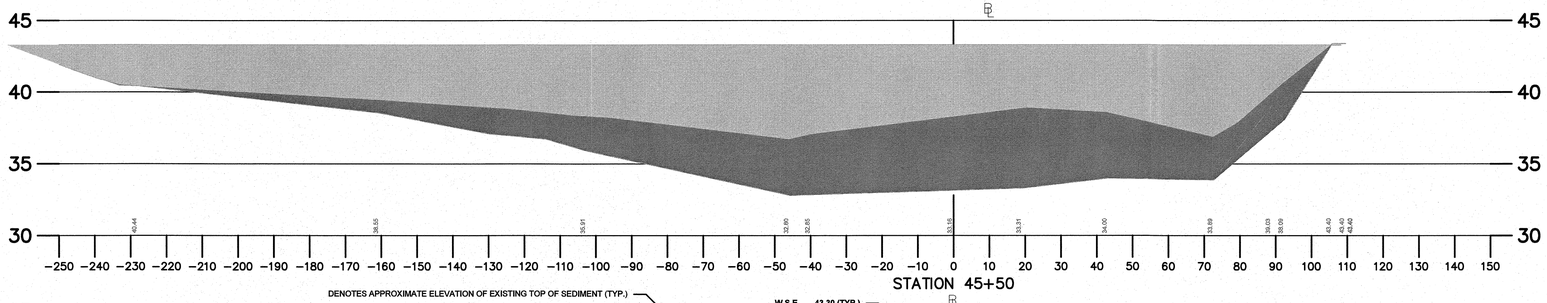
SCALE	DATE
As Shown	October 2024
DRAWN BY: TE	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 34 of 139

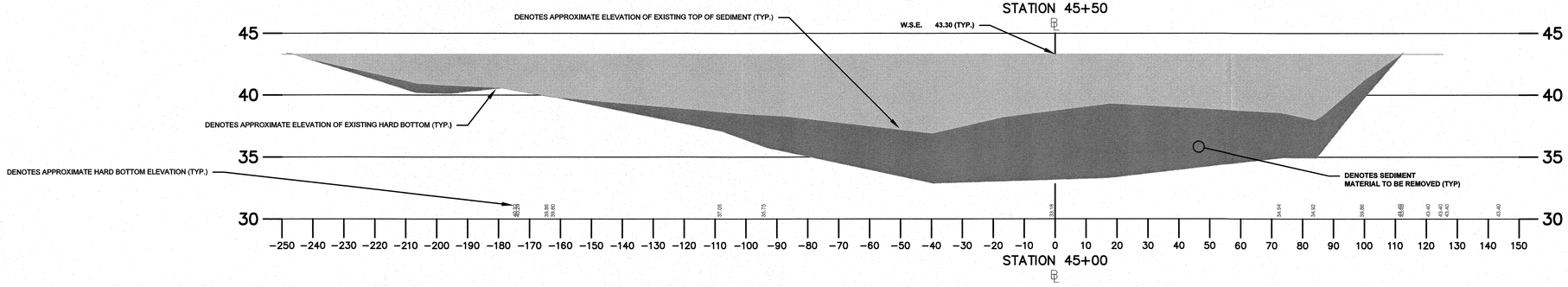
REGISTER NO.
FILE NO. 115.UN00213.P05
DRAWING NUMBER











CENTRAL LAKE CROSS SECTIONS

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVIEWED
1.	REVISED FOR RE-BID	04/03/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

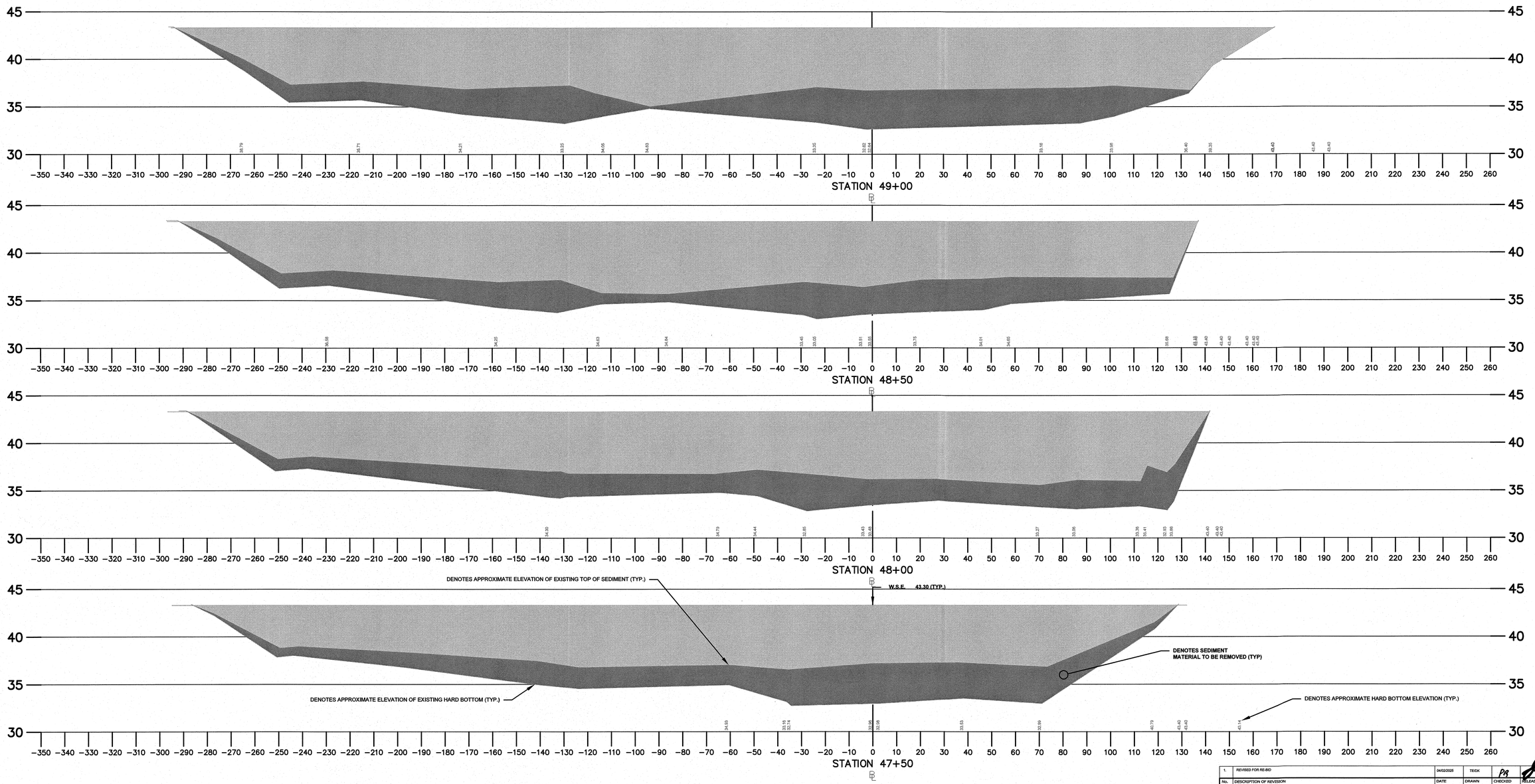
CENTRAL LAKE RESERVOIR CROSS SECTIONS (10 OF 15) STA. 45+00 TO 47+00

REGISTER NO. FILE NO. 115.UN00213.P05

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 35 of 139	



CENTRAL LAKE
CROSS SECTIONS

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

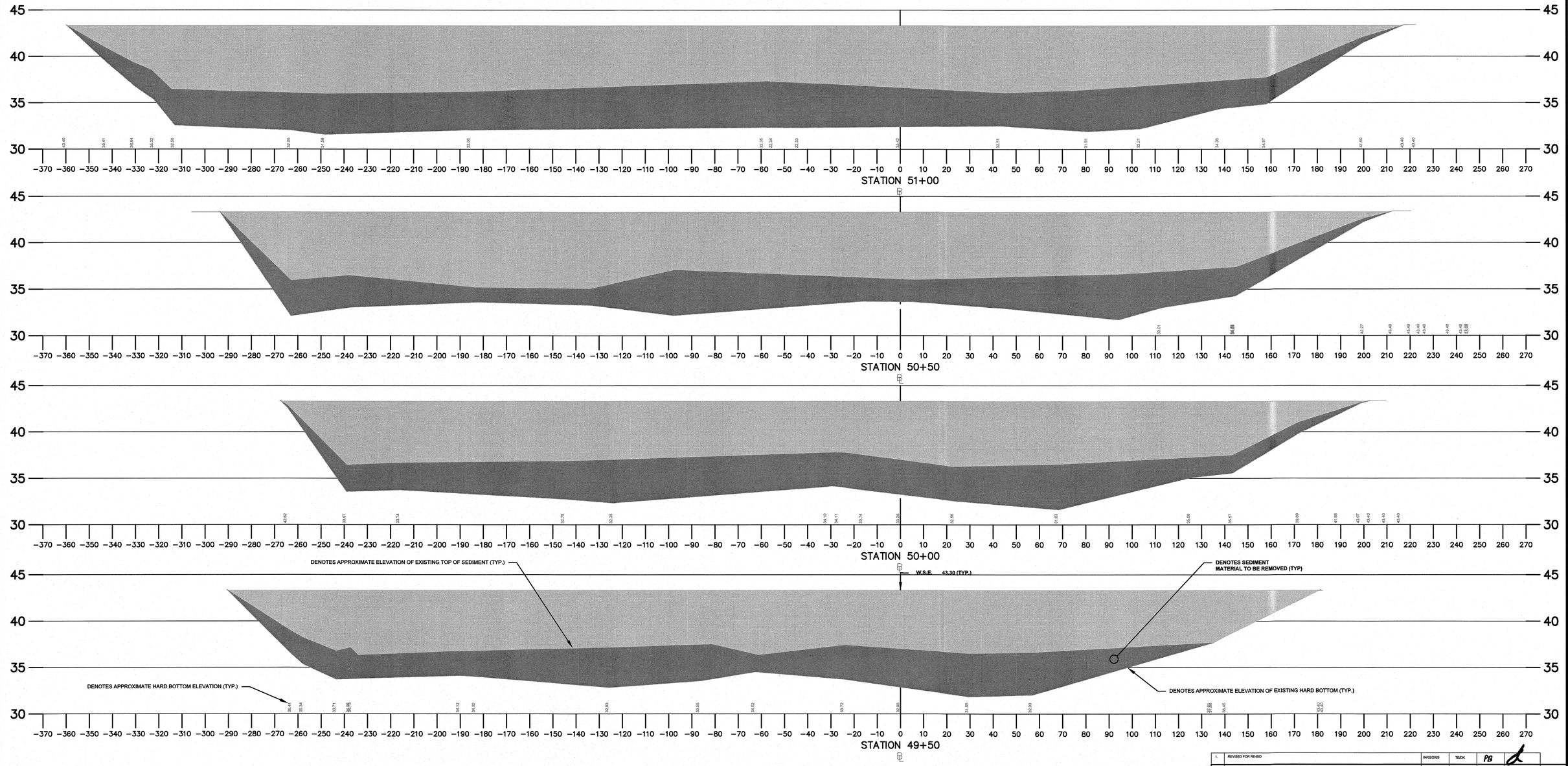
CENTRAL LAKE RESERVOIR CROSS SECTIONS (11 OF 15) STA. 47+50 TO 49+00

CVE ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	As Shown
DATE	October 2024
DRAWN BY	TE
DESIGNED BY	GO / PB
CHECKED BY	PB
SHEET	36 of 139

REGISTER NO.
FILE NO. 115.UN00213.P05
DRAWING NUMBER



CENTRAL LAKE
CROSS SECTIONS

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

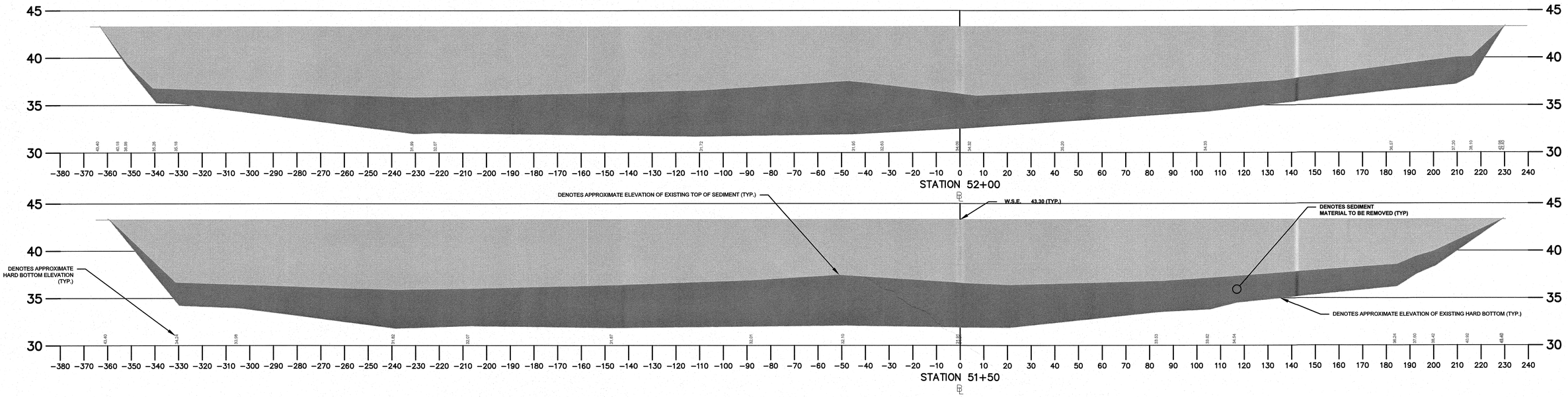
CENTRAL LAKE — RESERVOIR CROSS SECTIONS (2 OF 15) STA. 49+50 TO 51+00

CVE ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO. FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 37 of 139	



LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/GK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

CENTRAL LAKE RESERVOIR CROSS SECTIONS (13 OF 15) STA. 51+50 TO 52+00

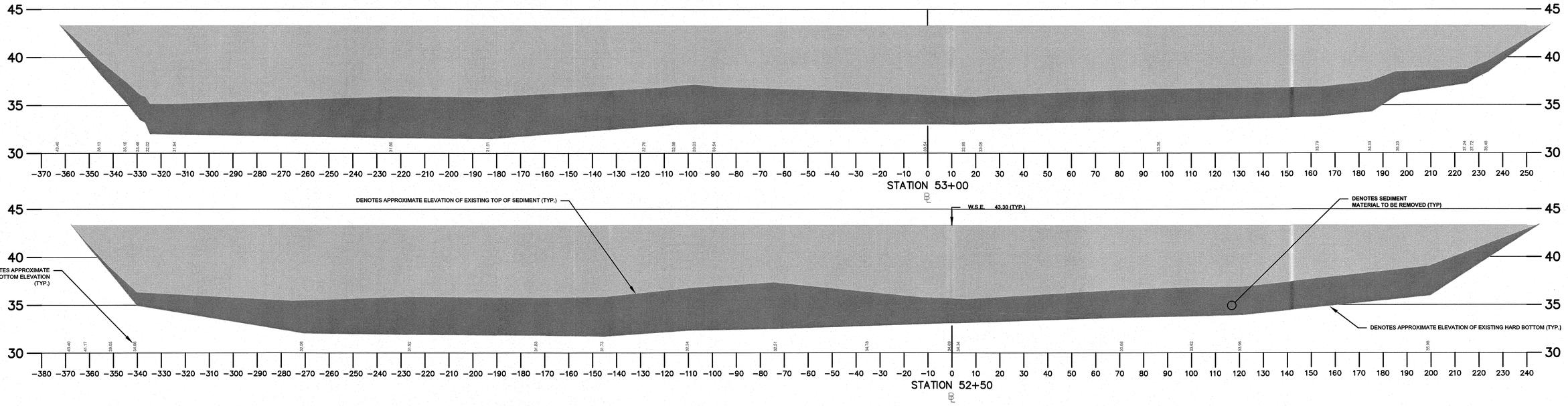
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO. FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 38 of 139	

CENTRAL LAKE
CROSS SECTIONS



LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	APPROVED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

CENTRAL LAKE RESERVOIR CROSS SECTIONS (14 OF 15) STA. 52+50 TO 53+00

REGISTER NO.

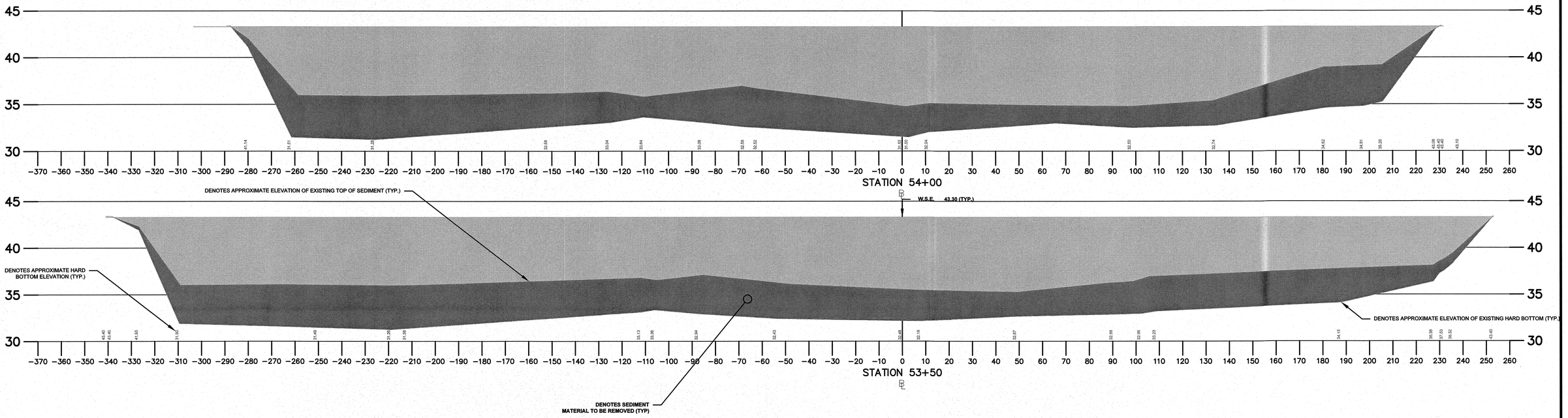
FILE NO. 115.UN00213.P05

CVE ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162
(732) 462 7400 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 39 of 139	

CENTRAL LAKE
CROSS SECTIONS



CENTRAL LAKE
CROSS SECTIONS

LEGEND

- AREA DENOTES SEDIMENT MATERIAL TO BE REMOVED (TYP.)

SCALE: 1"=20' (HORZ.)
1"=5' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

CENTRAL LAKE RESERVOIR CROSS SECTIONS
(15 OF 15) STA. 53+50 TO 54+00

CVE ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162
(732) 462 7400 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE: As Shown	DATE: October 2024
DRAWN BY: TE	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 40 of 139

REGISTER NO.
FILE NO. 115.UN00213.P05
DRAWING NUMBER

CENTRAL LAKE

B.L. CENTRAL LAKE

FLOODWAY LINE (TYP)

TOP OF BANK (TYP)

50' RIPARIAN ZONE LINE (TYP)

WETLANDS FLAG (TYP)

FLOOD HAZARD AREA LINE (PER NJDEP RULES)(TYP)

50' WETLANDS TRANSITION AREA

GINESI DRIVE

APPROXIMATE LIMIT OF DISTURBANCE (TYP.)

PROPOSED TEMPORARY ACCESS ROAD

CONSTRUCT WOODEN SNOW FENCE

CONSTRUCT CONSTRUCTION DRIVEWAY

MADISON HILL ROAD

Block 52 — 11
Block 52 — 14.08
Block 52 — 14.10
Block 52 — 14.09
Block 52 — 14.07
Block 52 — 14.06
Block 52 — 14.05
Block 52 — 14.04
Block 52 — 14.03
Block 52 — 14.02
Block 52 — 14.01
Block 52 — 11.02
Block 52 — 12
Block 52 — 11
Block 52 — 9
Block 52 — 29
Block 52 — 28
Block 52 — 27
Block 52 — 25
Block 52 — 26

Pay Item Number	To Be Constructed	Unit	Plan Quantity
7	Construction Driveway	TONS	1096
144	Wooden Snow Fence	LF	2455

SEED MIXTURE FOR STREAMBANK STABILIZATION

1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVE STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

NOTE:

DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

REFERENCE:

EXISTING CONDITION, TOPOGRAPHY, IN THE AREAS OF THE PROPOSED IMPROVEMENTS PREPARED BY CME ASSOCIATES. ALL TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

NOTE:

SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

NOTE:

THE CONTRACTOR IS ADVISED THAT THE PROPOSED WOODEN SNOW FENCE SHALL BE INSTALLED AT THE DRIPLINE OF THE EXISTING TREES TO BE PROTECTED ADJACENT TO THE THE PROPOSED ACCESS ROADWAY.

NOTE:

THE CONTRACTOR IS ADVISED THAT THE FOOTPRINT OF THE ACCESS ROAD SHALL BE CONSTRUCTED IN THE LOCATION OF THE PROPOSED ENTRANCE ROADWAY ACCESS ROAD, PARKING LOT AND BOAT RAMP

TREE LEGEND

- DENOTES TREE LARGER THAN 8" DIAMETER

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DREDGING IMPROVEMENTS

CENTRAL LAKE
ACCESS ROAD
CONSTRUCTION PLAN

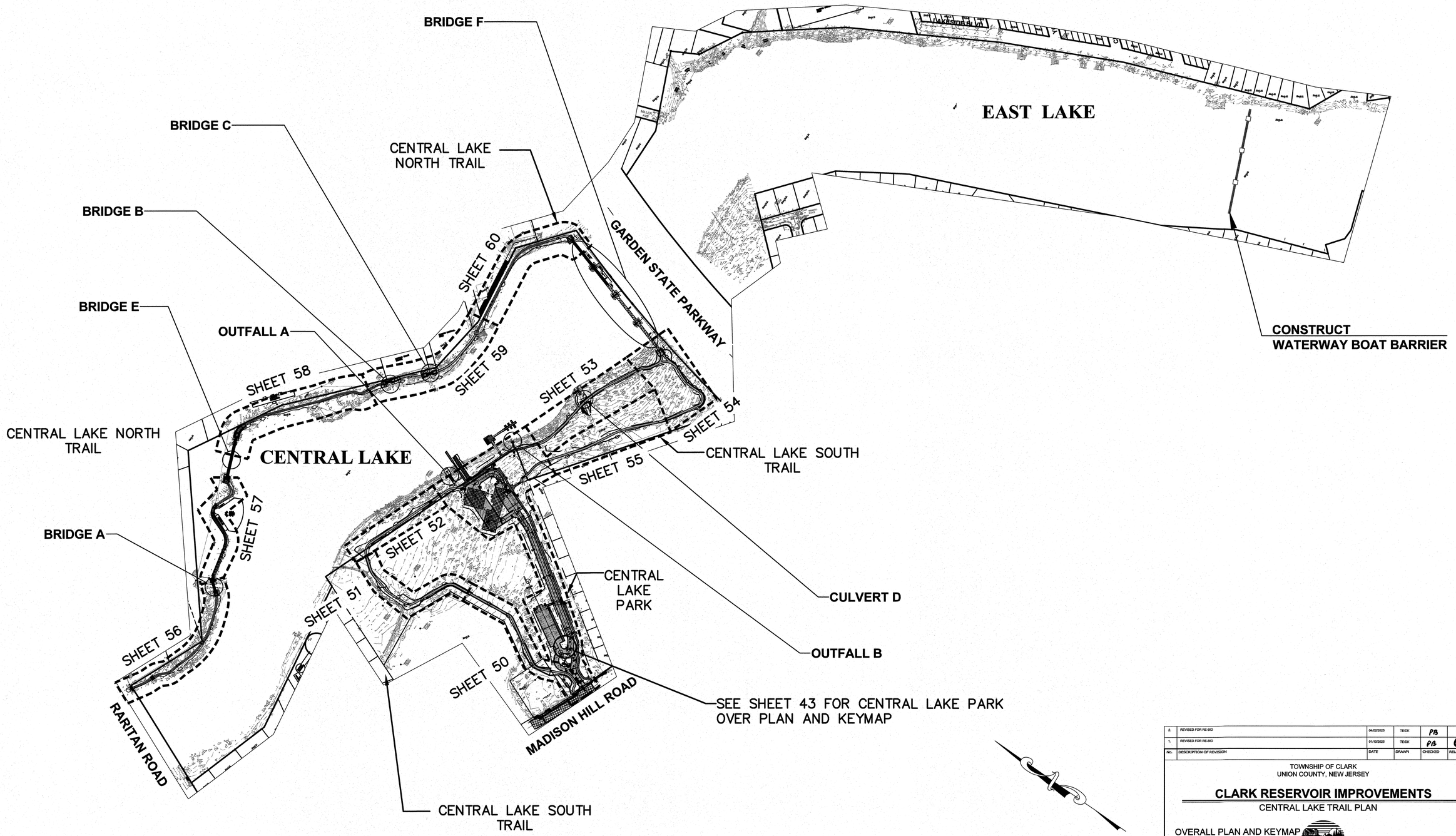
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

INDEX/TIE NO.

FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 41 of 139	



No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CENTRAL LAKE TRAIL PLAN

OVERALL PLAN AND KEYMAP

CVE ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

REGISTER NO.

FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: DK	DESIGNED BY: GO/PB	
CHECKED BY: PB	SHEET: 42 of 139	

CENTRAL LAKE PARK PLAN (1 OF 5) MADISON HILL ROAD CONSTRUCTION PLAN SHEET 45

CENTRAL LAKE PARK PLAN (2 OF 5) ENTRANCE CONSTRUCTION PLAN SHEET 46

CENTRAL LAKE PARK PLAN (4 OF 5) ACCESS ROAD PLAN (2 OF 2) SHEET 48

OUTFALL A

BOAT RAMP GRADING PLAN SHEET 80

MADISON HILL ROAD

CENTRAL LAKE PARK PLAN (3 OF 5) ACCESS ROAD PLAN (1 OF 2) SHEET 47

GINESI DRIVE

ANTHONY COURT

CENTRAL LAKE PARK PLAN (5 OF 5) FLOATING DOCK ACCESS PLAN SHEET 49

FLOATING DOCK GRADING PLAN SHEET 81

OUTFALL B

Block 52 14.01
Block 52 14.02
Block 52 14.03
Block 52 14.04
Block 52 14.05
Block 52 14.06
Block 52 14.07
Block 52 14.08
Block 52 14.09
Block 52 14.10

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CENTRAL LAKE PARK PLAN

OVERALL PLAN AND KEYMAP

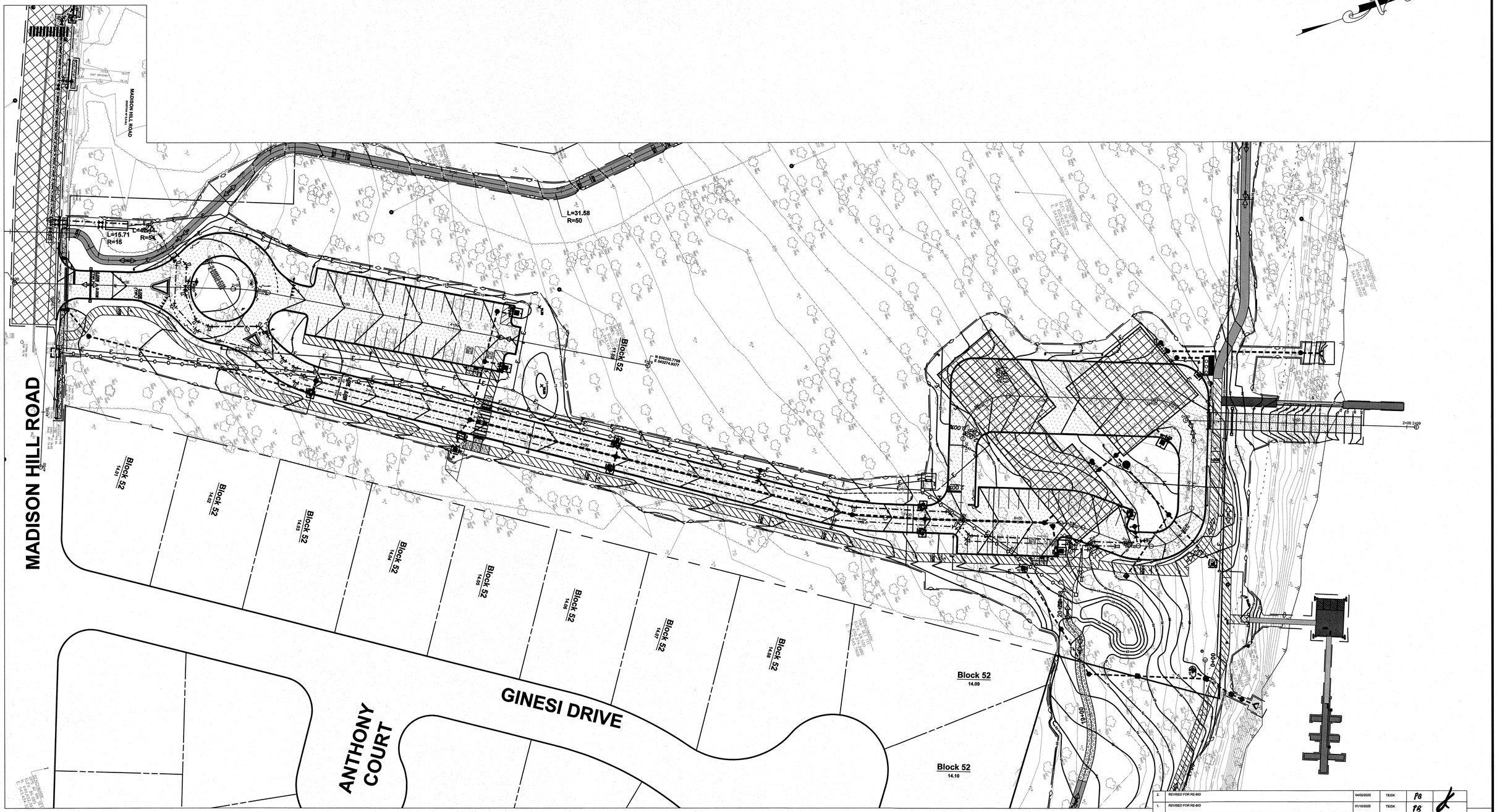
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28039500
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	As Shown
DATE	October 2024
DRAWN BY	TE
DESIGNED BY	GO/PB
CHECKED BY	PB
SHEET	43 of 139

DRAWING NUMBER

PROJECT NO. 115.UN00213.P05



GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CENTRAL LAKE PARK

OVERALL SITE
GRADING PLAN

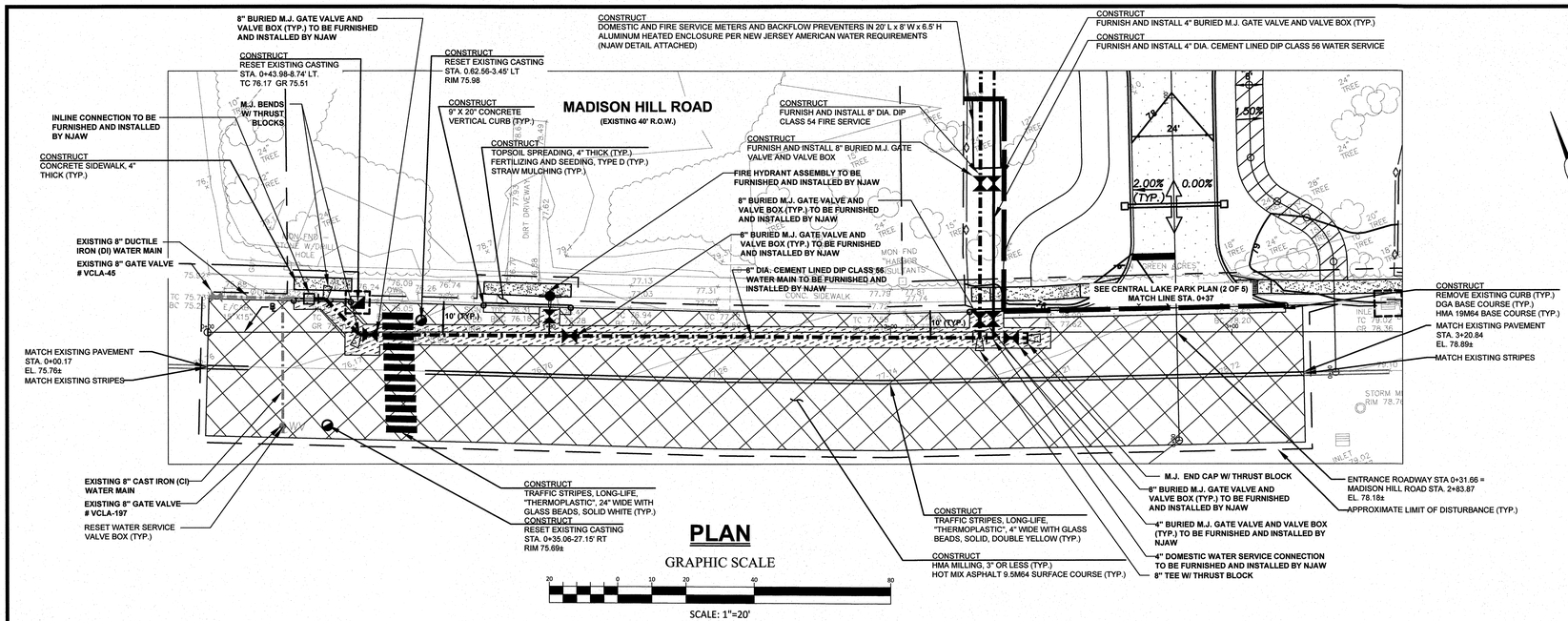
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY TE	DESIGNED BY GO/PB	
CHECKED BY PB	SHEET 44 of 139	

REGISTER NO.

FILE NO. 115.UN00213.P05

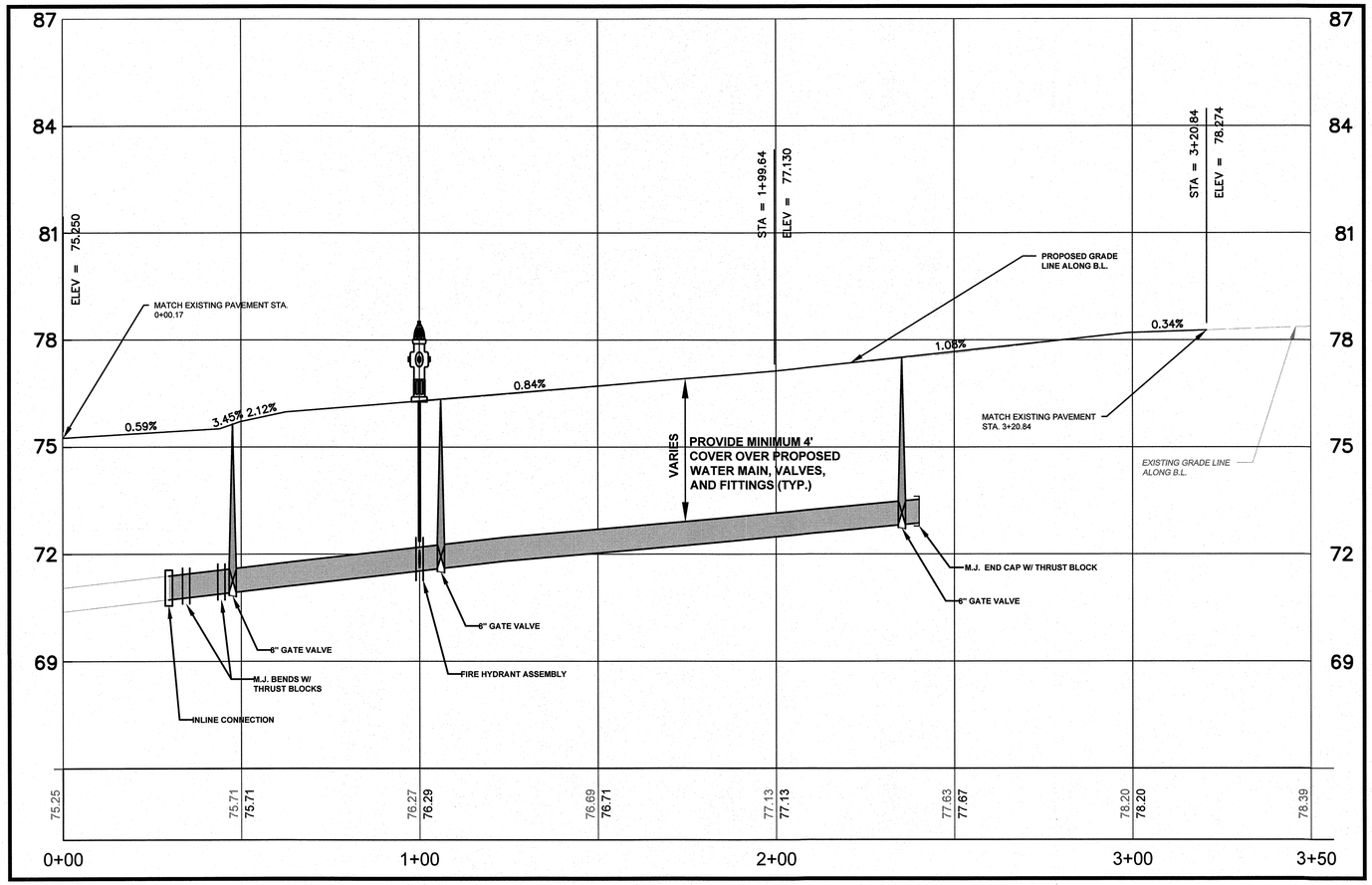


PLAN

GRAPHIC SCALE

20 0 10 20 40 80

SCALE: 1"=20'



PROFILE

SCALE: 1"=20' (HORZ.)
1"=2' (VERT.)

Pay Item Number	To Be Constructed	Unit	Plan Quantity
33	Dense graded aggregate base course, variable thickness	CY	5
34	HMA Milling, 3" or less	SY	1428
35	Tack coat	GAL	215
36	Prime coat	GAL	714
37	Polymerized joint adhesive	LF	1049
38	Hot mix asphalt 9.5M64 surface course	TON	168
39	Hot mix asphalt 19M64 base course	TON	11
128	Reset existing casting	UN	3
146	Concrete sidewalk, 4" thick	SF	194
153	9"x20" Concrete vertical curb	LF	72
157	Traffic stripes, long-life, thermoplastic, 4"	LF	540
160	Traffic stripes, long-life, thermoplastic, 24"	LF	108
189	Reset water valve box to grade	UN	1
190	Furnish and install 8" dia. cement lined class 56 water main	LF	70
192	Furnish and install 8" buried M.J. gate valve and valve box	UN	1
197	Furnish and install domestic and fire service meters and backflow preventers within aluminum heated enclosure with insulated walls (20'L X 8'W X 6.5'H)	LS	1
198	Furnish and install 4" dia. cement lined class 56 water service	LF	70
199	Furnish and install 4" buried M.J. gate valve and valve box	UN	1
233	Topsoil spreading, 4" thick	SY	24
235	Fertilizing and seeding, type D	SY	24
240	Straw mulching	SY	24

NOTES

1. CONSTRUCTION DETAILS APPLICABLE TO THE WORK DEPICTED ON THIS DRAWING ARE CONTAINED ON DRAWINGS NUMBERED 108 THROUGH 109, INCLUSIVE, ARE INCORPORATED HEREIN BY REFERENCE.
2. NOT ALL UTILITIES ARE SHOWN ON THIS PLAN AND THE EXISTING UTILITY LOCATIONS INDICATED ON THE PLANS, BOTH HORIZONTAL AND VERTICAL, ARE APPROXIMATE. THE CONTRACTOR SHALL REQUEST A UTILITY MARKOUT FROM THE RESPECTIVE UTILITY COMPANIES PRIOR TO COMMENCEMENT OF THE WORK. PROTECTION OF EXISTING UTILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.
3. LOCATIONS OF WATER SERVICES, SANITARY LATERALS, AND/OR STORMWATER LATERALS (WHERE APPLICABLE) AS SHOWN ON PLANS ARE APPROXIMATE.
4. THE CONTRACTOR IS ADVISED TO REVIEW THE SOIL BORINGS AND OTHER RELEVANT SECTIONS IN THE SPECIFICATIONS WITH REGARD TO SUBSURFACE CONDITIONS. AT A MINIMUM, THE CONTRACTOR SHALL RETAIN A DEWATERING SPECIALIST TO PREPARE A DEWATERING PLAN TO A MINIMUM OF 2 FEET BELOW THE REQUIRED BASE OF EXCAVATION AND RETAIN AN ENGINEER TO PREPARE AN EXCAVATION SUPPORT PLAN.

NOTE:
THE CONTRACTOR IS DIRECTED TO VERIFY ALL NECESSARY TREE REMOVALS WITH THE ENGINEER PRIOR TO BEGINNING ANY TREE REMOVAL WORK. THE CONTRACTOR IS ADVISED THAT THE INDIVIDUAL LOCATIONS OF EXISTING TREES INDICATED ON THE PLANS ARE APPROXIMATE AND ARE NOT GUARANTEED AS TO ACCURACY, NOR CAN THEY BE ASSUMED TO BE THE ONLY EXISTING TREES. MEASUREMENT AND PAYMENT FOR ALL TREE REMOVALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SELECTIVE CLEARING AS INDICATED ON THE BID FORM IN THE CONTRACT SPECIFICATIONS.

NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AREAS FOR CONSTRUCTION EQUIPMENT AND MATERIAL STORING AND STAGING. DO NOT STAGE, STORE, DELIVER, OR UNLOAD MATERIALS AND EQUIPMENT ON EXISTING COUNTY ROADWAYS OR PROPERTY OUTSIDE OF THE CONSTRUCTION LIMITS UNLESS PERMISSION IS GRANTED BY THE COUNTY TO DO SO AND ADEQUATE PROVISIONS FOR RESTORATION AND PROTECTION OF PROPERTY ARE ESTABLISHED AND APPROVED.

NOTE:
IT IS THE INTENT OF THIS PROJECT TO CONSTRUCT THE PROPOSED PATHWAY SYSTEM IN ACCORDANCE WITH THE LAYOUT ON THE PLANS WITH MINIMAL IMPACT TO THE EXISTING TREES, VEGETATION, AND TERRAIN TO THE EXTENT POSSIBLE. SHOULD THE CONTRACTOR OBSERVE ANY POTENTIAL CONFLICTS BETWEEN THE PROPOSED PATHWAY ALIGNMENT AND ANY EXISTING FIELD CONDITIONS OR OBSTRUCTIONS NOT INDICATED ON THE PLANS, SAID CONFLICTS WILL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION. MINOR ADJUSTMENTS TO THE PROPOSED PATHWAY ALIGNMENT IN ORDER TO MINIMIZE IMPACTS TO EXISTING TREES AND/OR SITE FEATURES WILL BE REVIEWED AND APPROVED BY THE ENGINEER IF DEEMED APPROPRIATE. THE CONTRACTOR SHALL LIMIT THE WORK AREA DISTURBANCE OUTSIDE THE LIMITS OF THE PROPOSED PATHWAY AND SPECIFICALLY IN AND AROUND EXISTING TREES IN ORDER TO PREVENT DAMAGE TO THE ROOT SYSTEM AND THE TREE ITSELF.

NOTE:
THE CONTRACTOR IS SPECIFICALLY DIRECTED TO THE REQUIREMENTS CONTAINED IN THE SPECIAL PROVISIONS SECTION OF THE CONTRACT SPECIFICATIONS.

SEED MIXTURE FOR STREAMBANK STABILIZATION

1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVING STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

NOTE:
DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

REFERENCE:
EXISTING CONDITION, TOPOGRAPHY, IN THE AREAS OF THE PROPOSED IMPROVEMENTS PREPARED BY CME ASSOCIATES. ALL TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

NOTE:
SEE SHEET NO. 83 FOR CURB RAMP DETAILS

NOTE:
SEE SHEETS NO. 84-88 FOR LANDSCAPING PLANS

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION AND SOIL EROSION AND SEDIMENT CONTROL PLAN

CENTRAL LAKE PARK PLAN (1 OF 5)

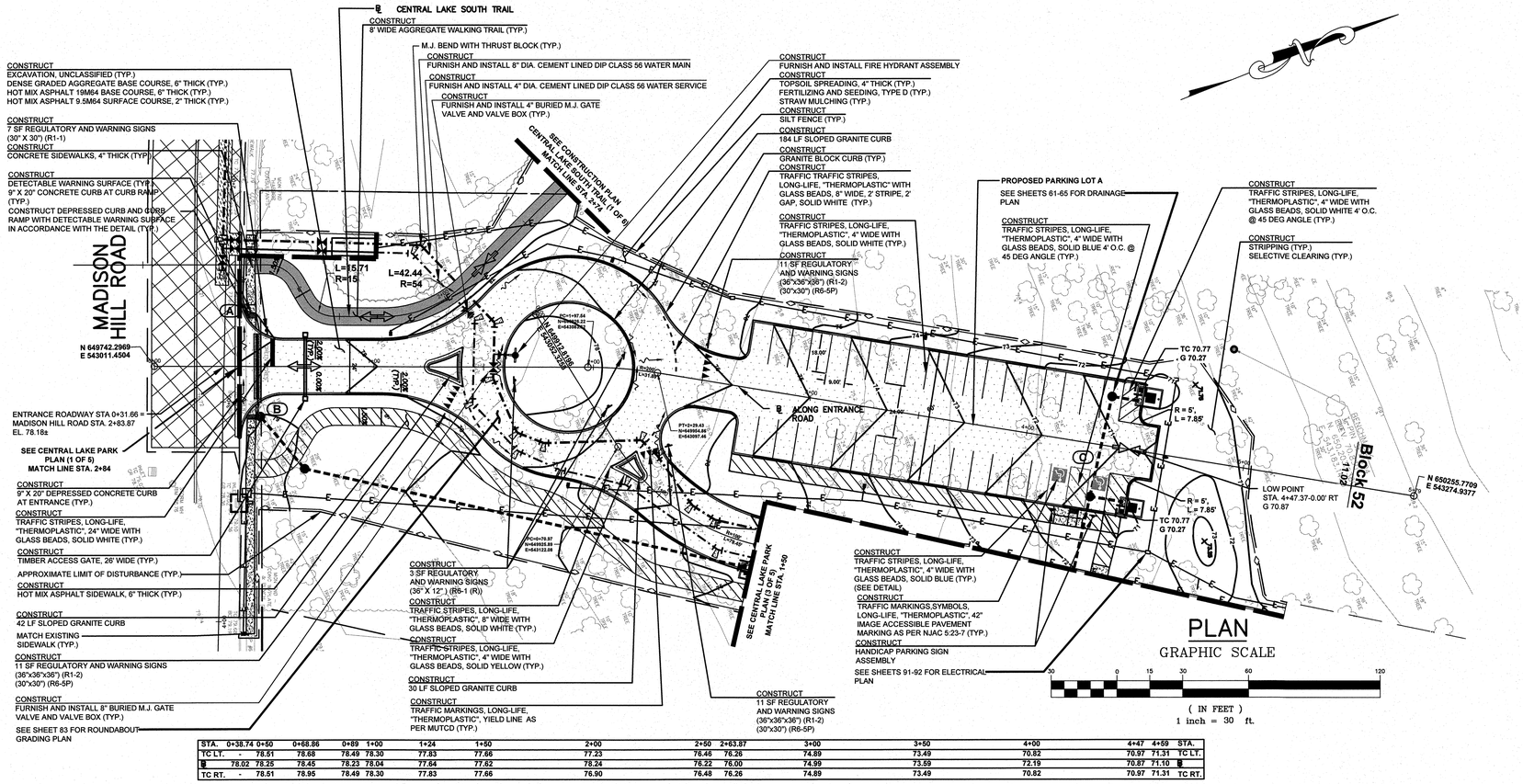
MADISON HILL ROAD STA. 0+00 TO STA. 3+21

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: AF/TE	DESIGNED BY: AF/TE	
CHECKED BY: PB	SHEET: 45 of 139	

REGISTER NO.
FILE NO. 115.UN00213.P05



STA.	0+38.74	0+50	0+68.86	0+89	1+00	1+24	1+50	2+00	2+50	2+63.87	3+00	3+50	4+00	4+47	4+59	STA.
TC LT.	-	78.51	78.68	78.49	78.30	77.83	77.66	77.23	76.46	76.26	74.89	73.49	70.82	70.97	71.31	TC LT.
℄	78.02	78.25	78.45	78.23	78.04	77.64	77.62	78.24	76.22	76.00	74.99	73.59	72.19	70.87	71.10	℄
TC RT.	-	78.51	78.95	78.49	78.30	77.83	77.66	76.90	76.48	76.26	74.89	73.49	70.82	70.97	71.31	TC RT.

Pay Item Number	To Be Constructed	Unit	Plan Quantity
3	Silt fence	LF	886
21	Stripping	SY	6166
22	Excavation, unclassified	CY	1904
33	Dense graded aggregate base course, variable thickness	CY	400
35	Tack coat	GAL	360
36	Prime coat	GAL	1200
37	Polymerized joint adhesive	LF	3524
38	Hot mix asphalt 9.5M64 surface course	TON	282
39	Hot mix asphalt 19M64 base course	TON	846
145	8' Wide aggregate walking trail	SY	154
146	Concrete sidewalk, 4" thick	SF	680
147	Hot mix asphalt sidewalk, 6" thick	SY	390
151	Detectable warning surface	SY	3
153	9"x20" Concrete vertical curb	LF	54
154	Granite block curb	LF	1057
155	Sloped granite curb	LF	256
157	Traffic stripes, long-life, thermoplastic, 4"	LF	918
158	Traffic stripes, long-life, thermoplastic, 8"	LF	72
160	Traffic stripes, long-life, thermoplastic, 24"	LF	13
161	Traffic markings, symbols, long-life, thermoplastic	SF	113
162	Regulatory and warning signs	SF	49
163	Handicap parking sign assembly	UN	2
190	Furnish and install 8" dia. cement lined class 56 water main	LF	249
192	Furnish and install 8" buried M.J. gate valve and valve box	UN	1
193	Furnish and install fire hydrant assembly	UN	1
198	Furnish and install 4" dia. cement lined class 56 water service	LF	246
199	Furnish and install 4" buried M.J. gate valve and valve box	UN	1
231	Selective clearing	SY	6166
233	Topsoil spreading, 4" thick	SY	3371
235	Fertilizing and seeding, type D	SY	3371
240	Straw mulching	SY	3371
280	Timber access gate, 26' wide	UN	1

NOTE:
THE CONTRACTOR IS DIRECTED TO VERIFY ALL NECESSARY TREE REMOVALS WITH THE ENGINEER PRIOR TO BEGINNING ANY TREE REMOVAL WORK. THE CONTRACTOR IS ADVISED THAT THE INDIVIDUAL LOCATIONS OF EXISTING TREES INDICATED ON THE PLANS ARE APPROXIMATE AND ARE NOT GUARANTEED AS TO ACCURACY, NOR CAN THEY BE ASSUMED TO BE THE ONLY EXISTING TREES. MEASUREMENT AND PAYMENT FOR ALL TREE REMOVALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SELECTIVE CLEARING AS INDICATED ON THE BID FORM IN THE CONTRACT SPECIFICATIONS.

NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AREAS FOR CONSTRUCTION EQUIPMENT AND MATERIAL STORING AND STAGING. DO NOT STAGE, STORE, DELIVER, OR UNLOAD MATERIALS AND EQUIPMENT ON EXISTING COUNTY ROADWAYS OR PROPERTY OUTSIDE OF THE CONSTRUCTION LIMITS UNLESS EXPRESS PERMISSION IS GRANTED BY THE COUNTY TO DO SO AND ADEQUATE PROVISIONS FOR RESTORATION AND PROTECTION OF PROPERTY ARE ESTABLISHED AND APPROVED.

NOTE:
IT IS THE INTENT OF THIS PROJECT TO CONSTRUCT THE PROPOSED PATHWAY SYSTEM IN ACCORDANCE WITH THE LAYOUT ON THE PLANS WITH MINIMAL IMPACT TO THE EXISTING TREES, VEGETATION, AND TERRAIN TO THE EXTENT POSSIBLE. SHOULD THE CONTRACTOR OBSERVE ANY POTENTIAL CONFLICTS BETWEEN THE PROPOSED PATHWAY ALIGNMENT AND ANY EXISTING FIELD CONDITIONS OR OBSTRUCTIONS NOT INDICATED ON THE PLANS, SAID CONFLICTS WILL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION. MINOR ADJUSTMENTS TO THE PROPOSED PATHWAY ALIGNMENT IN ORDER TO MINIMIZE IMPACTS TO EXISTING TREES AND/OR SITE FEATURES WILL BE REVIEWED AND APPROVED BY THE ENGINEER IF DEEMED APPROPRIATE. THE CONTRACTOR SHALL LIMIT THE WORK AREA DISTURBANCE OUTSIDE THE LIMITS OF THE PROPOSED PATHWAY AND SPECIFICALLY IN AND AROUND EXISTING TREES IN ORDER TO PREVENT DAMAGE TO THE ROOT SYSTEM AND THE TREE ITSELF.

NOTE:
THE CONTRACTOR IS SPECIFICALLY DIRECTED TO THE REQUIREMENTS CONTAINED IN THE SPECIAL PROVISIONS SECTION OF THE CONTRACT SPECIFICATIONS.

SEED MIXTURE FOR STREAMBANK STABILIZATION

1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVING STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

NOTE:
DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

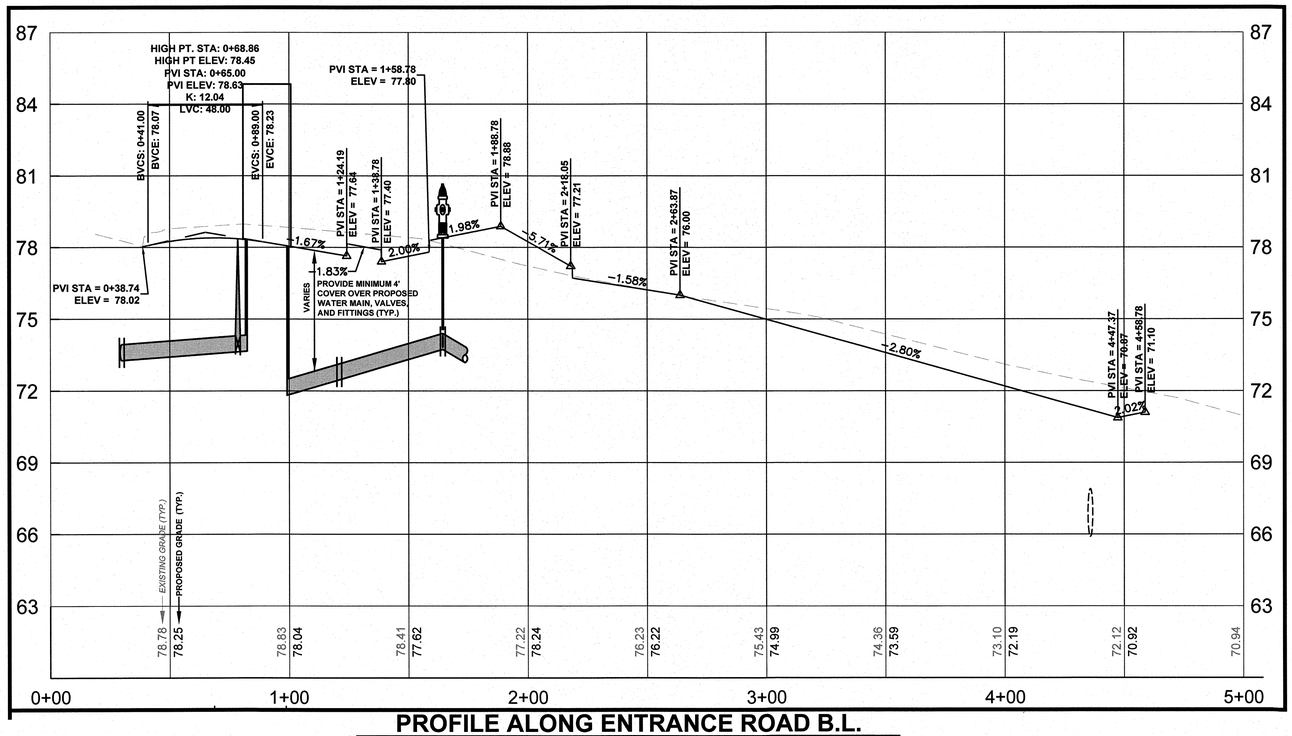
REFERENCE:
EXISTING CONDITION, TOPOGRAPHY, IN THE AREAS OF THE PROPOSED IMPROVEMENTS PREPARED BY CME ASSOCIATES. ALL TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

NOTE:
SEE SHEET NO. 83 FOR CURB RAMP DETAILS

NOTE:
SEE SHEET NO. 68 FOR CROSS SECTIONS

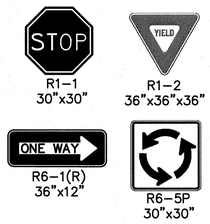
NOTE:
SEE SHEETS NO. 84-88 FOR LANDSCAPING PLANS

NOTE:
SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS



PROFILE ALONG ENTRANCE ROAD B.L.

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)



SIGN LEGEND
NOT TO SCALE

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION AND SOIL EROSION AND SEDIMENT CONTROL PLAN

CENTRAL LAKE PARK PLAN (2 OF 5)

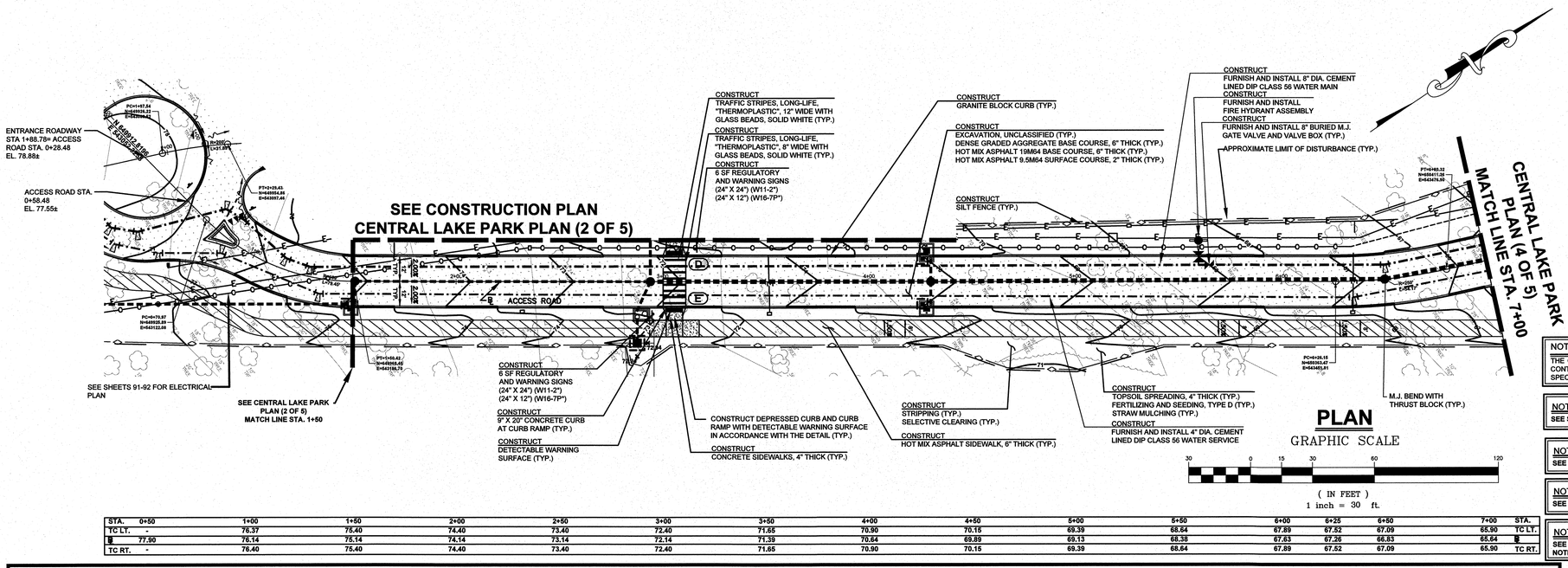
ENTRANCE ROADWAY STA. 0+39 TO STA. 4+59

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28259000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO. 115.UN0213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GG/PB	
CHECKED BY: PB	SHEET: 46 of 139	



STA.	0+50	1+00	1+50	2+00	2+50	3+00	3+50	4+00	4+50	5+00	5+50	6+00	6+25	6+50	7+00	STA.
TC LT.	-	76.37	75.40	74.40	73.40	72.40	71.65	70.90	70.15	69.39	68.64	67.89	67.52	67.09	65.90	TC LT.
℄	77.90	76.14	75.14	74.14	73.14	72.14	71.39	70.64	69.89	69.13	68.38	67.63	67.26	66.83	65.64	℄
TC RT.	-	76.40	75.40	74.40	73.40	72.40	71.65	70.90	70.15	69.39	68.64	67.89	67.52	67.09	65.90	TC RT.

Pay Item Number	To Be Constructed	Unit	Plan Quantity
3	Silt fence	LF	865
21	Stripping	SY	3592
22	Excavation, unclassified	CY	1354
33	Dense graded aggregate base course, variable thickness	CY	245
35	Tack coat	GAL	220
36	Prime coat	GAL	734
37	Polymerized joint adhesive	LF	3396
38	Hot mix asphalt 9.5M64 surface course	TON	173
39	Hot mix asphalt 19M64 base course	TON	517
146	Concrete sidewalk, 4" thick	SF	310
147	Hot mix asphalt sidewalk, 6" thick	SY	473
151	Detectable warning surface	SY	4
153	9"x20" Concrete vertical curb	LF	22
154	Granite block curb	LF	1080
158	Traffic stripes, long-life, thermoplastic, 8"	LF	48
159	Traffic stripes, long-life, thermoplastic, 12"	LF	88
162	Regulatory and warning signs	SF	12
190	Furnish and install 8" dia. cement lined class 56 water main	LF	549
192	Furnish and install 8" buried M.J. gate valve and valve box	UN	1
193	Furnish and install fire hydrant assembly	UN	1
198	Furnish and install 4" dia. cement lined class 56 water service	LF	552
231	Selective clearing	SY	3592
233	Topsoil spreading, 4" thick	SY	1613
235	Fertilizing and seeding, type D	SY	1613
240	Straw mulching	SY	1613

NOTE:
THE CONTRACTOR IS SPECIFICALLY DIRECTED TO THE REQUIREMENTS CONTAINED IN THE SPECIAL PROVISIONS SECTION OF THE CONTRACT SPECIFICATIONS.

NOTE:
SEE SHEET NO. 83 FOR CURB RAMP DETAILS

NOTE:
SEE SHEET NO. 69 FOR CROSS SECTIONS

NOTE:
SEE SHEETS NO. 84-88 FOR LANDSCAPING PLANS

NOTE:
SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

SEED MIXTURE FOR STREAMBANK STABILIZATION
1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVING STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

REFERENCE:
EXISTING CONDITION, TOPOGRAPHY, IN THE AREAS OF THE PROPOSED IMPROVEMENTS PREPARED BY CME ASSOCIATES. ALL TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

NOTE:
THE CONTRACTOR IS DIRECTED TO VERIFY ALL NECESSARY TREE REMOVALS WITH THE ENGINEER PRIOR TO BEGINNING ANY TREE REMOVAL WORK. THE CONTRACTOR IS ADVISED THAT THE INDIVIDUAL LOCATIONS OF EXISTING TREES INDICATED ON THE PLANS ARE APPROXIMATE AND ARE NOT GUARANTEED AS TO ACCURACY, NOR CAN THEY BE ASSUMED TO BE THE ONLY EXISTING TREES. MEASUREMENT AND PAYMENT FOR ALL TREE REMOVALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SELECTIVE CLEARING AS INDICATED ON THE BID FORM IN THE CONTRACT SPECIFICATIONS.

NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AREAS FOR CONSTRUCTION EQUIPMENT AND MATERIAL STORING AND STAGING. DO NOT STAGE, STORE, DELIVER, OR UNLOAD MATERIALS AND EQUIPMENT ON EXISTING COUNTY ROADWAYS OR PROPERTY OUTSIDE OF THE CONSTRUCTION LIMITS UNLESS EXPRESS PERMISSION IS GRANTED BY THE COUNTY TO DO SO AND ADEQUATE PROVISIONS FOR RESTORATION AND PROTECTION OF PROPERTY ARE ESTABLISHED AND APPROVED.

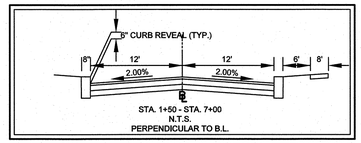
NOTE:
IT IS THE INTENT OF THIS PROJECT TO CONSTRUCT THE PROPOSED PATHWAY SYSTEM IN ACCORDANCE WITH THE LAYOUT ON THE PLANS WITH MINIMAL IMPACT TO THE EXISTING TREES, VEGETATION, AND TERRAIN TO THE EXTENT POSSIBLE. SHOULD THE CONTRACTOR OBSERVE ANY POTENTIAL CONFLICTS BETWEEN THE PROPOSED PATHWAY ALIGNMENT AND ANY EXISTING FIELD CONDITIONS OR OBSTRUCTIONS NOT INDICATED ON THE PLANS, SAID CONFLICTS WILL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION. MINOR ADJUSTMENTS TO THE PROPOSED PATHWAY ALIGNMENT IN ORDER TO MINIMIZE IMPACTS TO EXISTING TREES AND/OR SITE FEATURES WILL BE REVIEWED AND APPROVED BY THE ENGINEER IF DEEMED APPROPRIATE. THE CONTRACTOR SHALL LIMIT THE WORK AREA DISTURBANCE OUTSIDE THE LIMITS OF THE PROPOSED PATHWAY AND SPECIFICALLY IN AND AROUND EXISTING TREES IN ORDER TO PREVENT DAMAGE TO THE ROOT SYSTEM AND THE TREE ITSELF.

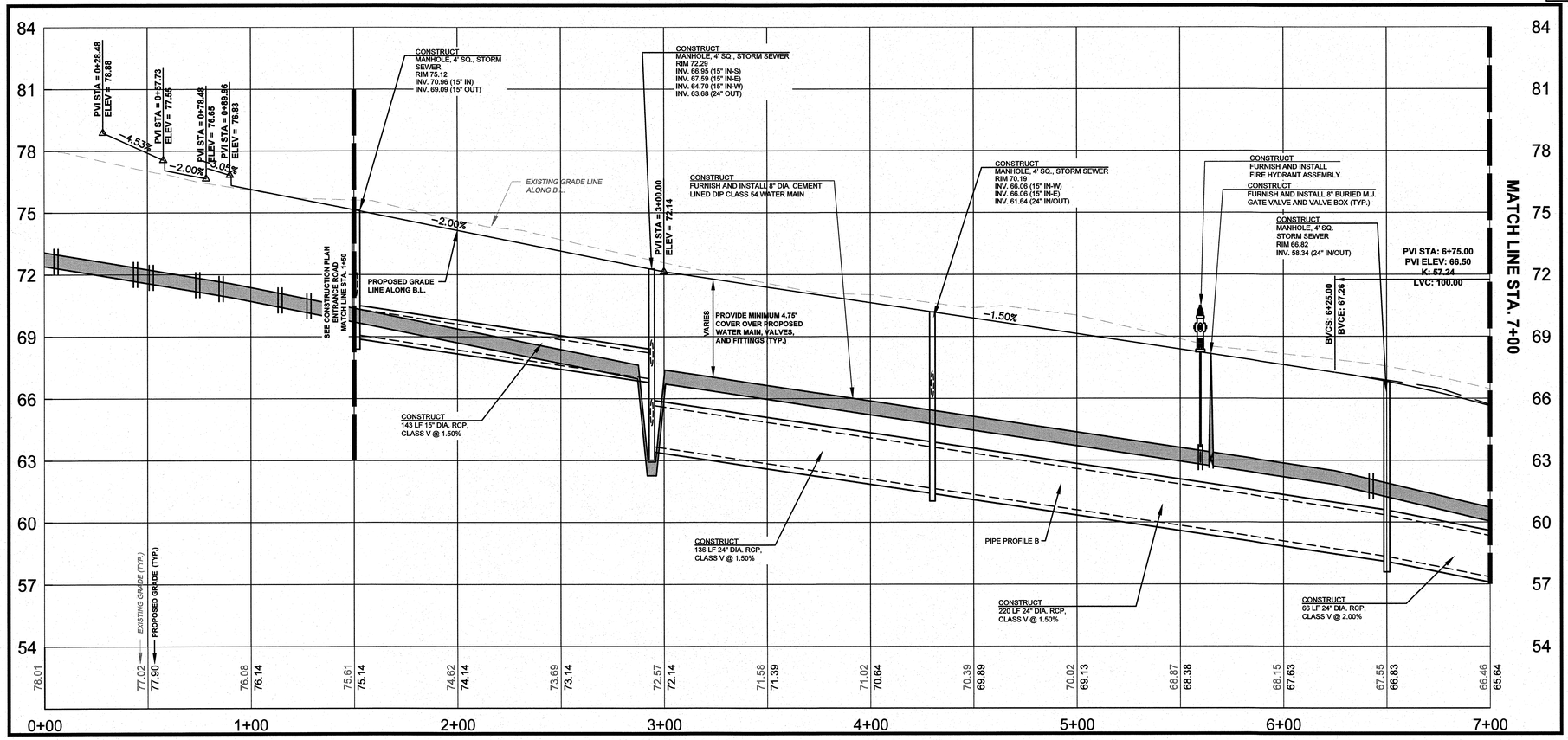


W11-2 (24" X 24")
W16-7P (24" X 12")

SIGN LEGEND
NOT TO SCALE

NOTE:
DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.





PROFILE ALONG ACCESS ROAD B.L.

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION AND SOIL EROSION AND SEDIMENT CONTROL PLAN

CENTRAL LAKE PARK PLAN (3 OF 5)

ACCESS ROAD (1 OF 2)
STA. 0+00 TO STA. 7+00

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28339000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY: TE/DK	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 47 of 139

DRAWING NUMBER

REGISTER NO.

FILE NO. 115.UN00213.P05

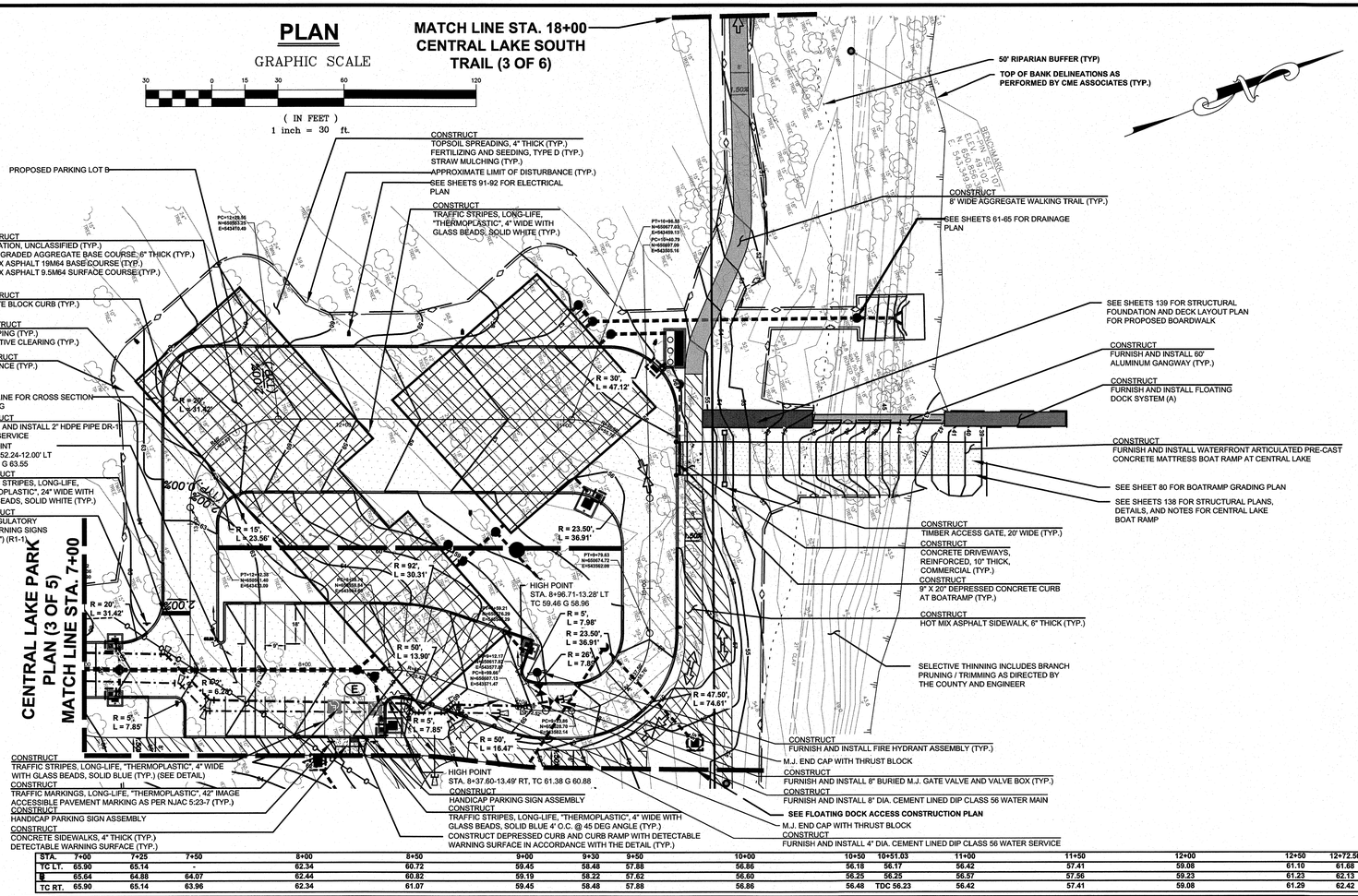
PLAN

GRAPHIC SCALE

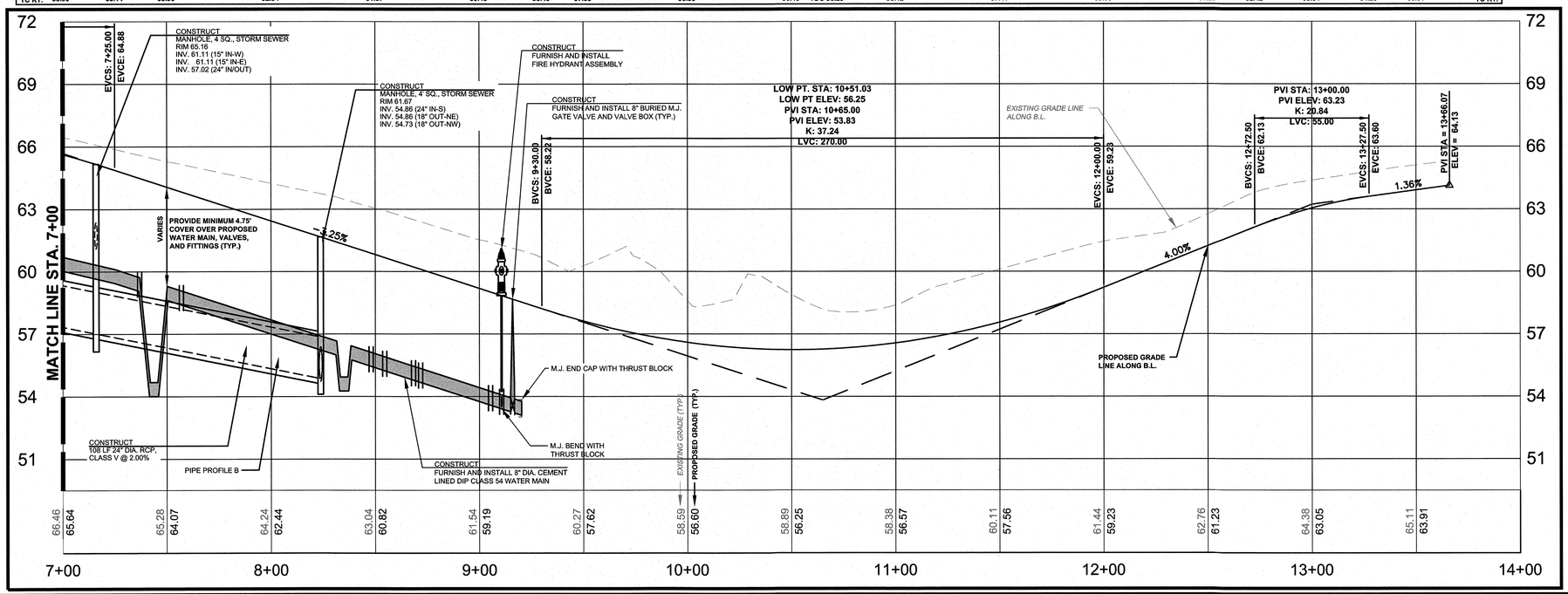
30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

MATCH LINE STA. 18+00 CENTRAL LAKE SOUTH TRAIL (3 OF 6)



STA.	7+00	7+25	7+50	8+00	8+50	9+00	9+30	9+50	10+00	10+50	10+51.03	11+00	11+50	12+00	12+50	12+72.50	13+00	13+27.50	13+50	13+66.07	STA.
TC LT.	65.90	65.14	-	62.34	60.72	-	59.45	58.48	57.88	56.86	56.18	56.17	56.42	57.41	59.08	61.10	61.68	63.21	63.77	64.02	-	TC LT.
℄	65.64	64.88	64.07	62.44	60.82	59.19	58.22	57.62	56.60	56.25	56.25	56.57	57.56	59.23	61.23	62.13	63.05	63.60	63.91	64.13	℄
TC RT.	65.90	65.14	63.96	62.34	61.07	59.45	58.48	57.88	56.86	56.48	TDC 56.23	56.42	57.41	59.08	61.29	62.42	63.54	64.26	65.01	-	TC RT.



PROFILE

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)

Pay Item Number	To Be Constructed	Unit	Plan Quantity
3	Silt fence	LF	1139
21	Stripping	SY	7536
22	Excavation, unclassified	CY	6214
33	Dense graded aggregate base course, variable thickness	CY	541
35	Tack coat	GAL	487
36	Prime coat	GAL	1623
37	Polymerized joint adhesive	LF	3048
38	Hot mix asphalt 9.5M64 surface course	TON	382
39	Hot mix asphalt 19M64 base course	TON	1144
141	Timber Access Gate, 20' Wide	UN	1
145	8' Wide aggregate walking trail	SY	148
146	Concrete sidewalk, 4" thick	SF	111
147	Hot mix asphalt sidewalk, 6" thick	SY	505
149	Concrete driveways, reinforced, 10" thick, commercial	SF	240
151	Detectable warning surface	SY	1
153	9"x20" Concrete vertical curb	LF	51
154	Granite block curb	LF	1351
157	Traffic stripes, long-life, thermoplastic, 4"	LF	1013
160	Traffic stripes, long-life, thermoplastic, 24"	LF	13
161	Traffic markings, symbols, long-life, thermoplastic	SF	80
162	Regulatory and warning signs	SF	7
163	Handicap parking sign assembly	UN	2
174	Furnish and install 60' aluminum gangway	UN	1
175	Furnish and install floating dock system (A)	LS	LS
178	Furnish and install waterfront articulated pre-cast concrete mattress boat ramp at Central Lake	LS	LS
190	Furnish and install 8" dia. cement lined class 56 water main	LF	227
192	Furnish and install 8" buried M.J. gate valve and valve box	UN	1
193	Furnish and install fire hydrant assembly	UN	1
195	Furnish and install 2" HDPE pipe DR-11 water service	LF	20
198	Furnish and install 4" dia. cement lined class 56 water service	LF	194
231	Selective clearing	SY	7536
232	Selective thinning	SY	1116
233	Topsoil spreading, 4" thick	SY	2911
235	Fertilizing and seeding, type D	SY	2911
240	Straw mulching	SY	2911

NOTE:
DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

SEED MIXTURE FOR STREAMBANK STABILIZATION

1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVING STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

REFERENCE:
EXISTING CONDITION, TOPOGRAPHY, IN THE AREAS OF THE PROPOSED IMPROVEMENTS PREPARED BY CME ASSOCIATES. ALL TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

NOTE:
SEE SHEET NO. 83 FOR CURB RAMP DETAILS

NOTE:
SEE SHEETS NO. 69-71 FOR CROSS SECTIONS

NOTE:
SEE SHEETS NO. 84-88 FOR LANDSCAPING PLANS

NOTE:
SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

NOTE:
THE CONTRACTOR IS DIRECTED TO VERIFY ALL NECESSARY TREE REMOVALS WITH THE ENGINEER PRIOR TO BEGINNING ANY TREE REMOVAL WORK. THE CONTRACTOR IS ADVISED THAT THE INDIVIDUAL LOCATIONS OF EXISTING TREES INDICATED ON THE PLANS ARE APPROXIMATE AND ARE NOT GUARANTEED AS TO ACCURACY, NOR CAN THEY BE ASSUMED TO BE THE ONLY EXISTING TREES. MEASUREMENT AND PAYMENT FOR ALL TREE REMOVALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SELECTIVE CLEARING AS INDICATED ON THE BID FORM IN THE CONTRACT SPECIFICATIONS.

NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AREAS FOR CONSTRUCTION EQUIPMENT AND MATERIAL STORING AND STAGING. DO NOT STAGE, STORE, DELIVER, OR UNLOAD MATERIALS AND EQUIPMENT ON EXISTING COUNTY ROADWAYS OR PROPERTY OUTSIDE OF THE CONSTRUCTION LIMITS UNLESS EXPRESS PERMISSION IS GRANTED BY THE COUNTY TO DO SO AND ADEQUATE PROVISIONS FOR RESTORATION AND PROTECTION OF PROPERTY ARE ESTABLISHED AND APPROVED.

NOTE:
IT IS THE INTENT OF THIS PROJECT TO CONSTRUCT THE PROPOSED PATHWAY SYSTEM IN ACCORDANCE WITH THE LAYOUT ON THE PLANS WITH MINIMAL IMPACT TO THE EXISTING TREES, VEGETATION, AND TERRAIN TO THE EXTENT POSSIBLE. SHOULD THE CONTRACTOR OBSERVE ANY POTENTIAL CONFLICTS BETWEEN THE PROPOSED PATHWAY ALIGNMENT AND ANY EXISTING FIELD CONDITIONS OR OBSTRUCTIONS NOT INDICATED ON THE PLANS, SAID CONFLICTS WILL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION. MINOR ADJUSTMENTS TO THE PROPOSED PATHWAY ALIGNMENT IN ORDER TO MINIMIZE IMPACTS TO EXISTING TREES AND/OR SITE FEATURES WILL BE REVIEWED AND APPROVED BY THE ENGINEER IF DEEMED APPROPRIATE. THE CONTRACTOR SHALL LIMIT THE WORK AREA DISTURBANCE OUTSIDE THE LIMITS OF THE PROPOSED PATHWAY AND SPECIFICALLY IN AND AROUND EXISTING TREES IN ORDER TO PREVENT DAMAGE TO THE ROOT SYSTEM AND THE TREE ITSELF.

NOTE:
THE CONTRACTOR IS SPECIFICALLY DIRECTED TO THE REQUIREMENTS CONTAINED IN THE SPECIAL PROVISIONS SECTION OF THE CONTRACT SPECIFICATIONS.

STOP
R1-1
30"x30"
SIGN LEGEND
NOT TO SCALE

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION AND SOIL EROSION AND SEDIMENT CONTROL PLAN

CENTRAL LAKE PARK PLAN (4 OF 5) — ACCESS ROAD (2 OF 2) STA. 7+00 TO STA. 13+66

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

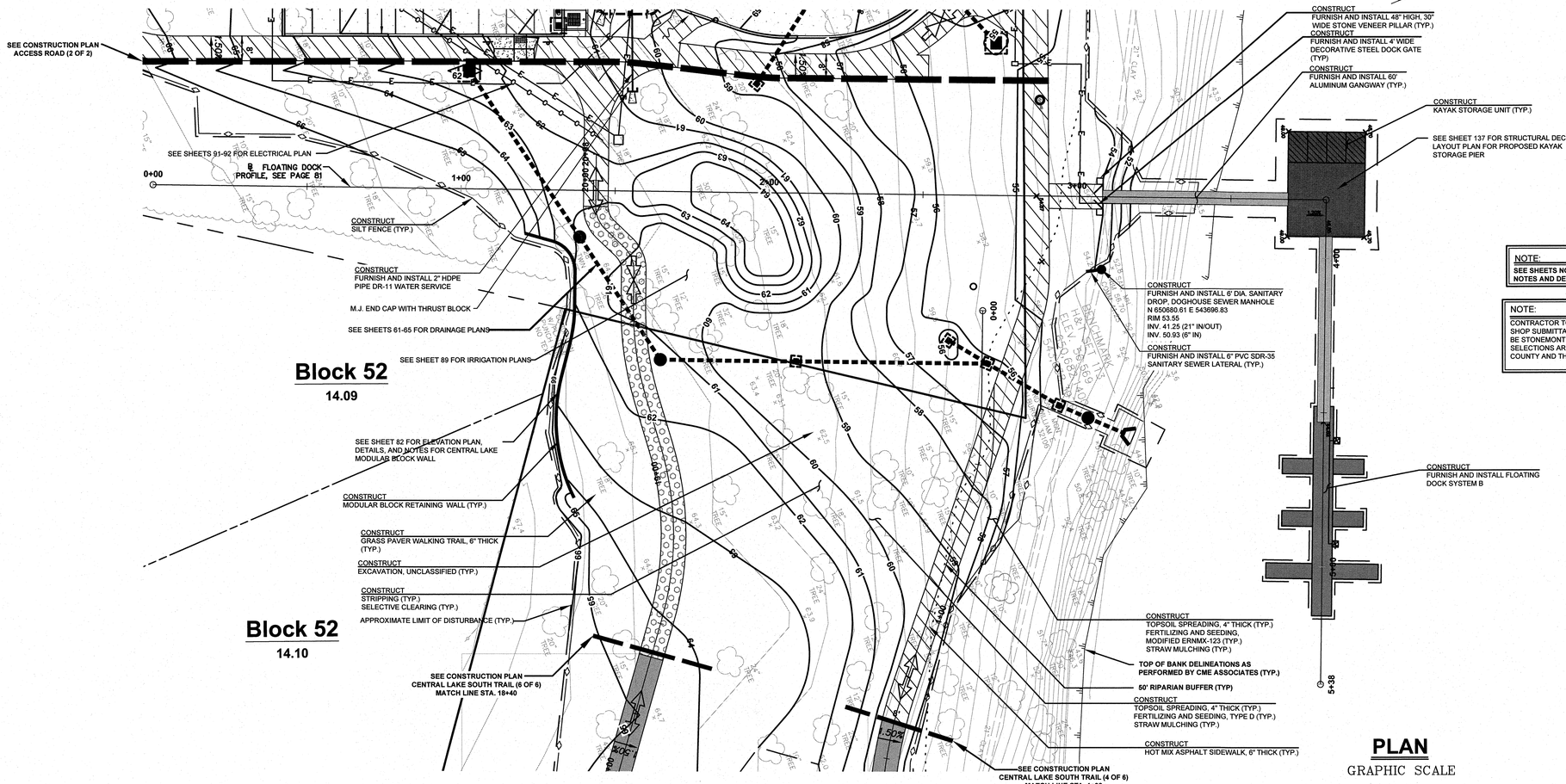
SCALE	DATE
As Shown	October 2024
DRAWN BY: TE/DK	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 48 of 139

DRAWING NUMBER

REGISTER NO.

FILE NO. 115.UN00213.P05

Pay Item Number	To Be Constructed	Unit	Plan Quantity
3	Silt fence	LF	628
21	Stripping	SY	3932
22	Excavation, unclassified	CY	3038
91	Modular block retaining wall	SF	390
143	4' wide decorative steel dock gate	UN	1
147	Hot mix asphalt sidewalk, 6" thick	SY	267
174	Furnish and install 60' aluminum gangway	UN	2
176	Furnish and install floating dock system (B)	LS	LS
180	Kayak storage unit	UN	1
182	Grass paver walking trail, 6" thick	SF	1223
187	48" High, 30" wide stone veneer pillar	UN	2
195	Furnish and install 2" HDPE pipe DR-11 water service	LF	10
200	Furnish and install 6' dia. precast concrete sanitary drop, doghouse sewer manhole	UN	1
230	Furnish and install fully automatic irrigation system for all open lawns and landscaped beds	LS	LS
231	Selective clearing	SY	3932
233	Topsoil spreading, 4" thick	SY	3531
235	Fertilizing and seeding, type D	SY	3285
236	Fertilizing and seeding, modified ERNMX-123	SY	246
240	Straw mulching	SY	3531



NOTE:
SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

NOTE:
CONTRACTOR TO SUBMIT SAMPLES OF CULTURED STONE DURING THE SHOP SUBMITTAL PROCESS. PATTERN OF STONE VENEER USED SHALL BE STONEMONT SPLIT LEDGE OR APPROVED EQUAL. ALL MATERIAL SELECTIONS ARE SUBJECT TO THE REVIEW AND APPROVAL OF THE COUNTY AND THE ENGINEER PRIOR TO INSTALLATION.

SEED MIXTURE FOR STREAMBANK STABILIZATION

1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVING STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

REFERENCE:
EXISTING CONDITION, TOPOGRAPHY, IN THE AREAS OF THE PROPOSED IMPROVEMENTS PREPARED BY CME ASSOCIATES. ALL TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

NOTE:
THE CONTRACTOR IS DIRECTED TO VERIFY ALL NECESSARY TREE REMOVALS WITH THE ENGINEER PRIOR TO BEGINNING ANY TREE REMOVAL WORK. THE CONTRACTOR IS ADVISED THAT THE INDIVIDUAL LOCATIONS OF EXISTING TREES INDICATED ON THE PLANS ARE APPROXIMATE AND ARE NOT GUARANTEED AS TO ACCURACY, NOR CAN THEY BE ASSUMED TO BE THE ONLY EXISTING TREES. MEASUREMENT AND PAYMENT FOR ALL TREE REMOVALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SELECTIVE CLEARING AS INDICATED ON THE BID FORM IN THE CONTRACT SPECIFICATIONS.

NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AREAS FOR CONSTRUCTION EQUIPMENT AND MATERIAL STORING AND STAGING. DO NOT STAGE, STORE, DELIVER, OR UNLOAD MATERIALS AND EQUIPMENT ON EXISTING COUNTY ROADWAYS OR PROPERTY OUTSIDE OF THE CONSTRUCTION LIMITS UNLESS EXPRESS PERMISSION IS GRANTED BY THE COUNTY TO DO SO AND ADEQUATE PROVISIONS FOR RESTORATION AND PROTECTION OF PROPERTY ARE ESTABLISHED AND APPROVED.

NOTE:
IT IS THE INTENT OF THIS PROJECT TO CONSTRUCT THE PROPOSED PATHWAY SYSTEM IN ACCORDANCE WITH THE LAYOUT ON THE PLANS WITH MINIMAL IMPACT TO THE EXISTING TREES, VEGETATION, AND TERRAIN TO THE EXTENT POSSIBLE. SHOULD THE CONTRACTOR OBSERVE ANY POTENTIAL CONFLICTS BETWEEN THE PROPOSED PATHWAY ALIGNMENT AND ANY EXISTING FIELD CONDITIONS OR OBSTRUCTIONS NOT INDICATED ON THE PLANS, SAID CONFLICTS WILL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION. MINOR ADJUSTMENTS TO THE PROPOSED PATHWAY ALIGNMENT IN ORDER TO MINIMIZE IMPACTS TO EXISTING TREES AND/OR SITE FEATURES WILL BE REVIEWED AND APPROVED BY THE ENGINEER IF DEEMED APPROPRIATE. THE CONTRACTOR SHALL LIMIT THE WORK AREA DISTURBANCE OUTSIDE THE LIMITS OF THE PROPOSED PATHWAY AND SPECIFICALLY IN AND AROUND EXISTING TREES IN ORDER TO PREVENT DAMAGE TO THE ROOT SYSTEM AND THE TREE ITSELF.

NOTE:
THE CONTRACTOR IS SPECIFICALLY DIRECTED TO THE REQUIREMENTS CONTAINED IN THE SPECIAL PROVISIONS SECTION OF THE CONTRACT SPECIFICATIONS.

NOTE:
SEE SHEET NO. 82 FOR FLOATING DOCK ACCESS GRADING PLAN

NOTE:
DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION AND SOIL EROSION AND SEDIMENT CONTROL PLAN

CENTRAL LAKE PARK PLAN (5 OF 5)

FLOATING DOCK ACCESS PLAN

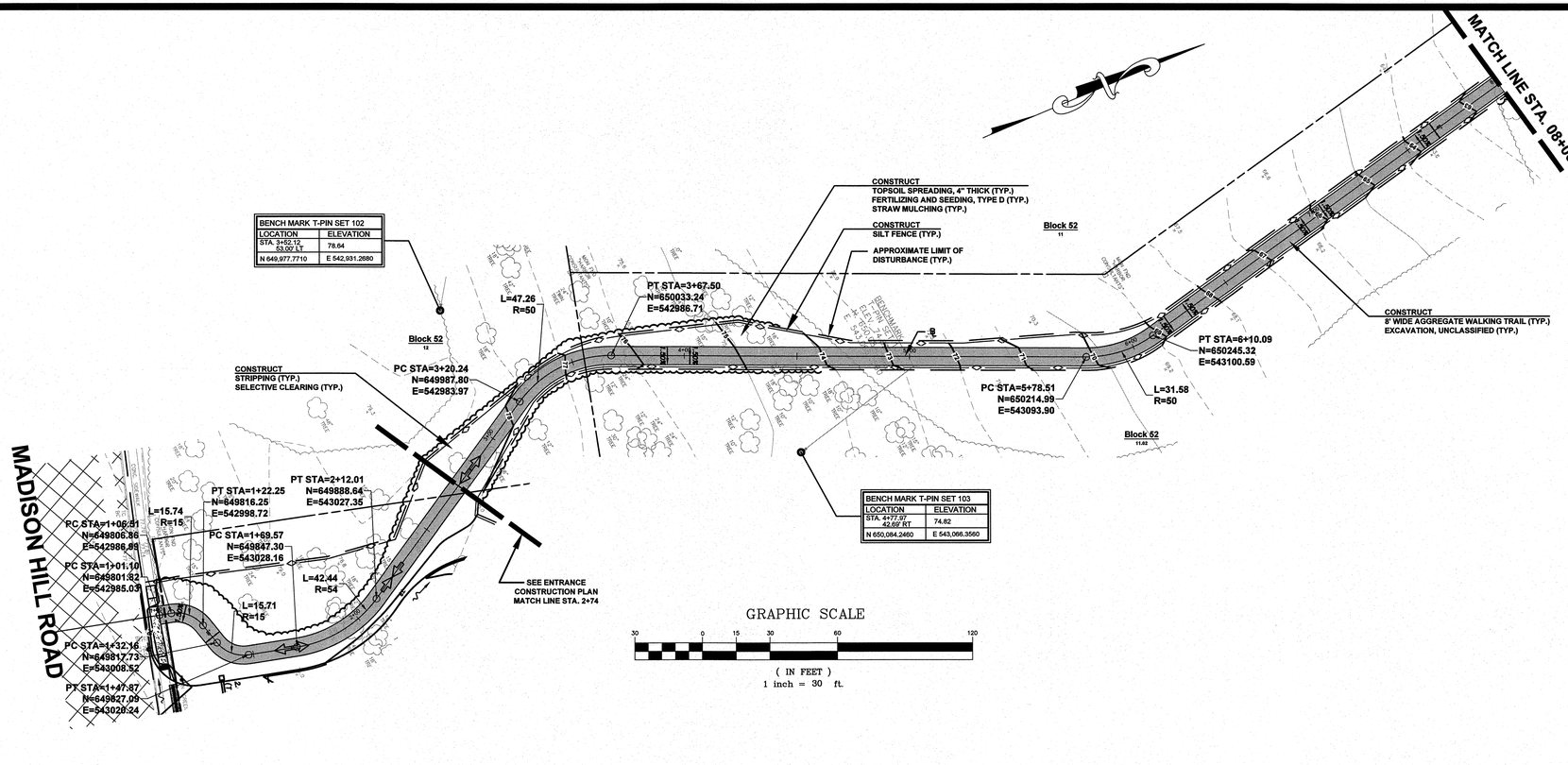
RECEIPT# NO.

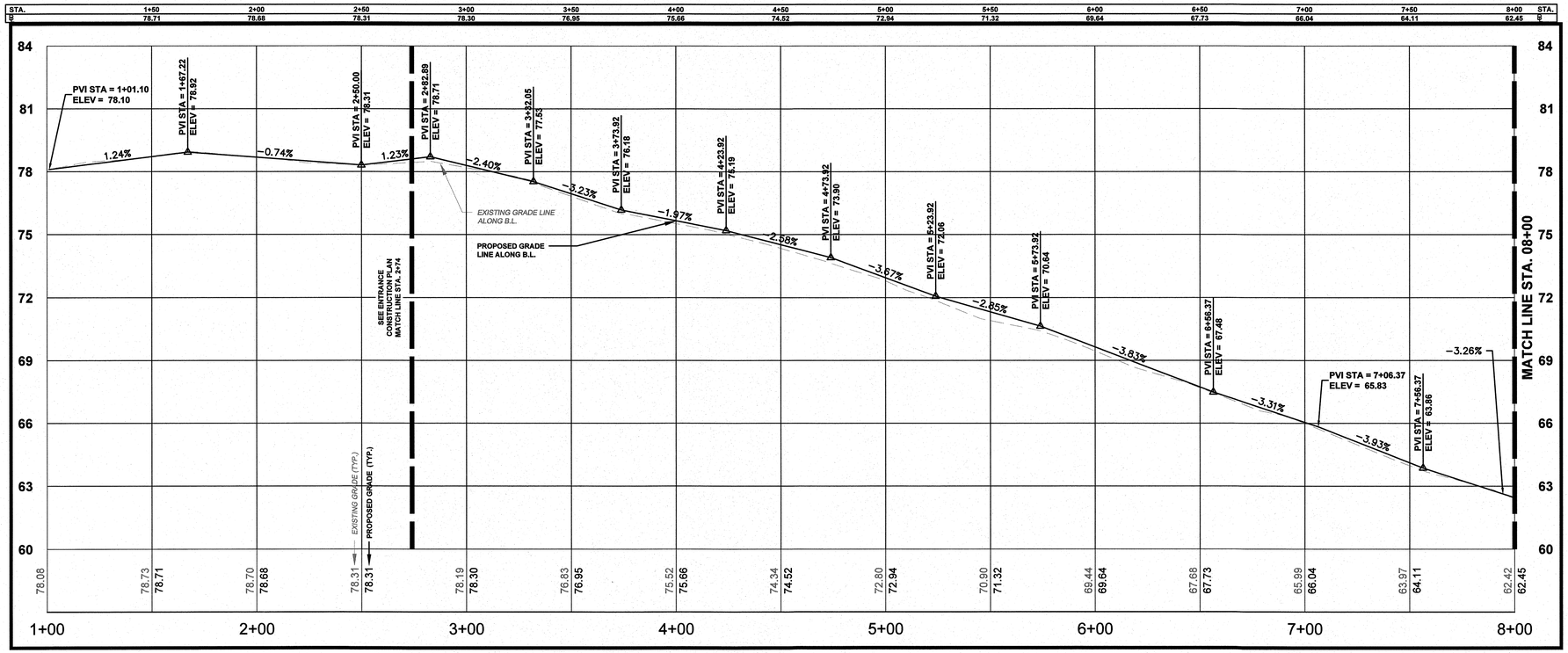
FILE NO. 115.UN00213.P05

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468
PE SEAL

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 49 of 139	





PROFILE

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)

Pay Item Number	To Be Constructed	Unit	Plan Quantity
3	Silt fence	LF	1055
21	Stripping	SY	863
22	Excavation, unclassified	CY	110
145	8' Wide Aggregate Walking Trail	SY	468
231	Selective Clearing	SY	863
233	Topsoil Spreading, 4" Thick	SY	395
235	Fertilizing and Seeding, Type D	SY	395
240	Straw Mulching	SY	395

NOTE:
THE CONTRACTOR IS DIRECTED TO VERIFY ALL NECESSARY TREE REMOVALS WITH THE ENGINEER PRIOR TO BEGINNING ANY TREE REMOVAL WORK. THE CONTRACTOR IS ADVISED THAT THE INDIVIDUAL LOCATIONS OF EXISTING TREES INDICATED ON THE PLANS ARE APPROXIMATE AND ARE NOT GUARANTEED AS TO ACCURACY, NOR CAN THEY BE ASSUMED TO BE THE ONLY EXISTING TREES. MEASUREMENT AND PAYMENT FOR ALL TREE REMOVALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SELECTIVE CLEARING AS INDICATED ON THE BID FORM IN THE CONTRACT SPECIFICATIONS.

NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AREAS FOR CONSTRUCTION EQUIPMENT AND MATERIAL STORING AND STAGING. DO NOT STAGE, STORE, DELIVER, OR UNLOAD MATERIALS AND EQUIPMENT ON EXISTING COUNTY ROADWAYS OR PROPERTY OUTSIDE OF THE CONSTRUCTION LIMITS UNLESS EXPRESS PERMISSION IS GRANTED BY THE COUNTY TO DO SO AND ADEQUATE PROVISIONS FOR RESTORATION AND PROTECTION OF PROPERTY ARE ESTABLISHED AND APPROVED.

NOTE:
IT IS THE INTENT OF THIS PROJECT TO CONSTRUCT THE PROPOSED PATHWAY SYSTEM IN ACCORDANCE WITH THE LAYOUT ON THE PLANS WITH MINIMAL IMPACT TO THE EXISTING TREES, VEGETATION, AND TERRAIN TO THE EXTENT POSSIBLE. SHOULD THE CONTRACTOR OBSERVE ANY POTENTIAL CONFLICTS BETWEEN THE PROPOSED PATHWAY ALIGNMENT AND ANY EXISTING FIELD CONDITIONS OR OBSTRUCTIONS NOT INDICATED ON THE PLANS, SAID CONFLICTS WILL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION. MINOR ADJUSTMENTS TO THE PROPOSED PATHWAY ALIGNMENT IN ORDER TO MINIMIZE IMPACTS TO EXISTING TREES AND/OR SITE FEATURES WILL BE REVIEWED AND APPROVED BY THE ENGINEER IF DEEMED APPROPRIATE. THE CONTRACTOR SHALL LIMIT THE WORK AREA DISTURBANCE OUTSIDE THE LIMITS OF THE PROPOSED PATHWAY AND SPECIFICALLY IN AND AROUND EXISTING TREES IN ORDER TO PREVENT DAMAGE TO THE ROOT SYSTEM AND THE TREE ITSELF.

NOTE:
THE CONTRACTOR IS SPECIFICALLY DIRECTED TO THE REQUIREMENTS CONTAINED IN THE SPECIAL PROVISIONS SECTION OF THE CONTRACT SPECIFICATIONS.

SEED MIXTURE FOR STREAMBANK STABILIZATION

1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVE STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

NOTE:
DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

NOTE:
SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

NOTE:
SEE SHEET NO. 72 FOR CROSS SECTIONS

REFERENCE:
EXISTING CONDITION, TOPOGRAPHY, IN THE AREAS OF THE PROPOSED IMPROVEMENTS PREPARED BY CME ASSOCIATES. ALL TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/03/2025	TE/DK	PB	
1.	REVISED FOR ADDENDUM	2/14/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION AND SOIL EROSION & SEDIMENT CONTROL PLAN

CENTRAL LAKE SOUTH TRAIL (1 OF 6)

STA. 2+74 TO 8+00

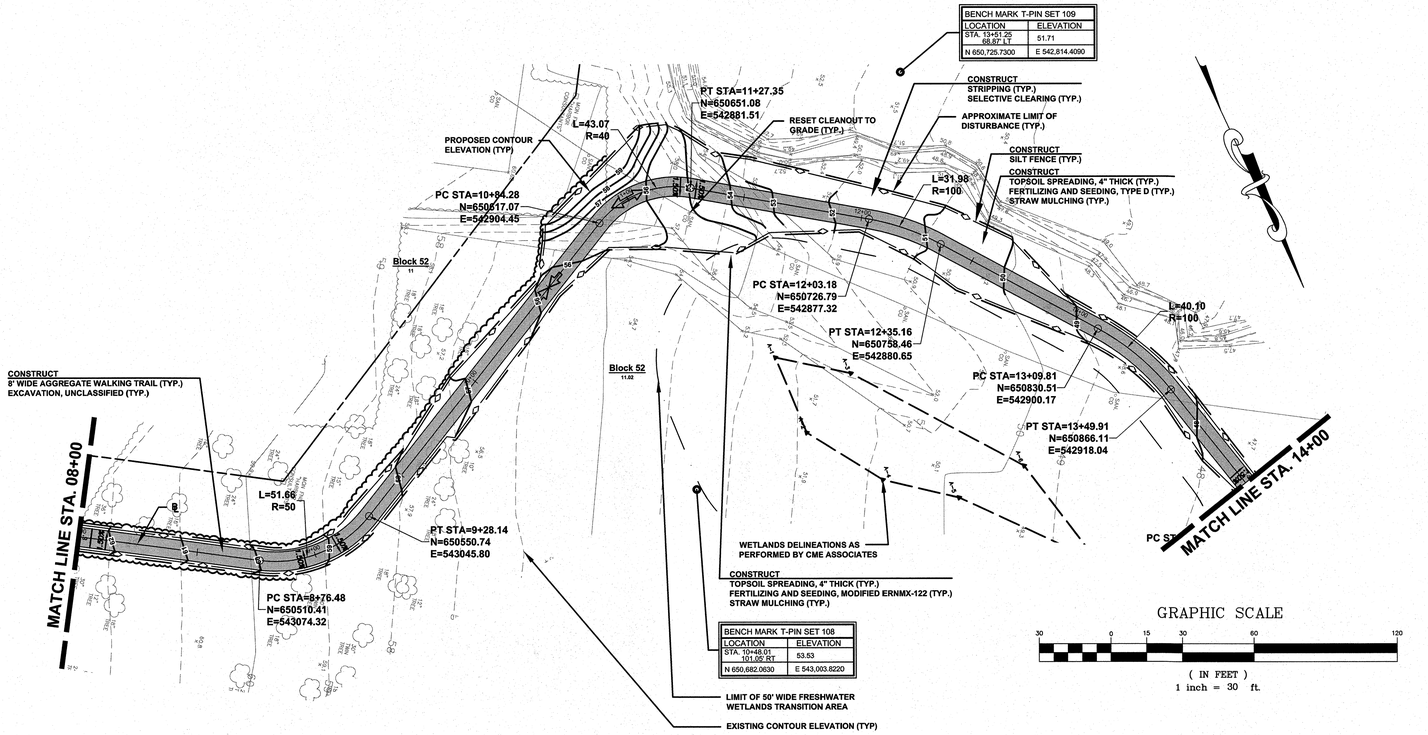
REGISTER NO.

FILE NO. 115.UN00213.P05

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: JC	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 50 of 139	



Pay Item Number	To Be Constructed	Unit	Plan Quantity
3	Silt fence	LF	1230
21	Stripping	SY	1370
22	Excavation, unclassified	CY	306
145	8' Wide Aggregate Walking Trail	SY	534
231	Selective Clearing	SY	1370
233	Topsoil Spreading, 4" Thick	SY	819
235	Fertilizing and Seeding, Type D	SY	814
237	Fertilizing and Seeding, Modified ERNMX-122	SY	5
240	Straw Mulching	SY	819

NOTE:

THE CONTRACTOR IS DIRECTED TO VERIFY ALL NECESSARY TREE REMOVALS WITH THE ENGINEER PRIOR TO BEGINNING ANY TREE REMOVAL WORK. THE CONTRACTOR IS ADVISED THAT THE INDIVIDUAL LOCATIONS OF EXISTING TREES INDICATED ON THE PLANS ARE APPROXIMATE AND ARE NOT GUARANTEED AS TO ACCURACY, NOR CAN THEY BE ASSUMED TO BE THE ONLY EXISTING TREES. MEASUREMENT AND PAYMENT FOR ALL TREE REMOVALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SELECTIVE CLEARING AS INDICATED ON THE BID FORM IN THE CONTRACT SPECIFICATIONS.

NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AREAS FOR CONSTRUCTION EQUIPMENT AND MATERIAL STORING AND STAGING. DO NOT STAGE, STORE, DELIVER, OR UNLOAD MATERIALS AND EQUIPMENT ON EXISTING COUNTY ROADWAYS OR PROPERTY OUTSIDE OF THE CONSTRUCTION LIMITS UNLESS EXPRESS PERMISSION IS GRANTED BY THE COUNTY TO DO SO AND ADEQUATE PROVISIONS FOR RESTORATION AND PROTECTION OF PROPERTY ARE ESTABLISHED AND APPROVED.

NOTE:

IT IS THE INTENT OF THIS PROJECT TO CONSTRUCT THE PROPOSED PATHWAY SYSTEM IN ACCORDANCE WITH THE LAYOUT ON THE PLANS WITH MINIMAL IMPACT TO THE EXISTING TREES, VEGETATION, AND TERRAIN TO THE EXTENT POSSIBLE. SHOULD THE CONTRACTOR OBSERVE ANY POTENTIAL CONFLICTS BETWEEN THE PROPOSED PATHWAY ALIGNMENT AND ANY EXISTING FIELD CONDITIONS OR OBSTRUCTIONS NOT INDICATED ON THE PLANS, SAID CONFLICTS WILL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION. MINOR ADJUSTMENTS TO THE PROPOSED PATHWAY ALIGNMENT IN ORDER TO MINIMIZE IMPACTS TO EXISTING TREES AND/OR SITE FEATURES WILL BE REVIEWED AND APPROVED BY THE ENGINEER IF DEEMED APPROPRIATE. THE CONTRACTOR SHALL LIMIT THE WORK AREA DISTURBANCE OUTSIDE THE LIMITS OF THE PROPOSED PATHWAY AND SPECIFICALLY IN AND AROUND EXISTING TREES IN ORDER TO PREVENT DAMAGE TO THE ROOT SYSTEM AND THE TREE ITSELF.

NOTE:

THE CONTRACTOR IS SPECIFICALLY DIRECTED TO THE REQUIREMENTS CONTAINED IN THE SPECIAL PROVISIONS SECTION OF THE CONTRACT SPECIFICATIONS.

SEED MIXTURE FOR STREAMBANK STABILIZATION

1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2.0 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVE STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

NOTE:

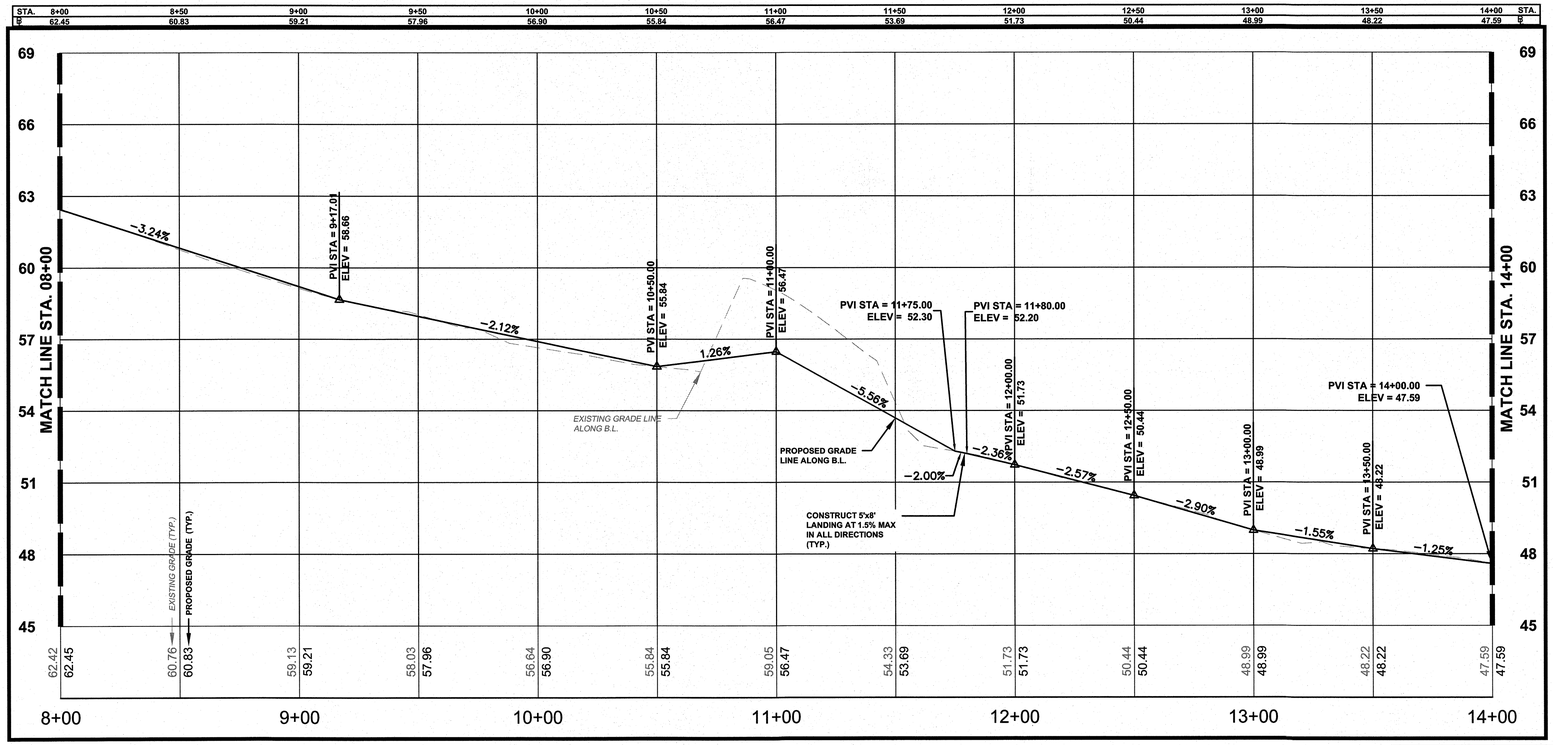
DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

NOTE:

SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

NOTE:

SEE SHEETS NO. 72-73 FOR CROSS SECTIONS



PROFILE

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)

REFERENCE:

EXISTING CONDITION, TOPOGRAPHY, IN THE AREAS OF THE PROPOSED IMPROVEMENTS PREPARED BY CME ASSOCIATES. ALL TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR ADDENDUM	2/14/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION AND SOIL EROSION & SEDIMENT CONTROL PLAN

CENTRAL LAKE SOUTH TRAIL (2 OF 6)

STA. 8+00 TO 14+00

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO. 115.UN00213.P05

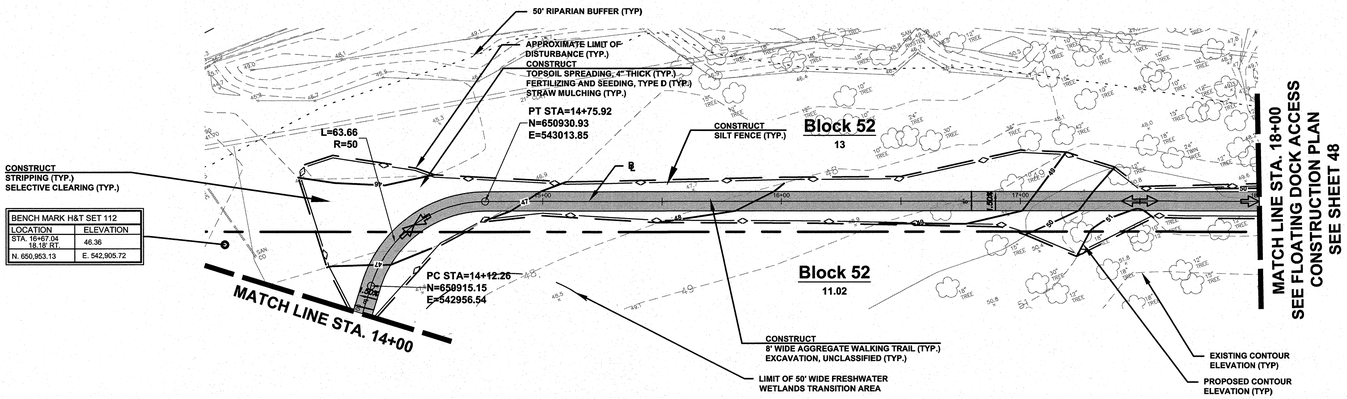
SEE NO.

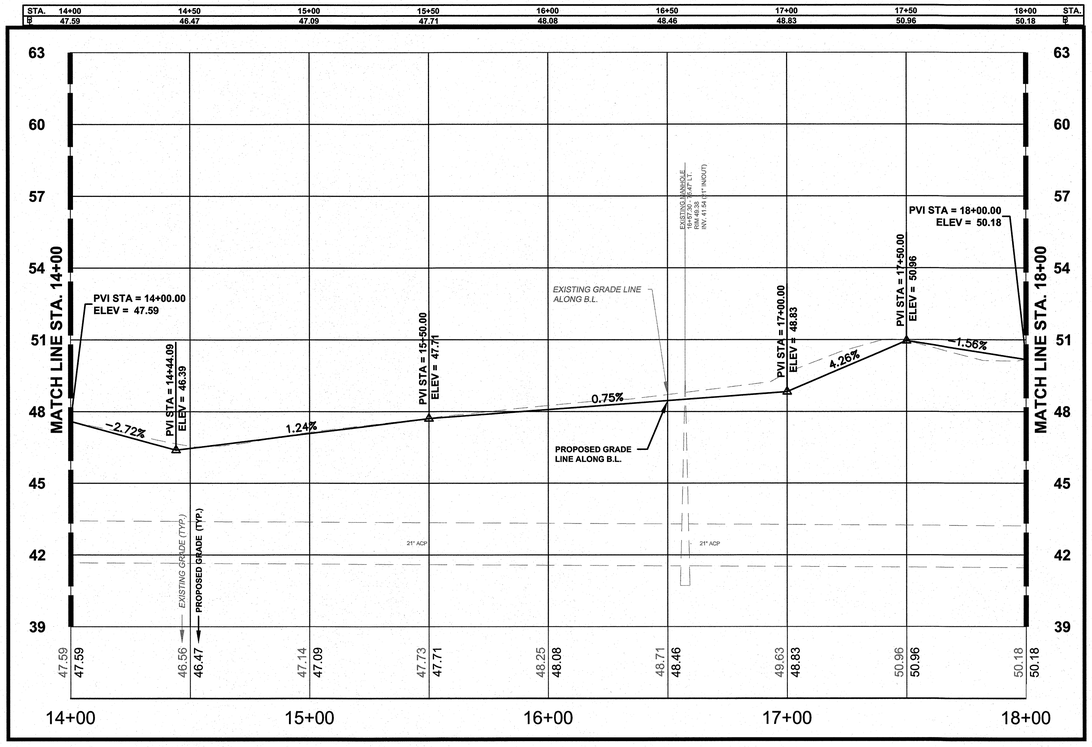
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY: JC	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 51 of 139

DRAWING NUMBER

Pay Item Number	To Be Constructed	Unit	Plan Quantity
3	Silt fence	LF	861
21	Stripping	SY	1062
22	Excavation, unclassified	CY	133
145	8' Wide Aggregate Walking Trail	SY	356
231	Selective Clearing	SY	1062
233	Topsoil Spreading, 4" Thick	SY	769
235	Fertilizing and Seeding, Type D	SY	769
240	Straw Mulching	SY	769





PROFILE

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)

NOTE:
THE CONTRACTOR IS DIRECTED TO VERIFY ALL NECESSARY TREE REMOVALS WITH THE ENGINEER PRIOR TO BEGINNING ANY TREE REMOVAL WORK. THE CONTRACTOR IS ADVISED THAT THE INDIVIDUAL LOCATIONS OF EXISTING TREES INDICATED ON THE PLANS ARE APPROXIMATE AND ARE NOT GUARANTEED AS TO ACCURACY, NOR CAN THEY BE ASSUMED TO BE THE ONLY EXISTING TREES. MEASUREMENT AND PAYMENT FOR ALL TREE REMOVALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SELECTIVE CLEARING AS INDICATED ON THE BID FORM IN THE CONTRACT SPECIFICATIONS.

NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AREAS FOR CONSTRUCTION EQUIPMENT AND MATERIAL STORING AND STAGING. DO NOT STAGE, STORE, DELIVER, OR UNLOAD MATERIALS AND EQUIPMENT ON EXISTING COUNTY ROADWAYS OR PROPERTY OUTSIDE OF THE CONSTRUCTION LIMITS UNLESS EXPRESS PERMISSION IS GRANTED BY THE COUNTY TO DO SO AND ADEQUATE PROVISIONS FOR RESTORATION AND PROTECTION OF PROPERTY ARE ESTABLISHED AND APPROVED.

NOTE:
IT IS THE INTENT OF THIS PROJECT TO CONSTRUCT THE PROPOSED PATHWAY SYSTEM IN ACCORDANCE WITH THE LAYOUT ON THE PLANS WITH MINIMAL IMPACT TO THE EXISTING TREES, VEGETATION, AND TERRAIN TO THE EXTENT POSSIBLE. SHOULD THE CONTRACTOR OBSERVE ANY POTENTIAL CONFLICTS BETWEEN THE PROPOSED PATHWAY ALIGNMENT AND ANY EXISTING FIELD CONDITIONS OR OBSTRUCTIONS NOT INDICATED ON THE PLANS, SAID CONFLICTS WILL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION. MINOR ADJUSTMENTS TO THE PROPOSED PATHWAY ALIGNMENT IN ORDER TO MINIMIZE IMPACTS TO EXISTING TREES AND/OR SITE FEATURES WILL BE REVIEWED AND APPROVED BY THE ENGINEER IF DEEMED APPROPRIATE. THE CONTRACTOR SHALL LIMIT THE WORK AREA DISTURBANCE OUTSIDE THE LIMITS OF THE PROPOSED PATHWAY AND SPECIFICALLY IN AND AROUND EXISTING TREES IN ORDER TO PREVENT DAMAGE TO THE ROOT SYSTEM AND THE TREE ITSELF.

NOTE:
THE CONTRACTOR IS SPECIFICALLY DIRECTED TO THE REQUIREMENTS CONTAINED IN THE SPECIAL PROVISIONS SECTION OF THE CONTRACT SPECIFICATIONS.

SEED MIXTURE FOR STREAMBANK STABILIZATION

1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVE STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

NOTE:
DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX", NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

NOTE:
SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

NOTE:
SEE SHEETS NO. 73 FOR CROSS SECTIONS

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

REFERENCE:
EXISTING CONDITION, TOPOGRAPHY, IN THE AREAS OF THE PROPOSED IMPROVEMENTS PREPARED BY CME ASSOCIATES. ALL TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
3	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
2.	REVISED FOR ADDENDUM	2/14/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION AND SOIL EROSION & SEDIMENT CONTROL PLAN

CENTRAL LAKE SOUTH TRAIL (3 OF 6)

STA. 14+00 TO 18+00

REGISTER NO.

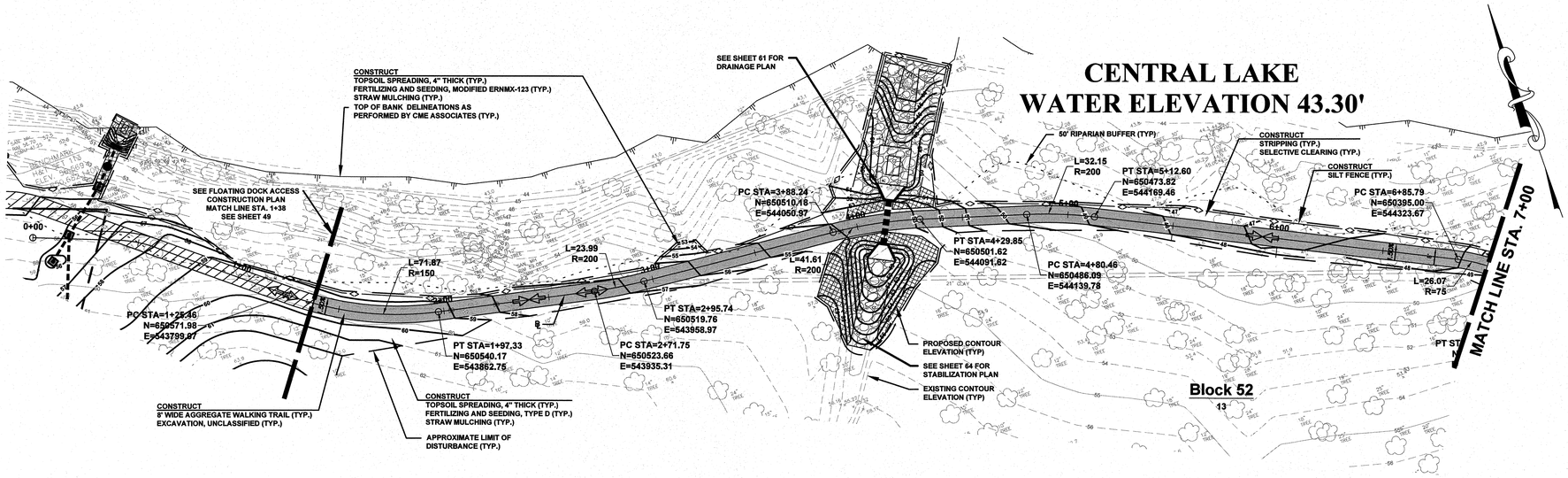
FILE NO. 115.UN00213.P05

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359600
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

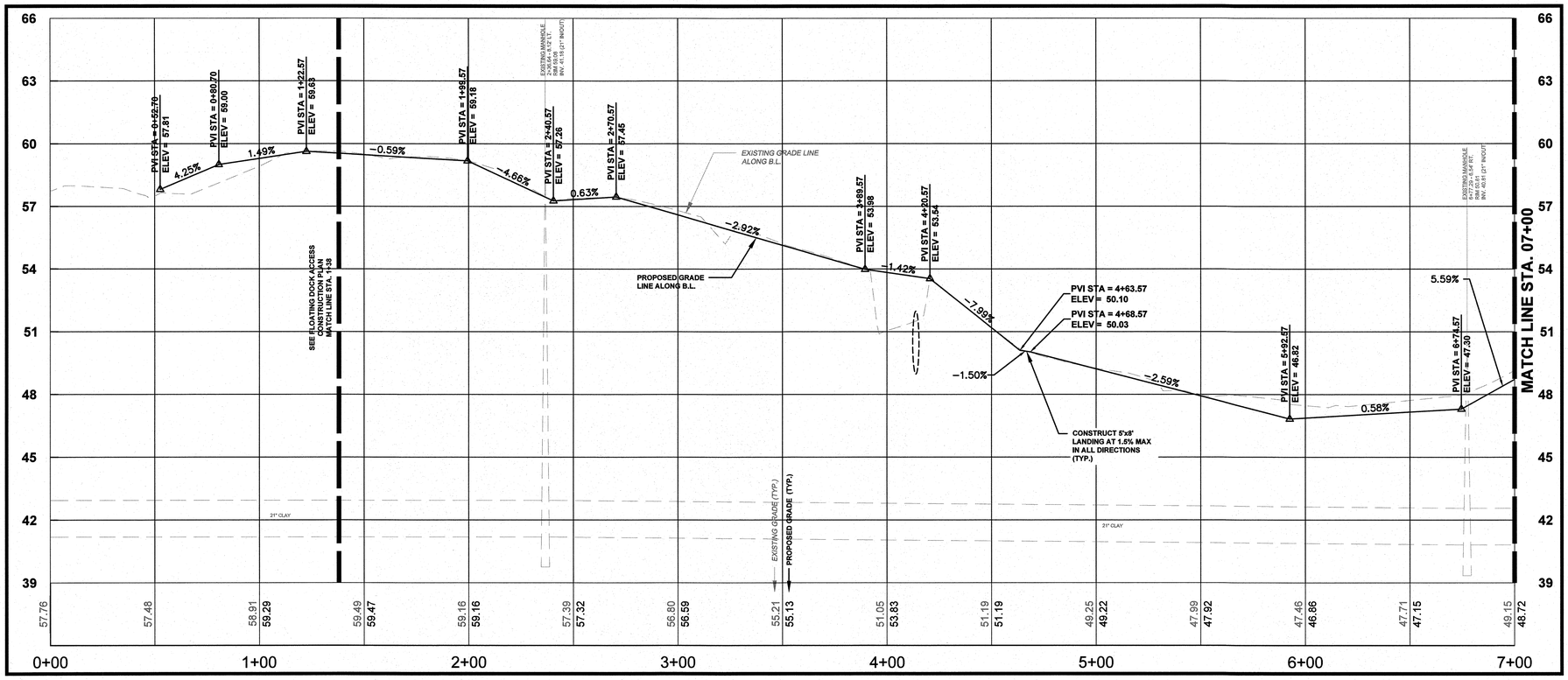
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

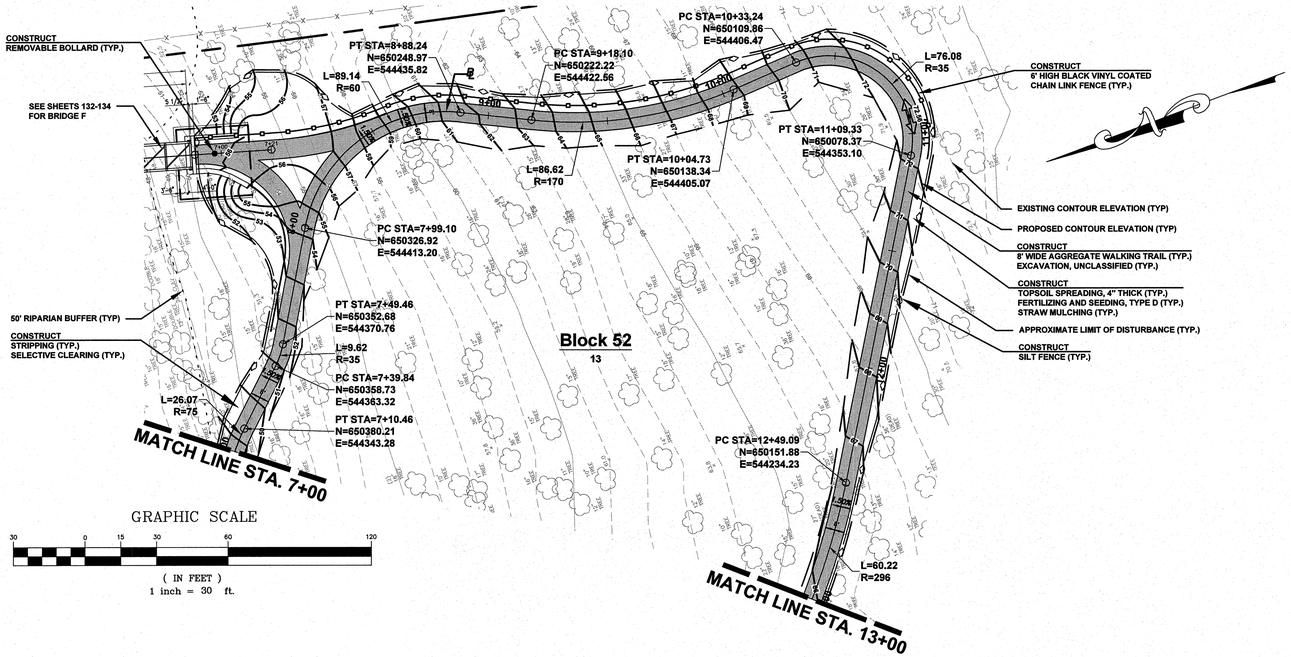
SCALE	DATE
As Shown	October 2024
DRAWN BY: JC	DESIGNED BY: GD / PB
CHECKED BY: PB	SHEET: 52 of 139

DRAWING NUMBER

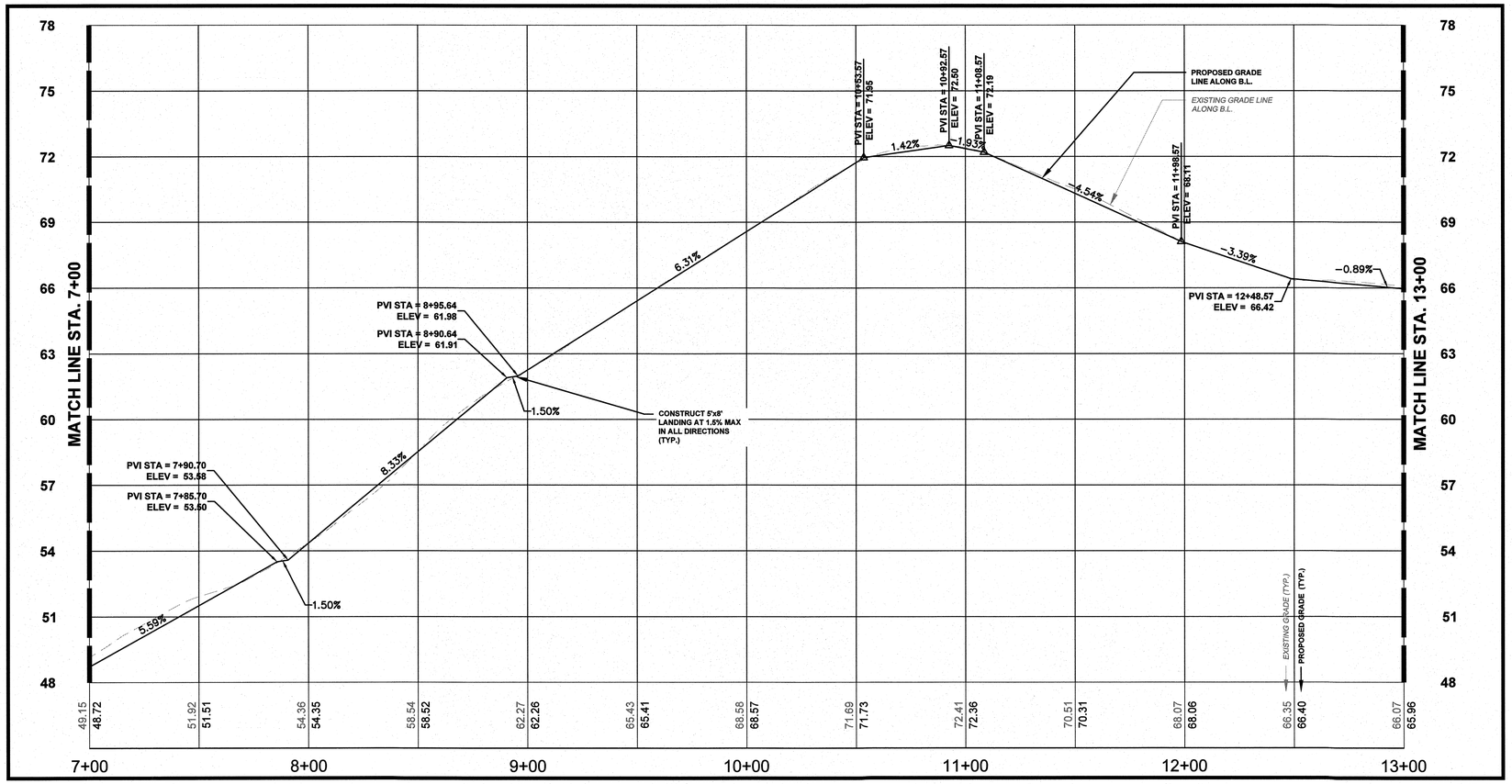


STA.	0+00	0+50	1+00	1+50	2+00	2+50	3+00	3+50	4+00	4+50	5+00	5+50	6+00	6+50	7+00	STA.
ft	-	-	59.29	59.47	59.16	57.32	56.59	55.13	53.83	51.19	49.22	47.92	46.86	47.15	48.72	ft


PVI STA = 0+52.70 ELEV = 57.81
PVI STA = 0+80.70 ELEV = 59.00
PVI STA = 1+22.57 ELEV = 59.63
PVI STA = 1+95.57 ELEV = 59.18
PVI STA = 2+40.57 ELEV = 57.26
PVI STA = 2+70.57 ELEV = 57.45
PVI STA = 3+89.57 ELEV = 53.98
PVI STA = 4+20.57 ELEV = 53.54
PVI STA = 4+63.57 ELEV = 50.10
PVI STA = 4+68.57 ELEV = 50.03
PVI STA = 5+92.57 ELEV = 46.82
PVI STA = 6+74.57 ELEV = 47.30
4.25%
1.49%
-0.59%
-4.66%
0.63%
-2.92%
-1.42%
-7.99%
-1.50%
-2.59%
0.58%
5.59%
EXISTING GRADE LINE ALONG B.L.
PROPOSED GRADE LINE ALONG B.L.
CONSTRUCT 5'x8' LANDING AT 1.5% MAX IN ALL DIRECTIONS (TYP.)
EXISTING MANHOLE RIM 62.61 INV. 45.28 (8") INV. 45.01 (10") INV. 45.01 (8") INV. 43.61 (10") INV. 43.61 (8") INV. 42.61 (10") INV. 42.61 (8") INV. 41.61 (10") INV. 41.61 (8") INV. 40.61 (10") INV. 40.61 (8") INV. 39.61 (10") INV. 39.61 (8") INV. 38.61 (10") INV. 38.61 (8") INV. 37.61 (10") INV. 37.61 (8") INV. 36.61 (10") INV. 36.61 (8") INV. 35.61 (10") INV. 35.61 (8") INV. 34.61 (10") INV. 34.61 (8") INV. 33.61 (10") INV. 33.61 (8") INV. 32.61 (10") INV. 32.61 (8") INV. 31.61 (10") INV. 31.61 (8") INV. 30.61 (10") INV. 30.61 (8") INV. 29.61 (10") INV. 29.61 (8") INV. 28.61 (10") INV. 28.61 (8") INV. 27.61 (10") INV. 27.61 (8") INV. 26.61 (10") INV. 26.61 (8") INV. 25.61 (10") INV. 25.61 (8") INV. 24.61 (10") INV. 24.61 (8") INV. 23.61 (10") INV. 23.61 (8") INV. 22.61 (10") INV. 22.61 (8") INV. 21.61 (10") INV. 21.61 (8") INV. 20.61 (10") INV. 20.61 (8") INV. 19.61 (10") INV. 19.61 (8") INV. 18.61 (10") INV. 18.61 (8") INV. 17.61 (10") INV. 17.61 (8") INV. 16.61 (10") INV. 16.61 (8") INV. 15.61 (10") INV. 15.61 (8") INV. 14.61 (10") INV. 14.61 (8") INV. 13.61 (10") INV. 13.61 (8") INV. 12.61 (10") INV. 12.61 (8") INV. 11.61 (10") INV. 11.61 (8") INV. 10.61 (10") INV. 10.61 (8") INV. 9.61 (10") INV. 9.61 (8") INV. 8.61 (10") INV. 8.61 (8") INV. 7.61 (10") INV. 7.61 (8") INV. 6.61 (10") INV. 6.61 (8") INV. 5.61 (10") INV. 5.61 (8") INV. 4.61 (10") INV. 4.61 (8") INV. 3.61 (10") INV. 3.61 (8") INV. 2.61 (10") INV. 2.61 (8") INV. 1.61 (10") INV. 1.61 (8") INV. 0.61 (10") INV. 0.61 (8") INV. -0.39 (10") INV. -0.39 (8") INV. -1.39 (10") INV. -1.39 (8") INV. -2.39 (10") INV. -2.39 (8") INV. -3.39 (10") INV. -3.39 (8") INV. -4.39 (10") INV. -4.39 (8") INV. -5.39 (10") INV. -5.39 (8") INV.



STA.	7+00	7+50	8+00	8+50	9+00	9+50	10+00	10+50	11+00	11+50	12+00	12+50	13+00	STA.
EG	48.72	51.51	54.35	58.52	62.26	65.41	68.57	71.73	72.36	70.31	68.06	66.40	65.96	EG



PROFILE

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)

Pay Item Number	To Be Constructed	Unit	Plan Quantity
3	Silt fence	LF	712
21	Stripping	SY	1612
22	Excavation, unclassified	CY	195
139	6' High Black Vinyl Coated Chain Link Fence	LF	348
145	8' Wide Aggregate Walking Trail	SY	627
169	Removable Bollard	UN	1
231	Selective Clearing	SY	1612
233	Topsoil Spreading, 4" Thick	SY	986
235	Fertilizing and Seeding, Type D	SY	986
240	Straw Mulching	SY	986

NOTE:
THE CONTRACTOR IS DIRECTED TO VERIFY ALL NECESSARY TREE REMOVALS WITH THE ENGINEER PRIOR TO BEGINNING ANY TREE REMOVAL WORK. THE CONTRACTOR IS ADVISED THAT THE INDIVIDUAL LOCATIONS OF EXISTING TREES INDICATED ON THE PLANS ARE APPROXIMATE AND ARE NOT GUARANTEED AS TO ACCURACY, NOR CAN THEY BE ASSUMED TO BE THE ONLY EXISTING TREES. MEASUREMENT AND PAYMENT FOR ALL TREE REMOVALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SELECTIVE CLEARING AS INDICATED ON THE BID FORM IN THE CONTRACT SPECIFICATIONS.

NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AREAS FOR CONSTRUCTION EQUIPMENT AND MATERIAL STORING AND STAGING. DO NOT STAGE, STORE, DELIVER, OR UNLOAD MATERIALS AND EQUIPMENT ON EXISTING COUNTY ROADWAYS OR PROPERTY OUTSIDE OF THE CONSTRUCTION LIMITS UNLESS EXPRESS PERMISSION IS GRANTED BY THE COUNTY TO DO SO AND ADEQUATE PROVISIONS FOR RESTORATION AND PROTECTION OF PROPERTY ARE ESTABLISHED AND APPROVED.

NOTE:
IT IS THE INTENT OF THIS PROJECT TO CONSTRUCT THE PROPOSED PATHWAY SYSTEM IN ACCORDANCE WITH THE LAYOUT ON THE PLANS WITH MINIMAL IMPACT TO THE EXISTING TREES, VEGETATION, AND TERRAIN TO THE EXTENT POSSIBLE. SHOULD THE CONTRACTOR OBSERVE ANY POTENTIAL CONFLICTS BETWEEN THE PROPOSED PATHWAY ALIGNMENT AND ANY EXISTING FIELD CONDITIONS OR OBSTRUCTIONS NOT INDICATED ON THE PLANS, SAID CONFLICTS WILL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION. MINOR ADJUSTMENTS TO THE PROPOSED PATHWAY ALIGNMENT IN ORDER TO MINIMIZE IMPACTS TO EXISTING TREES AND/OR SITE FEATURES WILL BE REVIEWED AND APPROVED BY THE ENGINEER IF DEEMED APPROPRIATE. THE CONTRACTOR SHALL LIMIT THE WORK AREA DISTURBANCE OUTSIDE THE LIMITS OF THE PROPOSED PATHWAY AND SPECIFICALLY IN AND AROUND EXISTING TREES IN ORDER TO PREVENT DAMAGE TO THE ROOT SYSTEM AND THE TREE ITSELF.

NOTE:
THE CONTRACTOR IS SPECIFICALLY DIRECTED TO THE REQUIREMENTS CONTAINED IN THE SPECIAL PROVISIONS SECTION OF THE CONTRACT SPECIFICATIONS.

SEED MIXTURE FOR STREAMBANK STABILIZATION

1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVE STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

NOTE:
DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

NOTE:
SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

NOTE:
SEE SHEETS NO. 74-75 FOR CROSS SECTIONS

REFERENCE:
EXISTING CONDITION, TOPOGRAPHY, IN THE AREAS OF THE PROPOSED IMPROVEMENTS PREPARED BY CME ASSOCIATES. ALL TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION AND SOIL EROSION & SEDIMENT CONTROL PLAN

CENTRAL LAKE SOUTH TRAIL (5 OF 6)

STA. 7+00 TO 13+00

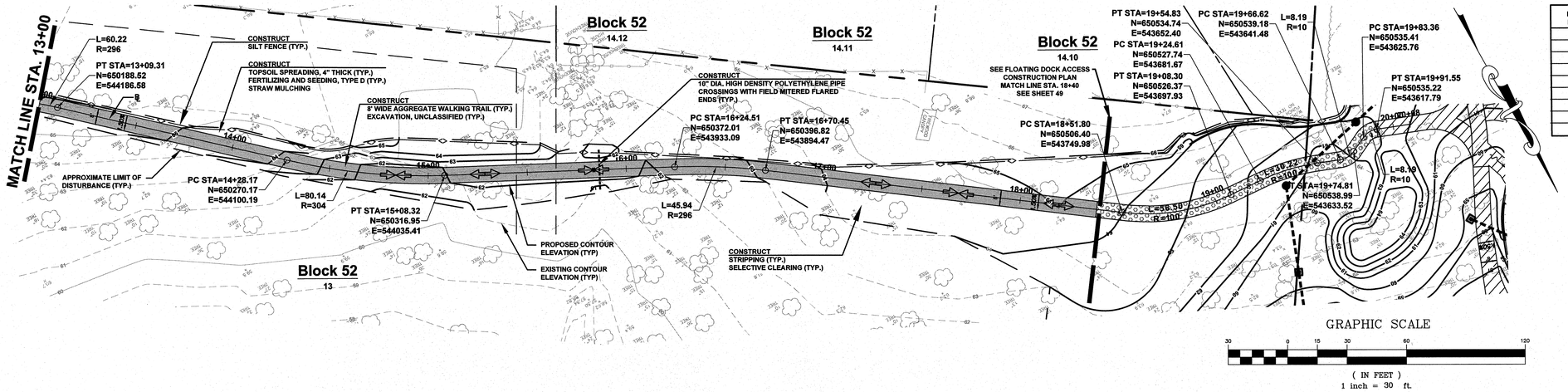
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO.

FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: JC	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 54 of 139	



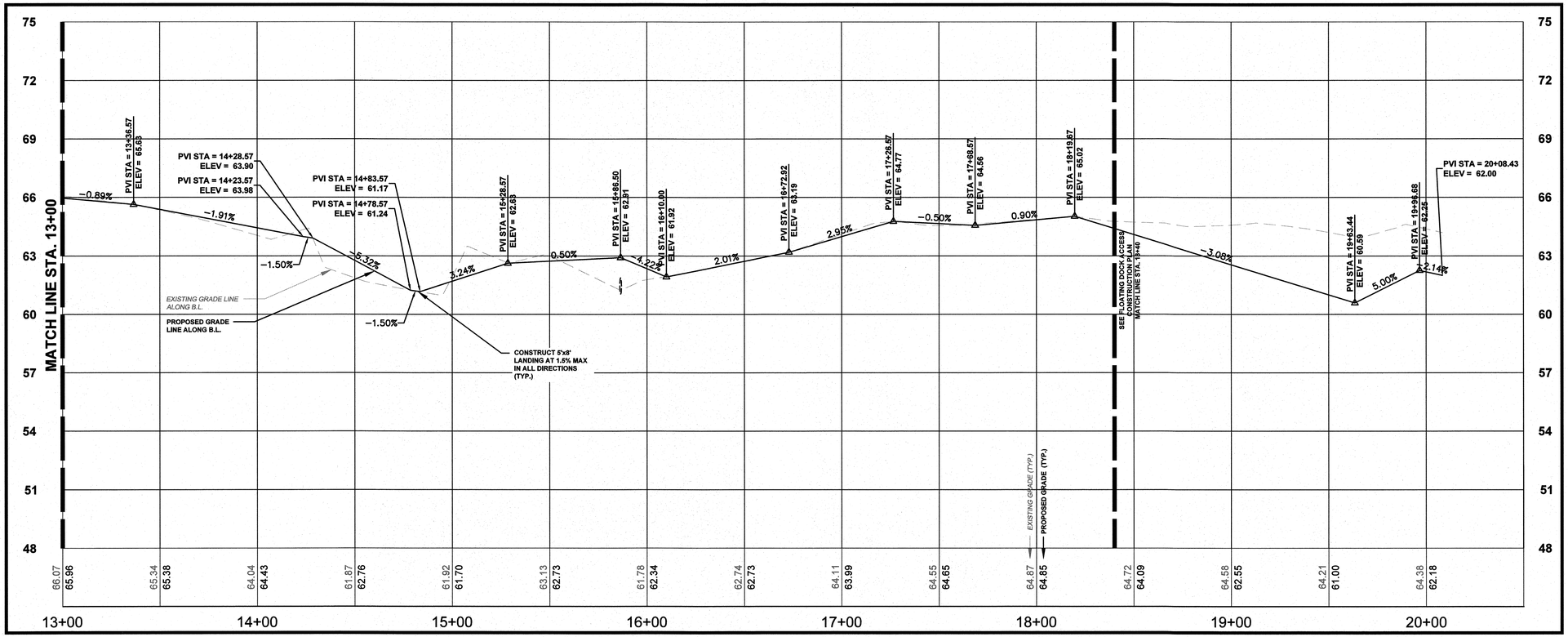
GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

Pay Item Number	To Be Constructed	Unit	Plan Quantity
3	Silt fence	LF	543
21	Stripping	SY	1563
22	Excavation, unclassified	CY	295
106	10" Dia. HDPE crossings with field mitered flared ends	LF	20
145	8' Wide Aggregate Walking Trail	SY	481
231	Selective Clearing	SY	1563
233	Topsoil Spreading, 4" Thick	SY	1082
235	Fertilizing and Seeding, Type D	SY	1082
240	Straw Mulching	SY	1082

STA.	13+00	13+50	14+00	14+50	15+00	15+50	16+00	16+50	17+00	17+50	18+00	18+50	19+00	19+50	20+00	STA.
℄	65.96	65.38	64.43	62.76	61.70	62.73	62.34	62.73	63.99	64.65	64.85	64.35	63.25	62.15	62.54	℄



PROFILE

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)

NOTE:
THE CONTRACTOR IS DIRECTED TO VERIFY ALL NECESSARY TREE REMOVALS WITH THE ENGINEER PRIOR TO BEGINNING ANY TREE REMOVAL WORK. THE CONTRACTOR IS ADVISED THAT THE INDIVIDUAL LOCATIONS OF EXISTING TREES INDICATED ON THE PLANS ARE APPROXIMATE AND ARE NOT GUARANTEED AS TO ACCURACY, NOR CAN THEY BE ASSUMED TO BE THE ONLY EXISTING TREES. MEASUREMENT AND PAYMENT FOR ALL TREE REMOVALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SELECTIVE CLEARING AS INDICATED ON THE BID FORM IN THE CONTRACT SPECIFICATIONS.

NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AREAS FOR CONSTRUCTION EQUIPMENT AND MATERIAL STORING AND STAGING. DO NOT STAGE, STORE, DELIVER, OR UNLOAD MATERIALS AND EQUIPMENT ON EXISTING COUNTY ROADWAYS OR PROPERTY OUTSIDE OF THE CONSTRUCTION LIMITS UNLESS EXPRESS PERMISSION IS GRANTED BY THE COUNTY TO DO SO AND ADEQUATE PROVISIONS FOR RESTORATION AND PROTECTION OF PROPERTY ARE ESTABLISHED AND APPROVED.

NOTE:
IT IS THE INTENT OF THIS PROJECT TO CONSTRUCT THE PROPOSED PATHWAY SYSTEM IN ACCORDANCE WITH THE LAYOUT ON THE PLANS WITH MINIMAL IMPACT TO THE EXISTING TREES, VEGETATION, AND TERRAIN TO THE EXTENT POSSIBLE. SHOULD THE CONTRACTOR OBSERVE ANY POTENTIAL CONFLICTS BETWEEN THE PROPOSED PATHWAY ALIGNMENT AND ANY EXISTING FIELD CONDITIONS OR OBSTRUCTIONS NOT INDICATED ON THE PLANS, SAID CONFLICTS WILL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION. MINOR ADJUSTMENTS TO THE PROPOSED PATHWAY ALIGNMENT IN ORDER TO MINIMIZE IMPACTS TO EXISTING TREES AND/OR SITE FEATURES WILL BE REVIEWED AND APPROVED BY THE ENGINEER IF DEEMED APPROPRIATE. THE CONTRACTOR SHALL LIMIT THE WORK AREA DISTURBANCE OUTSIDE THE LIMITS OF THE PROPOSED PATHWAY AND SPECIFICALLY IN AND AROUND EXISTING TREES IN ORDER TO PREVENT DAMAGE TO THE ROOT SYSTEM AND THE TREE ITSELF.

NOTE:
THE CONTRACTOR IS SPECIFICALLY DIRECTED TO THE REQUIREMENTS CONTAINED IN THE SPECIAL PROVISIONS SECTION OF THE CONTRACT SPECIFICATIONS.

SEED MIXTURE FOR STREAMBANK STABILIZATION

1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVE STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

NOTE:
DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

NOTE:
SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

NOTE:
SEE SHEET NO. 75 FOR CROSS SECTIONS

REFERENCE:
EXISTING CONDITION, TOPOGRAPHY, IN THE AREAS OF THE PROPOSED IMPROVEMENTS PREPARED BY CME ASSOCIATES. ALL TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION AND SOIL EROSION & SEDIMENT CONTROL PLAN

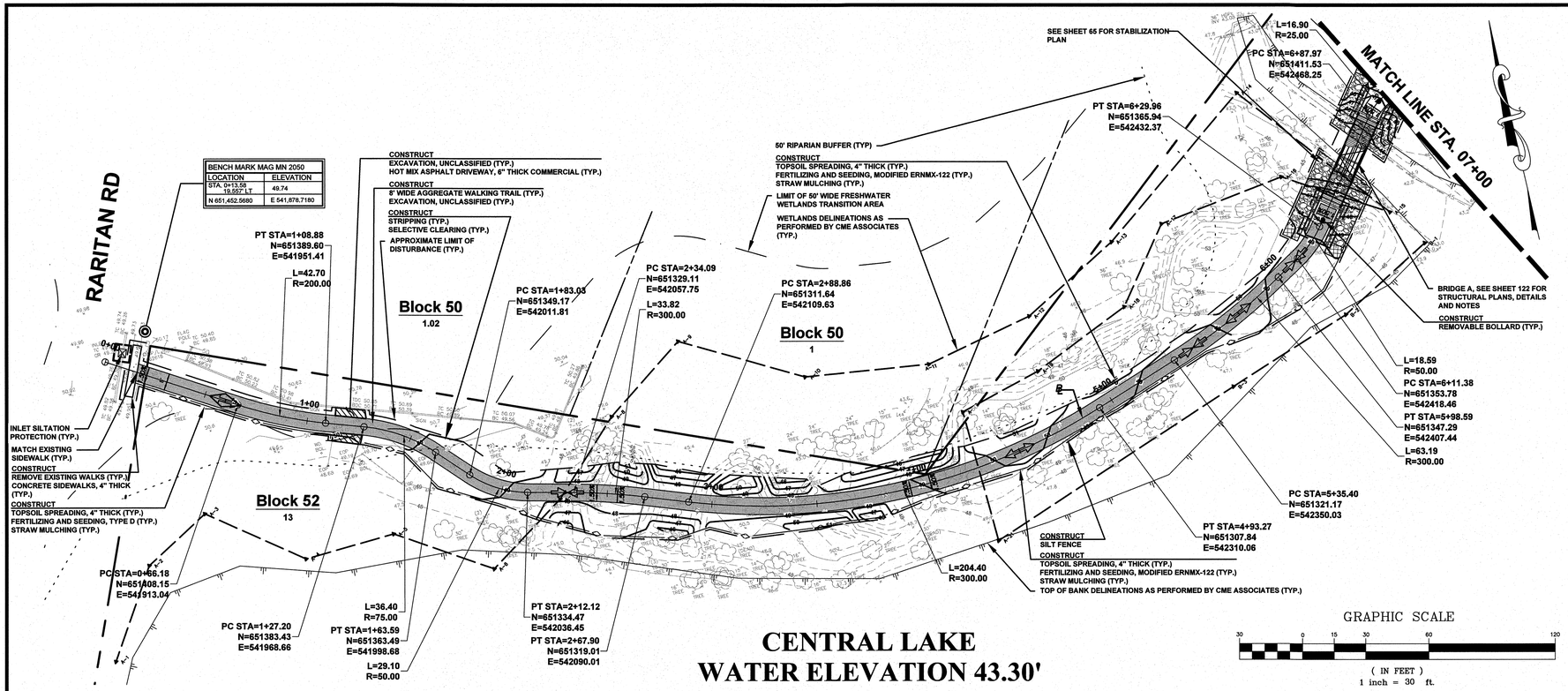
CENTRAL LAKE SOUTH TRAIL (6 OF 6) — STA. 13+00 TO 18+40

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: JC	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 55 of 139	

REGISTER NO.
FILE NO. 115.UN00213.P05



Pay Item Number	To Be Constructed	Unit	Plan Quantity
3	Silt fence	LF	732
21	Stripping	SY	1599
22	Excavation, unclassified	CY	326
145	8' Wide Aggregate Walking Trail	SY	567
146	Concrete Sidewalk	SF	98
148	Hot Mix Asphalt Driveway, 6" Thick, Commercial	SY	13
169	Removable Bollard	UN	2
231	Selective Clearing	SY	1599
233	Topsoil Spreading, 4" Thick	SY	818
235	Fertilizing and Seeding, Type D	SY	65
237	Fertilizing and Seeding, Modified ERNMX-122	SY	753
240	Straw Mulching	SY	818

NOTE:
THE CONTRACTOR IS DIRECTED TO VERIFY ALL NECESSARY TREE REMOVALS WITH THE ENGINEER PRIOR TO BEGINNING ANY TREE REMOVAL WORK. THE CONTRACTOR IS ADVISED THAT THE INDIVIDUAL LOCATIONS OF EXISTING TREES INDICATED ON THE PLANS ARE APPROXIMATE AND ARE NOT GUARANTEED AS TO ACCURACY, NOR CAN THEY BE ASSUMED TO BE THE ONLY EXISTING TREES. MEASUREMENT AND PAYMENT FOR ALL TREE REMOVALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SELECTIVE CLEARING AS INDICATED ON THE BID FORM IN THE CONTRACT SPECIFICATIONS.

NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AREAS FOR CONSTRUCTION EQUIPMENT AND MATERIAL STORING AND STAGING. DO NOT STAGE, STORE, DELIVER, OR UNLOAD MATERIALS AND EQUIPMENT ON EXISTING COUNTY ROADWAYS OR PROPERTY OUTSIDE OF THE CONSTRUCTION LIMITS UNLESS EXPRESS PERMISSION IS GRANTED BY THE COUNTY TO DO SO AND ADEQUATE PROVISIONS FOR RESTORATION AND PROTECTION OF PROPERTY ARE ESTABLISHED AND APPROVED.

NOTE:
IT IS THE INTENT OF THIS PROJECT TO CONSTRUCT THE PROPOSED PATHWAY SYSTEM IN ACCORDANCE WITH THE LAYOUT ON THE PLANS WITH MINIMAL IMPACT TO THE EXISTING TREES, VEGETATION, AND TERRAIN TO THE EXTENT POSSIBLE. SHOULD THE CONTRACTOR OBSERVE ANY POTENTIAL CONFLICTS BETWEEN THE PROPOSED PATHWAY ALIGNMENT AND ANY EXISTING FIELD CONDITIONS OR OBSTRUCTIONS NOT INDICATED ON THE PLANS, SAID CONFLICTS WILL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION. MINOR ADJUSTMENTS TO THE PROPOSED PATHWAY ALIGNMENT IN ORDER TO MINIMIZE IMPACTS TO EXISTING TREES AND/OR SITE FEATURES WILL BE REVIEWED AND APPROVED BY THE ENGINEER IF DEEMED APPROPRIATE. THE CONTRACTOR SHALL LIMIT THE WORK AREA DISTURBANCE OUTSIDE THE LIMITS OF THE PROPOSED PATHWAY AND SPECIFICALLY IN AND AROUND EXISTING TREES IN ORDER TO PREVENT DAMAGE TO THE ROOT SYSTEM AND THE TREE ITSELF.

NOTE:
THE CONTRACTOR IS SPECIFICALLY DIRECTED TO THE REQUIREMENTS CONTAINED IN THE SPECIAL PROVISIONS SECTION OF THE CONTRACT SPECIFICATIONS.

SEED MIXTURE FOR STREAMBANK STABILIZATION

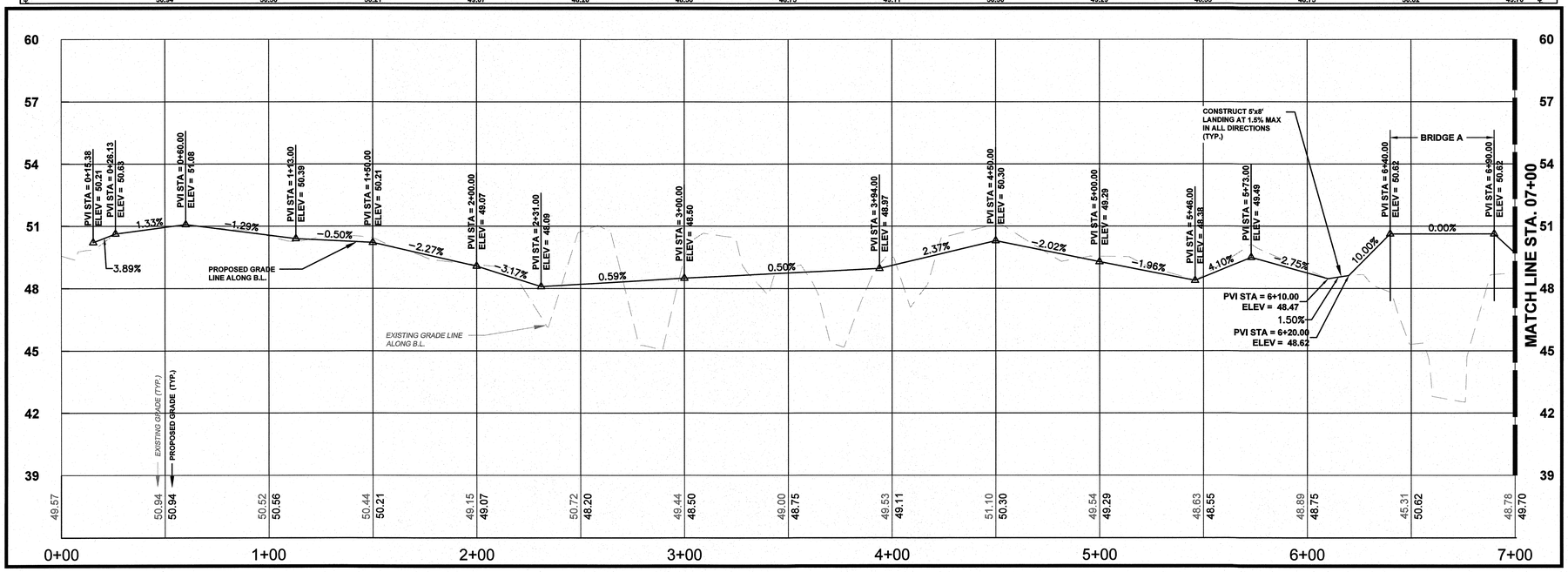
1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVE STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

NOTE:
DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

NOTE:
SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

NOTE:
SEE SHEET NO. 76 FOR CROSS SECTIONS

STA.	0+00	0+50	1+00	1+50	2+00	2+50	3+00	3+50	4+00	4+50	5+00	5+50	6+00	6+50	7+00	STA.
@	50.94	50.56	50.21	49.07	48.20	48.50	48.75	49.11	50.30	49.29	48.55	48.75	50.62	49.70	@	



PROFILE

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)

REFERENCE:
EXISTING CONDITION, TOPOGRAPHY, IN THE AREAS OF THE PROPOSED IMPROVEMENTS PREPARED BY CME ASSOCIATES. ALL TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION AND SOIL EROSION & SEDIMENT CONTROL PLAN

CENTRAL LAKE NORTH TRAIL — STA. 0+00 TO 7+00

(1 OF 5)

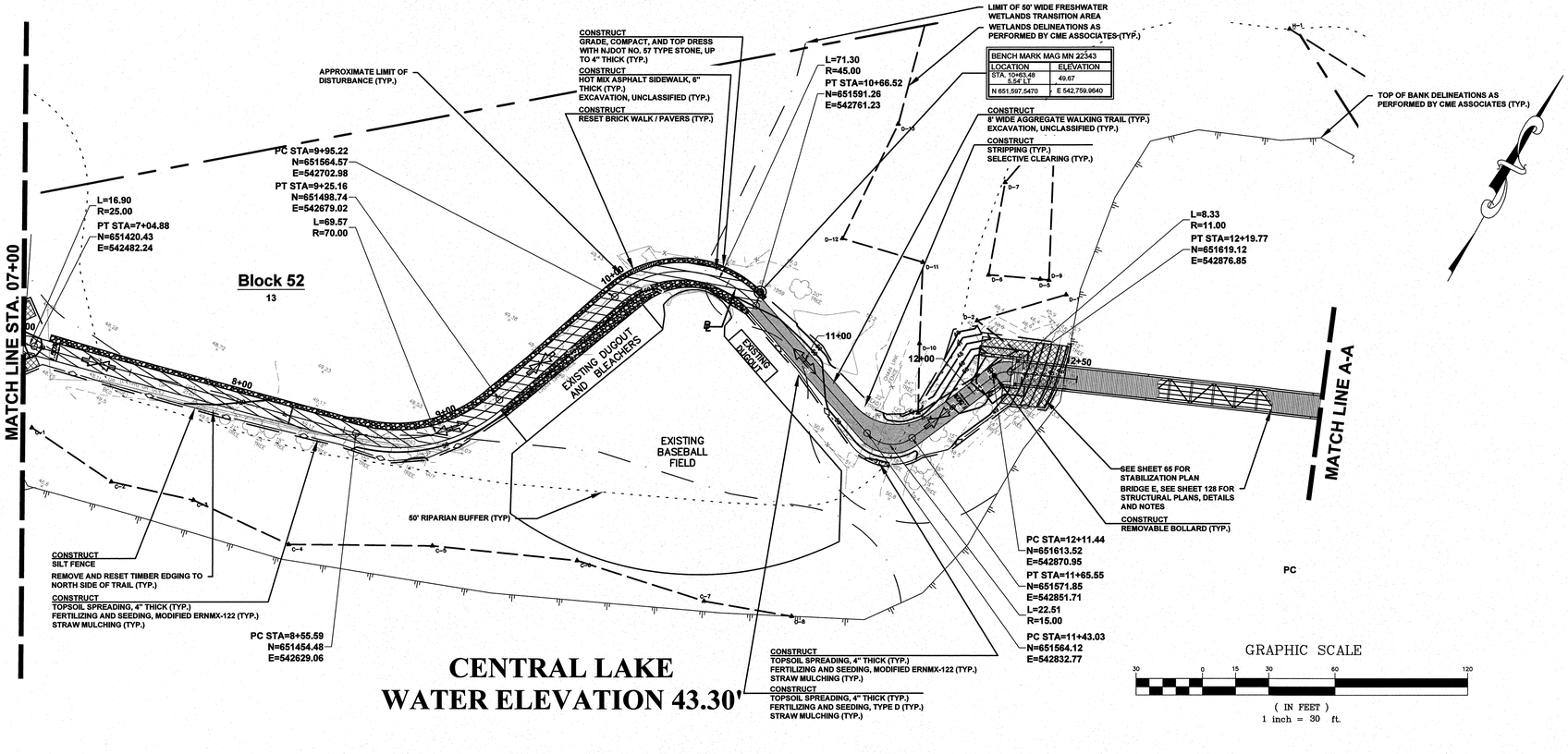
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28339000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY: DK	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 56 of 139

DRAWING NUMBER

REGISTRY NO.

FILE NO. 115.UN00213.P05



Pay Item Number	To Be Constructed	Unit	Plan Quantity
3	Silt fence	LF	570
20	Reset Brick Walk / Pavers	SF	32
21	Stripping	SY	1058
22	Excavation, unclassified	CY	141
145	8' Wide Aggregate Walking Trail	SY	149
147	Hot Mix Asphalt Sidewalk, 6" Thick	SY	326
152	Grade, Compact, and Top Dress with NJ DOT NO. 57 Type Stone, up to 4" Thick	SY	154
169	Removable Bollard	UN	1
231	Selective Clearing	SY	1058
233	Topsoil Spreading, 4" Thick	SY	295
235	Fertilizing and Seeding, Type D	SY	16
237	Fertilizing and Seeding, Modified ERNMX-122	SY	279
240	Straw Mulching	SY	295

NOTE:
THE CONTRACTOR IS DIRECTED TO VERIFY ALL NECESSARY TREE REMOVALS WITH THE ENGINEER PRIOR TO BEGINNING ANY TREE REMOVAL WORK. THE CONTRACTOR IS ADVISED THAT THE INDIVIDUAL LOCATIONS OF EXISTING TREES INDICATED ON THE PLANS ARE APPROXIMATE AND ARE NOT GUARANTEED AS TO ACCURACY, NOR CAN THEY BE ASSUMED TO BE THE ONLY EXISTING TREES. MEASUREMENT AND PAYMENT FOR ALL TREE REMOVALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SELECTIVE CLEARING AS INDICATED ON THE BID FORM IN THE CONTRACT SPECIFICATIONS.

NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AREAS FOR CONSTRUCTION EQUIPMENT AND MATERIAL STORING AND STAGING. DO NOT STAGE, STORE, DELIVER, OR UNLOAD MATERIALS AND EQUIPMENT ON EXISTING COUNTY ROADWAYS OR PROPERTY OUTSIDE OF THE CONSTRUCTION LIMITS UNLESS EXPRESS PERMISSION IS GRANTED BY THE COUNTY TO DO SO AND ADEQUATE PROVISIONS FOR RESTORATION AND PROTECTION OF PROPERTY ARE ESTABLISHED AND APPROVED.

NOTE:
IT IS THE INTENT OF THIS PROJECT TO CONSTRUCT THE PROPOSED PATHWAY SYSTEM IN ACCORDANCE WITH THE LAYOUT ON THE PLANS WITH MINIMAL IMPACT TO THE EXISTING TREES, VEGETATION, AND TERRAIN TO THE EXTENT POSSIBLE. SHOULD THE CONTRACTOR OBSERVE ANY POTENTIAL CONFLICTS BETWEEN THE PROPOSED PATHWAY ALIGNMENT AND ANY EXISTING FIELD CONDITIONS OR OBSTRUCTIONS NOT INDICATED ON THE PLANS, SAID CONFLICTS WILL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION. MINOR ADJUSTMENTS TO THE PROPOSED PATHWAY ALIGNMENT IN ORDER TO MINIMIZE IMPACTS TO EXISTING TREES AND/OR SITE FEATURES WILL BE REVIEWED AND APPROVED BY THE ENGINEER IF DEEMED APPROPRIATE. THE CONTRACTOR SHALL LIMIT THE WORK AREA DISTURBANCE OUTSIDE THE LIMITS OF THE PROPOSED PATHWAY AND SPECIFICALLY IN AND AROUND EXISTING TREES IN ORDER TO PREVENT DAMAGE TO THE ROOT SYSTEM AND THE TREE ITSELF.

NOTE:
THE CONTRACTOR IS SPECIFICALLY DIRECTED TO THE REQUIREMENTS CONTAINED IN THE SPECIAL PROVISIONS SECTION OF THE CONTRACT SPECIFICATIONS.

SEED MIXTURE FOR STREAMBANK STABILIZATION

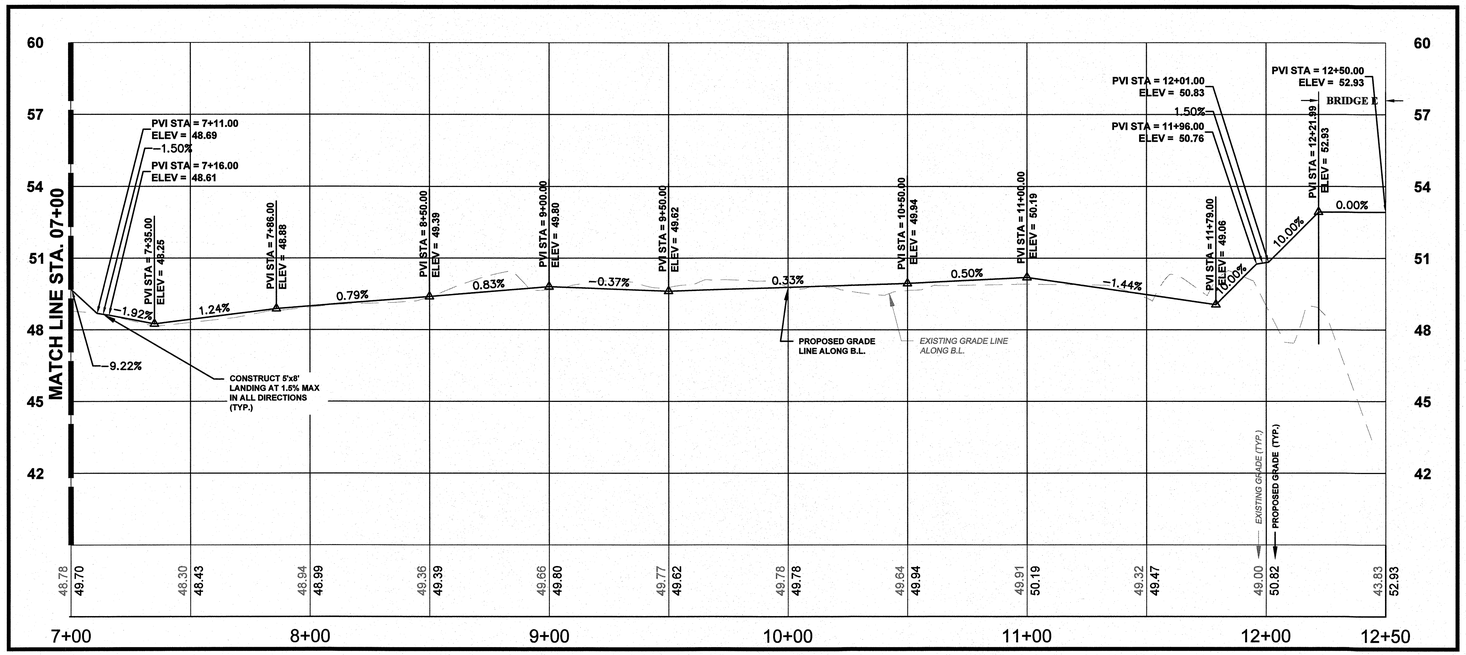
1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVE STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

NOTE:
DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

NOTE:
SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

NOTE:
SEE SHEET NO. 76-77 FOR CROSS SECTIONS

STA.	7+00	7+50	8+00	8+50	9+00	9+50	10+00	10+50	11+00	11+50	12+00	12+50	STA.
E	49.70	48.43	48.99	49.39	49.80	49.62	49.78	49.94	50.19	49.47	50.82	52.93	E



PROFILE

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)

REFERENCE:
EXISTING CONDITION, TOPOGRAPHY, IN THE AREAS OF THE PROPOSED IMPROVEMENTS PREPARED BY CME ASSOCIATES. ALL TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVIEWED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION AND SOIL EROSION & SEDIMENT CONTROL PLAN

CENTRAL LAKE NORTH TRAIL (2 OF 5)

STA. 7+00 TO 12+50

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

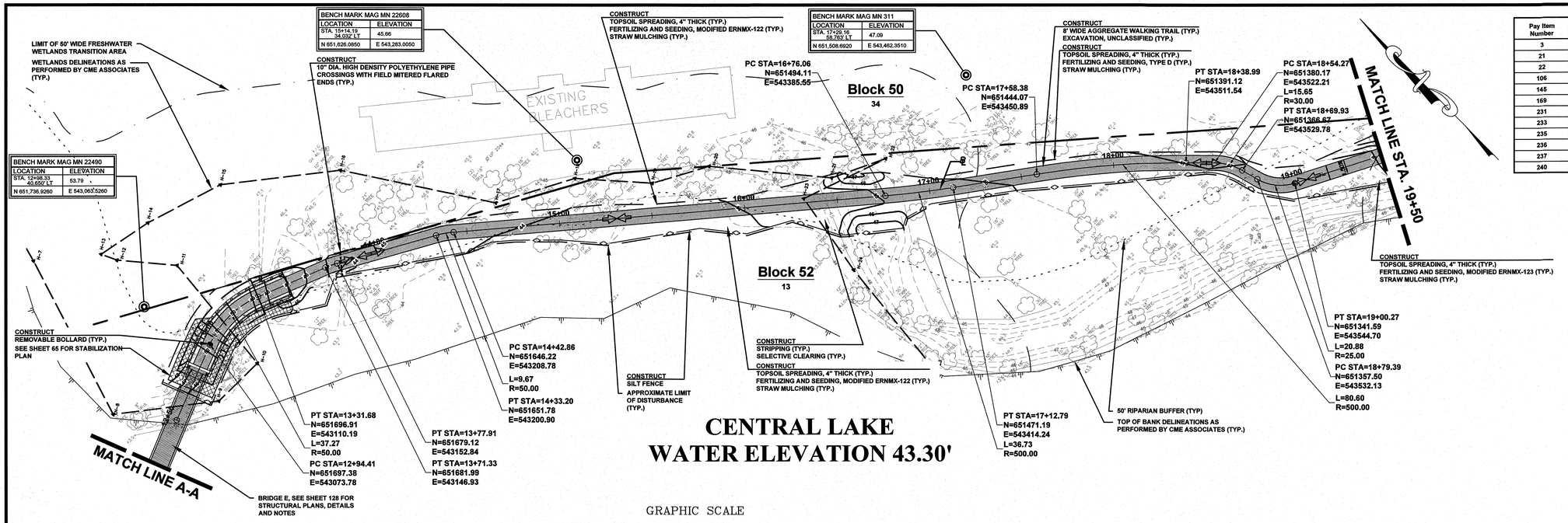
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY: DK	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 57 of 139

DRAWING NUMBER

REGISTRY NO.

FILE NO. 115.UN00213.P05



STA.	12+50	13+00	13+50	14+00	14+50	15+00	15+50	16+00	16+50	17+00	17+50	18+00	18+50	19+00	19+50	STA.
EP	52.93	51.36	46.86	44.99	44.13	43.87	43.63	44.00	44.64	45.55	46.17	46.64	47.10	46.33	47.45	EP

Pay Item Number	To Be Constructed	Unit	Plan Quantity
3	Silt fence	LF	718
21	Stripping	SY	1510
22	Excavation, unclassified	CY	289
106	10" Dia. HDPE crossings with field mitered flared ends	LF	13
145	8' Wide Aggregate Walking Trail	SY	595
169	Removable Bollard	UN	1
231	Selective Clearing	SY	1510
233	Topsoil Spreading, 4" Thick	SY	711
235	Fertilizing and Seeding, Type D	SY	115
236	Fertilizing and Seeding, Modified ERNMX-123	SY	86
237	Fertilizing and Seeding, Modified ERNMX-122	SY	510
240	Straw Mulching	SY	711

NOTE:
THE CONTRACTOR IS DIRECTED TO VERIFY ALL NECESSARY TREE REMOVALS WITH THE ENGINEER PRIOR TO BEGINNING ANY TREE REMOVAL WORK. THE CONTRACTOR IS ADVISED THAT THE INDIVIDUAL LOCATIONS OF EXISTING TREES INDICATED ON THE PLANS ARE APPROXIMATE AND ARE NOT GUARANTEED AS TO ACCURACY, NOR CAN THEY BE ASSUMED TO BE THE ONLY EXISTING TREES. MEASUREMENT AND PAYMENT FOR ALL TREE REMOVALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SELECTIVE CLEARING AS INDICATED ON THE BID FORM IN THE CONTRACT SPECIFICATIONS.

NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AREAS FOR CONSTRUCTION EQUIPMENT AND MATERIAL STORING AND STAGING. DO NOT STAGE, STORE, DELIVER, OR UNLOAD MATERIALS AND EQUIPMENT ON EXISTING COUNTY ROADWAYS OR PROPERTY OUTSIDE OF THE CONSTRUCTION LIMITS UNLESS EXPRESS PERMISSION IS GRANTED BY THE COUNTY TO DO SO AND ADEQUATE PROVISIONS FOR RESTORATION AND PROTECTION OF PROPERTY ARE ESTABLISHED AND APPROVED.

NOTE:
IT IS THE INTENT OF THIS PROJECT TO CONSTRUCT THE PROPOSED PATHWAY SYSTEM IN ACCORDANCE WITH THE LAYOUT ON THE PLANS WITH MINIMAL IMPACT TO THE EXISTING TREES, VEGETATION, AND TERRAIN TO THE EXTENT POSSIBLE. SHOULD THE CONTRACTOR OBSERVE ANY POTENTIAL CONFLICTS BETWEEN THE PROPOSED PATHWAY ALIGNMENT AND ANY EXISTING FIELD CONDITIONS OR OBSTRUCTIONS NOT INDICATED ON THE PLANS, SAID CONFLICTS WILL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION. MINOR ADJUSTMENTS TO THE PROPOSED PATHWAY ALIGNMENT IN ORDER TO MINIMIZE IMPACTS TO EXISTING TREES AND/OR SITE FEATURES WILL BE REVIEWED AND APPROVED BY THE ENGINEER IF DEEMED APPROPRIATE. THE CONTRACTOR SHALL LIMIT THE WORK AREA DISTURBANCE OUTSIDE THE LIMITS OF THE PROPOSED PATHWAY AND SPECIFICALLY IN AND AROUND EXISTING TREES IN ORDER TO PREVENT DAMAGE TO THE ROOT SYSTEM AND THE TREE ITSELF.

NOTE:
THE CONTRACTOR IS SPECIFICALLY DIRECTED TO THE REQUIREMENTS CONTAINED IN THE SPECIAL PROVISIONS SECTION OF THE CONTRACT SPECIFICATIONS.

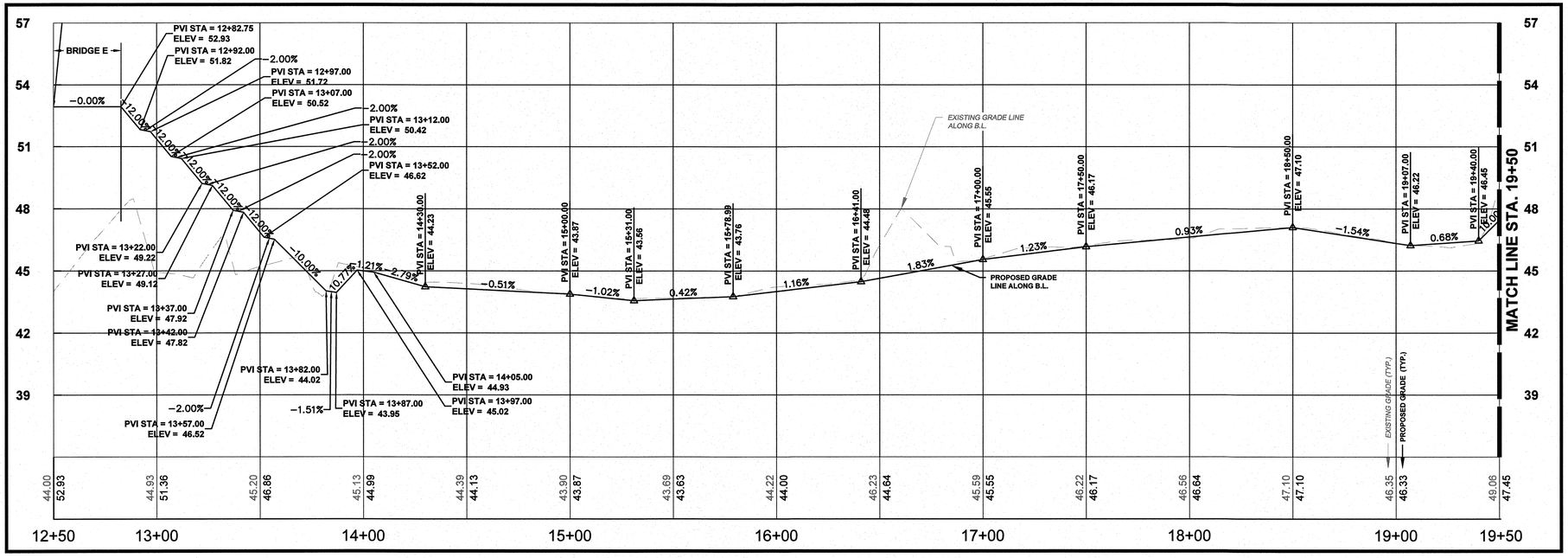
SEED MIXTURE FOR STREAMBANK STABILIZATION

1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVE STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

NOTE:
DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

NOTE:
SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

NOTE:
SEE SHEET NO. 77 FOR CROSS SECTIONS



PROFILE

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)

REFERENCE:
EXISTING CONDITION, TOPOGRAPHY, IN THE AREAS OF THE PROPOSED IMPROVEMENTS PREPARED BY CME ASSOCIATES. ALL TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
3.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
2.	REVISED FOR ADDENDUM	02/14/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION AND SOIL EROSION & SEDIMENT CONTROL PLAN

CENTRAL LAKE NORTH TRAIL (3 OF 5)

STA. 12+50 TO 19+50

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28339000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

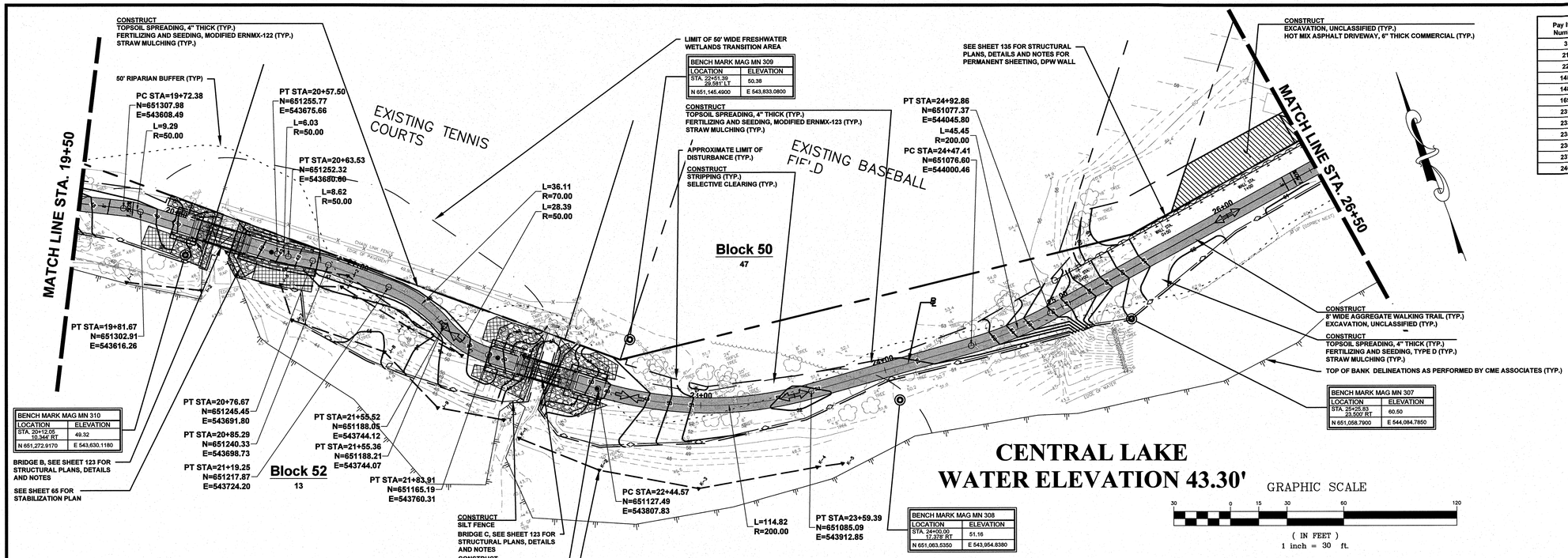
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY: DK	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 58 of 139

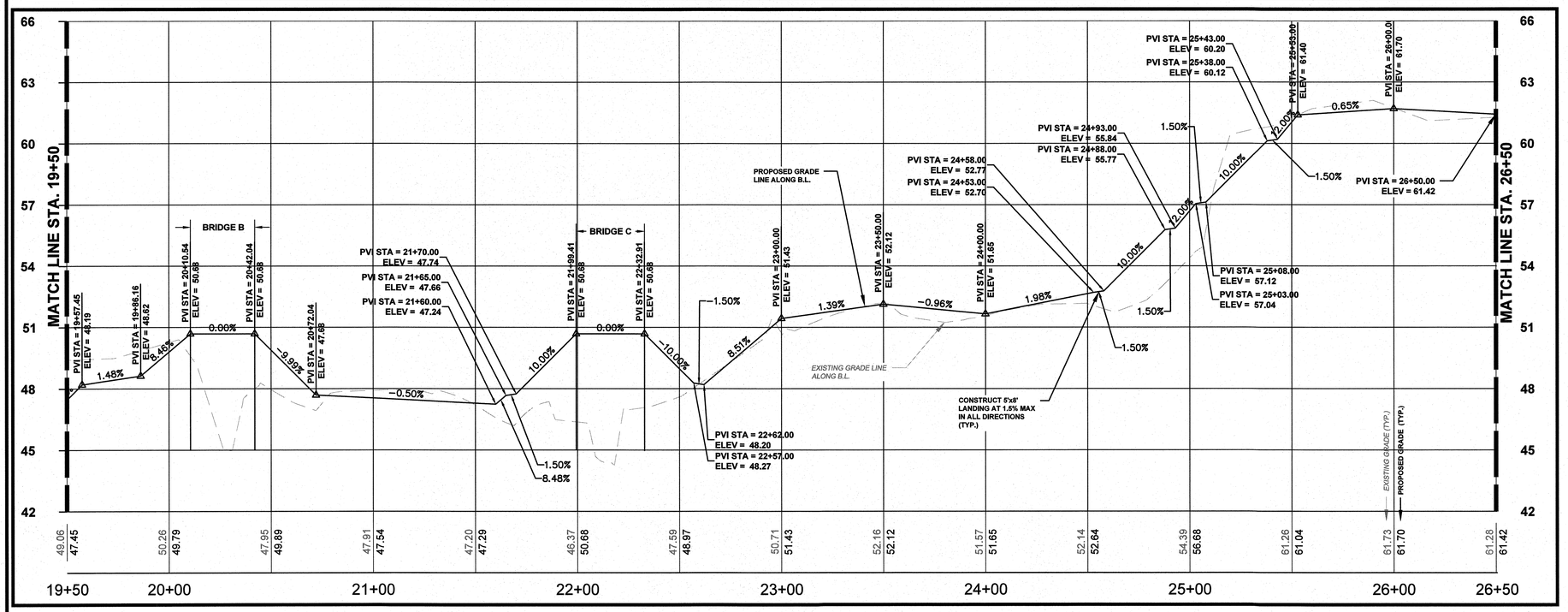
DRAWING NUMBER

REGISTER NO.

FILE NO. 115.UN00213.P05



STA.	19+50	20+00	20+50	21+00	21+50	22+00	22+50	23+00	23+50	24+00	24+50	25+00	25+50	26+00	26+50	STA.
EP	47.45	49.79	49.89	47.54	47.29	50.68	48.97	51.43	52.12	51.65	52.64	56.68	61.04	61.70	61.42	EP



PROFILE

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)

Pay Item Number	To Be Constructed	Unit	Plan Quantity
3	Silt fence	LF	837
21	Stripping	SY	2460
22	Excavation, unclassified	CY	443
145	8' Wide Aggregate Walking Trail	SY	565
148	Hot Mix Asphalt Driveway, 6" Thick, Commercial	SY	130
169	Removable Bollard	UN	4
231	Selective Clearing	SY	2460
233	Topsoil Spreading, 4" Thick	SY	1429
235	Fertilizing and Seeding, Type D	SY	452
236	Fertilizing and Seeding, Modified ERNMX-123	SY	128
237	Fertilizing and Seeding, Modified ERNMX-122	SY	849
240	Straw Mulching	SY	1429

NOTE:
THE CONTRACTOR IS DIRECTED TO VERIFY ALL NECESSARY TREE REMOVALS WITH THE ENGINEER PRIOR TO BEGINNING ANY TREE REMOVAL WORK. THE CONTRACTOR IS ADVISED THAT THE INDIVIDUAL LOCATIONS OF EXISTING TREES INDICATED ON THE PLANS ARE APPROXIMATE AND ARE NOT GUARANTEED AS TO ACCURACY, NOR CAN THEY BE ASSUMED TO BE THE ONLY EXISTING TREES. MEASUREMENT AND PAYMENT FOR ALL TREE REMOVALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SELECTIVE CLEARING AS INDICATED ON THE BID FORM IN THE CONTRACT SPECIFICATIONS.

NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AREAS FOR CONSTRUCTION EQUIPMENT AND MATERIAL STORING AND STAGING. DO NOT STAGE, STORE, DELIVER, OR UNLOAD MATERIALS AND EQUIPMENT ON EXISTING COUNTY ROADWAYS OR PROPERTY OUTSIDE OF THE CONSTRUCTION LIMITS UNLESS EXPRESS PERMISSION IS GRANTED BY THE COUNTY TO DO SO AND ADEQUATE PROVISIONS FOR RESTORATION AND PROTECTION OF PROPERTY ARE ESTABLISHED AND APPROVED.

NOTE:
IT IS THE INTENT OF THIS PROJECT TO CONSTRUCT THE PROPOSED PATHWAY SYSTEM IN ACCORDANCE WITH THE LAYOUT ON THE PLANS WITH MINIMAL IMPACT TO THE EXISTING TREES, VEGETATION, AND TERRAIN TO THE EXTENT POSSIBLE. SHOULD THE CONTRACTOR OBSERVE ANY POTENTIAL CONFLICTS BETWEEN THE PROPOSED PATHWAY ALIGNMENT AND ANY EXISTING FIELD CONDITIONS OR OBSTRUCTIONS NOT INDICATED ON THE PLANS, SAID CONFLICTS WILL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION. MINOR ADJUSTMENTS TO THE PROPOSED PATHWAY ALIGNMENT IN ORDER TO MINIMIZE IMPACTS TO EXISTING TREES AND/OR SITE FEATURES WILL BE REVIEWED AND APPROVED BY THE ENGINEER IF DEEMED APPROPRIATE. THE CONTRACTOR SHALL LIMIT THE WORK AREA DISTURBANCE OUTSIDE THE LIMITS OF THE PROPOSED PATHWAY AND SPECIFICALLY IN AND AROUND EXISTING TREES IN ORDER TO PREVENT DAMAGE TO THE ROOT SYSTEM AND THE TREE ITSELF.

NOTE:
THE CONTRACTOR IS SPECIFICALLY DIRECTED TO THE REQUIREMENTS CONTAINED IN THE SPECIAL PROVISIONS SECTION OF THE CONTRACT SPECIFICATIONS.

SEED MIXTURE FOR STREAMBANK STABILIZATION

1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVE STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

NOTE:
DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

NOTE:
SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

NOTE:
SEE SHEET NO. 77-78 FOR CROSS SECTIONS

REFERENCE:
EXISTING CONDITION, TOPOGRAPHY, IN THE AREAS OF THE PROPOSED IMPROVEMENTS PREPARED BY CME ASSOCIATES. ALL TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
3.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
2.	REVISED FOR ADDENDUM	02/14/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION AND SOIL EROSION & SEDIMENT CONTROL PLAN

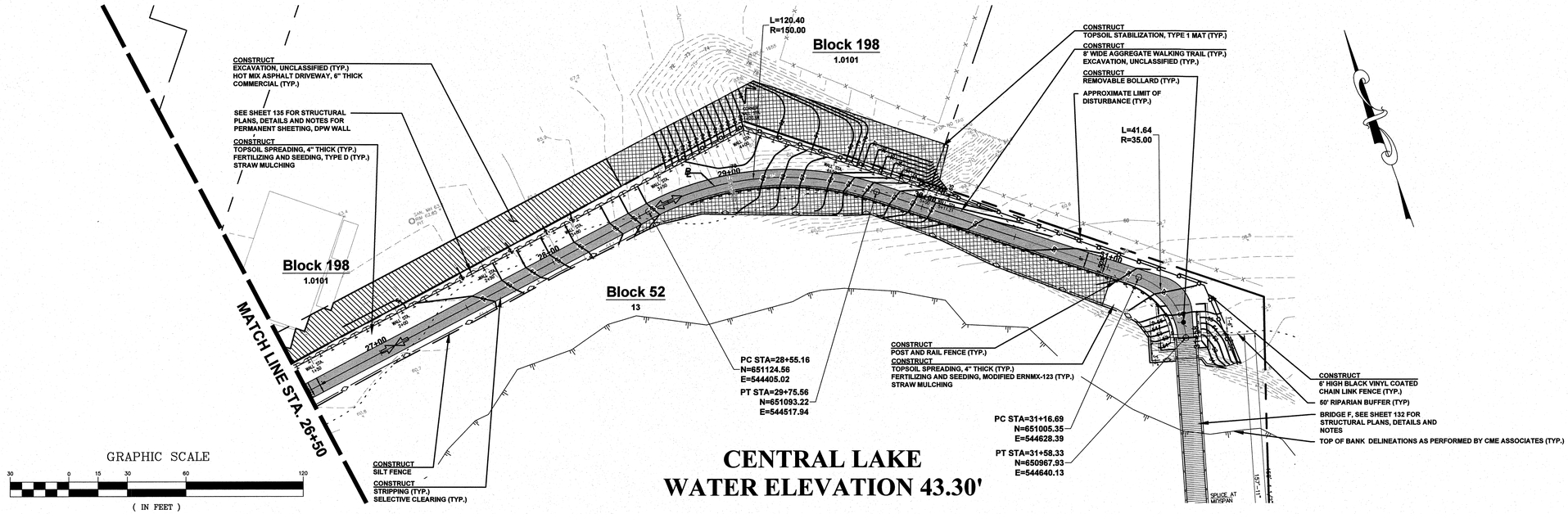
CENTRAL LAKE NORTH TRAIL — STA. 19+50 TO 26+50

(4 OF 5)

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

REGISTER NO. FILE NO. 115.UN00213.P05

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: DK	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 59 of 139	



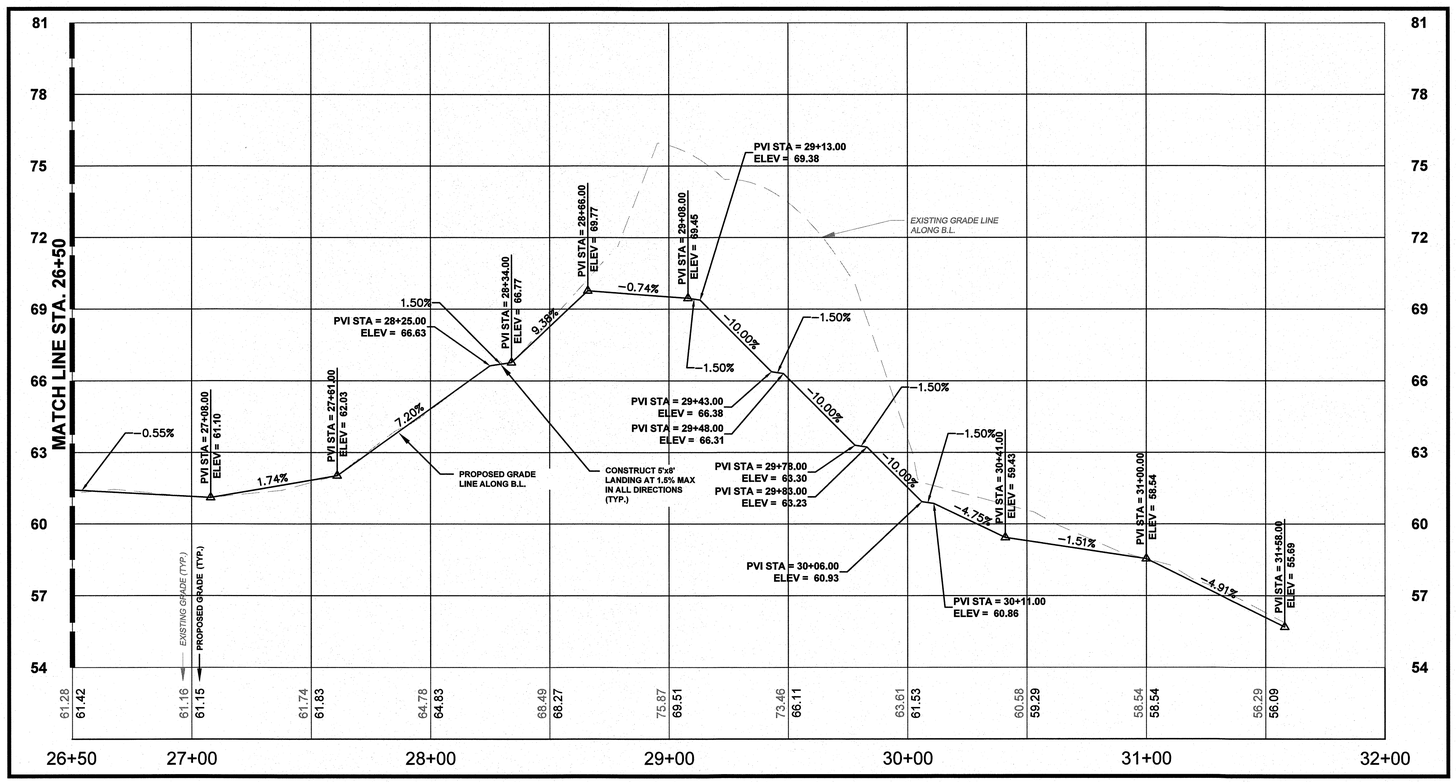
Pay Item Number	To Be Constructed	Unit	Plan Quantity
3	Silt fence	LF	535
21	Stripping	SY	2091
22	Excavation, unclassified	CY	1178
139	6' High Black Vinyl Coated Chain Link Fence	LF	339
140	Post and Rail Fence	LF	256
145	8' Wide Aggregate Walking Trail	SY	463
148	Hot Mix Asphalt Driveway, 6" Thick, Commercial	SY	354
169	Removable Bollard	UN	1
231	Selective Clearing	SY	2091
233	Topsoil Spreading, 4" Thick	SY	1575
235	Fertilizing and Seeding, Type D	SY	1143
236	Fertilizing and Seeding, Modified ERNMX-123	SY	432
239	Topsoil Stabilization, Type 1 Mat	SY	708
240	Straw Mulching	SY	1575

NOTE:
THE CONTRACTOR IS DIRECTED TO VERIFY ALL NECESSARY TREE REMOVALS WITH THE ENGINEER PRIOR TO BEGINNING ANY TREE REMOVAL WORK. THE CONTRACTOR IS ADVISED THAT THE INDIVIDUAL LOCATIONS OF EXISTING TREES INDICATED ON THE PLANS ARE APPROXIMATE AND ARE NOT GUARANTEED AS TO ACCURACY, NOR CAN THEY BE ASSUMED TO BE THE ONLY EXISTING TREES. MEASUREMENT AND PAYMENT FOR ALL TREE REMOVALS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SELECTIVE CLEARING AS INDICATED ON THE BID FORM IN THE CONTRACT SPECIFICATIONS.

NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AREAS FOR CONSTRUCTION EQUIPMENT AND MATERIAL STORING AND STAGING. DO NOT STAGE, STORE, DELIVER, OR UNLOAD MATERIALS AND EQUIPMENT ON EXISTING COUNTY ROADWAYS OR PROPERTY OUTSIDE OF THE CONSTRUCTION LIMITS UNLESS EXPRESS PERMISSION IS GRANTED BY THE COUNTY TO DO SO AND ADEQUATE PROVISIONS FOR RESTORATION AND PROTECTION OF PROPERTY ARE ESTABLISHED AND APPROVED.

NOTE:
IT IS THE INTENT OF THIS PROJECT TO CONSTRUCT THE PROPOSED PATHWAY SYSTEM IN ACCORDANCE WITH THE LAYOUT ON THE PLANS WITH MINIMAL IMPACT TO THE EXISTING TREES, VEGETATION, AND TERRAIN TO THE EXTENT POSSIBLE. SHOULD THE CONTRACTOR OBSERVE ANY POTENTIAL CONFLICTS BETWEEN THE PROPOSED PATHWAY ALIGNMENT AND ANY EXISTING FIELD CONDITIONS OR OBSTRUCTIONS NOT INDICATED ON THE PLANS, SAID CONFLICTS WILL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION. MINOR ADJUSTMENTS TO THE PROPOSED PATHWAY ALIGNMENT IN ORDER TO MINIMIZE IMPACTS TO EXISTING TREES AND/OR SITE FEATURES WILL BE REVIEWED AND APPROVED BY THE ENGINEER IF DEEMED APPROPRIATE. THE CONTRACTOR SHALL LIMIT THE WORK AREA DISTURBANCE OUTSIDE THE LIMITS OF THE PROPOSED PATHWAY AND SPECIFICALLY IN AND AROUND EXISTING TREES IN ORDER TO PREVENT DAMAGE TO THE ROOT SYSTEM AND THE TREE ITSELF.

STA.	26+50	27+00	27+50	28+00	28+50	29+00	29+50	30+00	30+50	31+00	31+50	32+00	STA.
EX	61.42	61.15	61.83	64.83	68.27	69.51	66.11	61.53	59.29	58.54	56.09		EX



PROFILE

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)

SEED MIXTURE FOR STREAMBANK STABILIZATION

1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVE STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

NOTE:
DISTURBED FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-122 "FACW, WETLANDS MEADOW MIX". DISTURBED AREAS WITHIN THE 50' RIPARIAN BUFFER BUT OUTSIDE OF ANY FRESHWATER WETLANDS AND FRESHWATER WETLAND TRANSITION AREAS SHALL BE RESEEDED WITH ERNMX-123 "NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX". NON-NATIVE SPECIES BLACK-EYES SUSAN (RUDBECKIA HIRTA) TO BE REMOVED. ALL AREAS WITHIN PROPOSED LIMITS OF STREAMBANK STABILIZATION AND SLOPE PROTECTION SHALL BE RESEEDED WITH ERNMX-280. AREAS WITHIN THE LIMITS OF THE PROPOSED STORMWATER DETENTION BASIN SHALL BE SEEDED WITH ERNMX-183. ALL OTHER DISTURBED AREAS SHALL BE RESEEDED WITH SEEDING TYPE D UNLESS OTHERWISE NOTED.

NOTE:
SEE SHEETS NO. 7-8 FOR SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

NOTE:
SEE SHEET NO. 78-79 FOR CROSS SECTIONS

REFERENCE:
EXISTING CONDITION, TOPOGRAPHY, IN THE AREAS OF THE PROPOSED IMPROVEMENTS PREPARED BY CME ASSOCIATES. ALL TOPOGRAPHY PREPARED IN NAD 83 AND NAVD 88, U.S. SURVEY FEET.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	05/10/2025	TE/DK	MM	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION AND SOIL EROSION & SEDIMENT CONTROL PLAN

CENTRAL LAKE NORTH TRAIL (5 OF 5)

STA. 26+50 TO 31+58

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 60 of 139	

REGISTER NO.
FILE NO. 115.UN00213.P05

Pay Item No.	To Be Constructed	Unit	Plan Quantity
95	6" HDPE pipe	LF	24
96	8" HDPE pipe	LF	44
97	15" HDPE pipe	LF	20
120	18" HDPE pipe	LF	88
121	24" HDPE pipe	LF	26
98	15" Reinforced concrete pipe, class V	LF	674
99	18" Reinforced concrete pipe, class V	LF	146
100	24" Reinforced concrete pipe, class V	LF	530
104	36" Reinforced concrete pipe, class V	LF	20
105	Dense graded aggregate for pipe trench	CY	1273
107	Manhole, 4' square, storm sewer	U	16
108	Manhole, 4' square, storm sewer, shallow casting	U	1
109	Outlet control structure	U	2
110	Subsurface Infiltration Basin, #1, Furnish and install complete subsurface infiltration basin, including excavation and backfill, geotextiles, dewatering, No. 57 stone aggregate, I-9 soil, piping, structures, and all associated work and all materials	LS	LS
111	Subsurface Infiltration Basin, #2, Furnish and install complete subsurface infiltration basin, including excavation and backfill, geotextiles, dewatering, No. 57 stone aggregate, I-9 soil, piping, structures, and all associated work and all materials	LS	LS
112	Reinforced concrete headwall	CY	18
113	Contech Filterra HC Peak Diversion 6' x 6' media bay, or approved equal	U	5
114	Contech Filterra HC Peak Diversion 6' x 8' media bay, or approved equal	U	1
115	Contech Filterra HC Peak Diversion 6' x 10' media bay, or approved equal	U	1
116	Contech Filterra HC Peak Diversion 7' x 10' media bay, or approved equal	U	1
117	Contech Filterra HC Peak Diversion 8' x 10.5' media bay, or approved equal	U	2
118	Contech Modular Wetland 8' x 16', or approved equal	U	1
119	High Capacity Kraken Filter 72" manhole, or approved equal	U	1
123	High Capacity Kraken Filter Peak Diversion 4'X6' vault, or approved equal	U	1
124	Inlet, Type D, 6" head	U	1
125	Inlet, Type E	U	1
126	Inlet, trench drain	LF	45
139	6' High Black Vinyl Coated Chain Link Fence	LF	55

CONSTRUCT
30 LF TRENCH DRAIN, 8" WIDE, BOTTOM @ 1.00%
GR 77.90 (WEST END)
GR 78.30 (EAST END)
INV. 76.30 (8" OUT)

CONSTRUCT
9 LF 8" DIA. HDPE PIPE, @ 1.00%

CONSTRUCT
MANHOLE, 4' SQ., STORM SEWER
RIM 79.00
INV. 76.21 (8" IN)
INV. 75.00 (15" OUT)

CONSTRUCT
31 LF 15" DIA. RCP, CLASS V @ 1.00%

CONSTRUCT
MANHOLE, 4' SQ., STORM SEWER
RIM 78.80
INV. 74.69 (15" IN)
INV. 73.19 (15" OUT)

CONSTRUCT
205 LF 15" DIA. RCP, CLASS V @ 1.00%

PROFILE A

CONSTRUCT
11 LF 15" DIA. RCP, CLASS V @ 1.50%

CONSTRUCT
CONTECH FILTERRA HC PEAK DIVERSION - #1, 6'X6' MEDIA BAY, OR APPROVED EQUAL
TC 75.46 GR 74.96
INV. 71.13 (15" IN/OUT)

CONSTRUCT
13 LF 15" DIA. RCP, CLASS V @ 1.50%

CONSTRUCT
MANHOLE, 4' SQ., STORM SEWER
RIM 70.74
INV. 66.25 (15" IN/OUT)

CONSTRUCT
48 LF 15" DIA. RCP, CLASS V @ 1.50%

CONSTRUCT
MANHOLE, 4' SQ., STORM SEWER
RIM 70.78
INV. 66.28 (15" IN-N)
INV. 65.53 (15" IN-W)
INV. 65.53 (15" OUT)

CONSTRUCT
55 LF 15" DIA. RCP, CLASS V @ 1.50%

PROFILE C

CONSTRUCT
143 LF 15" DIA. RCP, CLASS V @ 1.50%

PROFILE B

CONSTRUCT
MANHOLE, 4' SQ., STORM SEWER
RIM 75.12
INV. 70.96 (15" IN)
INV. 69.09 (15" OUT)

APPROXIMATE LIMIT OF DISTURBANCE (TYP.)

CONSTRUCT
5 LF 18" DIA. HDPE PIPE @ 2.00%

CONSTRUCT
MANHOLE, 4' SQ., STORM SEWER
RIM 57.50
INV. 51.08 (18" HDPE IN/OUT)
INV. 51.33 (15" HDPE IN)

CONSTRUCT
14 LF 18" DIA. HDPE PIPE @ 2.00%

CONSTRUCT
13 LF 24" DIA. HDPE PIPE @ 0.00%

CONSTRUCT
3 - 4 LF 6" DIA. HDPE PIPE @ 1.50% (TYP.)

CONSTRUCT
MANHOLE, 4' SQ., STORM SEWER
RIM 58.90
INV. 54.42 (18" HDPE IN)
INV. 53.40 (24" HDPE OUT)

CONSTRUCT
2 - 4 LF 18" DIA. HDPE PIPE @ 1.50% (TYP.)

CONSTRUCT
SUBSURFACE INFILTRATION BASIN #1
1,771 AQUABOX MODULES, OR APPROVED EQUAL
EL. 57.13 (TOP OF STONE)
INV. 54.65 (15" HDPE IN)
INV. 54.48 (2 - 18" HDPE IN)
INV. 54.48 (2 - 18" HDPE OUT)
INV. 54.21 (3 - 6" HDPE OUT)
INV. 54.00 (31.50" AQUABOX)
EL. 53.50 (BOTTOM OF STONE)

CONSTRUCT
CONTECH FILTERRA HC PEAK DIVERSION - #2, 8'X10.5' MEDIA BAY, OR APPROVED EQUAL
TC 70.77 GR 70.27
INV. 66.44 (15" OUT)

CONSTRUCT
16 LF 15" DIA. RCP, CLASS V @ 1.50%

CONSTRUCT
CONTECH FILTERRA HC PEAK DIVERSION - #3, 7'X10' MEDIA BAY, OR APPROVED EQUAL
TC 70.50 GR 70.35
INV. 66.52 (15" OUT)

CONSTRUCT
7 LF 18" DIA. HDPE PIPE @ 2.50%

CONSTRUCT
10 LF 18" DIA. HDPE PIPE @ 2.50%

CONSTRUCT
CONTECH FILTERRA HC PEAK DIVERSION - #5, 6'X6' MEDIA BAY, OR APPROVED EQUAL
TC 65.55 GR 65.05
INV. 61.22 (15" OUT)

CONSTRUCT
11 LF 15" DIA. RCP, CLASS V @ 1.00%

CONSTRUCT
66 LF 24" DIA. RCP, CLASS V @ 2.00%

CONSTRUCT
136 LF 24" DIA. RCP, CLASS V @ 1.50%

CONSTRUCT
CONTECH FILTERRA HC PEAK DIVERSION - #4, 6'X8' MEDIA BAY, OR APPROVED EQUAL
TC 70.50 GR 70.00
INV. 66.17 (15" OUT)

CONSTRUCT
11 LF 15" DIA. RCP, CLASS V @ 1.00%

CONSTRUCT
MANHOLE, 4' SQ., STORM SEWER
RIM 67.29
INV. 67.59 (15" IN-E)
INV. 66.95 (15" IN-S)
INV. 64.70 (15" IN-W)
INV. 63.68 (24" OUT)

CONSTRUCT
16 LF 15" DIA. RCP, CLASS V @ 1.00%

CONSTRUCT
HIGH CAPACITY KRAKEN FILTER PEAK DIVERSION 4'X6' VAULT - #13, 23 - 30" HIGH CARTRIDGES
RIM 73.00
INV. 70.12 (15" IN)
INV. 67.75 (15" OUT)

CONSTRUCT
12 LF 15" DIA. RCP, CLASS V @ 1.00%

CONSTRUCT
INLET, TYPE E
GR 72.60
INV. 70.24 (15" OUT)

CONSTRUCT
MANHOLE, 4' SQ., STORM SEWER
RIM 70.19
INV. 66.06 (15" IN-E)
INV. 65.06 (15" IN-W)
INV. 61.64 (24" IN/OUT)

CONSTRUCT
11 LF 15" DIA. RCP, CLASS V @ 1.00%

CONSTRUCT
CONTECH FILTERRA HC PEAK DIVERSION - #5, 6'X6' MEDIA BAY, OR APPROVED EQUAL
TC 70.50 GR 70.00
INV. 66.17 (15" OUT)

CONSTRUCT
220 LF 24" DIA. RCP, CLASS V @ 1.50%

CONSTRUCT
MANHOLE, 4' SQ., STORM SEWER
RIM 66.82
INV. 58.34 (24" IN/OUT)

CONSTRUCT
MANHOLE, 4 SQ., STORM SEWER
RIM 65.16
INV. 61.11 (15" IN-W)
INV. 61.11 (15" IN-E)
INV. 57.02 (24" IN/OUT)

CONSTRUCT
11 LF 15" DIA. RCP CLASS V @ 1.00%

CONSTRUCT
CONTECH FILTERRA HC PEAK DIVERSION - #7, 6'X6' MEDIA BAY, OR APPROVED EQUAL
TC 65.55 GR 65.05
INV. 61.22 (15" OUT)

CONSTRUCT
105 LF 24" DIA. RCP, CLASS V @ 2.00%

CONSTRUCT
MANHOLE, 4' SQ., STORM SEWER
RIM 61.67
INV. 54.86 (24" IN-SW)
INV. 54.86 (18" OUT-NE)
INV. 54.73 (18" OUT-NW)

CONSTRUCT
8 LF 18" DIA. RCP, CLASS V @ 2.50%

CONSTRUCT
MANHOLE, 4' SQ., STORM SEWER
RIM 61.36
INV. 56.68 (15" IN)
INV. 54.66 (18" IN/OUT)

CONSTRUCT
20 LF 15" DIA. RCP, CLASS V @ 1.00%

CONSTRUCT
CONTECH FILTERRA HC PEAK DIVERSION - #6, 6'X10' MEDIA BAY, OR APPROVED EQUAL
TC 61.21 GR 60.71
INV. 56.88 (15" OUT)

CONSTRUCT
7 LF 18" DIA. HDPE PIPE @ 0.50%

CONSTRUCT
OUTLET CONTROL STRUCTURE #2, RIM 56.60
INV. 51.55 (18" RECT. WEIR)
INV. 50.92 (18" HDPE IN)
INV. 50.80 (6" RECT. WEIR)
INV. 49.90 (24" HDPE IN)
INV. 47.95 (18" OUT)

CONSTRUCT
13 LF 24" DIA. HDPE @ 0.00%

CONSTRUCT
3 - 4 LF 6" DIA. HDPE @ 1.50% (TYP.)

CONSTRUCT
MANHOLE, 4' SQ., STORM SEWER
RIM 56.75
INV. 50.92 (18" HDPE IN)
INV. 49.90 (24" HDPE OUT)

CONSTRUCT
2 - 4 LF 18" DIA. HDPE @ 1.50% (TYP.)

CONSTRUCT
SUBSURFACE INFILTRATION BASIN #2
1,120 AQUABOX MODULES, OR APPROVED EQUAL
EL. 53.63 (TOP OF STONE)
INV. 51.15 (15" HDPE IN)
INV. 50.98 (18" HDPE IN)
INV. 50.98 (2 - 18" HDPE OUT)
INV. 50.71 (8" HDPE OUT)
INV. 50.50 (31.50" AQUABOX)
EL. 50.00 (BOTTOM OF STONE)

INSPECTION PORT (TYP.)

SUBSURFACE INFILTRATION BASIN #2
100-YR FUTURE WSEL: 52.60
10-YR FUTURE WSEL: 51.92
2-YR FUTURE WSEL: 51.58
100-YR CURRENT WSEL: 52.33
10-YR CURRENT WSEL: 51.76
2-YR CURRENT WSEL: 51.37
WQDS WSEL: 50.61

SUBSURFACE INFILTRATION BASIN #1
100-YR FUTURE WSEL: 56.72
10-YR FUTURE WSEL: 55.58
2-YR FUTURE WSEL: 54.95
100-YR CURRENT WSEL: 56.20
10-YR CURRENT WSEL: 55.32
2-YR CURRENT WSEL: 54.74
WQDS WSEL: 54.19

CONSTRUCT
MANHOLE, 4' SQ. STORM SEWER
RIM 56.43
INV. 51.02 (18" IN/OUT)

CONSTRUCT
25 LF 18" DIA. HDPE PIPE @ 0.50%

BASIN PROFILE ALIGNMENT

CONSTRUCT
INLET, TYPE D, 6" HEAD
TC 55.96 GR 55.46
INV. 51.25 (18" OUT)

CONSTRUCT
4 LF 18" DIA. HDPE PIPE @ 1.00%

CONSTRUCT
CONTECH MODULAR WETLAND - #11, 8'X16', OR APPROVED EQUAL
RIM 55.53
INV. 52.04 (8" IN)
INV. 51.21 (18" IN)
INV. 51.15 (18" OUT)

PROFILE E

CONSTRUCT
120 LF 18" DIA. RCP, CLASS V @ 2.50%

18" SPACING BETWEEN STORM AND SANITARY
PR STORM BP 44.89 (18" RCP)
EX SANI. TP 43.37 (21" CLAY)
EX SANI. INV. 41.39 (21" CLAY)

CONSTRUCT
MANHOLE, 4' SQ., STORM SEWER, SHALLOW CASTING
RIM 48.50
INV. 44.95 (18" IN)
INV. 43.45 (18" OUT)

CONSTRUCT
18 LF 18" DIA. RCP, CLASS V @ 2.50%

OUTFALL A

CONSTRUCT
REINFORCED CONCRETE HEADWALL
6' HIGH CHAINLINK FENCE
TW 45.92
INV. 43.00 (18" OUT)

CONSTRUCT
9 LF 8" DIA. HDPE PIPE @ 1.00%

CONSTRUCT
MANHOLE, 4' SQ., STORM SEWER
RIM 56.00
INV. 53.49 (8" IN)
INV. 52.13 (8" OUT)

CONSTRUCT
26 LF 8" DIA. HDPE PIPE @ 3.50%

CONSTRUCT
15 LF TRENCH DRAIN, 8" WIDE, BOTTOM @ 1.00%
GR 56.10
INV. 54.40 (8" OUT)

TOP OF BANK (TYP.)

NJDEP FLOOD HAZARD AREA (TYP.)

CONSTRUCT
8 LF 15" DIA. HDPE PIPE @ 9.25%

CONSTRUCT
CONTECH FILTERRA HC PEAK DIVERSION - #10, 8'X10.5' MEDIA BAY, OR APPROVED EQUAL
TC 56.22 GR 55.72
INV. 51.89 (OUT)

CONSTRUCT
HIGH CAPACITY KRAKEN FILTER
72" MANHOLE - #12, 18 - 20" HIGH CARTRIDGES, OR APPROVED EQUAL
RIM 57.50
INV. 52.24 (15" IN)
INV. 51.41 (15" OUT)

CONSTRUCT
48 LF 15" DIA. RCP, CLASS V @ 0.70%

CONSTRUCT
CONTECH FILTERRA HC PEAK DIVERSION - #9, 6'X6' MEDIA BAY, OR APPROVED EQUAL
TC 59.12 GR 58.62
INV. 54.79 (15" OUT)

CONSTRUCT
12 LF 15" DIA. HDPE PIPE @ 1.17%

CONSTRUCT
12 LF 15" DIA. RCP, CLASS V @ 0.70%

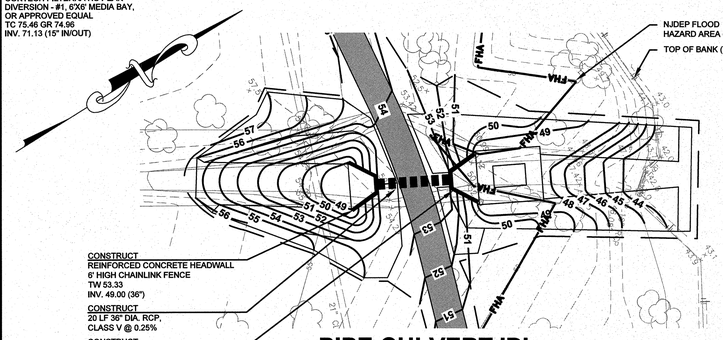
CONSTRUCT
OUTLET CONTROL STRUCTURE #1, RIM 59.05
INV. 55.05 (12" RECT. WEIR)
INV. 54.42 (18" HDPE IN)
INV. 54.19 (6" RECT. WEIR)
INV. 53.40 (24" HDPE IN)
INV. 51.36 (18" OUT)

INSPECTION PORT (TYP.)

Block 52
11.02

MATCHLINE A-A'
SEE SHEET 62

0+00
1+00
2+00
2+62



CONSTRUCT
REINFORCED CONCRETE HEADWALL
6' HIGH CHAINLINK FENCE
TW 53.33
INV. 49.00 (36")

CONSTRUCT
20 LF 36" DIA. RCP, CLASS V @ 0.25%

CONSTRUCT
REINFORCED CONCRETE HEADWALL
6' HIGH CHAINLINK FENCE
TW 53.28
INV. 48.95 (36")

PIPE CULVERT 'D'

SCALE: 1"=20'

PLAN

GRAPHIC SCALE

40 0 20 40 80 160

SCALE: 1"=40'

NOTE:
SEE SHEET NO. 66-67 FOR STORM SEWER PROFILE DETAILS

NOTE:
THE STATE OF NEW JERSEY HAS DETERMINED THAT ALL OR A PORTION OF THIS LOT LIES IN A FLOOD HAZARD AREA. CERTAIN ACTIVITIES IN NJDEP FLOOD HAZARD AREAS ARE REGULATED BY THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SOME ACTIVITIES MAY BE PROHIBITED ON THIS SITE OR MAY FIRST REQUIRE A PERMIT. CONTACT THE DIVISION OF LAND USE REGULATION AT (609) 777-0454 FOR MORE INFORMATION PRIOR TO ANY CONSTRUCTION ONSITE.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
4.	REVISED PER REBID	4/10/2025	JPB	SCB	
3.	REVISED PER NJDEP COMMENTS	2/28/2025	BDP	SCB	
2.	REVISED FOR REBID	1/15/2025	BDP	SCB	
1.	REVISED PER NJDEP COMMENTS	11/25/2024	BDP	SCB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DRAINAGE PLAN - 1 OF 2

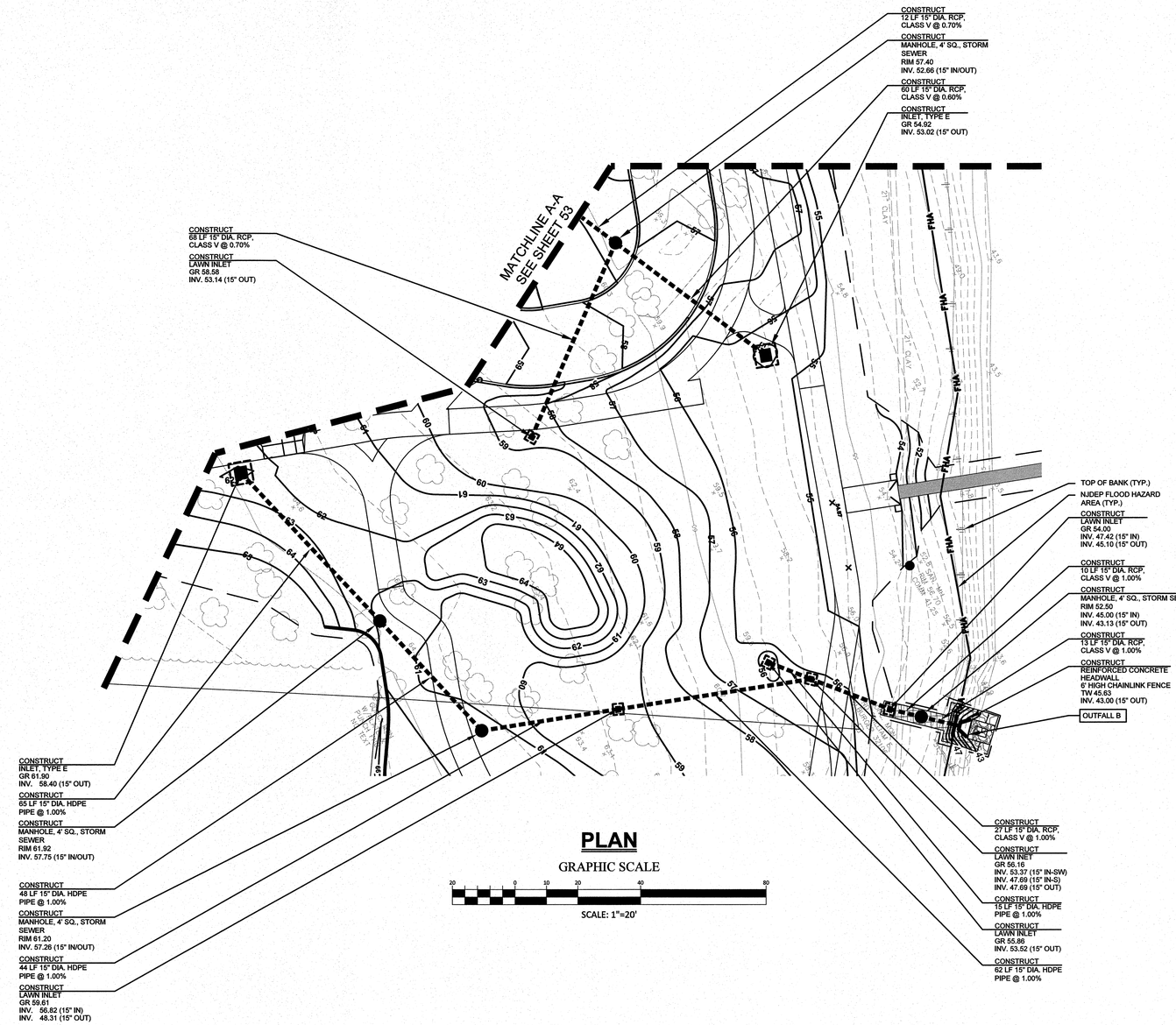
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	As Shown
DATE	October 2024
DRAWN BY	BDP
DESIGNED BY	BDP
CHECKED BY	SCB
SHEET	61 of 139
DRAWING NUMBER	

PROJECT NO. 115.UN00213.P05
WEBSTER NO.

Pay Item No.	To Be Constructed	Unit	Plan Quantity
97	15" HDPE pipe	LF	234
98	15" Reinforced concrete pipe, class V	LF	190
105	Dense graded aggregate for pipe trench	CY	229
107	Manhole, 4' square, storm sewer	U	4
112	Reinforced concrete headwall	CY	3
125	Inlet, Type E	U	2
122	Lawn Inlet	U	5
139	6' High Black Vinyl Coated Chain Link Fence	LF	11



PLAN

GRAPHIC SCALE

20 0 10 20 40 80

SCALE: 1"=20'

NOTE:
SEE SHEET NO. 66-67 FOR STORM SEWER PROFILE DETAILS

NOTE:
THE STATE OF NEW JERSEY HAS DETERMINED THAT ALL OR A PORTION OF THIS LOT LIES IN A FLOOD HAZARD AREA. CERTAIN ACTIVITIES IN NJDEP FLOOD HAZARD AREAS ARE REGULATED BY THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SOME ACTIVITIES MAY BE PROHIBITED ON THIS SITE OR MAY FIRST REQUIRE A PERMIT. CONTACT THE DIVISION OF LAND USE REGULATION AT (609) 777-0454 FOR MORE INFORMATION PRIOR TO ANY CONSTRUCTION ONSITE.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DRAINAGE PLAN - 2 OF 2

REGISTER NO.

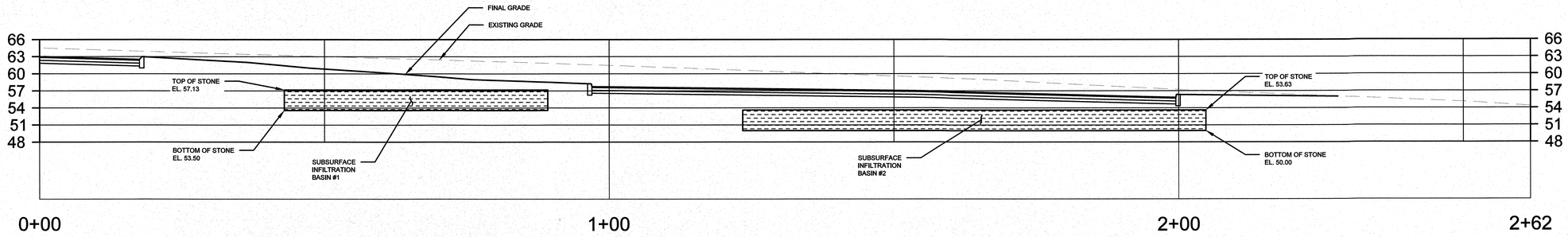
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468
DATE 4.18.24

SCALE	DATE
As Shown	October 2024
DRAWN BY	DESIGNED BY
JPB	BDP
CHECKED BY	SHEET
SCB	62 of 139

DRAWING NUMBER

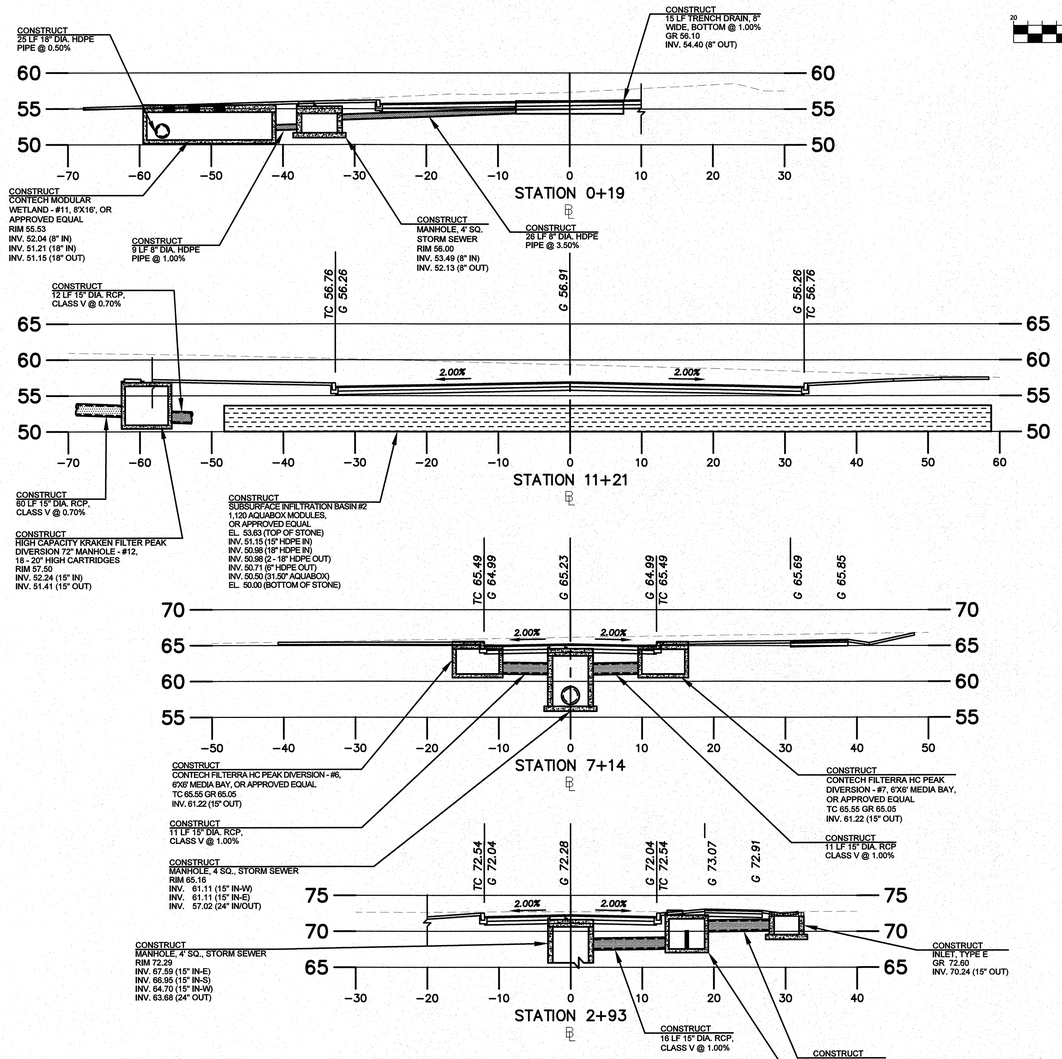


BASIN PROFILE

GRAPHIC SCALE

20 10 0 5 10 20

SCALE: 1"=10'

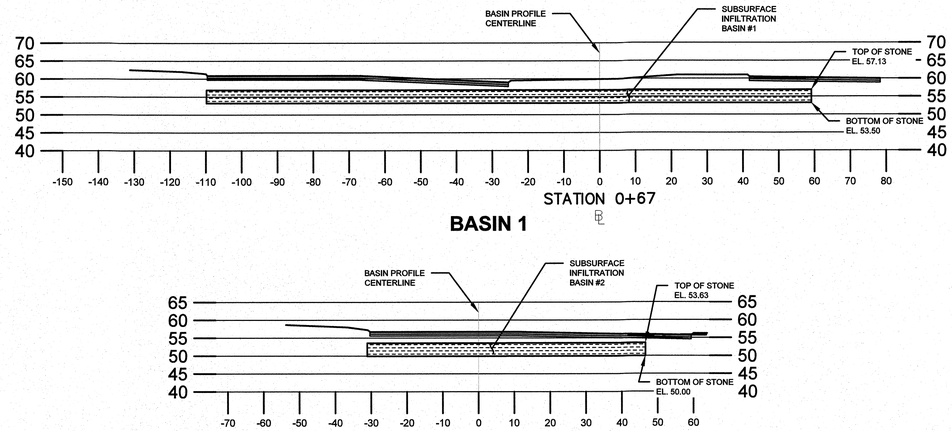


TYPICAL MTD CROSS SECTIONS

GRAPHIC SCALE

10 0 5 10 20 40

SCALE: 1"=20'



BASIN SECTIONS

GRAPHIC SCALE

20 0 10 20 40 80

SCALE: 1"=20'

STORMWATER MANAGEMENT PROFILE AND SECTIONS ALIGNMENTS		
STATION NO.	ALIGNMENT	SHEET REFERENCE
2+93.00	ACCESS ROAD	47
7+14.00	ACCESS ROAD	48
11+21.00	ACCESS ROAD	48
0+19.00	C. LAKE BOAT RAMP	80
N/A	BASIN PROFILE	61
0+67.00	BASIN PROFILE	61
1+63.00	BASIN PROFILE	61

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

STORMWATER MANAGEMENT PROFILE AND SECTIONS

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

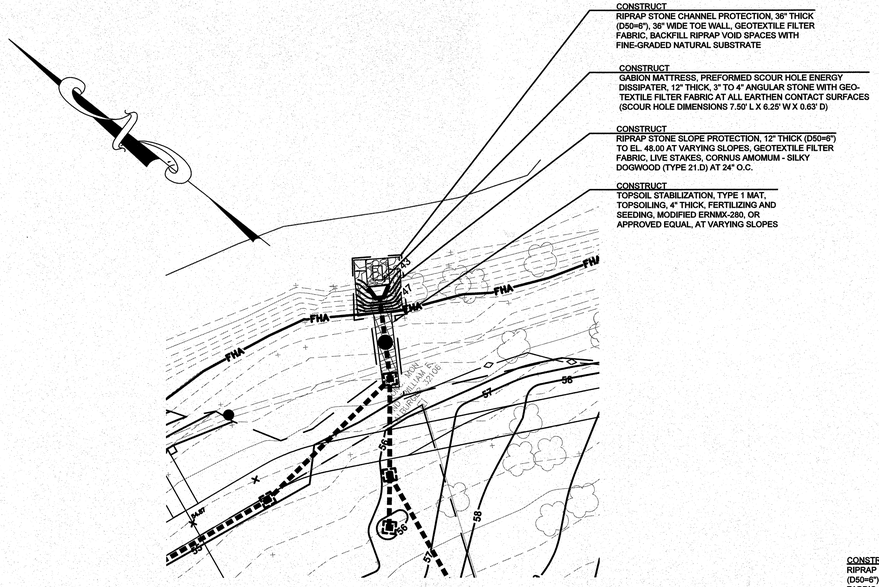
DATE 4.10.25

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: BDP	DESIGNED BY: BDP	
CHECKED BY: SCB	SHEET: 63 of 139	

REGISTER NO.

PROJECT NO. 115.UN00213.P05

Pay Item No.	To Be Constructed	Unit	Plan Quantity
129	Riprap stone slope protection, 12" thick (d50=6")	SY	44
130	Riprap stone channel protection, 36" thick (d50=6")	SY	6
131	Riprap stone slope protection, 48" thick (d50=24")	SY	199
132	Riprap stone channel protection, 36" thick (d50=24")	SY	111
133	Gabion mattress	CY	20
233	Topsoil spreading, 4" thick	SY	175
239	Topsoil stabilization, type 1 mat	SY	175
264	Live stakes, Cornus Amomum, Silky Dogwood (type 21.D)	U	100
275	Fertilizer and seeding, modified ERNMX-280, or approved equal	SY	175



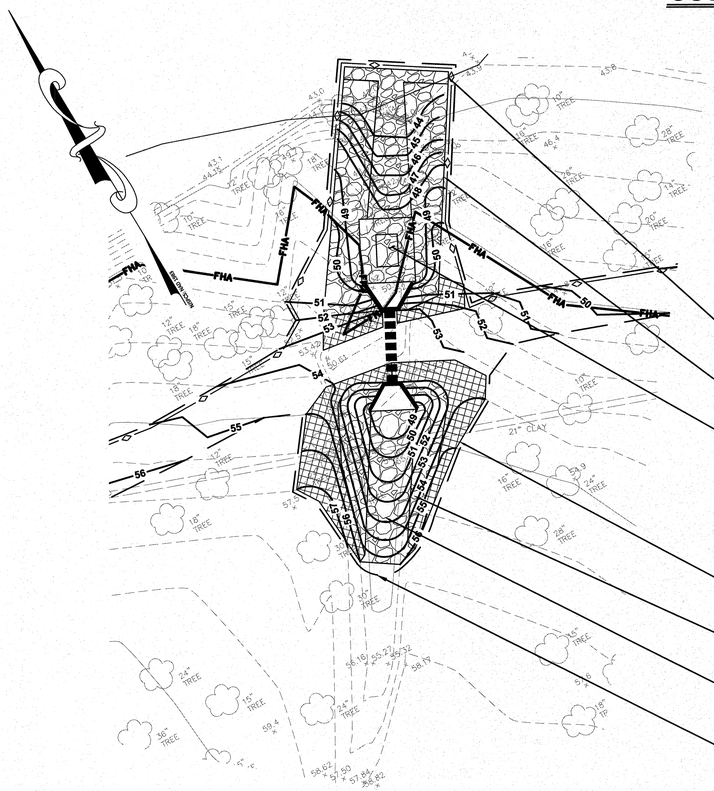
CONSTRUCT
RIPRAP STONE CHANNEL PROTECTION, 36" THICK (D50=6"), 36" WIDE TOE WALL, GEOTEXTILE FILTER FABRIC, BACKFILL RIPRAP VOID SPACES WITH FINE-GRADED NATURAL SUBSTRATE

CONSTRUCT
GABION MATTRESS, PREFORMED SCOUR HOLE ENERGY DISSIPATER, 12" THICK, 3" TO 4" ANGULAR STONE WITH GEO-TEXTILE FILTER FABRIC AT ALL EARTHEN CONTACT SURFACES (SCOUR HOLE DIMENSIONS 7.50' L X 6.25' W X 0.63' D)

CONSTRUCT
RIPRAP STONE SLOPE PROTECTION, 12" THICK (D50=6") TO EL. 48.00 AT VARYING SLOPES, GEOTEXTILE FILTER FABRIC, LIVE STAKES, CORNUS AMOMUM - SILKY DOGWOOD (TYPE 21.D) AT 24" O.C.

CONSTRUCT
TOPSOIL STABILIZATION, TYPE 1 MAT, TOPSOILING, 4" THICK, FERTILIZING AND SEEDING, MODIFIED ERNMX-280, OR APPROVED EQUAL, AT VARYING SLOPES

OUTFALL B



CONSTRUCT
RIPRAP STONE CHANNEL PROTECTION, 36" THICK (D50=24"), 36" WIDE TOE WALL, GEOTEXTILE FILTER FABRIC, BACKFILL RIPRAP VOID SPACES WITH FINE-GRADED NATURAL SUBSTRATE

CONSTRUCT
RIPRAP STONE SLOPE PROTECTION, 48" THICK (D50=24") TO EL. 52.00 AT VARYING SLOPES, GEOTEXTILE FILTER FABRIC

CONSTRUCT
GABION MATTRESS, PREFORMED SCOUR HOLE ENERGY DISSIPATER, 18" THICK, 3" TO 4" ANGULAR STONE WITH GEO-TEXTILE FILTER FABRIC AT ALL EARTHEN CONTACT SURFACES (SCOUR HOLE DIMENSIONS 18.00' L X 15.00' W X 1.50' D)

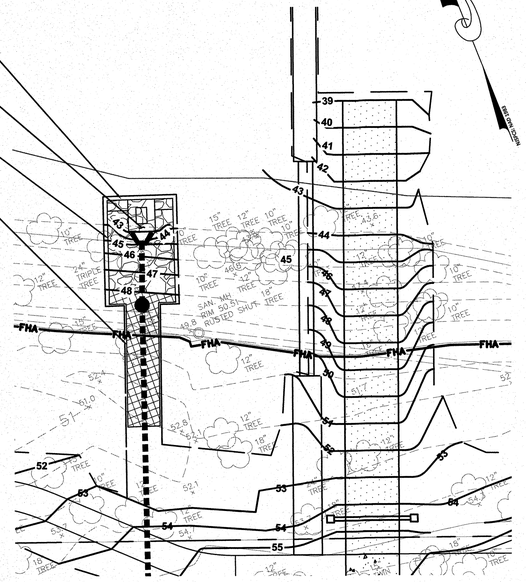
CONSTRUCT
TOPSOIL STABILIZATION, TYPE 1 MAT, TOPSOILING, 4" THICK, FERTILIZING AND SEEDING, MODIFIED ERNMX-280, OR APPROVED EQUAL, AT VARYING SLOPES (TYP.)

CONSTRUCT
RIPRAP STONE SLOPE PROTECTION, 48" THICK (D50=24") TO EL. 53.00 AT VARYING SLOPES, GEOTEXTILE FILTER FABRIC

CONSTRUCT
RIPRAP STONE CHANNEL PROTECTION, 36" THICK (D50=24"), 36" WIDE TOE WALL, GEOTEXTILE FILTER FABRIC, BACKFILL RIPRAP VOID SPACES WITH FINE-GRADED NATURAL SUBSTRATE

APPROXIMATE LIMIT OF DISTURBANCE (TYP.)

PIPE CULVERT D



CONSTRUCT
RIPRAP STONE CHANNEL PROTECTION, 36" THICK (D50=6"), 36" WIDE TOE WALL, GEOTEXTILE FILTER FABRIC, BACKFILL RIPRAP VOID SPACES WITH FINE-GRADED NATURAL SUBSTRATE

CONSTRUCT
GABION MATTRESS, PREFORMED SCOUR HOLE ENERGY DISSIPATER, 12" THICK, 3" TO 4" ANGULAR STONE WITH GEO-TEXTILE FILTER FABRIC AT ALL EARTHEN CONTACT SURFACES (SCOUR HOLE DIMENSIONS 9.00' L X 7.50' W X 0.75' D)

CONSTRUCT
RIPRAP STONE SLOPE PROTECTION, 12" THICK (D50=6") TO EL. 48.00 AT VARYING SLOPES, GEOTEXTILE FILTER FABRIC, LIVE STAKES, CORNUS AMOMUM - SILKY DOGWOOD (TYPE 21.D) AT 24" O.C.

CONSTRUCT
TOPSOIL STABILIZATION, TYPE 1 MAT, TOPSOILING, 4" THICK, FERTILIZING AND SEEDING, MODIFIED ERNMX-280, OR APPROVED EQUAL, AT VARYING SLOPES

OUTFALL A

PLAN

GRAPHIC SCALE

20 0 10 20 40 80

SCALE: 1"=20'

NOTE:
THE STATE OF NEW JERSEY HAS DETERMINED THAT ALL OR A PORTION OF THIS LOT LIES IN A FLOOD HAZARD AREA. CERTAIN ACTIVITIES IN NJDEP FLOOD HAZARD AREAS ARE REGULATED BY THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SOME ACTIVITIES MAY BE PROHIBITED ON THIS SITE OR MAY FIRST REQUIRE A PERMIT. CONTACT THE DIVISION OF LAND USE REGULATION AT (609) 777-0454 FOR MORE INFORMATION PRIOR TO ANY CONSTRUCTION ONSITE.

SEED MIXTURE FOR STREAMBANK STABILIZATION

1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVING STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED PER NJDEP COMMENTS	2/28/2025	BDP	SCB	
1.	REVISED FOR REBID	1/15/2025	BDP	SCB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

STABILIZATION PLAN - OUTFALLS

CVE ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

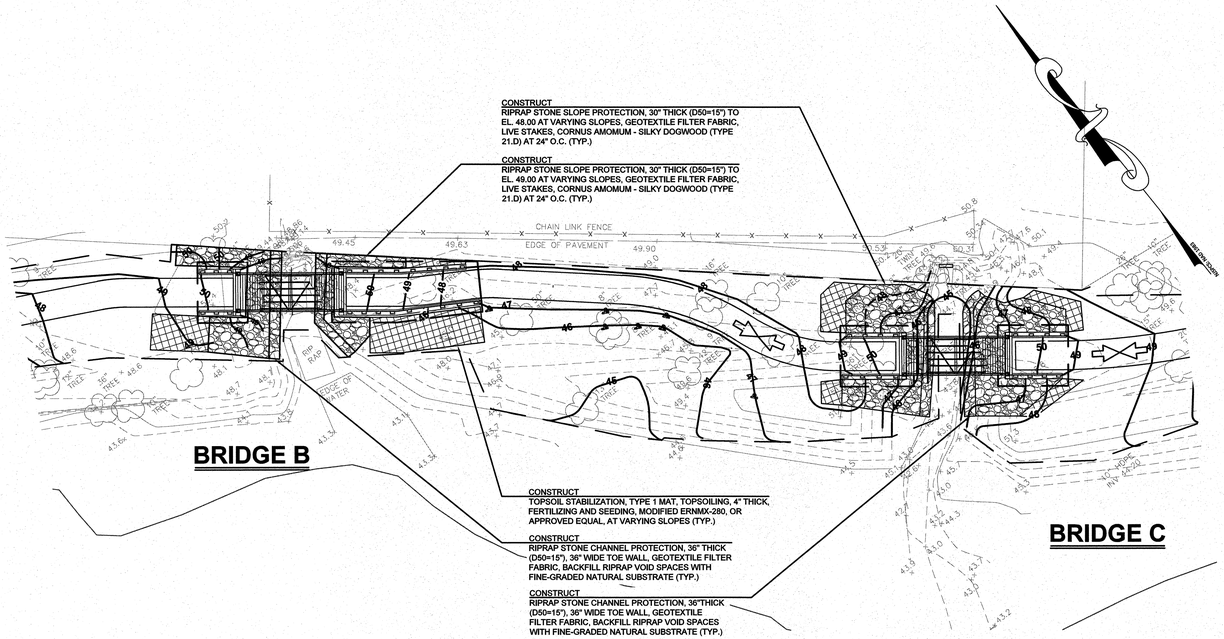
REGISTER NO.

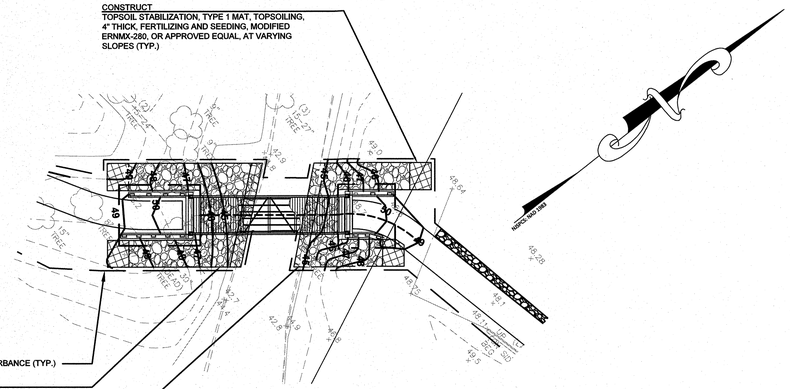
FILE NO. 115.UN00213.P05

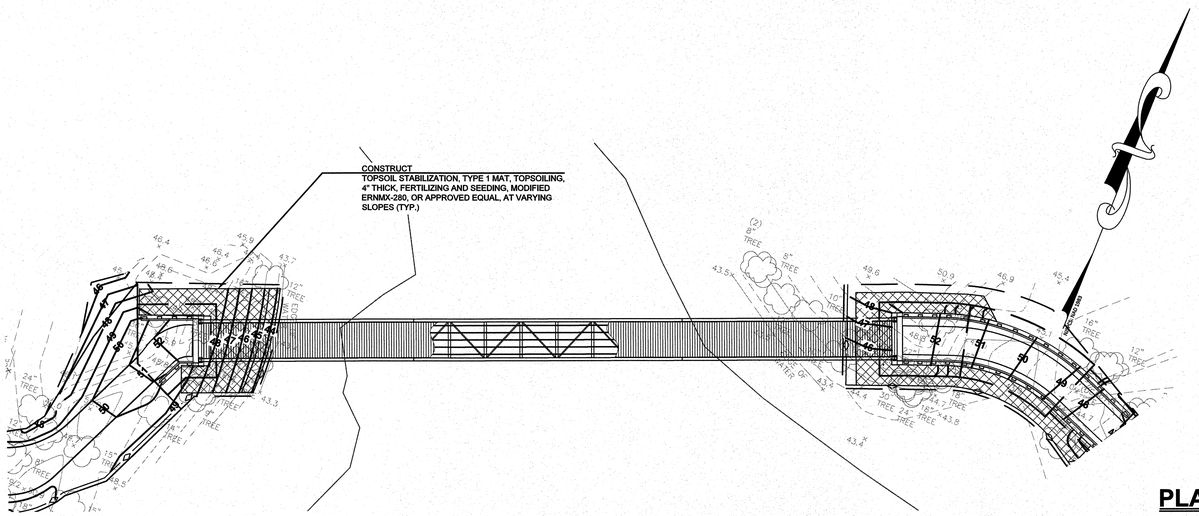
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: BDP	DESIGNED BY: BDP/SCB	
CHECKED BY: SCB	SHEET: 64 of 139	

Pay Item No.	To Be Constructed	Unit	Plan Quantity
265	Riprap stone slope protection, 30" thick (d50=15")	SY	302
266	Riprap stone channel protection, 36" thick (d50=15")	SY	62
233	Topsoil spreading, 4" thick	SY	270
239	Topsoil stabilization, type 1 mat	SY	270
264	Live stakes, Cornus Amomum, Silky Dogwood (type 21.D)	U	680
275	Fertilizer and seeding, modified ERNMX-280, or approved equal	SY	270







PLAN

GRAPHIC SCALE

20 10 0 10 20 40 80

SCALE: 1"=20'

NOTE:
THE STATE OF NEW JERSEY HAS DETERMINED THAT ALL OR A PORTION OF THIS LOT LIES IN A FLOOD HAZARD AREA. CERTAIN ACTIVITIES IN NJDEP FLOOD HAZARD AREAS ARE REGULATED BY THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SOME ACTIVITIES MAY BE PROHIBITED ON THIS SITE OR MAY FIRST REQUIRE A PERMIT. CONTACT THE DIVISION OF LAND USE REGULATION AT (609) 777-0454 FOR MORE INFORMATION PRIOR TO ANY CONSTRUCTION ONSITE.

SEED MIXTURE FOR STREAMBANK STABILIZATION

1. LIVE STAKING TO BE IN ACCORDANCE WITH TYPE 21.D PLANTING SCHEDULE FOUND IN TABLE 4-2 OF THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, JANUARY 2014.
2. LIVE STAKING TO RECEIVE FERTILIZATION AND LIME AFTER FIRST YEAR OF ESTABLISHMENT. LIVING STAKING WITH NO NEW GROWTH SHOULD BE REPLACED AS NECESSARY.
3. AREAS OF PROPOSED STONE RIPRAP AND EROSION CONTROL MATTING TO RECEIVE MODIFIED SEED MIX ERNMX-280 "EASTERN WEST VIRGINIA STEEP SLOPE MIX" (DEERTONGUE AND BLACKEYED SUSAN SEEDS REMOVED).
4. TEMPORARY SEED MIX AS DESCRIBED ON SOIL EROSION & SEDIMENT CONTROL NOTES AND DETAILS PLAN MAY BE USED IN CONJUNCTION WITH MODIFIED SEED MIX ERNMX-280, IF NECESSARY.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED PER NJDEP COMMENTS	2/28/2025	BDP	SCB	
1.	REVISED FOR REBID	1/15/2025	BDP	SCB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

STABILIZATION PLAN - STREAMBANKS

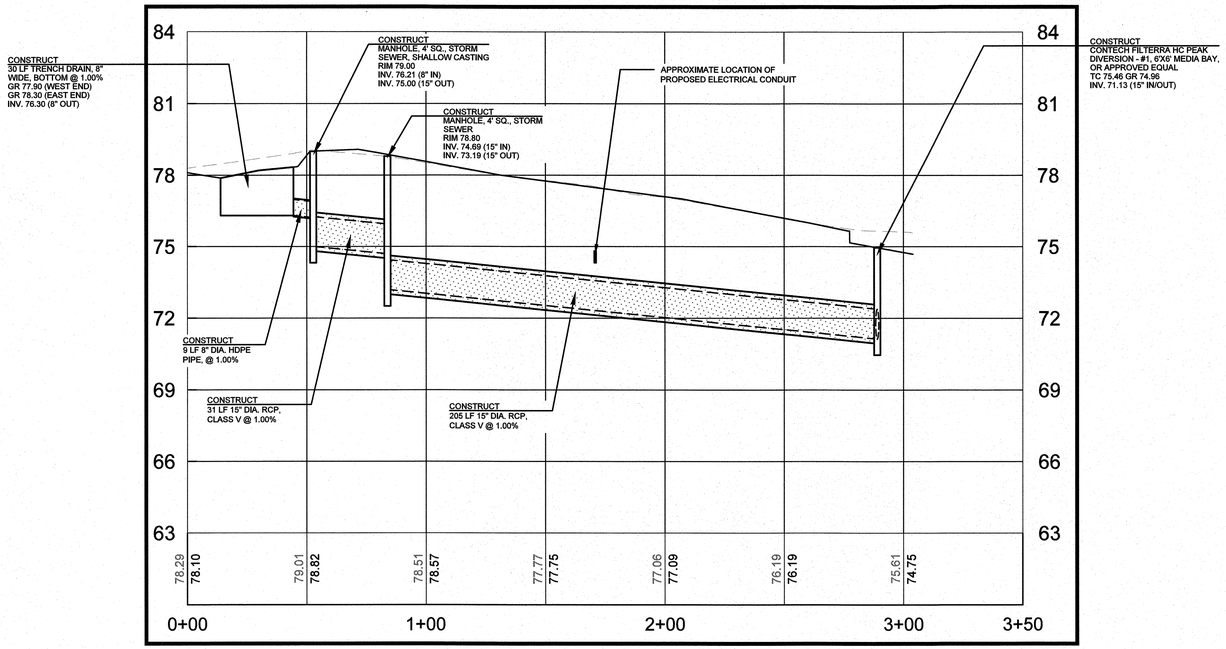
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY: BDP	DESIGNED BY: BDP/SCB
CHECKED BY: SCB	SHEET: 65 of 139

DRAWING NUMBER

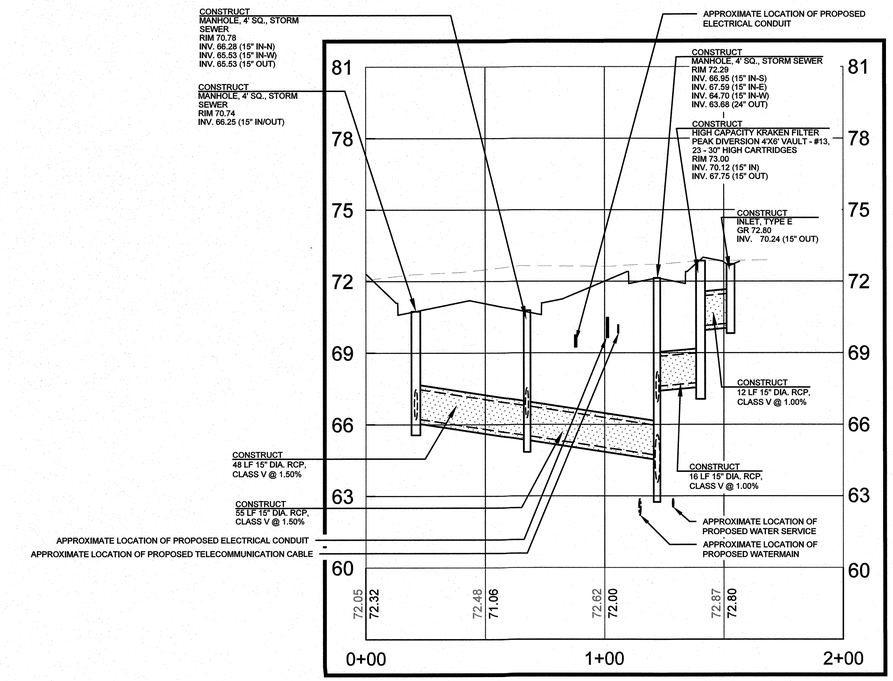
REGISTER NO.

FILE NO. 115.UN00213.P05



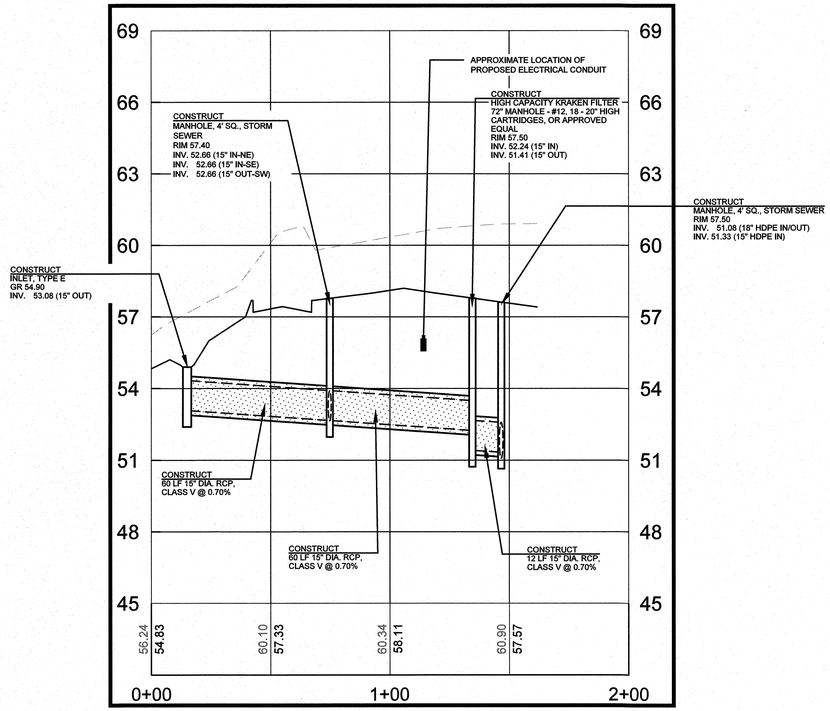
PROFILE A

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)



PROFILE C

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)



PROFILE D

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	ISSUED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PG	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

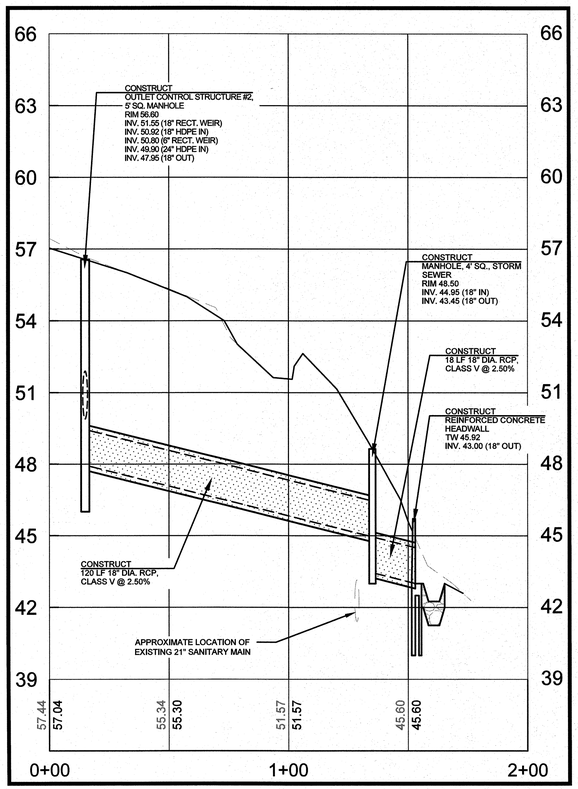
CLARK RESERVOIR IMPROVEMENTS

STORM SEWER PROFILES (1 OF 2)

CME ASSOCIATES
(732) 727 8000 CONSULTING AND MUNICIPAL ENGINEERS (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

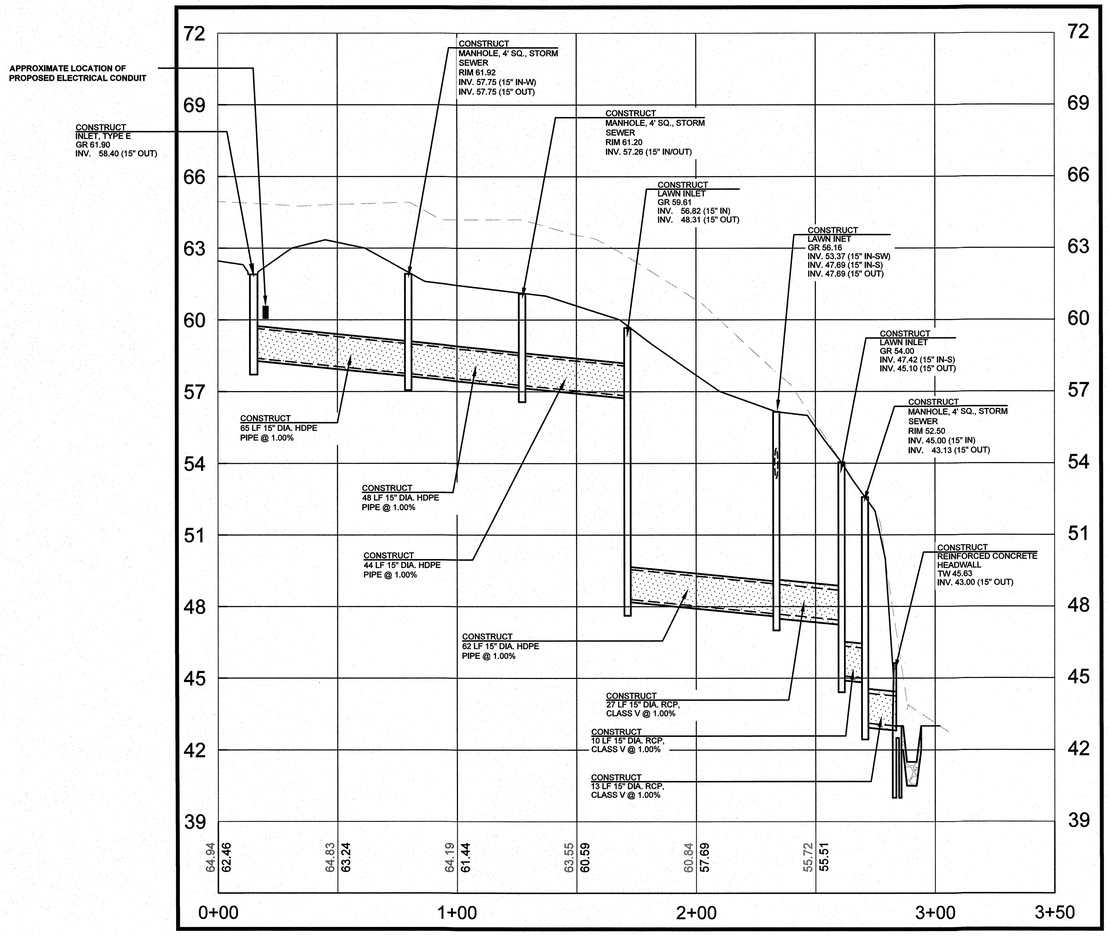
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

REGISTER NO.	
FILE NO.	115.UN00213.P05
SCALE	As Shown
DATE	October 2024
DRAWN BY	TE
DESIGNED BY	TE
CHECKED BY	PG
SHEET	66 of 139
DRAWING NUMBER	



PROFILE E

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)



PROFILE F

SCALE: 1"=30' (HORZ.)
1"=3' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	BDP	SCB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

STORM SEWER PROFILES (2 OF 2)

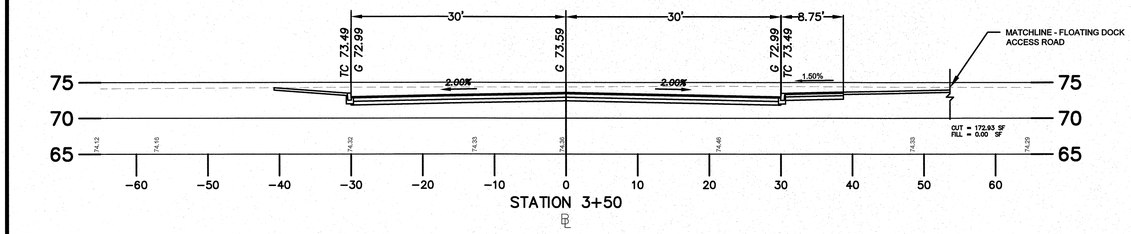
REGISTER NO.

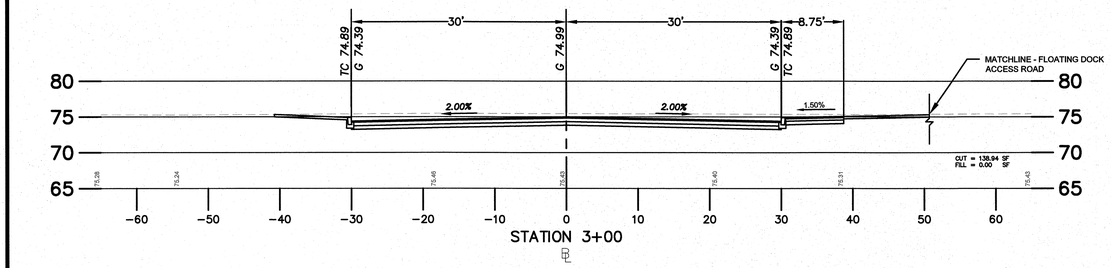
FILE NO. 115.UN00213.P05

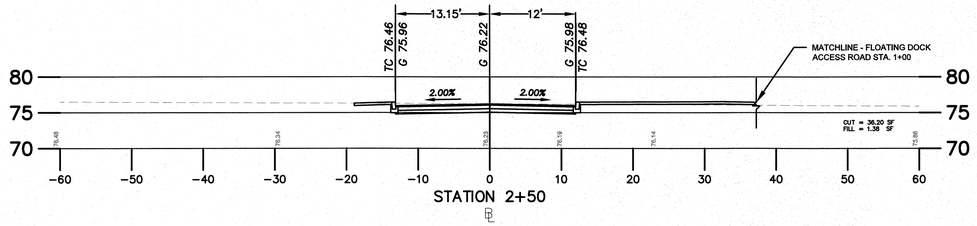
CME ASSOCIATES
(732) 727 8000 CONSULTING AND MUNICIPAL ENGINEERS (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

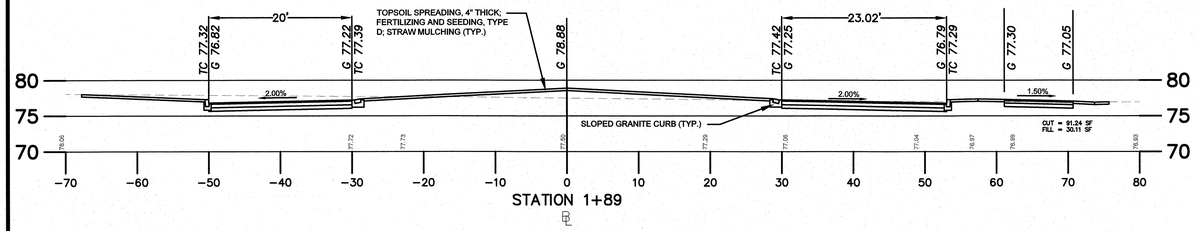
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

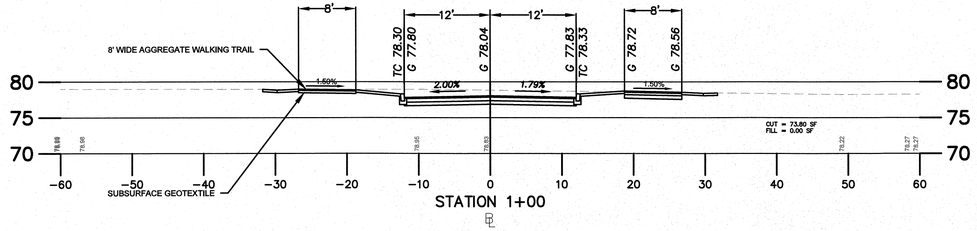
SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: TE	
CHECKED BY: PB	SHEET: 67 of 139	

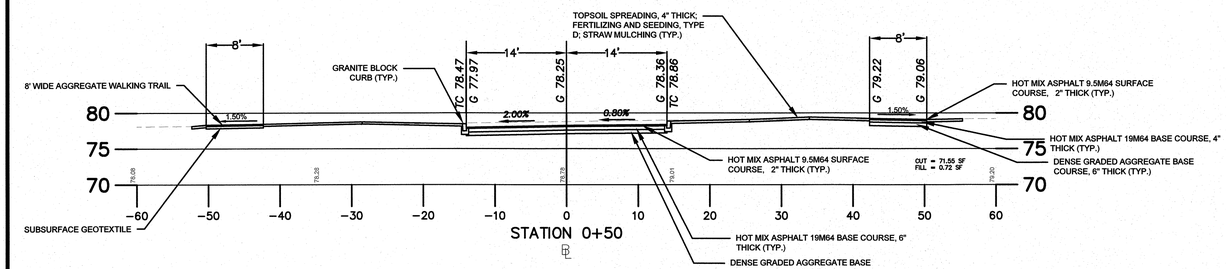


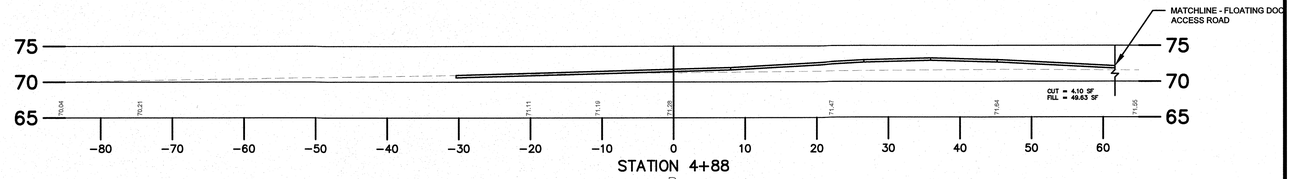


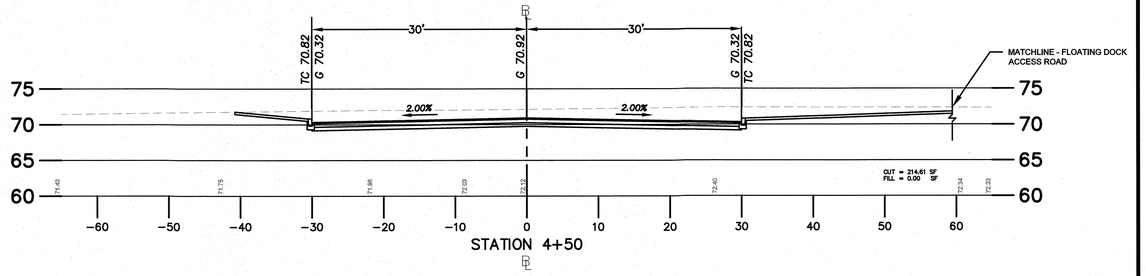


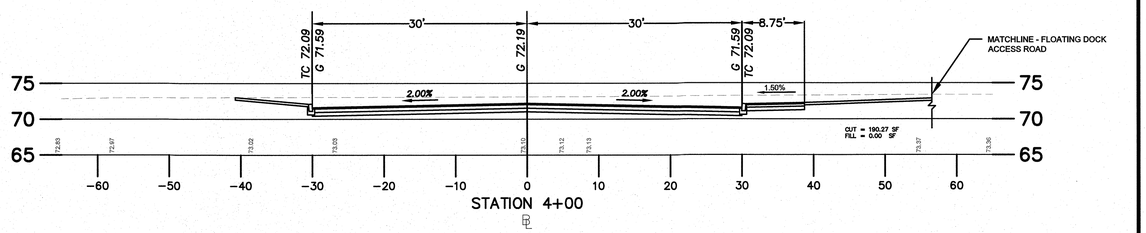












SCALE: 1"=10' (HORZ.)
1"=10' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CENTRAL LAKE PARK

ENTRANCE CROSS SECTIONS — STA. 0+50 TO STA. 4+88

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28059000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

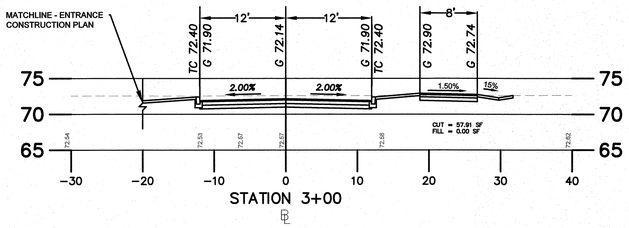
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468
DATE 11/1/24

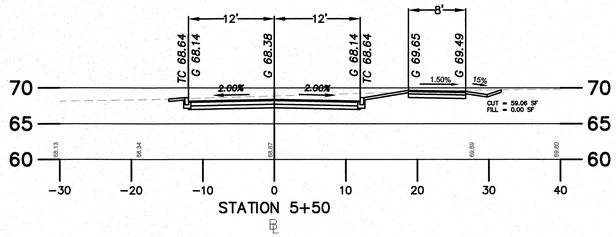
SCALE	DATE
As Shown	October 2024
DRAWN BY: TE	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 68 of 139

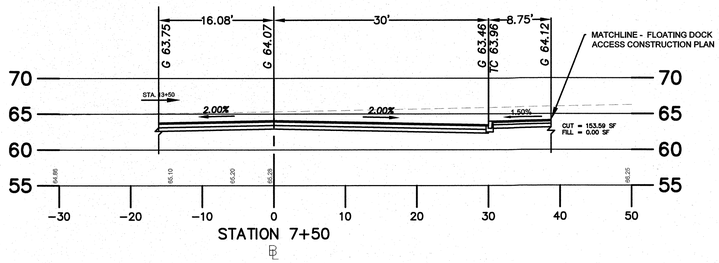
DRAWING NUMBER

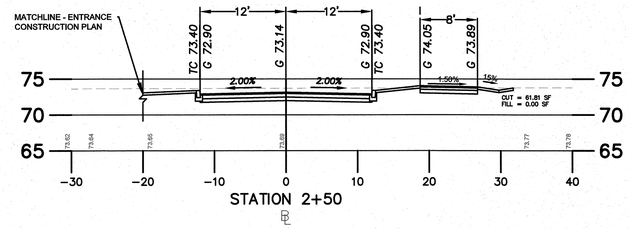
REGISTER NO.

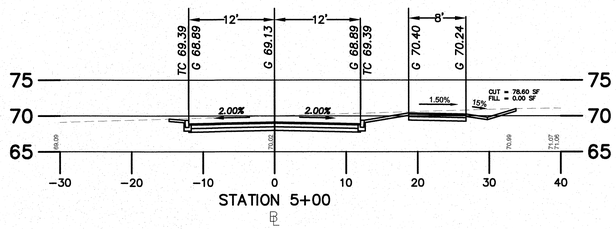
FILE NO. 115.UN00213.P05

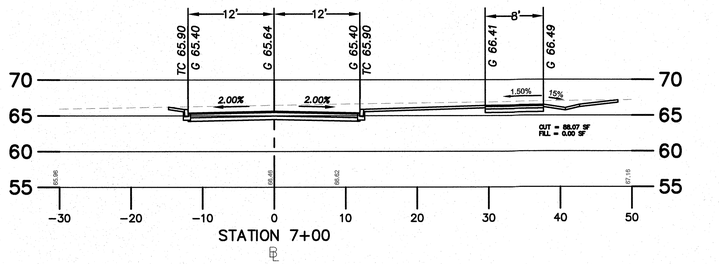


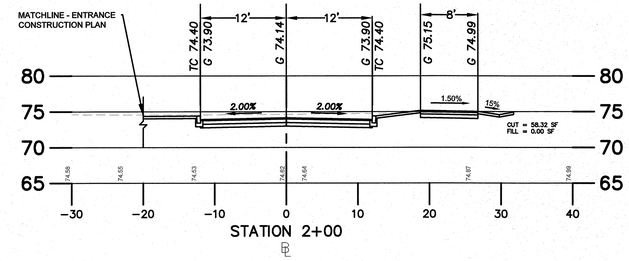


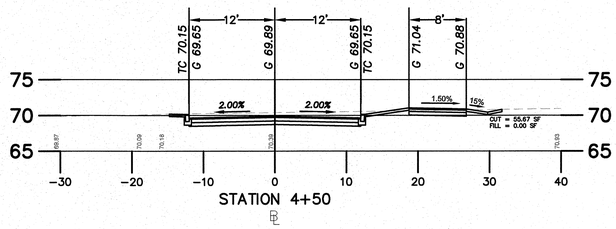


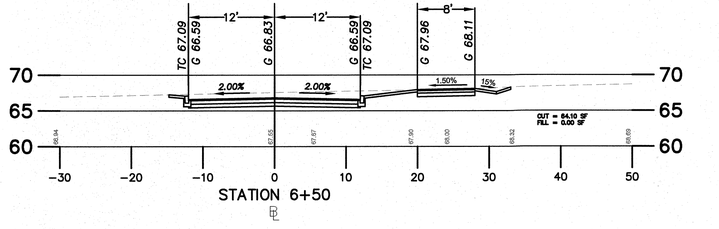


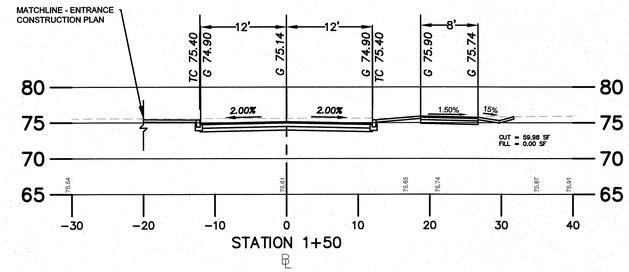


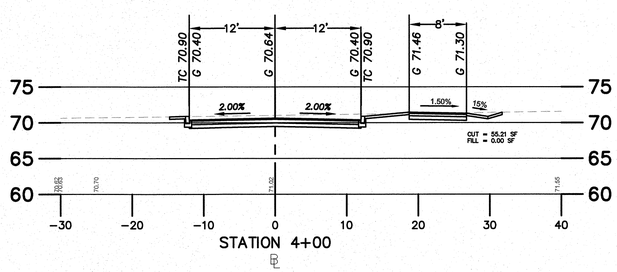


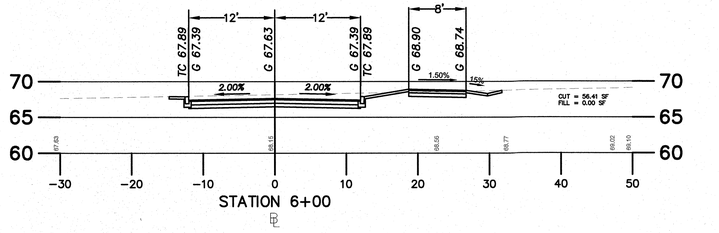


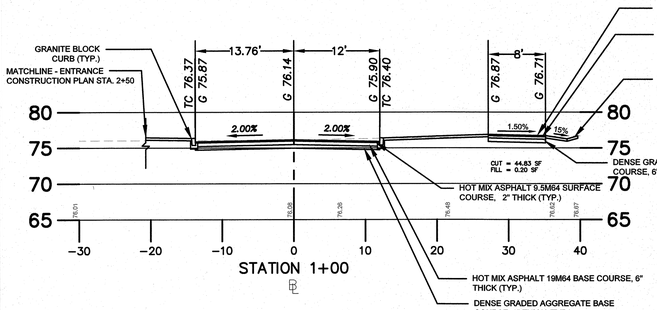


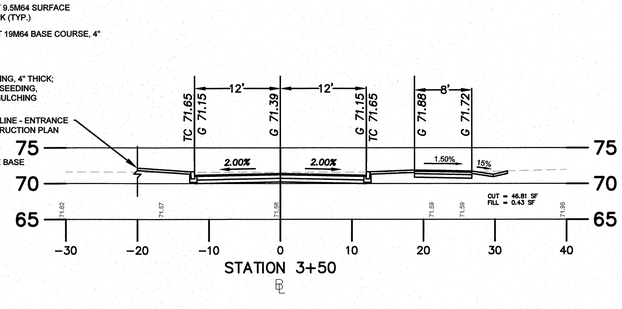












SCALE: 1"=10' (HORZ.)
1"=10' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CENTRAL LAKE PARK

ACCESS ROAD — STA. 1+00 TO STA. 7+50

CROSS SECTIONS (1 OF 3)

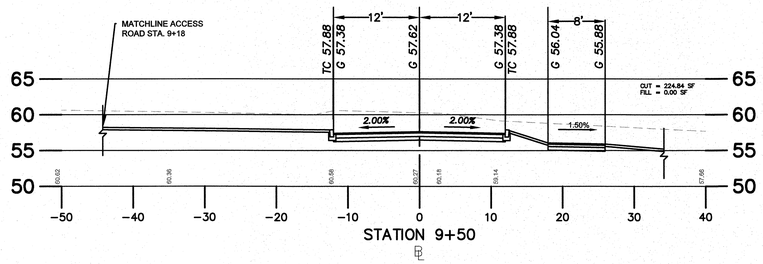
CME ASSOCIATES
(732) 727 8000 CONSULTING AND MUNICIPAL ENGINEERS (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

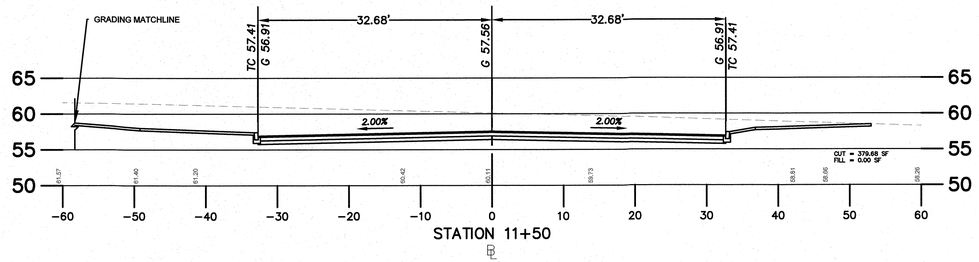
REGISTER NO.

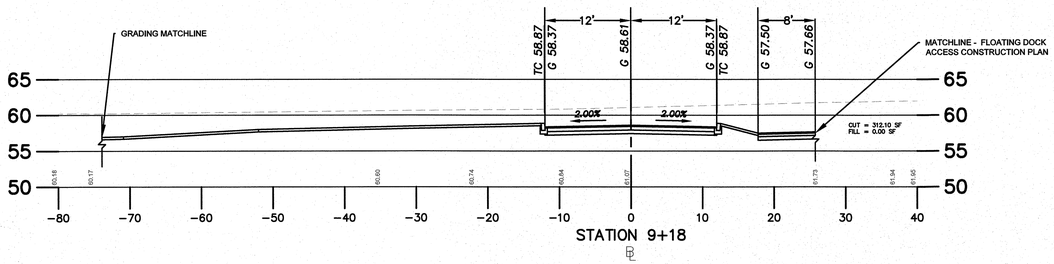
FILE NO. 115.UN00213.P05

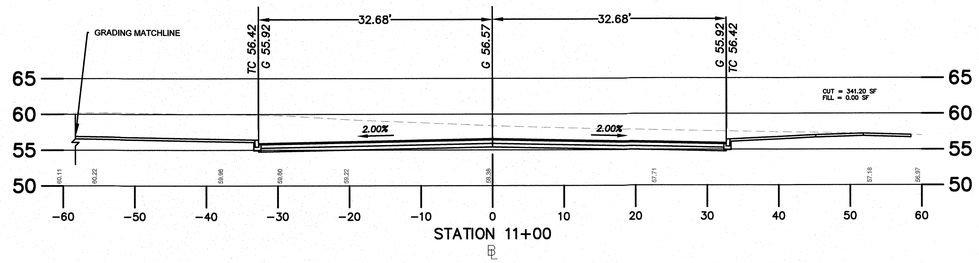
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

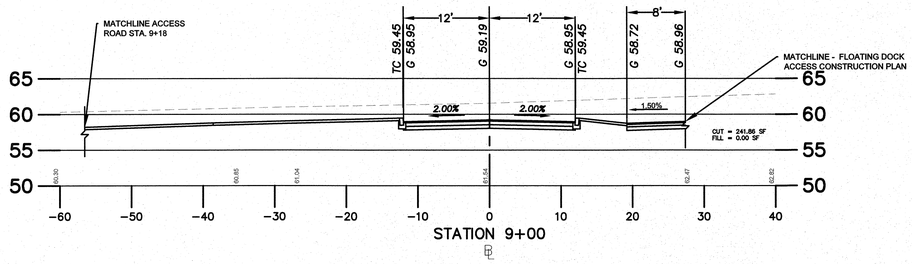
SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 69 of 139	

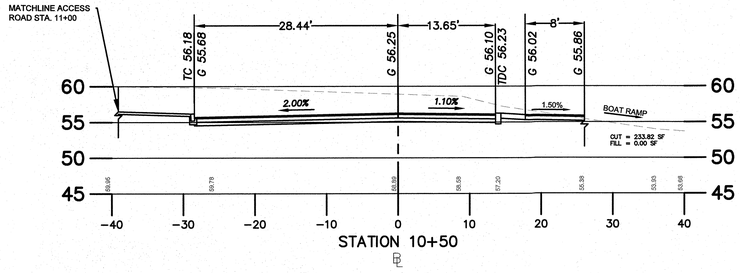


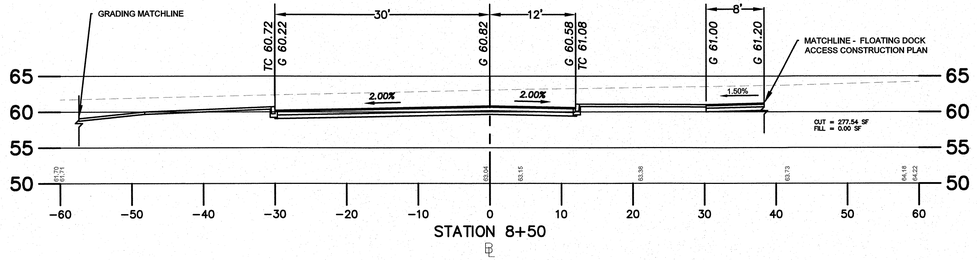


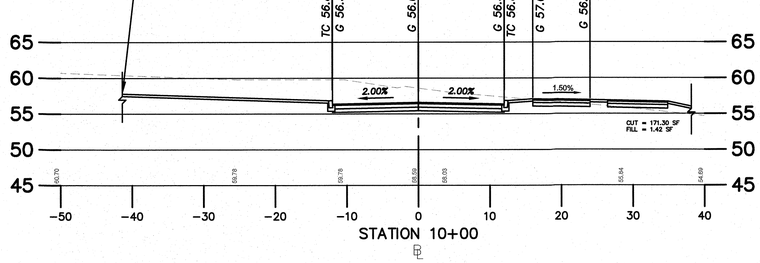


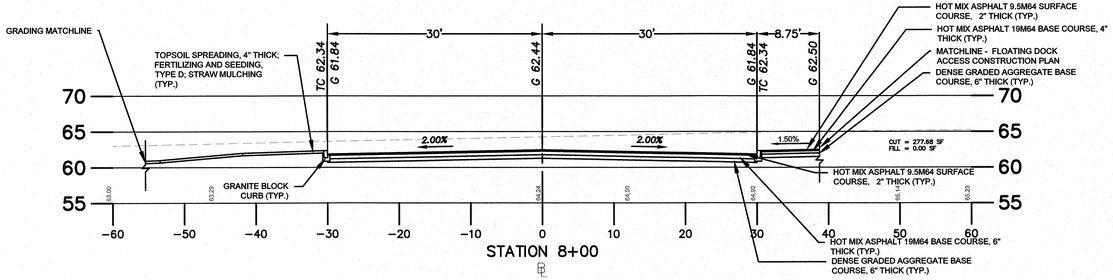












SCALE: 1"=10' (HORZ.)
1"=10' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CENTRAL LAKE PARK

ACCESS ROAD — STA. 8+00 TO STA. 11+50

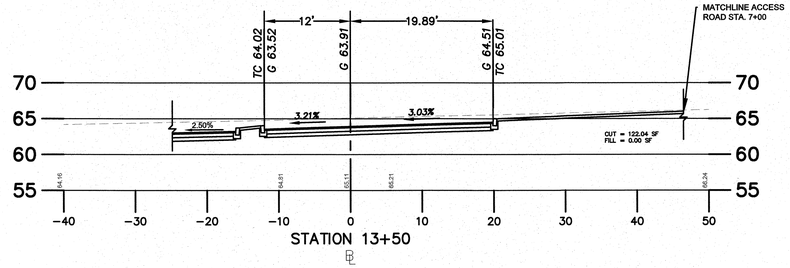
CROSS SECTIONS (2 OF 3)

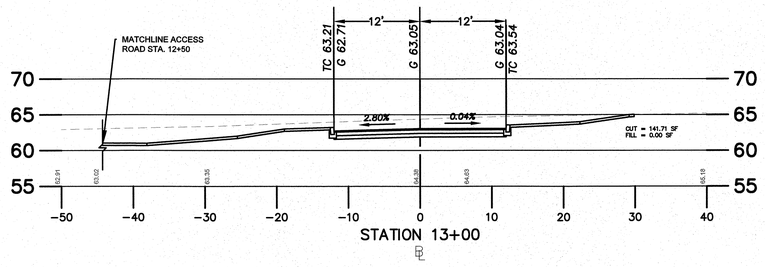
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

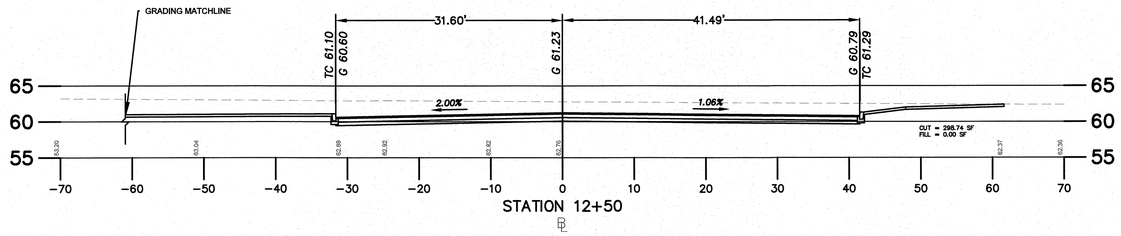
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

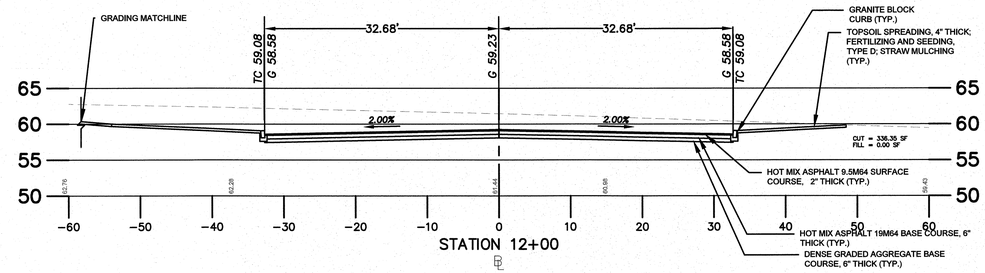
SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 70 of 139	

REGISTER NO.
FILE NO. 115.UN00213.P05









SCALE: 1"=10' (HORZ.)
1"=10' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CENTRAL LAKE PARK

ACCESS ROAD — STA. 12+00 TO STA. 13+50

CROSS SECTIONS (3 OF 3)

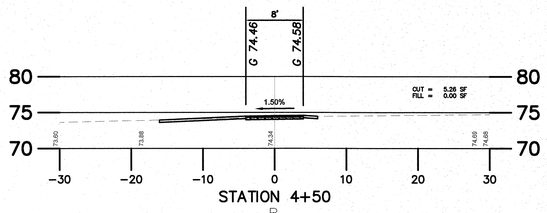
CVE ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO.

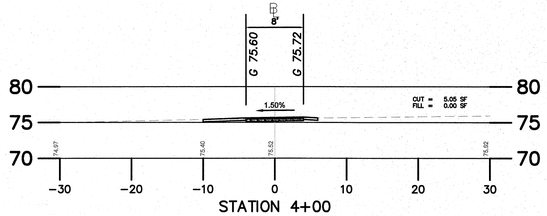
FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

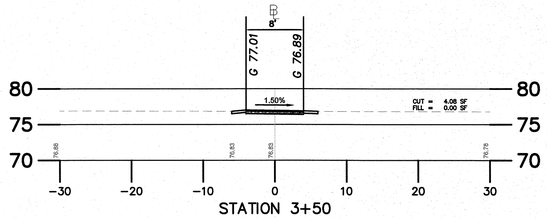
SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 71 of 139	



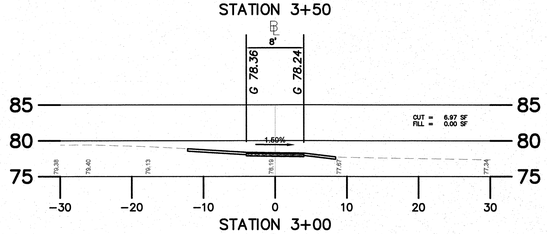
STATION 4+50



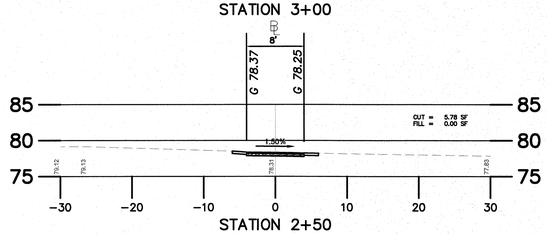
STATION 4+00



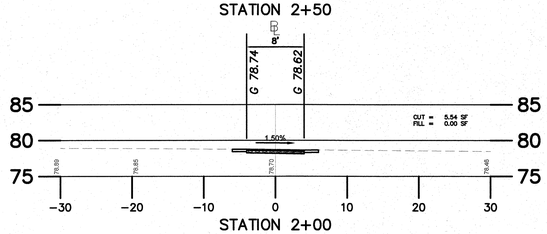
STATION 3+50



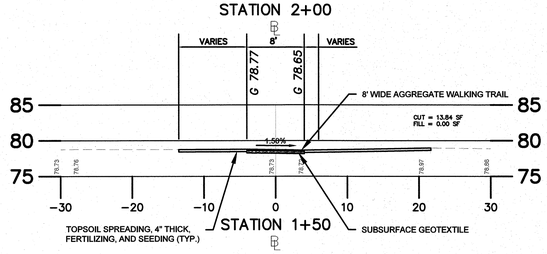
STATION 3+00



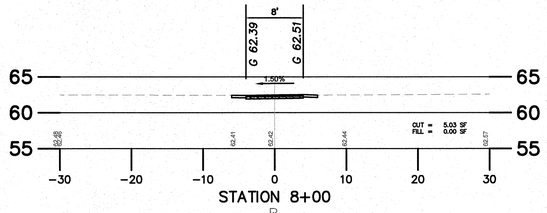
STATION 2+50



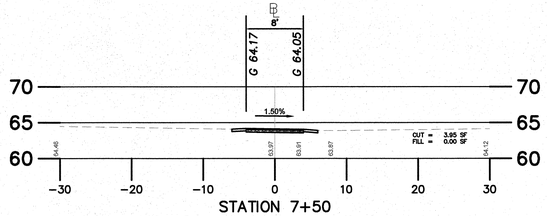
STATION 2+00



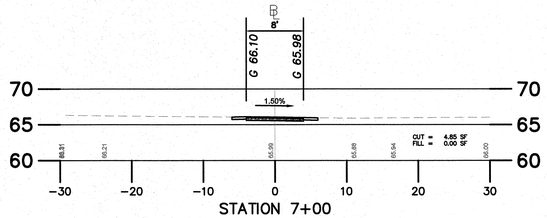
STATION 1+50



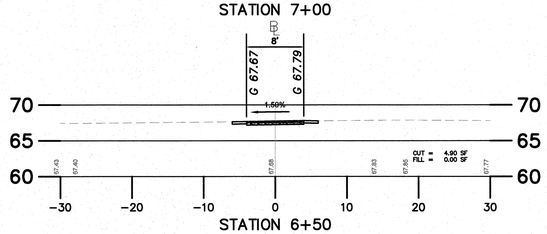
STATION 8+00



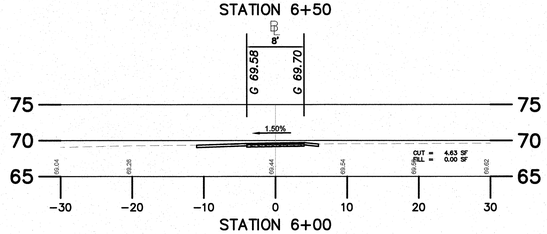
STATION 7+50



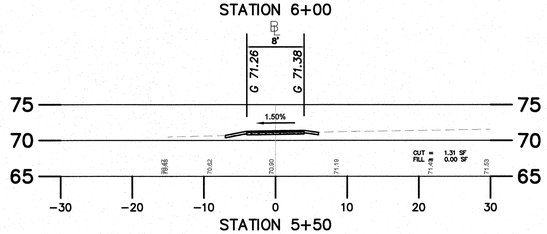
STATION 7+00



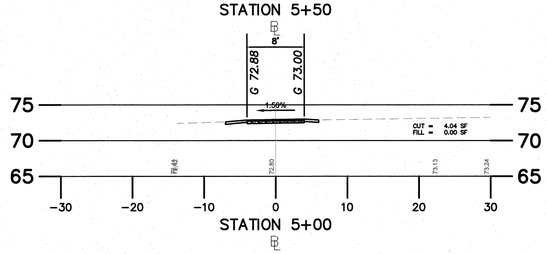
STATION 6+50



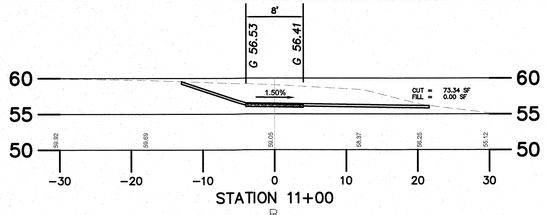
STATION 6+00



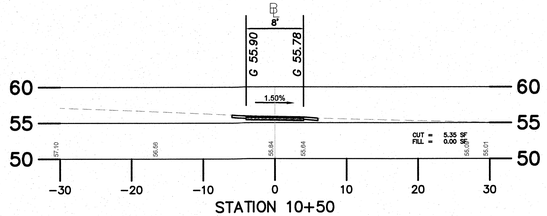
STATION 5+50



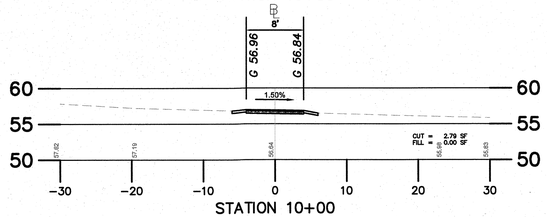
STATION 5+00



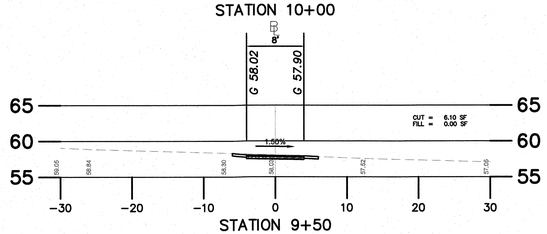
STATION 11+00



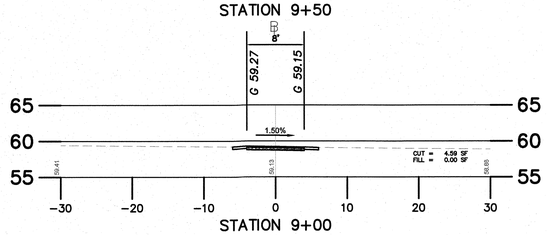
STATION 10+50



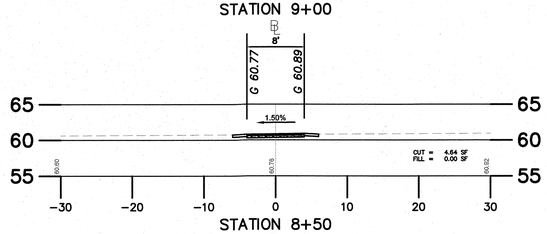
STATION 10+00



STATION 9+50



STATION 9+00



STATION 8+50

SCALE: 1"=10' (HORZ.)
1"=10' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR ADDENDUM	2/14/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CROSS SECTIONS

CENTRAL LAKE SOUTH TRAIL — STA 1+50 - 11+00
(1 OF 4)

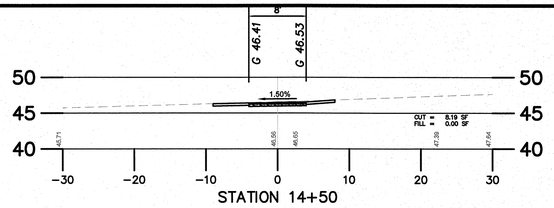
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28059000
(732) 727 8000 — 3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162
(732) 462 7400 — 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO. FILE NO. 115.UN00213.P05

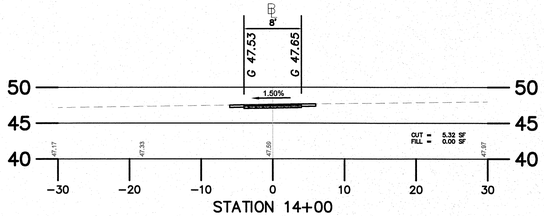
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468
11.1.24

SCALE	DATE
As Shown	October 2024
DRAWN BY: JC	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 72 of 139

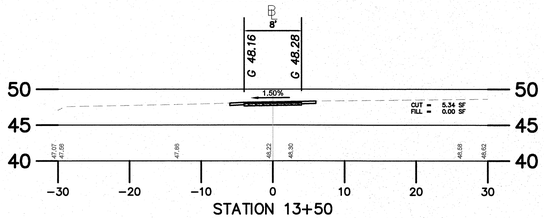
DRAWING NUMBER



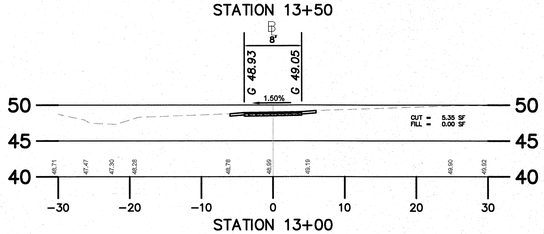
STATION 14+50



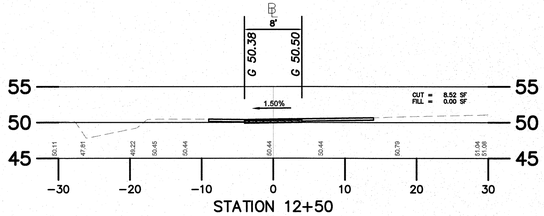
STATION 14+00



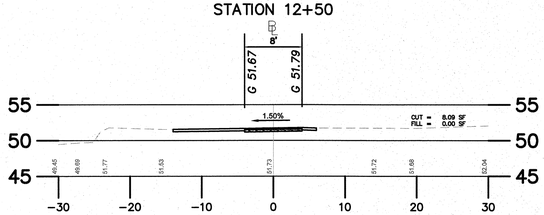
STATION 13+50



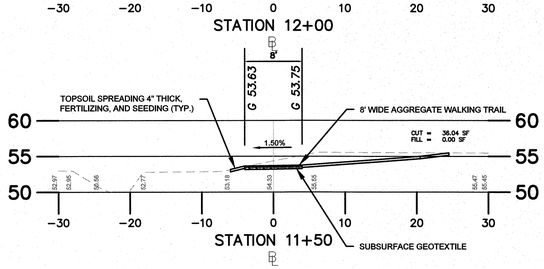
STATION 13+00



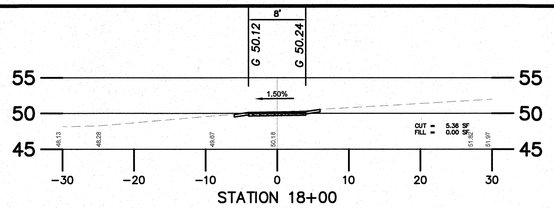
STATION 12+50



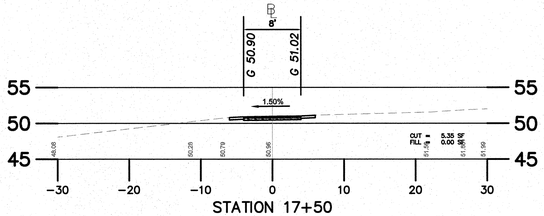
STATION 12+00



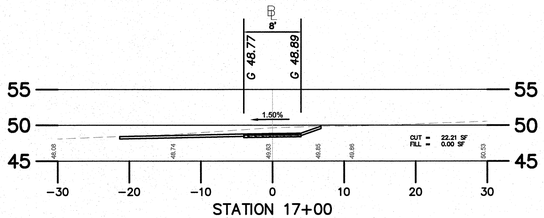
STATION 11+50



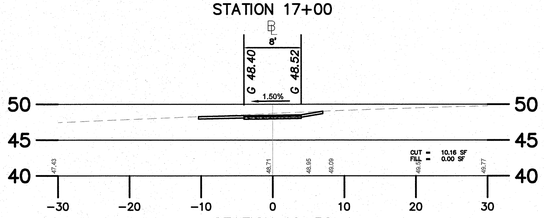
STATION 18+00



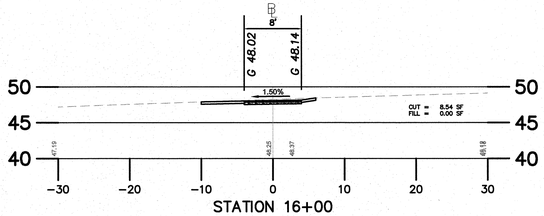
STATION 17+50



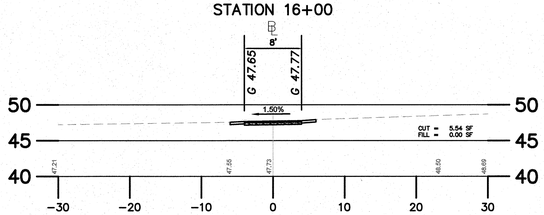
STATION 17+00



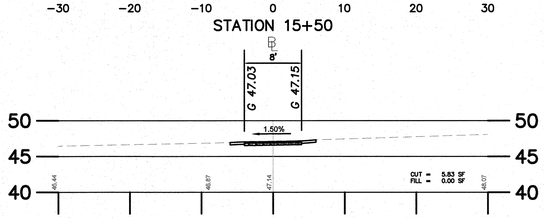
STATION 16+50



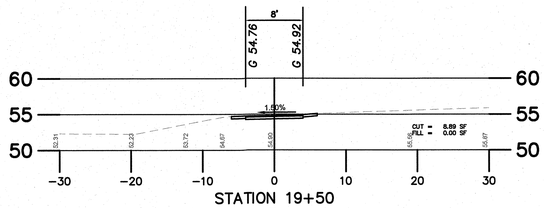
STATION 16+00



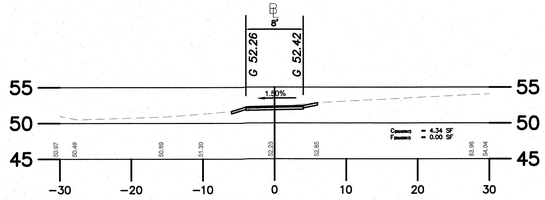
STATION 15+50



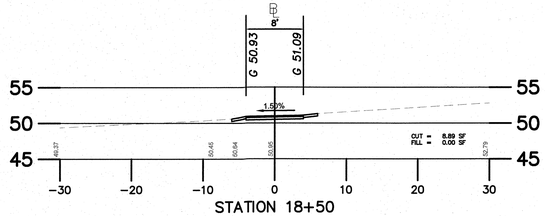
STATION 15+00



STATION 19+50



STATION 19+00



STATION 18+50

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR ADDENDUM	2/14/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CROSS SECTIONS

CENTRAL LAKE SOUTH TRAIL — STA 11+50 - 19+50

(2 OF 4)

CVE ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 — 3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162
(732) 462 7400 — 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

SCALE: 1"=10' (HORZ.)
1"=10' (VERT.)

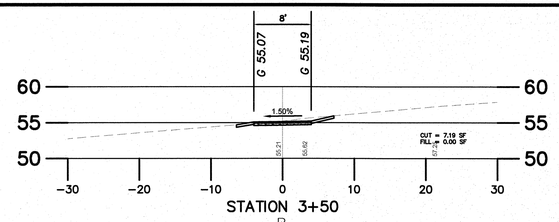
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468
DATE 11/1/24

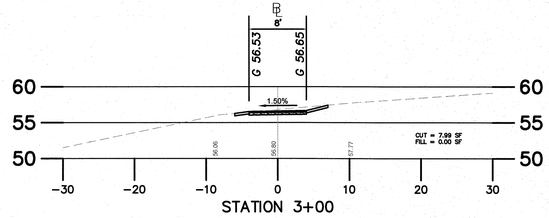
SCALE	DATE
As Shown	October 2024
DRAWN BY: JC	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 73 of 139

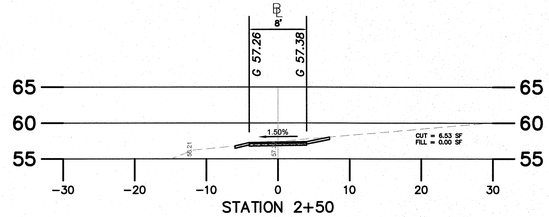
DRAWING NUMBER

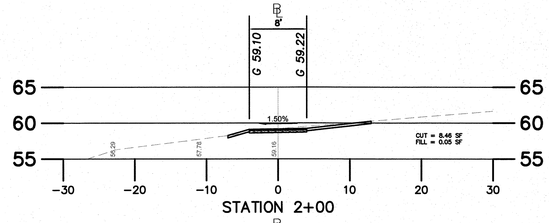
REGISTER NO.

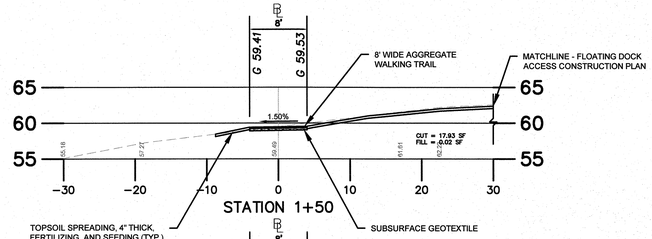
FILE NO. 115.UN00213.P05

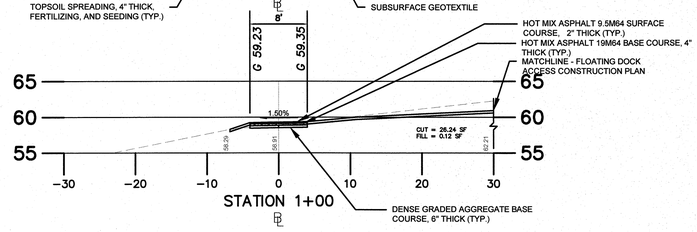


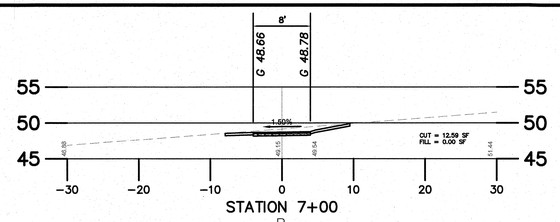


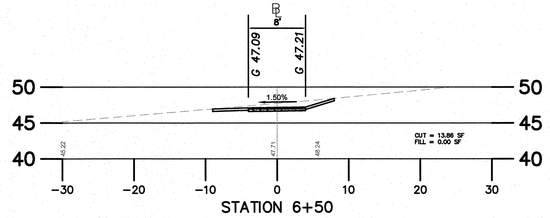


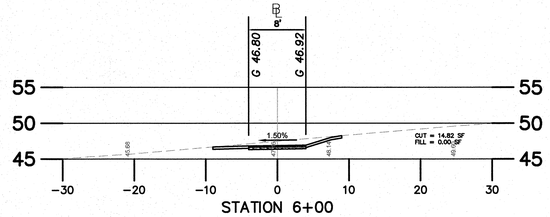


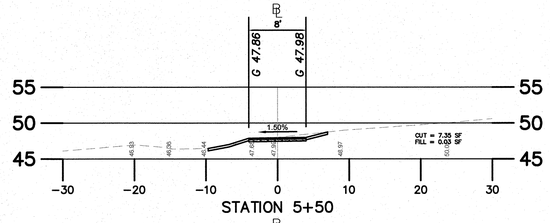


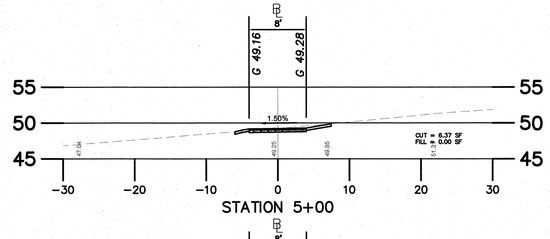


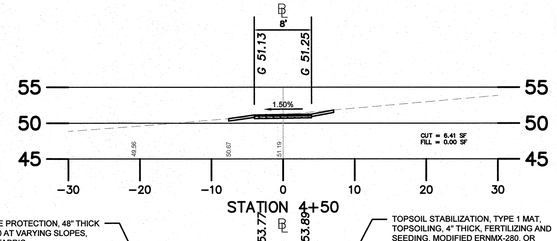


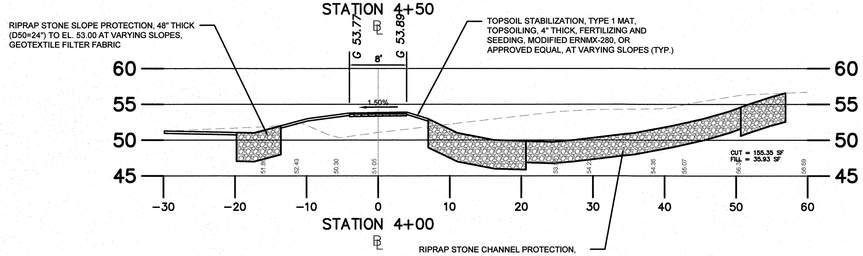


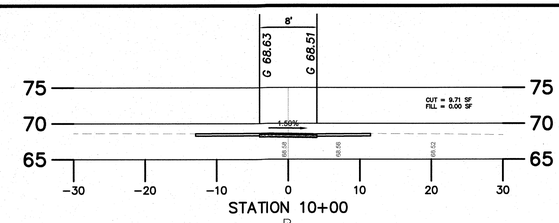


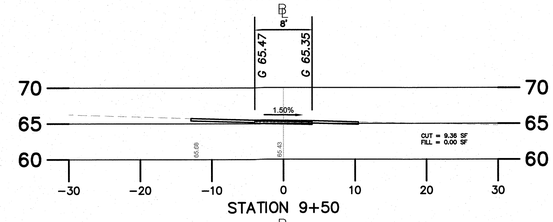


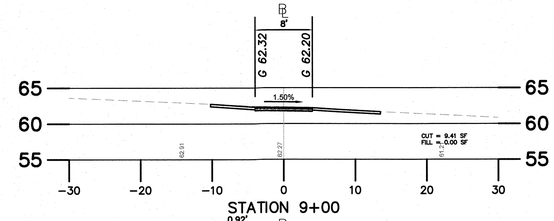


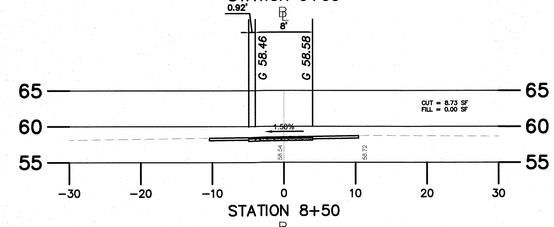


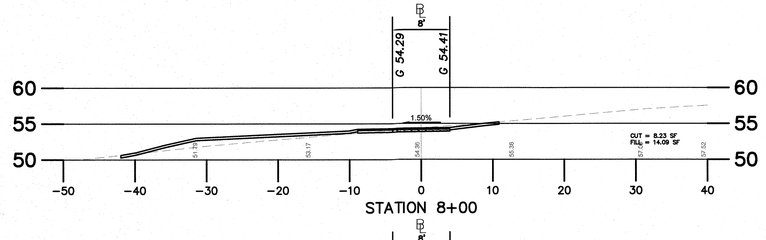


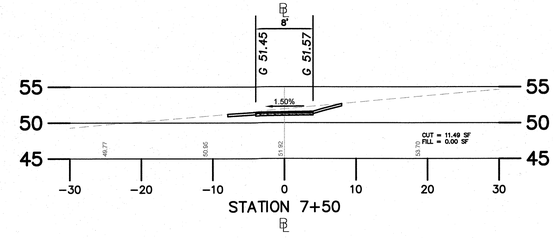












SCALE: 1"=10' (HORZ.)
1"=10' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/CK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/CK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CROSS SECTIONS

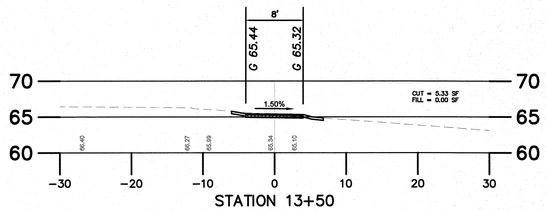
CENTRAL LAKE SOUTH TRAIL — STA 1+00 - 10+00
(3 OF 4)

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

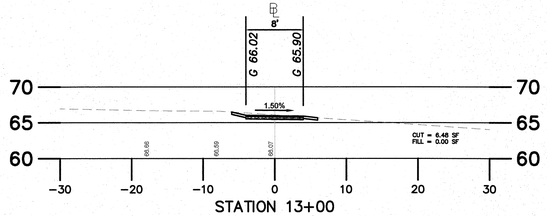
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY: JC	DESIGNED BY: GO / PB
CHECKED BY: PB.	SHEET: 74 of 139

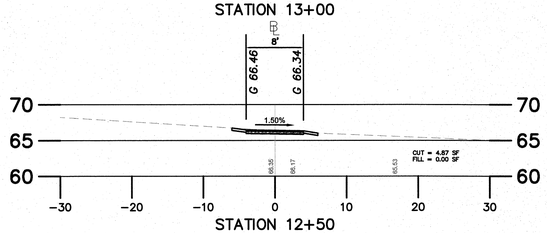
REGISTER NO.
FILE NO. 115.UN00213.P05
DRAWING NUMBER



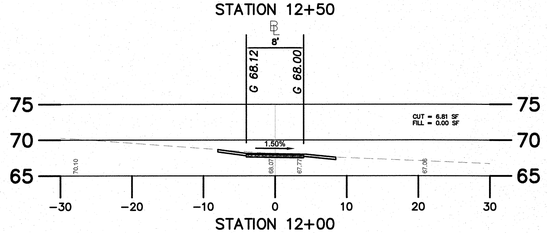
STATION 13+50



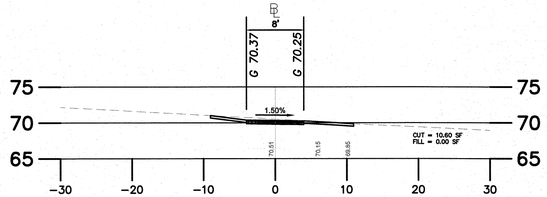
STATION 13+00



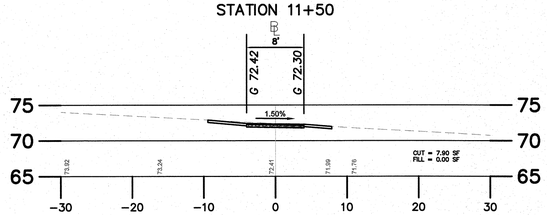
STATION 12+50



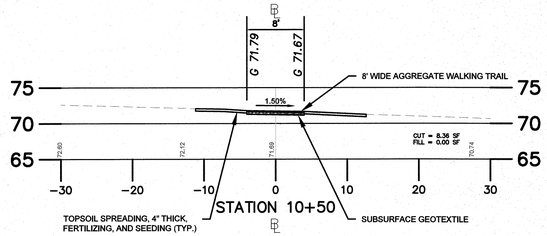
STATION 12+00



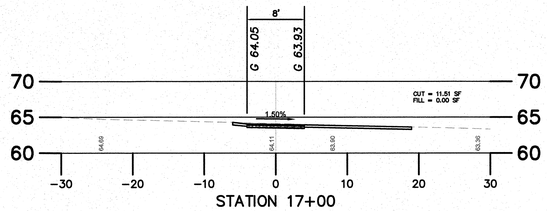
STATION 11+50



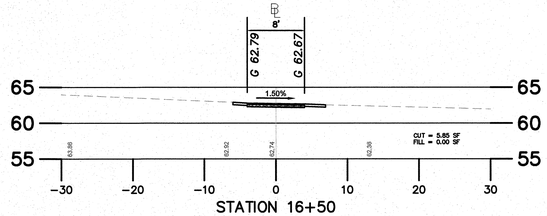
STATION 11+00



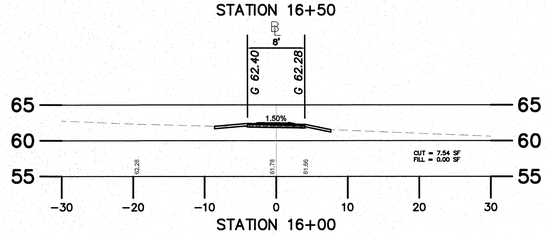
STATION 10+50



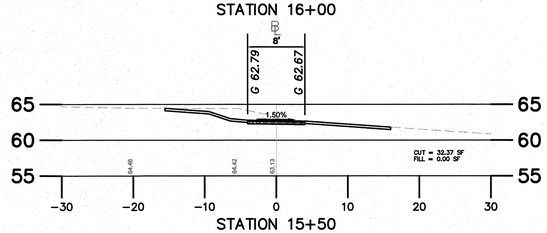
STATION 17+00



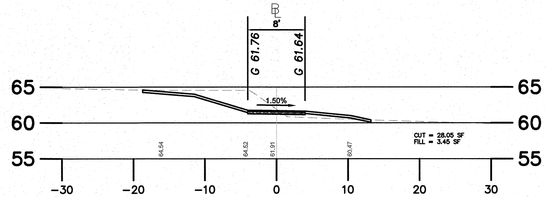
STATION 16+50



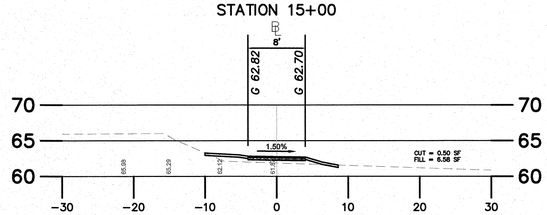
STATION 16+00



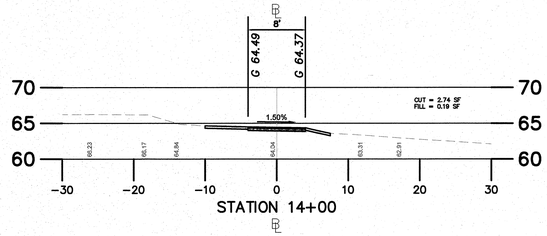
STATION 15+50



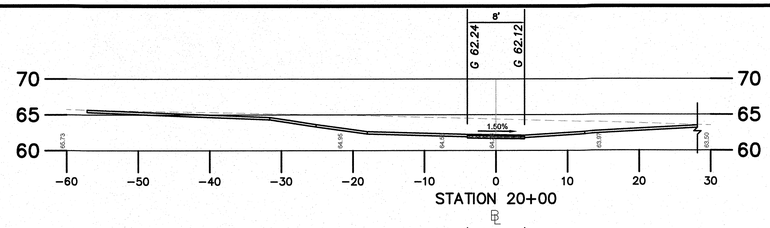
STATION 15+00



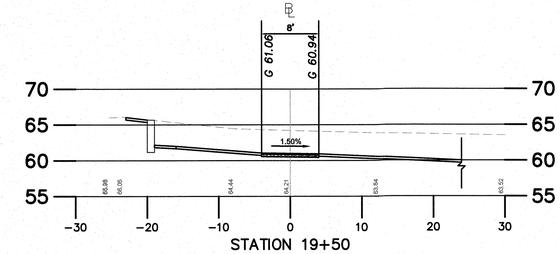
STATION 14+50



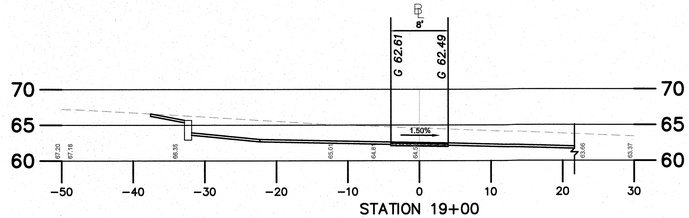
STATION 14+00



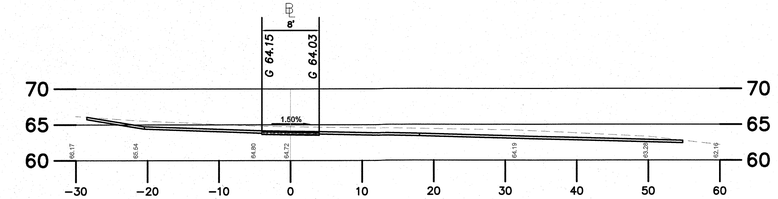
STATION 20+00



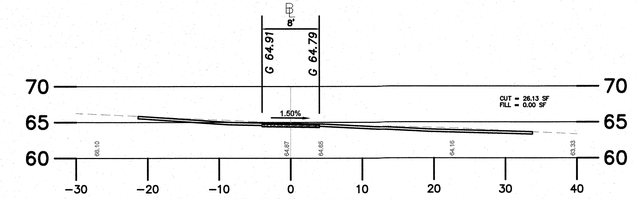
STATION 19+50



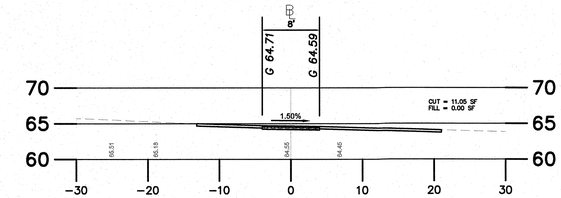
STATION 19+00



STATION 18+50



STATION 18+00



STATION 17+50

SCALE: 1"=10' (HORZ.)
1"=10' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CROSS SECTIONS

CENTRAL LAKE SOUTH TRAIL — STA 10+50 - 20+00

(4 OF 4)

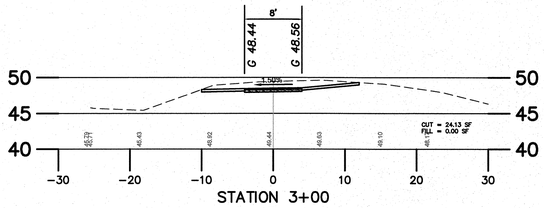
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

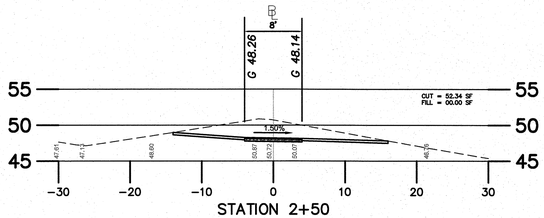
REGISTER NO.

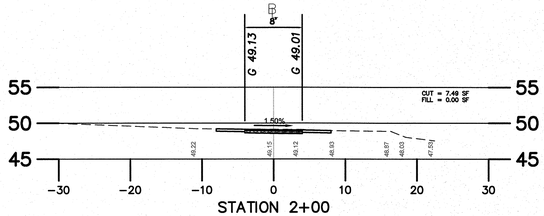
FILE NO. 115.UN00213.P05

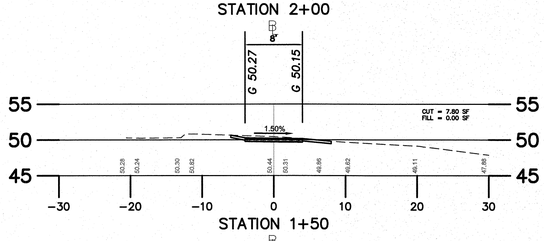
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

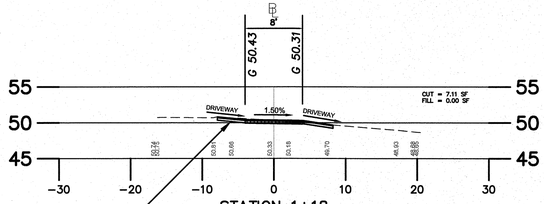
SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: JC	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 75 of 139	

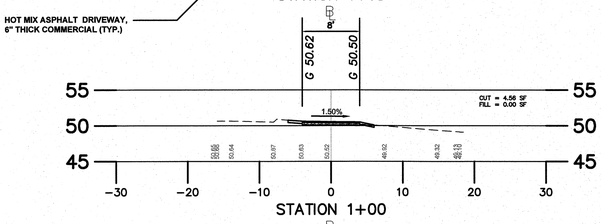


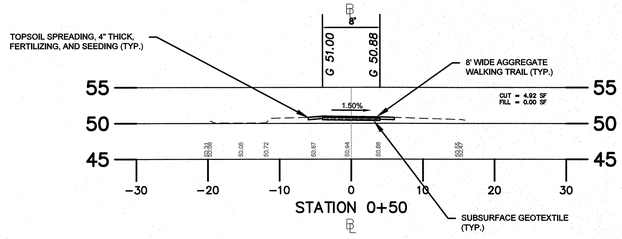


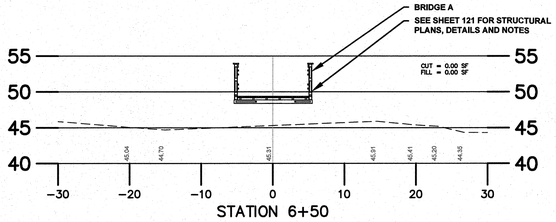


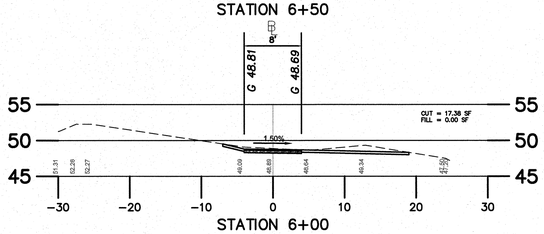


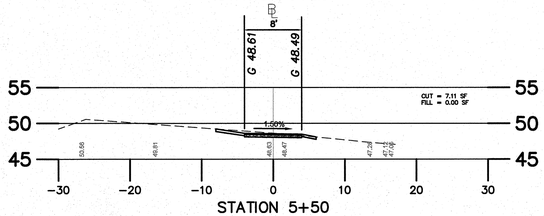


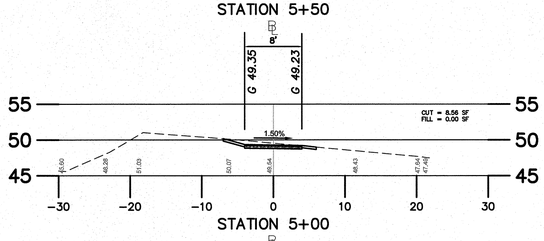


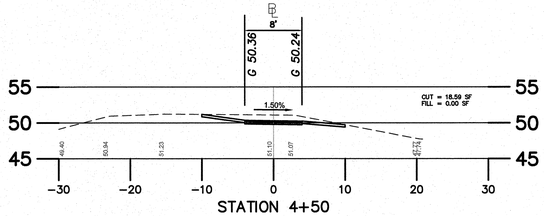


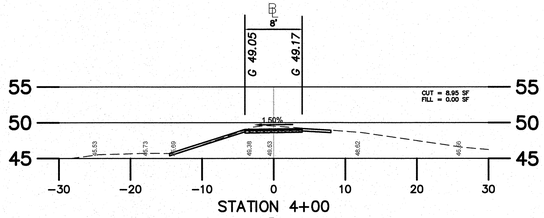


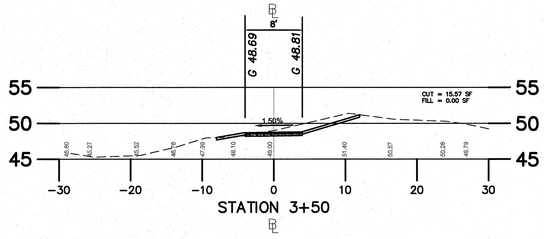


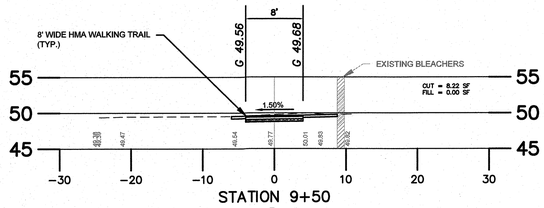


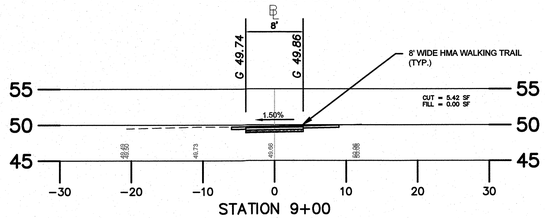


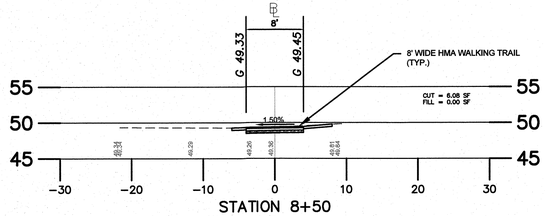


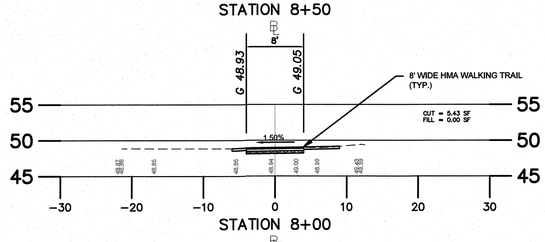


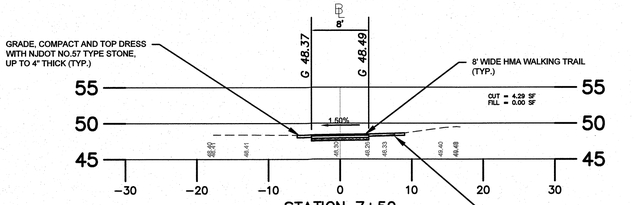


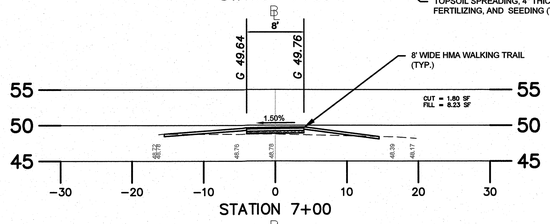












No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CROSS SECTIONS

CENTRAL LAKE NORTH TRAIL — STA 00+50 - 09+50

(1 OF 4)

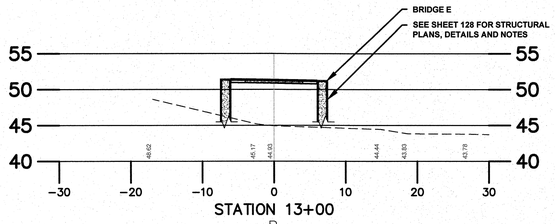
SCALE: 1"=10' (HORZ.)
1"=10' (VERT.)

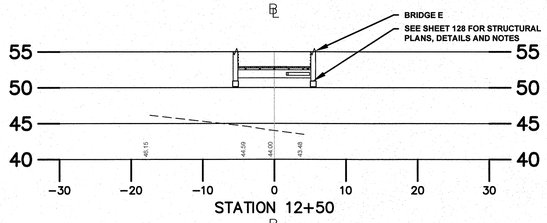
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

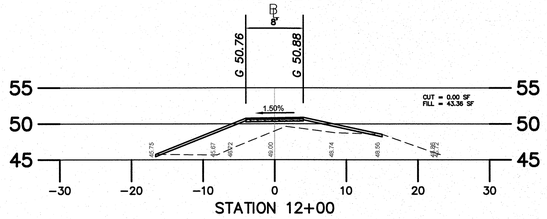
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

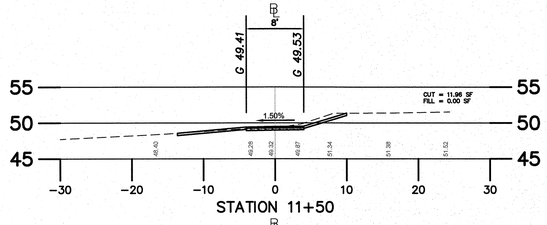
SCALE	DATE
As Shown	October 2024
DRAWN BY	DESIGNED BY
DK	GO / PB
CHECKED BY	SHEET
PB	76 of 139

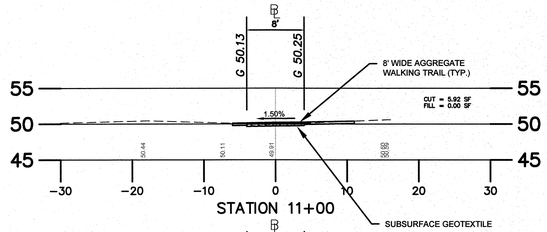
REGISTER NO.
FILE NO. 115.UN00213.P05
DRAWING NUMBER

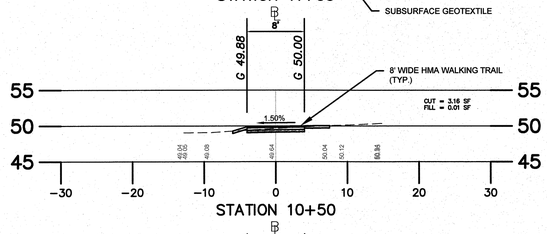


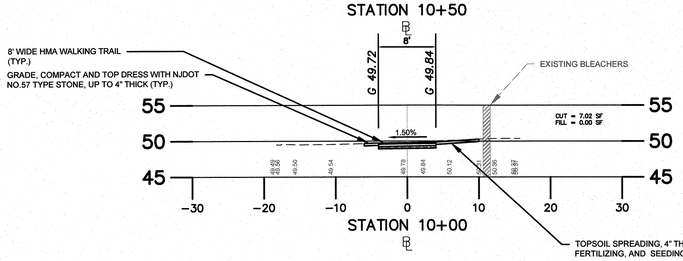


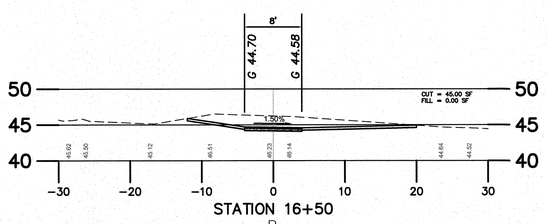


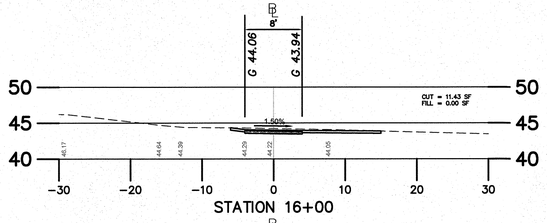


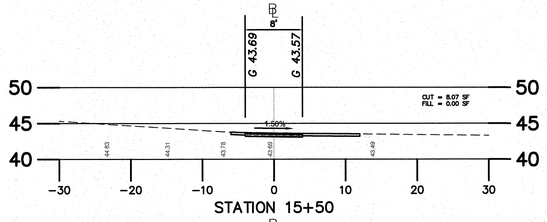


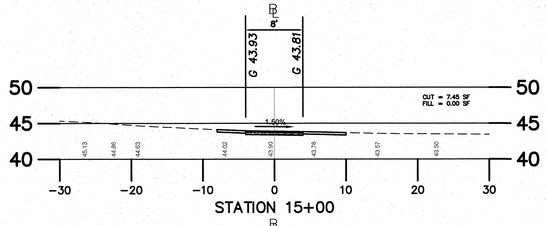


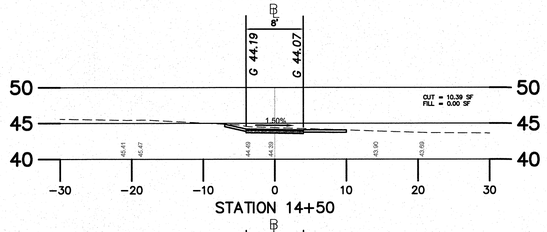


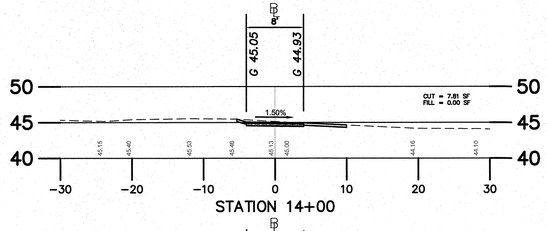


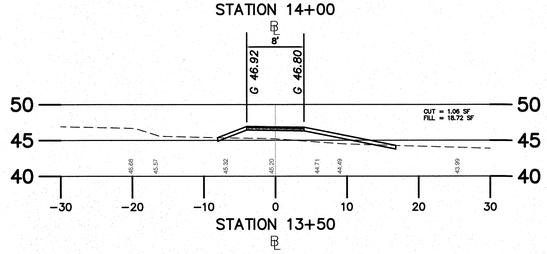


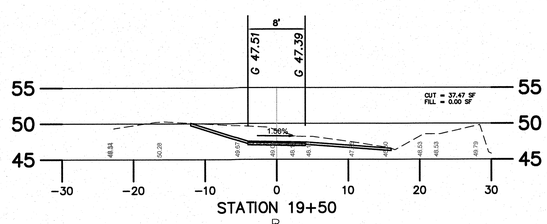


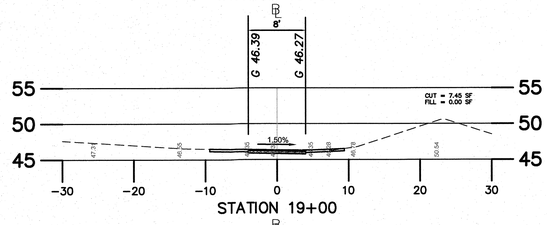


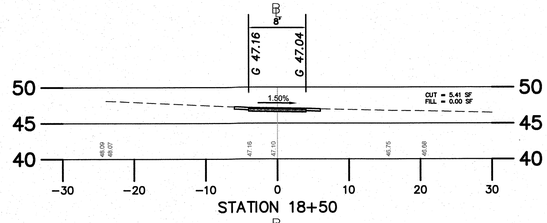


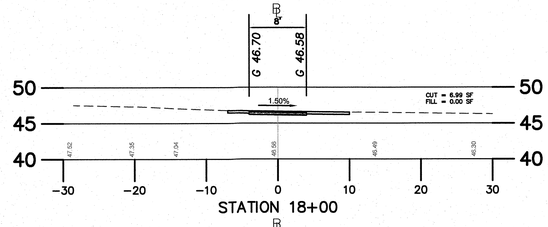


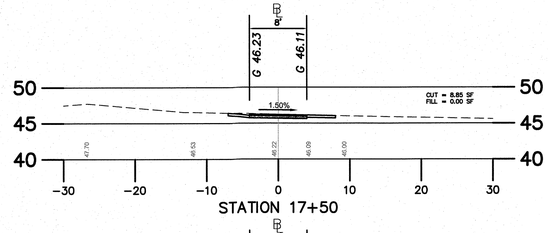


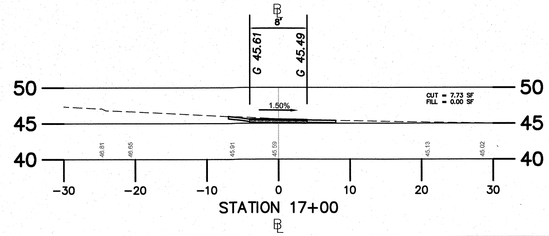












No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CROSS SECTIONS

CENTRAL LAKE NORTH TRAIL ALIGNMENT — STA 10+00 - 19+50

(2 OF 4)

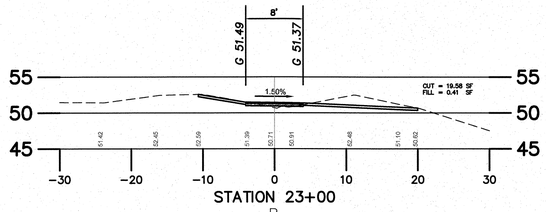
SCALE: 1"=10' (HORZ.)
1"=10' (VERT.)

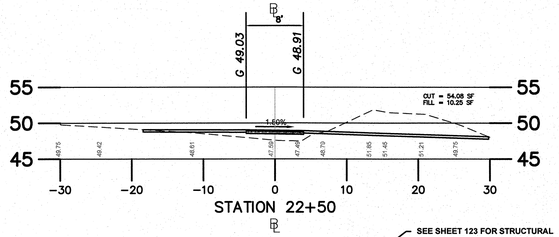
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

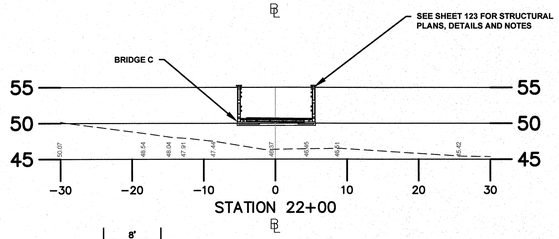
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

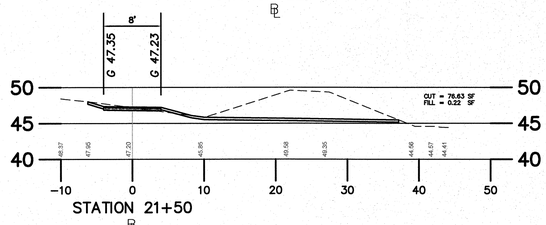
SCALE	DATE
As Shown	October 2024
DRAWN BY: DK	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 77 of 139

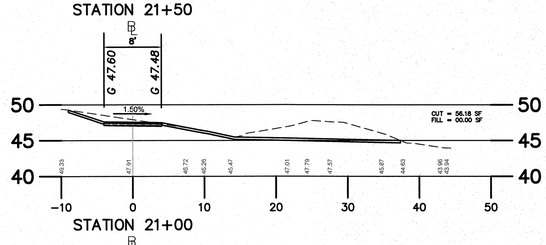
REGISTER NO.
FILE NO. 115.UN00213.P05
DRAWING NUMBER

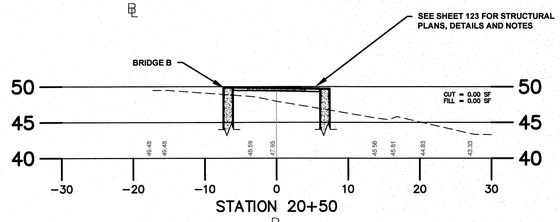


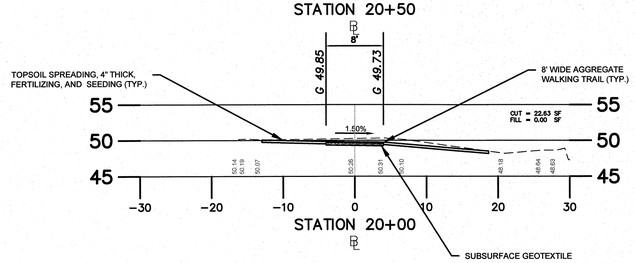


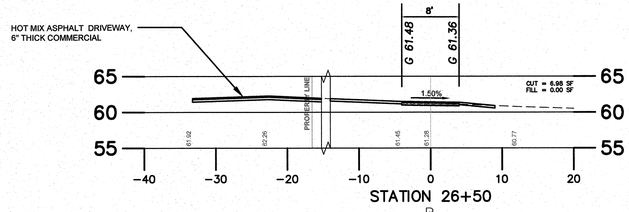


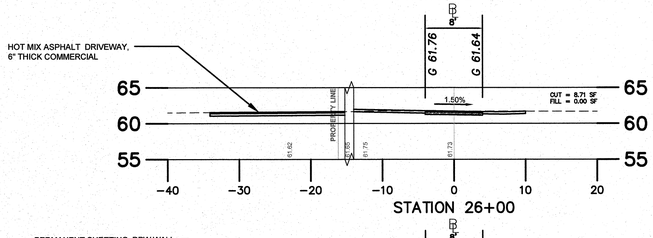


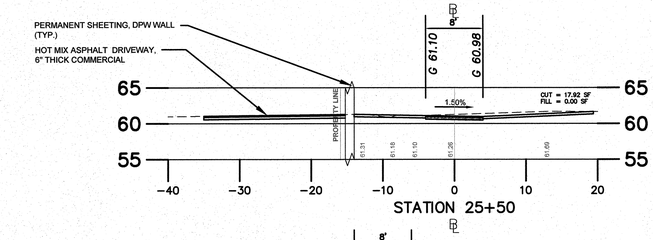


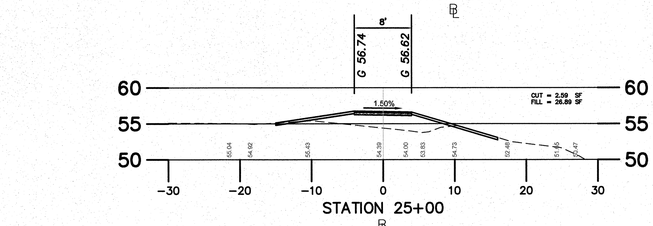


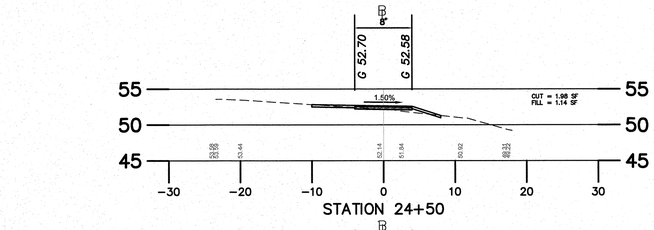


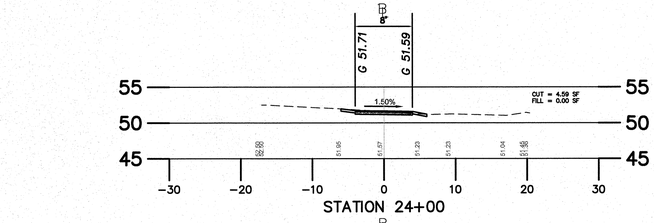


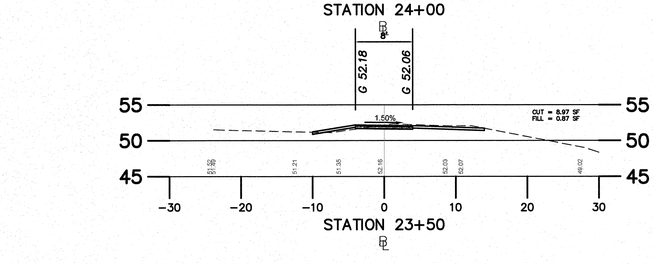


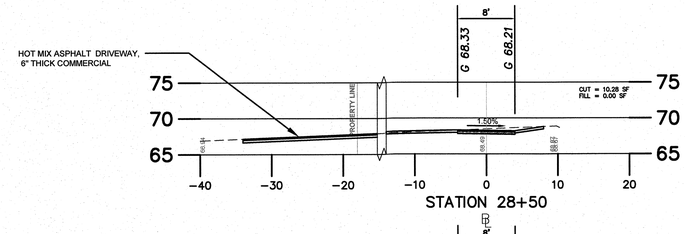


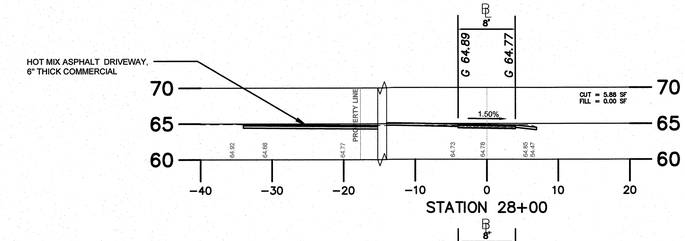


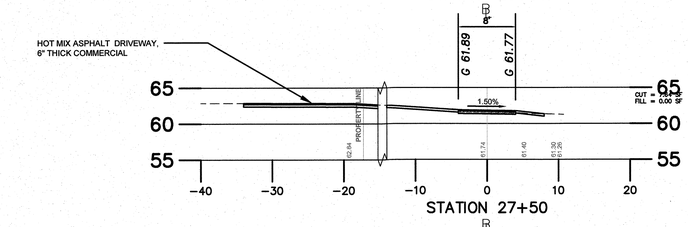


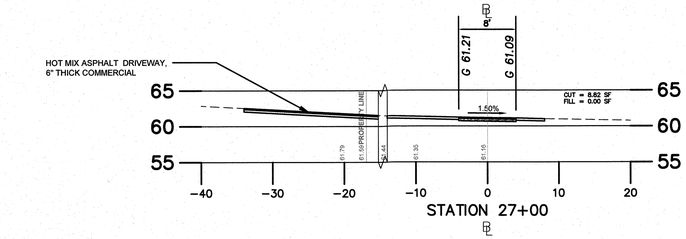












SCALE: 1"=10' (HORZ.)
1"=10' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CROSS SECTIONS

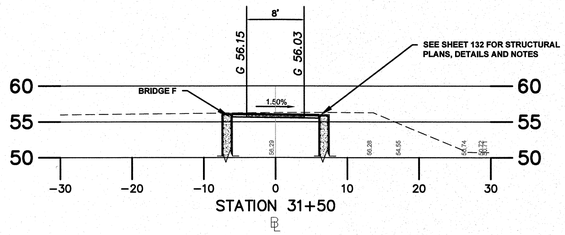
CENTRAL LAKE NORTH TRAIL — STA 20+00 - 28+50
(3 OF 4)

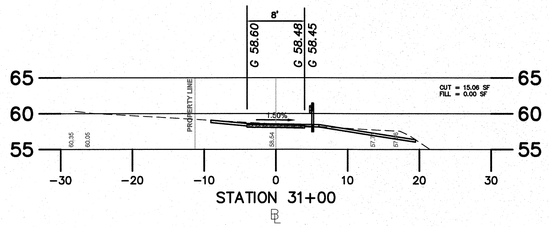
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

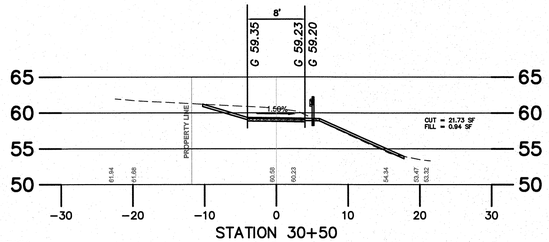
REGISTER NO.
FILE NO. 115.UN00213.P05

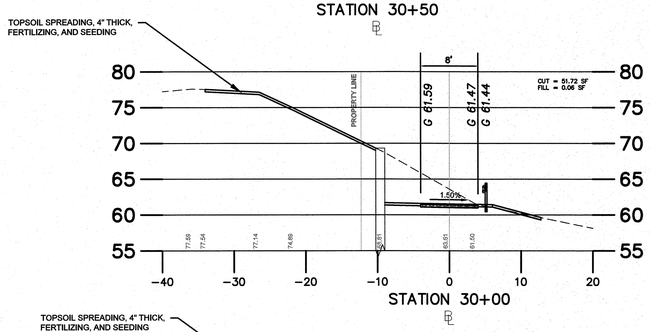
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

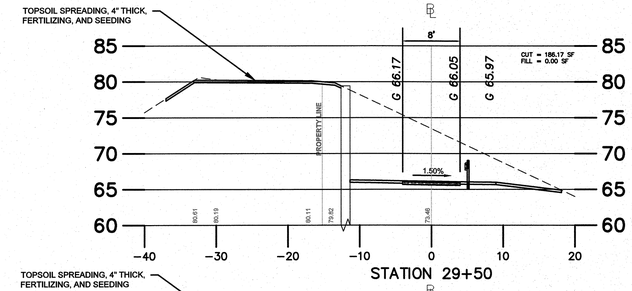
SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: DK	DESIGNED BY: GO / PB	
CHECKED BY: PB	SHEET: 78 of 139	

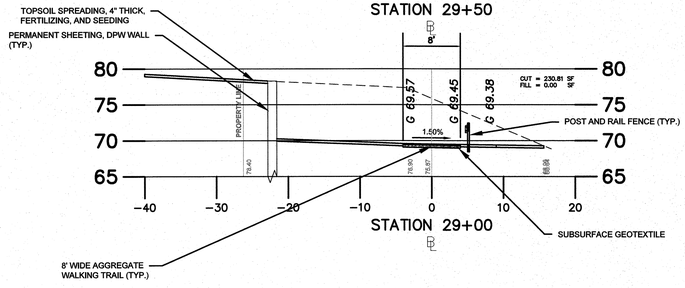












SCALE: 1"=10' (HORZ.)
1"=10' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CROSS SECTIONS

CENTRAL LAKE NORTH TRAIL — STA 29+00 - 31+50
(4 OF 4)

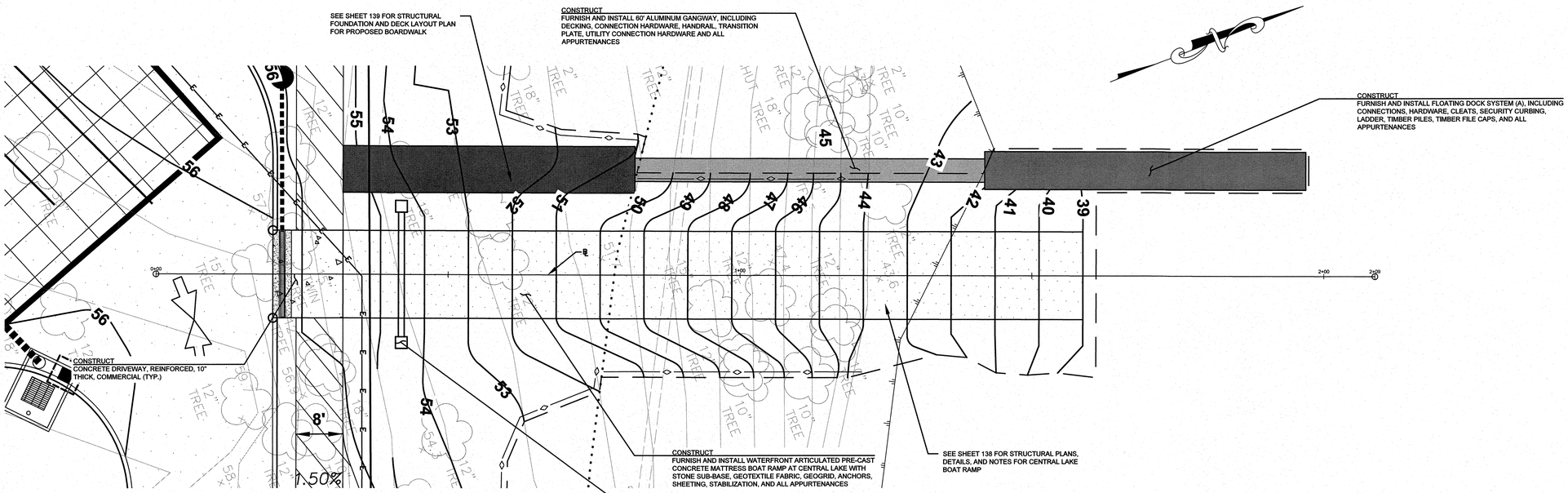
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO. FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY: DK	DESIGNED BY: GO / PB
CHECKED BY: PB	SHEET: 79 of 139

DRAWING NUMBER

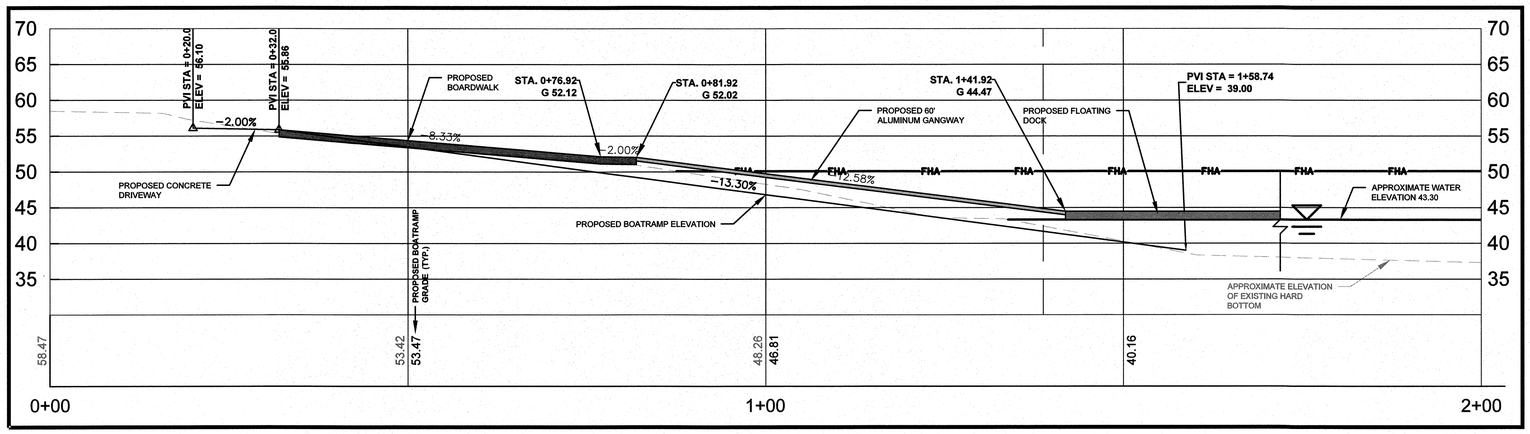


PLAN

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.



PROFILE

1"=10' (HORZ.)
1"=10' (VERT.)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CENTRAL LAKE PARK

BOAT RAMP GRADING PLAN

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28339900
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

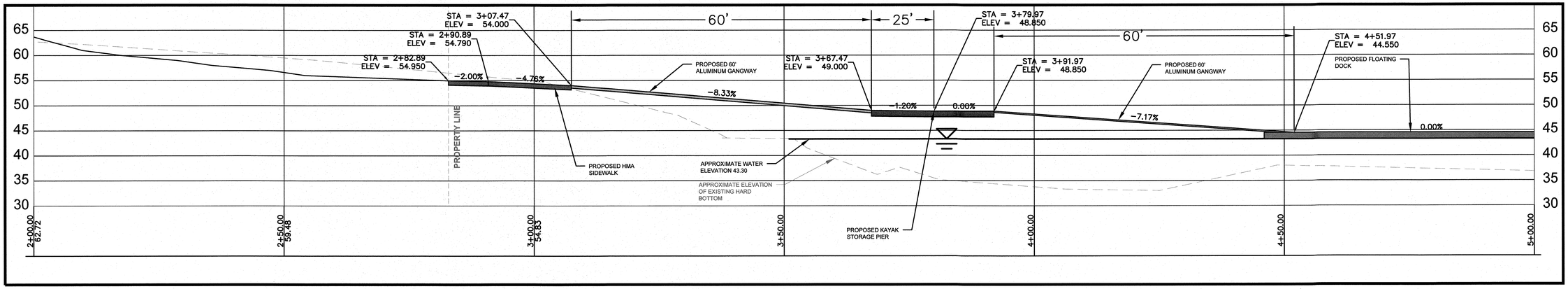
REGISTER NO.

FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

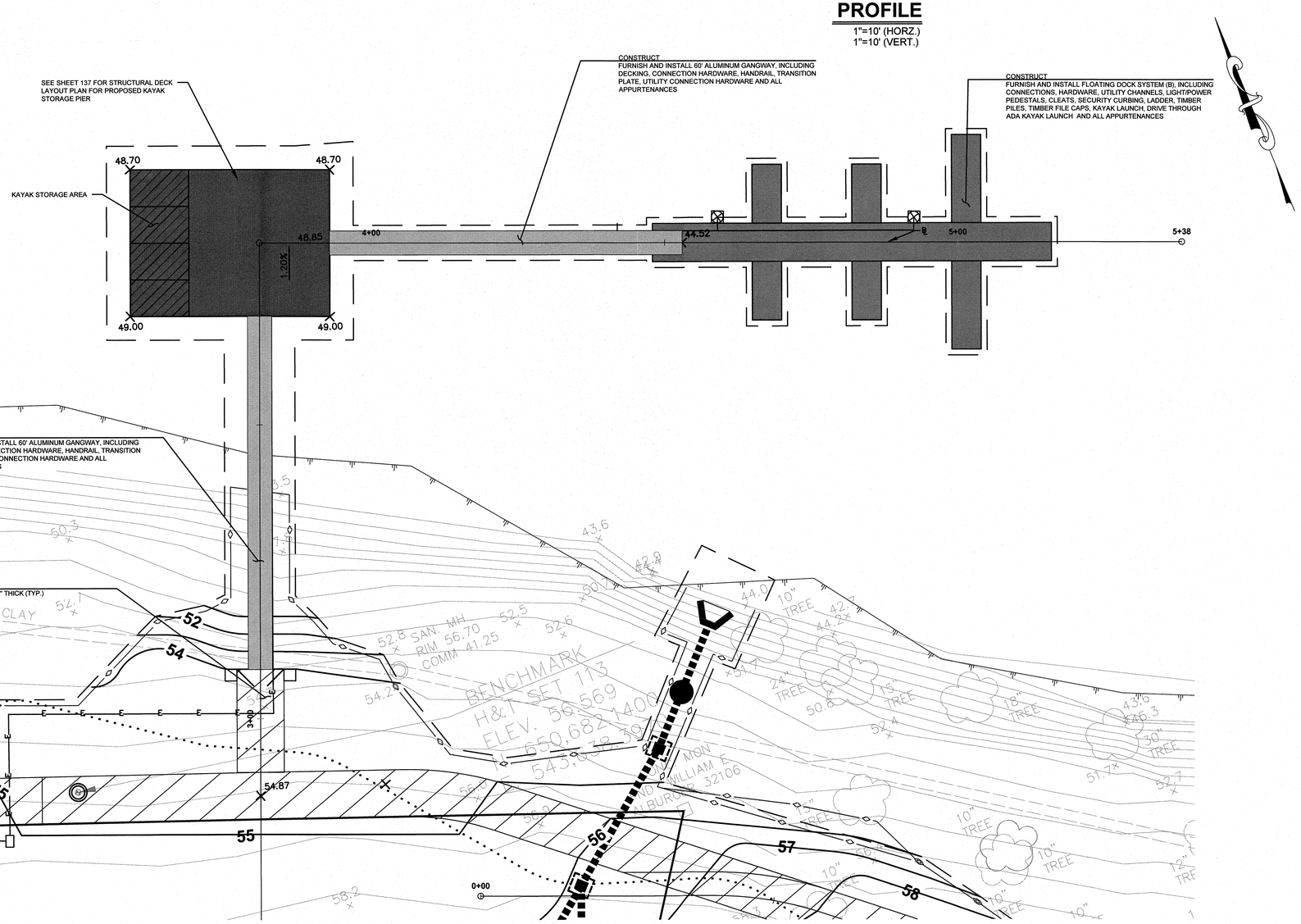
SCALE	DATE
As Shown	October 2024
DRAWN BY	DESIGNED BY
TE	GO/PB
CHECKED BY	SHEET
PB	80 of 139

DRAWING NUMBER



PROFILE

1"=10' (HORZ.)
1"=10' (VERT.)



GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVISED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CENTRAL LAKE PARK

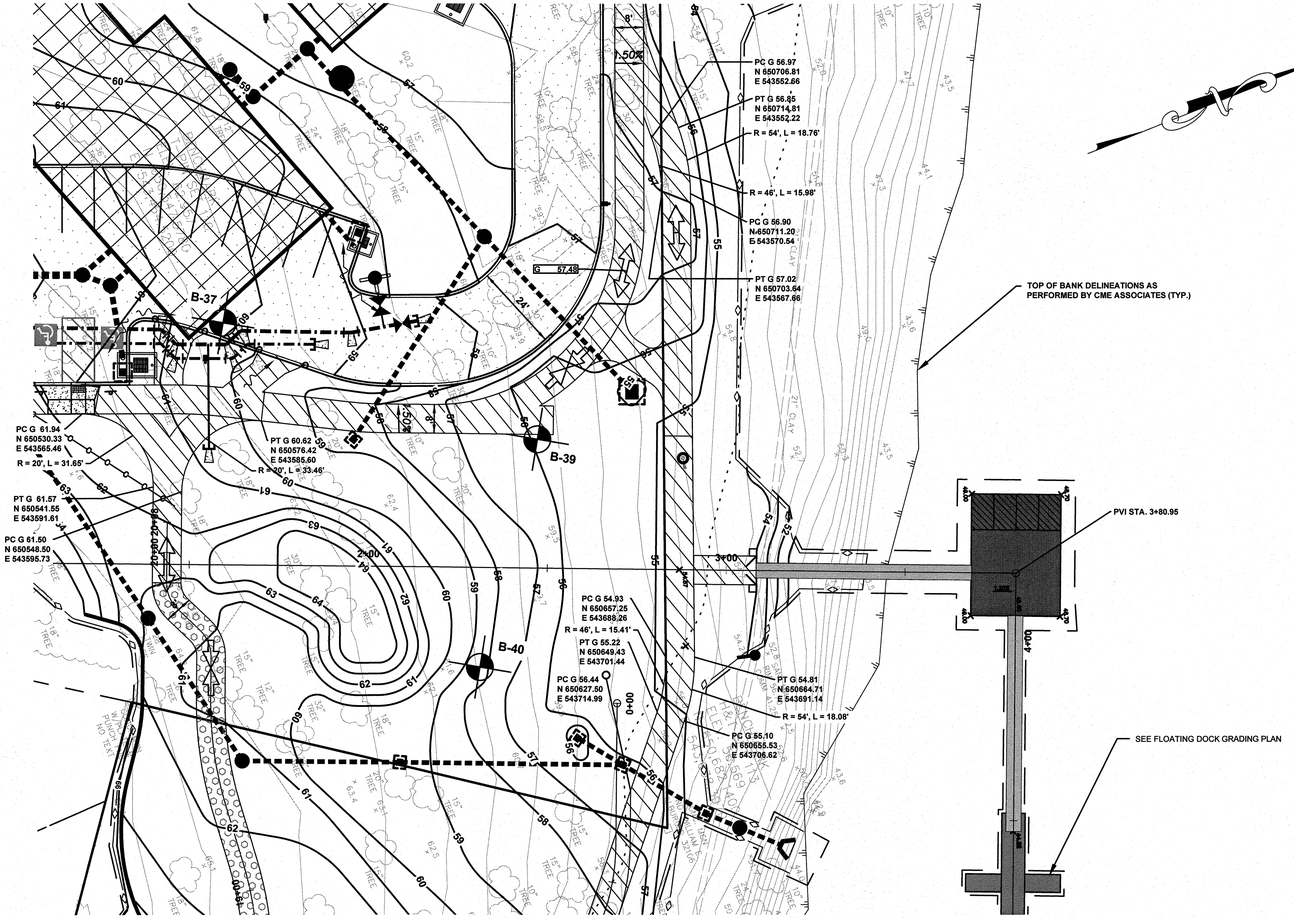
FLOATING DOCK
GRADING PLAN

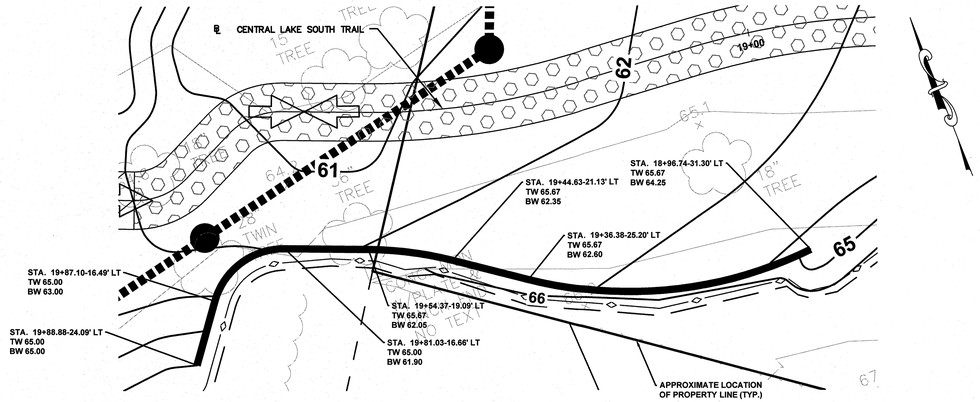
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY	DESIGNED BY
TE	GO/PB
CHECKED BY	SHEET
PB	81 of 139

REGISTER NO.
FILE NO. 115.UN00213.P05
DRAWING NUMBER





MODULAR BLOCK WALL

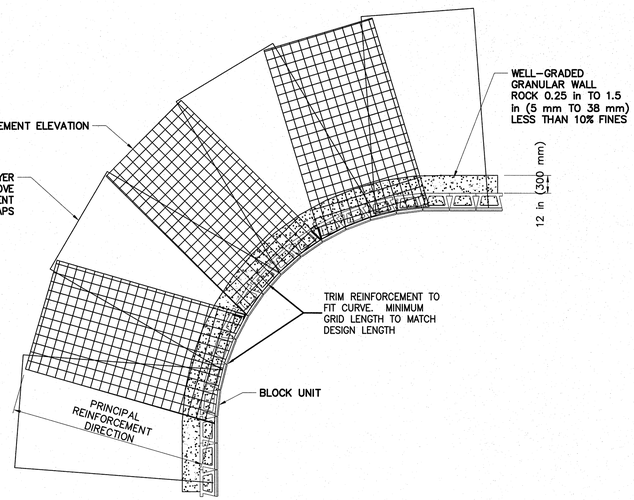
SCALE: 1" = 10'

PROPRIETARY RETAINING WALL DESIGN–BUILD CONSTRUCTION NOTES:

1. THE PROPOSED PROPRIETARY RETAINING WALL SHOWN IN THESE DRAWINGS IS THE ALLAN BLOCK TYPICAL GRAVITY WALL AND/OR REINFORCED GEOGRID WALL OR APPROVED EQUAL. DUE TO THE PROPOSED HEIGHT OF THE WALL, PLUS THE PROXIMITY OF THE PROPERTY LINE BEHIND THE WALL, THE PREFERRED WALL TYPE IS A GRAVITY WALL. THE MODULAR ALLAN BLOCK DETAILS SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. CONTRACTOR TO COORDINATE WITH WALL MANUFACTURER ON EXACT BLOCK DIMENSIONS AND BLOCK PLACEMENT IN ACCORDANCE WITH THE BLOCK MANUFACTURER'S DESIGN AND WALL SPECIFICATIONS.
2. THE CONTRACTOR IS HEREIN ADVISED THAT THE PROPRIETARY RETAINING WALL DESIGN DRAWINGS CONTAIN A PRELIMINARY DESIGN LAYOUT FOR THE CONSTRUCTION OF THE MODULAR BLOCK TYPE RETAINING WALL AND ITS FOUNDATION ELEMENTS THAT WILL BE REQUIRED FOR THIS PROJECT. THESE DETAILS PROVIDE FOR MINIMUM DIMENSIONS AND MINIMUM REQUIREMENTS FOR THE STRUCTURES AND STRUCTURAL ELEMENTS TO BE DESIGNED AND BUILT. AS A PART OF THE BID FOR THIS PROJECT, THE CONTRACTOR WILL BE REQUIRED TO RETAIN THE SERVICES OF A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW JERSEY TO DESIGN ALL OF THESE STRUCTURAL ELEMENTS FOR THE RETAINING WALL SPECIFIED AND TO FINALIZE ALL WALL DIMENSIONS.
3. THE CONTRACTOR'S ENGINEER WILL BE REQUIRED TO REVIEW THE PRELIMINARY DESIGN LAYOUT FOR STRUCTURAL DESIGN LOADS, CODE COMPLIANCE (LATEST EDITIONS OF IBC, NJ EDITION AND ASCE 7) AND CONSTRUCTABILITY.
4. CONTRACTOR TO PERFORM A SUBSURFACE EXPLORATION PROGRAM CONSISTING OF A MINIMUM OF ONE BORING ALONG THE WALL. A GEOTECHNICAL INTERPRETATION OF THE SOIL BORINGS PERFORMED AT AND ADJACENT TO THE PROPOSED WALL WILL BE REQUIRED TO OBTAIN SOIL DESIGN PROPERTIES FOR THE DESIGN OF THE WALL. THE SUBSURFACE EXPLORATION PROGRAM SHALL BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER BY A LICENSED PROFESSIONAL ENGINEER CURRENTLY REGISTERED IN THE STATE OF NEW JERSEY RETAINED BY THE CONTRACTOR. THE RESULTS OF THE SUBSURFACE EXPLORATION PROGRAM SHALL BE SUBMITTED TO THE OWNER'S ENGINEER FOR REVIEW ALONG WITH THE REQUIRED CALCULATIONS, SHOP DRAWINGS, SPECIFICATIONS AND/OR CATALOG CUTS.
5. THE CONTRACTOR'S ENGINEER WILL BE REQUIRED TO SUBMIT DETAILED DESIGN CALCULATIONS, SHOP DRAWINGS AND/OR CATALOG CUTS TO THE OWNER'S ENGINEER FOR REVIEW AND APPROVAL FOR THE SPECIFIED RETAINING WALL PRIOR TO THE WALL'S FABRICATION OR CONSTRUCTION. THE CONTRACTOR'S ENGINEER'S LAYOUT SHALL BE BASED ON THE PRELIMINARY LAYOUT SHOWN ON THESE DRAWINGS.
6. UPON APPROVAL BY THE OWNER'S ENGINEER, THE CONTRACTOR'S LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW JERSEY SHALL PROVIDE SIX (6) SETS OF SIGNED AND SEALED DETAILED DOCUMENTS TO THE OWNER'S ENGINEER FOR USE BY THE CONTRACTOR DURING CONSTRUCTION. THE COSTS ASSOCIATED WITH RETAINING A LICENSED PROFESSIONAL ENGINEER, INCLUDING PROVIDING THE REQUIRED DOCUMENTS, SHALL BE INCLUDED IN THE PRICE BID FOR THE NEW RETAINING WALL STRUCTURE AND ITS FOUNDATION, INCLUDING ALL APPURTENANCES, AS DESCRIBED HEREIN.
7. GRADING/SLOPE BEHIND WALLS OR BETWEEN TERRACED WALLS WILL BE AS REQUIRED BY THE WALL MANUFACTURER.

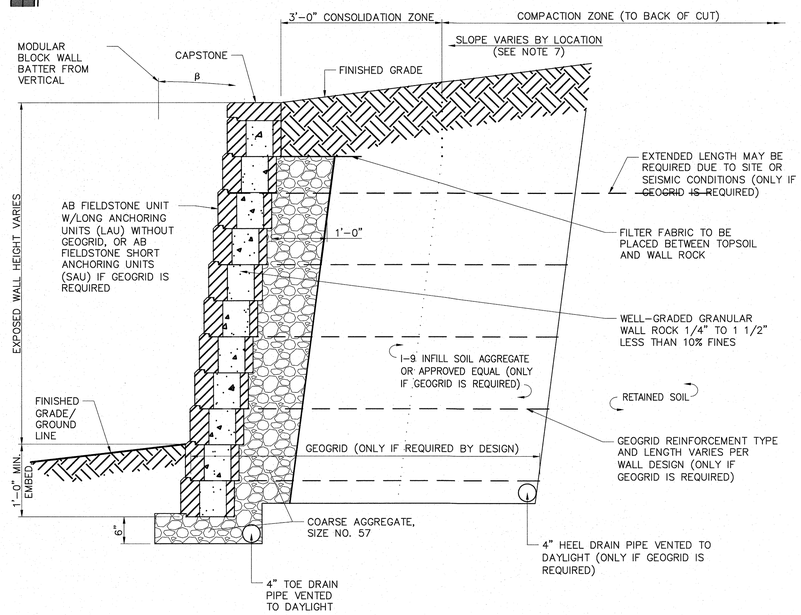
PAY LIMIT NOTES:

1. THE PROPRIETARY RETAINING WALL WILL BE MEASURED BY THE SQUARE FOOT UNDER THE PAY ITEM "MODULAR BLOCK RETAINING WALL".
2. THE AREA MEASURED WILL BE THE PRODUCT OF THE EXPOSED AND BURIED WALL FACE AND THE TOTAL LENGTH OF WALL SHOWN.
3. GEOGRID REINFORCEMENT (ONLY IF REQUIRED BY DESIGN), BASE LEVELING PAD, UNIT FILL, BACKFILL, EXCAVATION, FOUNDATION, SOIL PREPARATION, BLOCK WALL UNITS, CAPS, FILTER FABRIC, TOE DRAINS, HEEL DRAINS, ANY SUPPORT OF EXCAVATION AND/OR DEWATERING REQUIRED TO FACILITATE THE CONSTRUCTION OF THE RETAINING WALL, THE SUBSURFACE EXPLORATION PROGRAM, COMPLETE WALL DESIGN, AND ANY OTHER WORK REQUIRED TO SATISFACTORILY COMPLETE SAME SHALL NOT BE MEASURED SEPARATELY FOR PAYMENT AND WILL BE INCLUDED IN THE SQUARE FOOT "MODULAR BLOCK RETAINING WALL" ITEM.



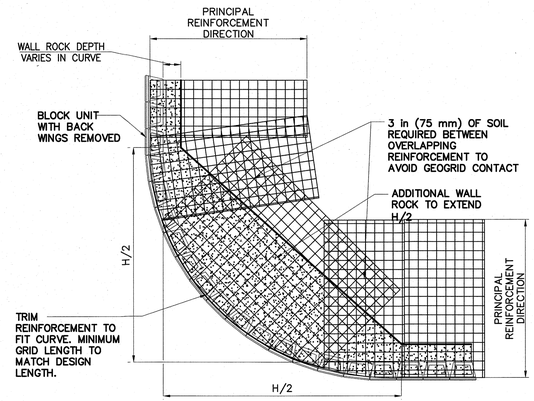
OUTSIDE CURVE GEOGRID DETAILS

SCALE: 1 1/2" = 1'–0" (ONLY IF GEOGRID IS REQUIRED)



TYPICAL MODULAR BLOCK RETAINING WALL SECTION

SCALE: 3/4"=1'–0"



INSIDE CURVE GEOGRID DETAILS

SCALE: 1 1/2" = 1'–0" (ONLY IF GEOGRID IS REQUIRED)

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CENTRAL LAKE PARK

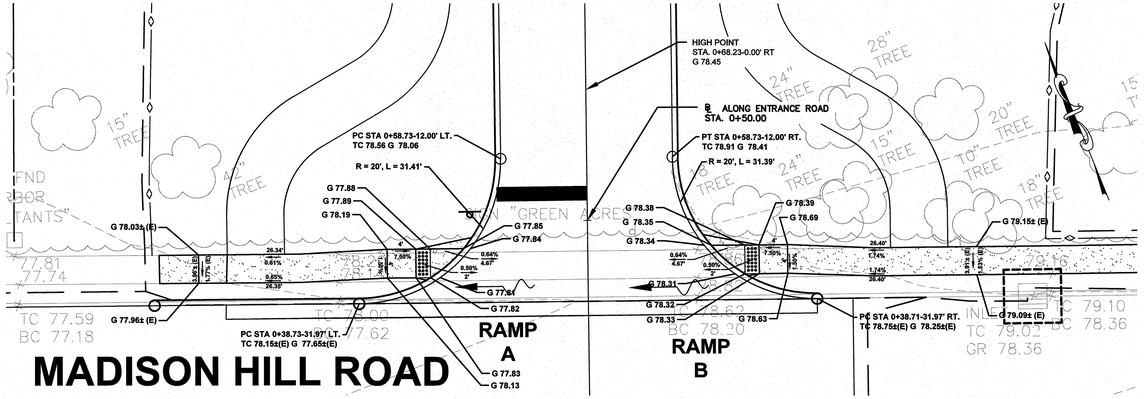
FLOATING DOCK ACCESS GRADING PLAN

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO. FILE NO. 115.UN00213.P05

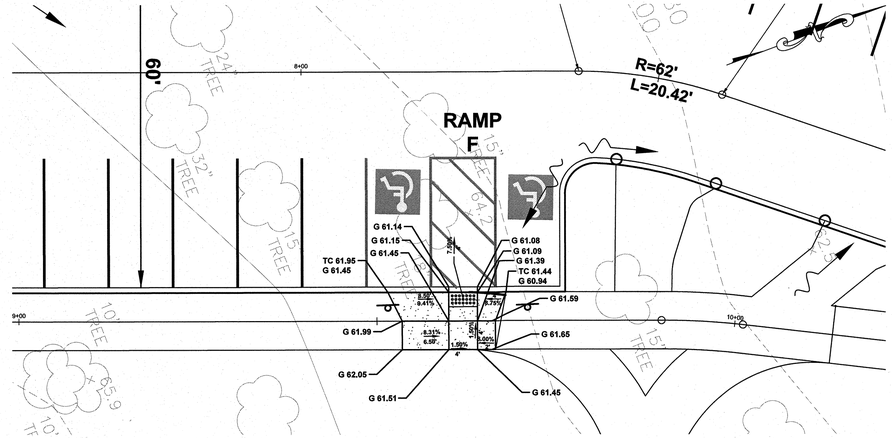
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO/PB	
CHECKED BY: PB	SHEET: 82 of 139	



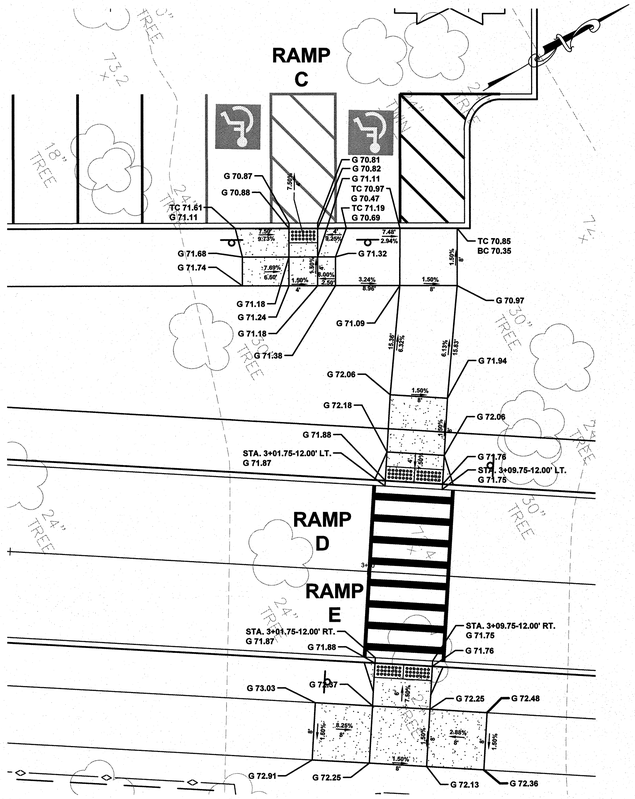
RAMPS A & B

Scale = 1'=10'



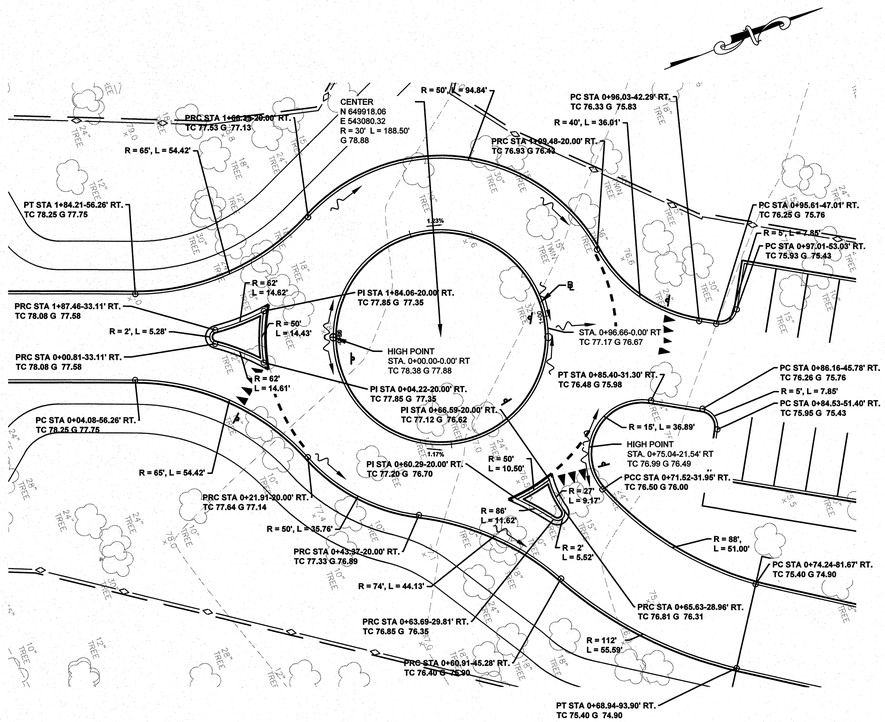
RAMP F

Scale = 1'=10'



RAMPS C, D, & E

Scale = 1'=10'



ROUNDABOUT GRADING PLAN

SCALE: 1"=20'

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)

1 inch = 10 ft.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CENTRAL LAKE PARK

CURB RAMP DETAILS

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

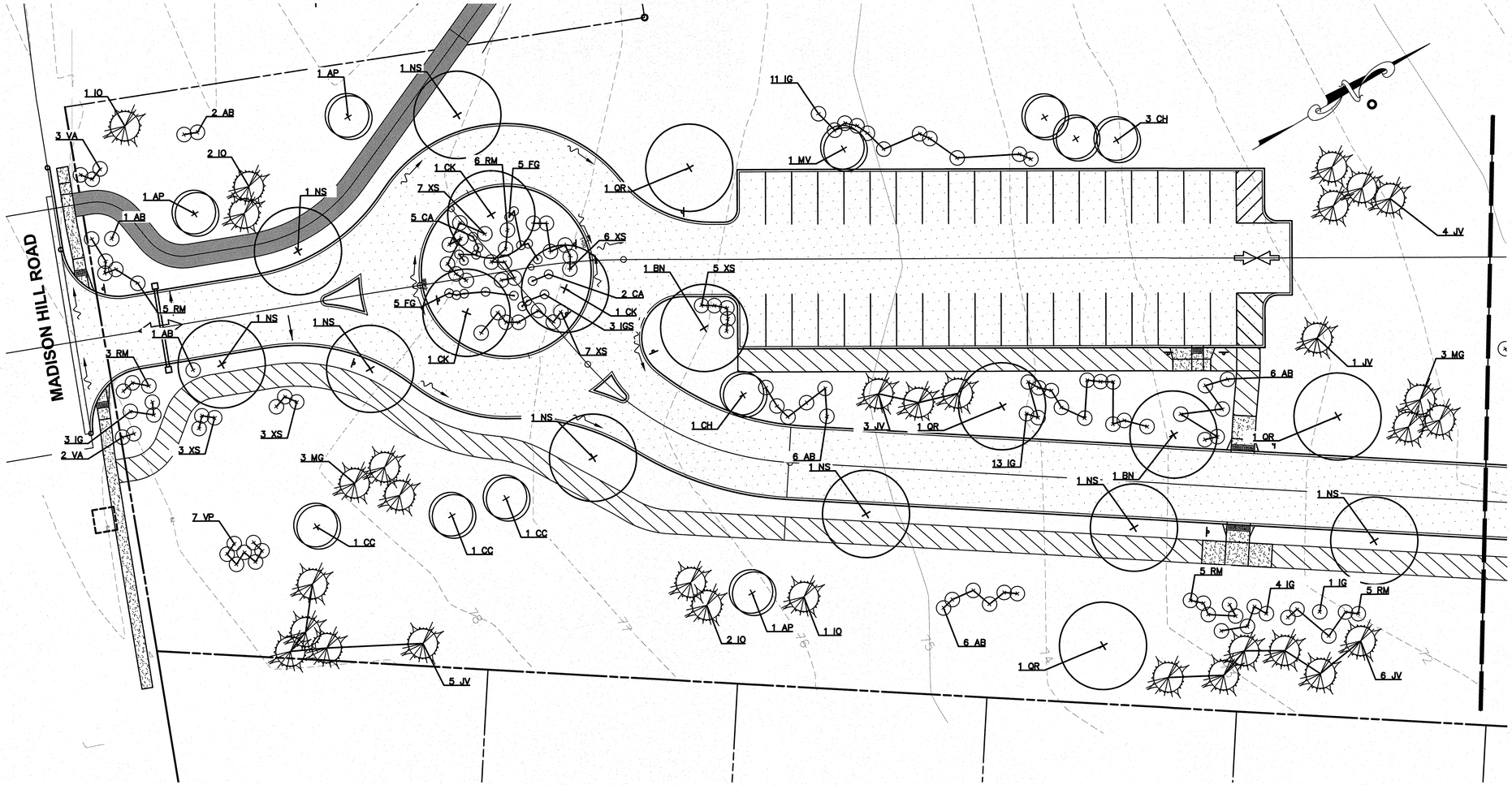
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

4.1.24

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: TE	
CHECKED BY: PB	SHEET: 83 of 139	

REGISTER NO.

FILE NO. 115.UN00213.P05



ENTRANCE PARKING LOT
LANDSCAPE PLAN

SCALE: 1"=20'

NOTES:
1. THE INTENT FOR THE PROJECT IS FOR THE SITE'S NATIVE TOPSOIL TO BE AMENDED AND REUSED THROUGHOUT THE ENTIRE SITE FOR AREAS TO BE PLANTED, SEEDED, AND SODDED.
2. CONTRACTOR TO TEST A MINIMUM OF THREE (3) TOPSOIL SAMPLES, THROUGHOUT THE PROJECT AREA, TO ESTABLISH THE COMPOSITION OF THE EXISTING TOPSOIL. AMENDMENTS SUCH AS, BUT NOT LIMITED TO SAND, LEAF MULCH, AND LIME SHOULD BE UTILIZED TO ENSURE THE TOPSOIL MEETS THE FOLLOWING:
   - 6.0–7.0 pH LEVEL
   - 2%–7% ORGANIC MATTER
   - < 4% GRAVEL (> 2.0 MM)
   - 60%–80% SAND
   - 10%–15% SILT
   - 5%–10% CLAY

   –ALL IMPORTED TOPSOIL SHALL MEET THE ABOVE SPECIFICATIONS
3. ALL EXISTING TREES TO REMAIN SHALL RECEIVE A MULCH RING 3' OFF OF THE MAIN TRUNK UNLESS OTHERWISE SHOWN. ALL PROPOSED MULCH BEDS SHALL BE AT LEAST 6' OFF OF WALKWAYS TO FACILITATE MAINTENANCE, UNLESS OTHERWISE SHOWN.
4. ALL INDIVIDUAL TREES WITHIN LANDSCAPE BUFFER PLANTINGS SHALL HAVE AN INDIVIDUAL MULCH RING.
5. ALL LANDSCAPE BUFFER PLANTINGS WITHIN GROUPINGS SHALL HAVE ONE ENCOMPASSING, CONTINUOUS MULCH BED. MULCH BEDS SHALL BE LAID OUT IN FIELD BY THE OWNER'S LANDSCAPE ARCHITECT.
6. ALL PLANTINGS SHALL CONFORM TO THE REQUIREMENTS SET FORTH WITHIN THE NO NET LOSS GRANT. CONTRACTOR WILL BE RESPONSIBLE TO SCHEDULE A PLANTING DEMONSTRATION WITH LABORERS, CME ASSOCIATES, AND STATE REPRESENTATIVES TO ENSURE PLANTINGS ARE COMPLETED AS REQUIRED.
7. SHOULD PROPOSED LANDSCAPE / UTILITY CONFLICTS EXIST, LANDSCAPE MATERIAL SHALL BE FIELD ADJUSTED.
8. WHEN PLANTING WINTERBERRY HOLLIES, ENSURE THERE ARE MALE POLLINATORS AS WELL AS FEMALE PLANTS TO ENSURE THE FEMALE PLANTINGS HAVE FRUIT.

GRAPHIC SCALE

2 0 10 2 40 80

(IN FEET)
1 inch = 20 ft.

NOTE:
SEE SHEET NO. 88 FOR PLANTING SCHEDULE

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVIEWED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

LANDSCAPING PLAN AND DETAILS

CENTRAL LAKE PARK (1 OF 2)

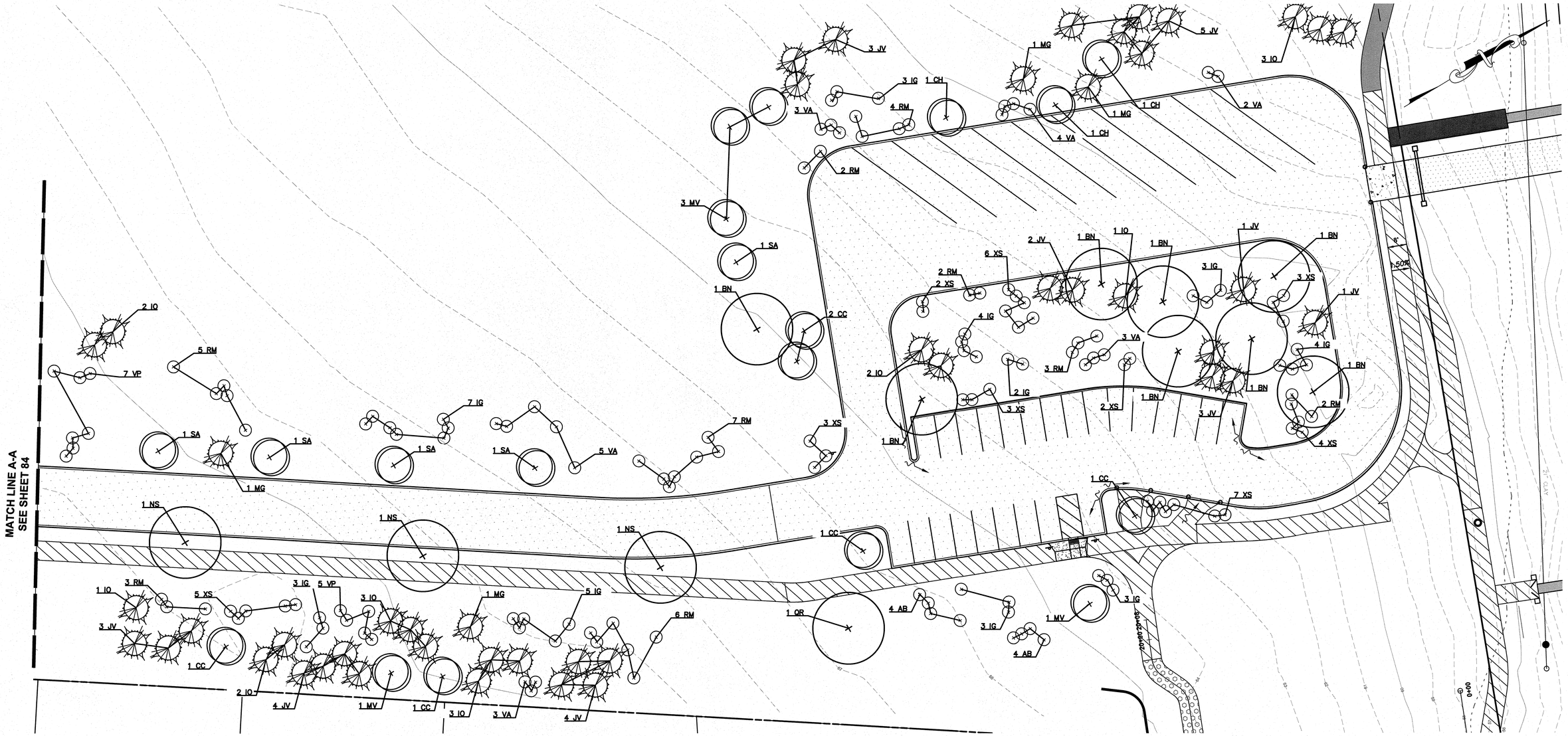
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: AM	DESIGNED BY: AM/KT	
CHECKED BY: KT	SHEET: 84 of 139	

REGISTER NO.

FILE NO. 115.UN00213.P05



NOTES:
1. THE INTENT FOR THE PROJECT IS FOR THE SITE'S NATIVE TOPSOIL TO BE AMENDED AND REUSED THROUGHOUT THE ENTIRE SITE FOR AREAS TO BE PLANTED, SEEDED, AND SODDED.

2. CONTRACTOR TO TEST A MINIMUM OF THREE (3) TOPSOIL SAMPLES, THROUGHOUT THE PROJECT AREA, TO ESTABLISH THE COMPOSITION OF THE EXISTING TOPSOIL. AMENDMENTS SUCH AS, BUT NOT LIMITED TO SAND, LEAF MULCH, AND LIME SHOULD BE UTILIZED TO ENSURE THE TOPSOIL MEETS THE FOLLOWING:
   - 6.0–7.0 pH LEVEL
   - 2%–7% ORGANIC MATTER
   - < 4% GRAVEL (> 2.0 MM)
   - 60%–80% SAND
   - 10%–15% SILT
   - 5%–10% CLAY

   –ALL IMPORTED TOPSOIL SHALL MEET THE ABOVE SPECIFICATIONS

3. ALL EXISTING TREES TO REMAIN SHALL RECEIVE A MULCH RING 3' OFF OF THE MAIN TRUNK UNLESS OTHERWISE SHOWN. ALL PROPOSED MULCH BEDS SHALL BE AT LEAST 6' OFF OF WALKWAYS TO FACILITATE MAINTENANCE, UNLESS OTHERWISE SHOWN.

4. ALL INDIVIDUAL TREES WITHIN LANDSCAPE BUFFER PLANTINGS SHALL HAVE AN INDIVIDUAL MULCH RING.

5. ALL LANDSCAPE BUFFER PLANTINGS WITHIN GROUPINGS SHALL HAVE ONE ENCOMPASSING, CONTINUOUS MULCH BED. MULCH BEDS SHALL BE LAID OUT IN FIELD BY THE OWNER'S LANDSCAPE ARCHITECT.

6. ALL PLANTINGS SHALL CONFORM TO THE REQUIREMENTS SET FORTH WITHIN THE NO NET LOSS GRANT. CONTRACTOR WILL BE RESPONSIBLE TO SCHEDULE A PLANTING DEMONSTRATION WITH LABORERS, CME ASSOCIATES, AND STATE REPRESENTATIVES TO ENSURE PLANTINGS ARE COMPLETED AS REQUIRED.

7. SHOULD PROPOSED LANDSCAPE / UTILITY CONFLICTS EXIST, LANDSCAPE MATERIAL SHALL BE FIELD ADJUSTED.

8. WHEN PLANTING WINTERBERRY HOLLIES, ENSURE THERE ARE MALE POLLINATORS AS WELL AS FEMALE PLANTS TO ENSURE THE FEMALE PLANTINGS HAVE FRUIT.

PARKING LOT LANDSCAPE PLAN

SCALE: 1"=20'

GRAPHIC SCALE

2 0 10 2 40 80

(IN FEET)
1 inch = 20 ft.

NOTE:
SEE SHEET NO. 88 FOR PLANTING SCHEDULE

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

LANDSCAPING PLAN AND DETAILS

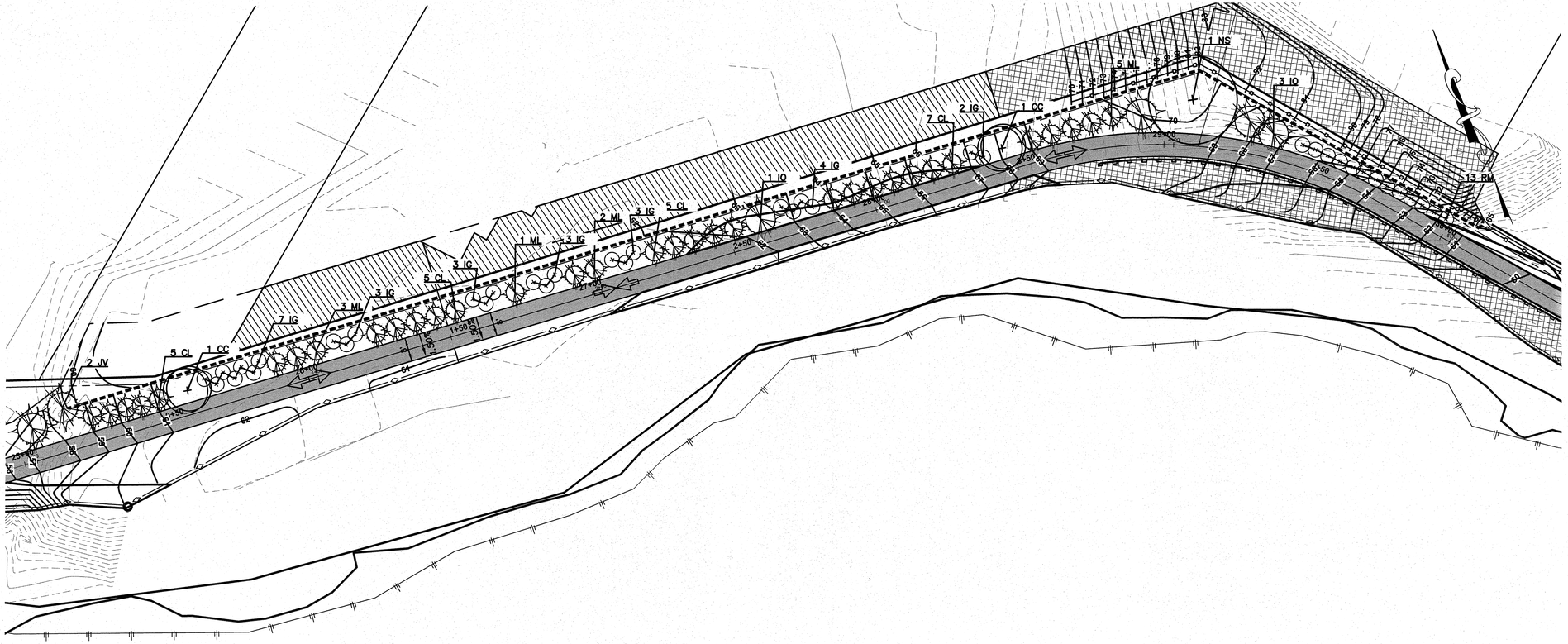
CENTRAL LAKE PARK (2 OF 2)

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY: AM	DESIGNED BY: AM/KT
CHECKED BY: KT	SHEET: 85 of 139

REGISTER NO.
FILE NO. 115.UN00213.P05
DRAWING NUMBER



NOTES:

1. THE INTENT FOR THE PROJECT IS FOR THE SITE'S NATIVE TOPSOIL TO BE AMENDED AND REUSED THROUGHOUT THE ENTIRE SITE FOR AREAS TO BE PLANTED, SEEDED, AND SODDED.
2. CONTRACTOR TO TEST A MINIMUM OF THREE (3) TOPSOIL SAMPLES, THROUGHOUT THE PROJECT AREA, TO ESTABLISH THE COMPOSITION OF THE EXISTING TOPSOIL AMENDMENTS SUCH AS, BUT NOT LIMITED TO SAND, LEAF MULCH, AND LIME SHOULD BE UTILIZED TO ENSURE THE TOPSOIL MEETS THE FOLLOWING:
   - 6.0–7.0 pH LEVEL
   - 2%–7% ORGANIC MATTER
   - < 4% GRAVEL (> 2.0 MM)
   - 60%–80% SAND
   - 10%–15% SILT
   - 5%–10% CLAY

   –ALL IMPORTED TOPSOIL SHALL MEET THE ABOVE SPECIFICATIONS
3. ALL EXISTING TREES TO REMAIN SHALL RECEIVE A MULCH RING 3' OFF OF THE MAIN TRUNK UNLESS OTHERWISE SHOWN. ALL PROPOSED MULCH BEDS SHALL BE AT LEAST 6' OFF OF WALKWAYS TO FACILITATE MAINTENANCE, UNLESS OTHERWISE SHOWN.
4. ALL INDIVIDUAL TREES WITHIN LANDSCAPE BUFFER PLANTINGS SHALL HAVE AN INDIVIDUAL MULCH RING.
5. ALL LANDSCAPE BUFFER PLANTINGS WITHIN GROUPINGS SHALL HAVE ONE ENCOMPASSING, CONTINUOUS MULCH BED. MULCH BEDS SHALL BE LAID OUT IN FIELD BY THE OWNER'S LANDSCAPE ARCHITECT.
6. ALL PLANTINGS SHALL CONFORM TO THE REQUIREMENTS SET FORTH WITHIN THE NO NET LOSS GRANT. CONTRACTOR WILL BE RESPONSIBLE TO SCHEDULE A PLANTING DEMONSTRATION WITH LABORERS, CME ASSOCIATES, AND STATE REPRESENTATIVES TO ENSURE PLANTINGS ARE COMPLETED AS REQUIRED.
7. SHOULD PROPOSED LANDSCAPE / UTILITY CONFLICTS EXIST, LANDSCAPE MATERIAL SHALL BE FIELD ADJUSTED.
8. WHEN PLANTING WINTERBERRY HOLLIES, ENSURE THERE ARE MALE POLLINATORS AS WELL AS FEMALE PLANTS TO ENSURE THE FEMALE PLANTINGS HAVE FRUIT.

NOTE:
SEE SHEET NO. 88 FOR PLANTING SCHEDULE

RETAINING WALL LANDSCAPE PLAN

SCALE: 1"=20'

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

LANDSCAPING PLAN AND DETAILS

CENTRAL LAKE NORTH TRAIL

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162
(732) 462 7400 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY: AM	DESIGNED BY: AM/KT
CHECKED BY: KT	SHEET: 86 of 139

DRAWING NUMBER

REGISTER NO.

FILE NO. 115.UN00213.P05

NOTES:
1. THE INTENT FOR THE PROJECT IS FOR THE SITE'S NATIVE TOPSOIL TO BE AMENDED AND REUSED THROUGHOUT THE ENTIRE SITE FOR AREAS TO BE PLANTED, SEEDED, AND SODDED.

2. CONTRACTOR TO TEST A MINIMUM OF THREE (3) TOPSOIL SAMPLES, THROUGHOUT THE PROJECT AREA, TO ESTABLISH THE COMPOSITION OF THE EXISTING TOPSOIL. AMENDMENTS SUCH AS, BUT NOT LIMITED TO SAND, LEAF MULCH, AND LIME SHOULD BE UTILIZED TO ENSURE THE TOPSOIL MEETS THE FOLLOWING:
   - 6.0–7.0 pH LEVEL
   - 2%–7% ORGANIC MATTER
   - < 4% GRAVEL (> 2.0 MM)
   - 60%–80% SAND
   - 10%–15% SILT
   - 5%–10% CLAY

   –ALL IMPORTED TOPSOIL SHALL MEET THE ABOVE SPECIFICATIONS

3. ALL EXISTING TREES TO REMAIN SHALL RECEIVE A MULCH RING 3' OFF OF THE MAIN TRUNK UNLESS OTHERWISE SHOWN. ALL PROPOSED MULCH BEDS SHALL BE AT LEAST 6' OFF OF WALKWAYS TO FACILITATE MAINTENANCE, UNLESS OTHERWISE SHOWN.

4. ALL INDIVIDUAL TREES WITHIN LANDSCAPE BUFFER PLANTINGS SHALL HAVE AN INDIVIDUAL MULCH RING.

5. ALL LANDSCAPE BUFFER PLANTINGS WITHIN GROUPINGS SHALL HAVE ONE ENCOMPASSING, CONTINUOUS MULCH BED. MULCH BEDS SHALL BE LAID OUT IN FIELD BY THE OWNER'S LANDSCAPE ARCHITECT.

6. ALL PLANTINGS SHALL CONFORM TO THE REQUIREMENTS SET FORTH WITHIN THE NO NET LOSS GRANT. CONTRACTOR WILL BE RESPONSIBLE TO SCHEDULE A PLANTING DEMONSTRATION WITH LABORERS, CME ASSOCIATES, AND STATE REPRESENTATIVES TO ENSURE PLANTINGS ARE COMPLETED AS REQUIRED.

7. SHOULD PROPOSED LANDSCAPE / UTILITY CONFLICTS EXIST, LANDSCAPE MATERIAL SHALL BE FIELD ADJUSTED.

8. REFORESTATION TREE PLANTINGS TO BE FIELD LOCATED WITHIN THE HATCHED AREAS. THE ESTIMATED NUMBER OF RESTORATION TRESS WITHIN THE HATCHED AREA IS APPROXIMATELY 540 TREES. AN ADDITIONAL 90 TREES SHALL PLANTED THROUGHOUT THE PROJECT LIMITS AT LOCATIONS IDENTIFIED BY THE COUNTY, ENGINEER, AND LANDSCAPE ARCHITECT.

LEGEND

▨ - DENOTES REFORESTATION AREA WITH DECIDUOUS TREES

CENTRAL LAKE

WILS

EAST LAKE

GARDEN STATE PARKWAY

MADISON HILL RD

ELIS

EXISTING DRIVEWAY

EXISTING SHED

EXISTING TENNIS COURTS

EXISTING BASEBALL FIELD

REFORESTATION AREA:
270± DECIDUOUS TREES

REFORESTATION AREA:
55± DECIDUOUS TREES

REFORESTATION AREA:
65± DECIDUOUS TREES

REFORESTATION AREA:
35± DECIDUOUS TREES

REFORESTATION AREA:
65± DECIDUOUS TREES

B:52
L:14.11

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

REFORESTATION PLANT SCHEDULE

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	COMMENTS
SHADE TREES					
64	AR	Acer rubrum 'Red October'	October Glory Red Maple	2" – 2 1/2" cal.	B&B, Spacing as shown
90	BN	Betula nigra	River Birch	2" – 2 1/2" cal.	B&B, Spacing as shown
40	CK	Cladrastis kentukea 'Sweetshade'	Sweetshade Yellowwood	2" – 2 1/2" cal.	B&B, Spacing as shown
85	LS	Liquidambar styraciflua	Sweetgum	2" – 2 1/2" cal.	B&B, Spacing as shown
95	NS	Nyssa sylvatica 'Green Gable'	Blackgum	2 1/2" – 3" cal.	B&B, Spacing as shown
85	QR	Quercus bicolor	Swamp White Oak	2" – 2 1/2" cal.	B&B, Spacing as shown
90	QP	Quercus palustris	Pin Oak	2" – 2 1/2" cal.	B&B, Spacing as shown
31	TD	Taxodium distichum	Bald Cypress	2" – 2 1/2" cal.	B&B, Spacing as shown
580 Total					

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PG	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PG	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

TRAIL PLAN

REFORESTATION
LANDSCAPE PLAN

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28339000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

ASSISTER NO.

FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

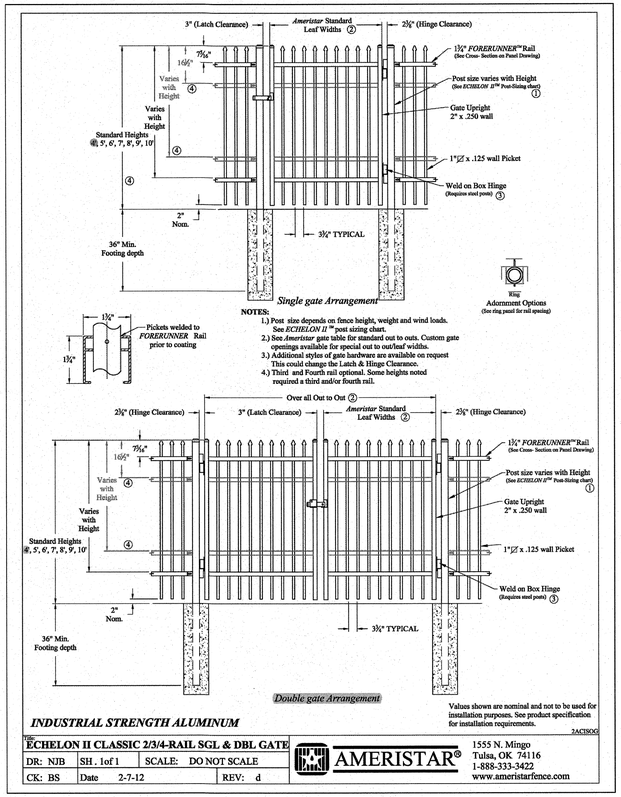
SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: AM	DESIGNED BY: AM/KT	
CHECKED BY: KT	SHEET: 87 of 139	

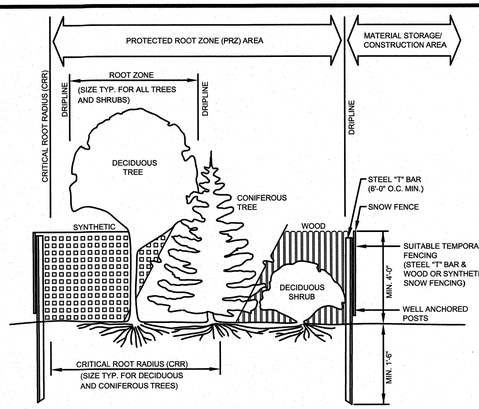
PLANT SCHEDULE

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	COMMENTS
SHADE TREES					
10	BN	Betula nigra	River Birch	2" – 2 1/2" cal.	B&B, Spacing as shown
3	CK	Cladrastis kentukea 'Sweetshade'	Sweetshade Yellowwood	2" – 2 1/2" cal.	B&B, Spacing as shown
12	NS	Nyssa sylvatica 'Green Gable'	Green Gable Blackgum	2 1/2" – 3" cal.	B&B, Spacing as shown
5	QR	Quercus bicolor	Swamp White Oak	2" – 2 1/2" cal.	B&B, Spacing as shown
30 Total					
ORNAMENTAL TREES					
3	AP	Aesculus pavia 'Splendida'	Splendida Red Buckeye	2" – 2 1/2" cal.	B&B, Single Stem, Spacing as shown
7	CH	Carpinus caroliniana	American Hornbeam	2" – 2 1/2" cal.	B&B, Single Stem, Spacing as shown
11	CC	Cercis canadensis 'Forest Pansy'	Forest Pansy Eastern Redbud	2" – 2 1/2" cal.	B&B, Single Stem, Spacing as shown
6	MV	Magnolia virginiana 'Green Shadow'	Green Shadow Sweetbay Magnolia	2" – 2 1/2" cal.	B&B, Single Stem, Spacing as shown
5	SA	Sassafras albidum	Sassafras	2" – 2 1/2" cal.	B&B, Single Stem, Spacing as shown
32 Total					
EVERGREEN TREES					
22	CL	Cupressocyparis leylandii	Leyland Cypress	8' – 10' ht.	B&B, Spacing as shown
27	IO	Ilex opaca 'Satyr Hill'	American Holly	8' – 10' ht.	B&B, Spacing as shown
47	JV	Juniperus virginiana 'Corcorcor'	Corcorcor Eastern Red Cedar	8' – 10' ht.	B&B, Spacing as shown
10	MG	Magnolia grandiflora 'Bracken's Brown Beauty'	Bracken's Brown Beauty Southern Magnolia	8' – 10' ht.	B&B, Spacing as shown
11	ML	Magnolia grandiflora 'Little Gem'	Little Gem Southern Magnolia	8' – 10' ht.	B&B, Spacing as shown
117 Total					
SHRUBS					
30	AB	Aesculus parviflora	Bottlebrush Buckeye	30" – 36" ht.	Container, 4.5' on center
7	CA	Clethra alnifolia 'Hummingbird'	Hummingbird Summersweet	#3 can	Container, 3' on center
10	FG	Fothergilla gardenii	Dwarf Fothergilla	#3 can	Container, 3' on center
99	IG	Ilex glabra	Inkberry Holly	30" – 36" ht.	Container, 4.5' on center
3	IGS	Ilex glabra 'Shamrock'	Shamrock Inkberry Holly	#3 can	Container, 3' on center
71	RM	Rhododendron maximum	Rosebay Rhododendron	30" – 36" ht.	Container, 4.5' on center
25	VA	Viburnum acerifolium	Mapleleaf Viburnum	30" – 36" ht.	Container, 4.5' on center
19	VP	Viburnum prunifolium	Blackhaw Viburnum	30" – 36" ht.	Container, 4.5' on center
66	XS	Xanthorhiza simplicissima	Yellowroot	30" – 36" ht.	Container, 4.5' on center
325 Total					

PLANTING NOTES:

1. THE LANDSCAPE CONTRACTOR SHALL FURNISH AND INSTALL ALL PLANT MATERIAL AS INDICATED, INCLUDING ALL LABOR, MATERIALS, EQUIPMENT, INCIDENTALS (INCLUDING WATERING) AND CLEAN-UP.
2. THE LANDSCAPE CONTRACTOR SHALL PERFORM SOIL SAMPLING OF THE SITE, IF DEEMED NECESSARY, PRIOR TO ANY PLANT INSTALLATIONS TO DETERMINE SOIL CHARACTERISTICS. IF NECESSARY, ADJUSTMENTS SHALL BE MADE BY THE LANDSCAPE CONTRACTOR IN COOPERATION WITH THE OWNER BASED ON THE SOIL TEST REPORT TO ENSURE SURVIVAL OF ALL PLANT MATERIAL.
3. THE CONTRACTOR SHALL LOCATE AND VERIFY THE EXISTENCE OF ALL UTILITIES AND/OR CONFLICTING SITE AMENITIES PRIOR TO STARTING THE WORK.
4. ALL PLANTS SHALL BE DUG, PACKED, TRANSPORTED, AND HANDLED WITH UTMOST CARE AND PROTECTION FROM INJURY AND DESICCATION.
5. ALL PLANTS SHALL BE FREE FROM DISEASE AND INFESTATION.
6. THE CENTRAL LEADER SHALL NOT BE CUT, DAMAGED, OR BROKEN. NO PLANT WITH CENTRAL LEADER DAMAGE SHALL BE ACCEPTED.
7. PLANTS SHALL NOT BE PRUNED ON LOCATION UNLESS IT IS NECESSARY TO REMOVE BROKEN OR DAMAGED LIMBS.
8. ALL PLANT MATERIAL SHALL BE GUARANTEED BY THE CONTRACTOR TO BE IN VIGOROUS GROWING CONDITION AND HAVE AN ACCEPTABLE HABIT. PROVISIONS SHALL BE MADE FOR A GROWTH GUARANTEE OF AT LEAST TWO YEARS FOR TREES AND A MINIMUM OF TWO GROWING SEASONS FOR SHRUBS OR AS PER THAT WHICH MAY BE STATED IN THE MUNICIPALITY'S LAND DEVELOPMENT ORDINANCE. REPLACEMENTS SHALL BE MADE AT THE BEGINNING OF THE FIRST SUCCEEDING PLANTING SEASON. ALL REPLACEMENTS SHALL HAVE A GUARANTEE EQUAL TO THAT STATED ABOVE.
9. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE WATER AND FERTILIZER TO ALL PLANT MATERIAL DURING THE GUARANTEE PERIOD TO ENSURE PLANT SURVIVAL.
10. THE MINIMUM DEPTH OF TOPSOIL IN PARKING LOT ISLANDS SHALL BE TWO FEET.
11. TREES SHALL BE ROOTED INTO THE BALL SO THAT SOIL OR MEDIA REMAINS INTACT AND TRUNK AND ROOTBALL MOVE AS ONE WHEN LIFTED. THE TREE TRUNK SHOULD BEND WHEN GENTLY PUSHED, NOT PIVOT AT OR BELOW THE SOIL LINE.
12. THE POINT WHERE THE TOP-MOST ROOT IN THE ROOT BALL EMERGES FROM THE TRUNK (FLARE) SHALL BE VISIBLE AT THE SOIL SURFACE. NO MULCH SHALL BE PLACED ON THE TRUNK FLARE.
13. THE RELATIONSHIP BETWEEN CALIPER, HEIGHT AND ROOTBALL SIZE FOR ALL TREES SHALL MEET ANSI Z60.1 2014 OR LATEST EDITION STANDARDS.
14. ALL DECIDUOUS SHADE TREES SHALL HAVE ONE DOMINANT CENTRAL LEADER, MORE OR LESS STRAIGHT TO THE TOP OF THE TREE WITH THE LARGEST BRANCHES SPACED AT LEAST 6 INCHES APART. THERE CAN BE A DOUBLE LEADER IN THE TOP 10% OF THE TREE CANOPY.
15. THE TREE CANOPY SHOULD BE SYMMETRICAL, FREE OF LARGE VOIDS, AND TYPICAL OF THE SPECIES OR CULTIVAR. LIVE CROWN RATIO (DISTANCE FROM BOTTOM OF CANOPY TO TREE TOP/TREE HEIGHT) SHOULD BE AT LEAST 60%
16. SHADE TREE BRANCHES SHOULD BE LESS THAN 2/3 THE TRUNK DIAMETER, FREE OF BARK INCLUSIONS, AND MORE OR LESS RADIALLY DISTRIBUTED AROUND THE TRUNK.
17. TREE TRUNKS AND MAIN BRANCHES SHALL BE FREE OF WOUNDS, DAMAGED AREAS, CONKS, BLEEDING, AND SIGNS OF INSECTS OR DISEASE.
18. BACKFILL MATERIAL FOR PLANTING PITS SHALL BE ONE-THIRD PEAT MOSS, ONE-THIRD SCREENED TOPSOIL, AND ONE-THIRD TOPSOIL FROM THE SITE (NATIVE), FREE OF ACIDIC MARL, STICKS, LARGE STONES, DEBRIS, OR OTHER OBJECTIONABLE MATERIAL.
19. PLANTS SHALL BE SET TO ULTIMATE FINISH GRADE SO THAT THE ROOT COLLAR AND FLARE ARE EXPOSED AT THE SURFACE OF THE BALL. ANY EXCESS SOIL SHOULD BE GENTLY REMOVED AND PROPERLY DISPOSED OF OFFSITE. ALL PLANTS SHALL BE SET PLUM AND STRAIGHT IN THE CENTER OF THE PIT.
20. ANY CORD BINDING THE BALL OF ALL BALLED AND BURLAPPED (B&B) PLANTS SHALL BE CUT AND REMOVED, AS WELL AS ALL BURLAP ON THE SIDES AND TOP OF THE ROOT BALL. AS MUCH BURLAP AS POSSIBLE MUST BE REMOVED FROM THE PLANTING PIT. ANY REMAINING BURLAP SHOULD BE TUCKED DOWN TO LIMIT THE FORMATION OF AIR POCKETS UPON BACKFILLING. SYNTHETIC MATERIALS AND ANY BANNED STAKING WITHIN THE ROOTBALL SHALL BE COMPLETELY REMOVED. TREES INSTALLED WITH WIRE BASKETS SHOULD HAVE THE WIRE BASKET REMOVED COMPLETELY TO PREVENT THE POTENTIAL FOR GIRDLED ROOT GROWTH. IN THE EVENT THAT THE ROOT BALL IS UNUSUALLY LOOSE OR SANDY, IT MAY BE PERMITTED TO REMOVE ONLY THE TOP 1/3 OF THE WIRE BASKETS, TOP 2/3 OF BURLAP, AND ALL HOPES OR BINDINGS. THIS CAN BE DETERMINED BY MUTUAL AGREEMENT BY THE STATE INSPECTOR (IF A STATE INSPECTOR IS REQUIRED ON SITE) AND THE AUTHORIZED AGENTS IN RESPONSIBLE CARE FOR THE OVERSIGHT OF TREE INSTALLATION.
21. TREES SHALL BE STAKED IMMEDIATELY AFTER PLANTING IN ACCORDANCE WITH THE DETAIL. ALL SUPPORT SYSTEMS IN DIRECT CONTACT WITH THE TREE TRUNK SHALL BE LOOSELY ATTACHED TO PREVENT GIRDLING. ALL TRUNK PROTECTION WRAPPING SHALL BE REMOVED AT THE TIME OF PLANTING. THE CONTRACTOR SHALL INSTALL NEW TRUNK PROTECTION, OPEN-AIR MATS, MESH TYPE, IN ACCORDANCE WITH THE INSTALL DETAILS.
22. ALL EVERGREEN AND DECIDUOUS TREES FIVE FEET OR GREATER IN HEIGHT SHALL BE STAKED AS PER DETAIL. ALL SUPPORTS SHALL BE REMOVED WITHIN ONE YEAR OF PLANTING FROM TREES THAT DO NOT NEED OBVIOUS STRAIGHTENING.
23. ALL PARKING ISLANDS SHALL BE MULCHED. ALL SHADE/ORNAMENTAL TREES SHALL BE SET IN 5' DIAMETER MULCHED BEDS (MINIMUM) WITH THE TRUNK CENTERED. ALL EVERGREEN TREES SHALL BE SET IN A CIRCULAR MULCHED BED WHICH TOTALLY ENCOMPASSES THE OUTERMOST / LOWEST LIMBS (DRIP LINE) (MINIMUM) OF THE EVERGREEN TREE WITH THE TRUNK CENTERED. IF A SHADE/ORNAMENTAL/EVERGREEN TREE IS IN CLOSE PROXIMITY TO SHRUB MASSING, THE MULCHED BED SHALL BE EXTENDED AROUND THE TREE. ALL SUCH BEDS SHALL RECEIVE A 3" THICK APPLICATION OF DOUBLE SHREDDED HARDWOOD MULCH. THE MULCH SHALL NOT BE PILED IN DIRECT CONTACT WITH THE ROOT COLLAR AREA OF THE TREE.
24. BED LINES SHALL HAVE A CLEAN, SHARP EDGE CUT WITH A SPADE UNLESS OTHERWISE SPECIFIED.
25. ANY CHANGES IN PLANT SPECIES, SIZE, OR LOCATION SHALL BE CONFIRMED AND APPROVED BY THE LANDSCAPE ARCHITECT (DME ASSOCIATES, 732-462-7400) PRIOR TO INSTALLATION. WRITTEN APPROVAL OF ANY PLANT MATERIAL CHANGE MAY BE REQUIRED BY THE MUNICIPALITY'S LANDSCAPE ARCHITECT, STATE INSPECTOR, OR SHADE TREE COMMISSION. ALL SUBSTITUTIONS WILL BE OF EQUAL OR GREATER SIZE THAN THE ORIGINALLY SPECIFIED PLANT.
26. ALL PLANTING MATERIALS AND METHODS SHALL MEET OR EXCEED THE REQUIREMENTS SET FORTH BY THE MUNICIPALITY AND LATEST EDITION OF THE OF THE AMERICAN STANDARDS FOR NURSERY STOCK. THE LANDSCAPE CONTRACTOR SHOULD BE PREPARED TO MAKE AVAILABLE UPON REQUEST, A NURSERY STOCK CERTIFICATE OR PLANT DEALER CERTIFICATION TO CONFIRM NURSERY STOCK CERTIFICATION BY THE NEW JERSEY DEPARTMENT OF AGRICULTURE.
27. ALL AREAS WHICH ARE TO BE DISTURBED BEYOND THE MULCHED BEDS SHALL BE SEEDED WITH THE TURF GRASS MIXTURE FOUND IN THE SOIL EROSION AND SEDIMENT CONTROL DETAIL SHEET OR SODDED, IF NOTED..
28. NO SHADE TREE SHALL BE LOCATED CLOSER THAN 10' FROM ANY LIGHT FIXTURE.
29. TREES LOCATED WITHIN THE SIGHT TRIANGLE EASEMENTS SHALL HAVE THE LOWEST BRANCH MAINTAINED AT A MINIMUM HEIGHT OF 10'0" ABOVE THE INTERSECTING CENTERLINES OR WHICH IS INDICATED BY THE MUNICIPALITY'S ORDINANCE. SHRUBS SHALL BE MAINTAINED AT A HEIGHT NOT TO EXCEED 30" ABOVE THE INTERSECTING CENTERLINES.
30. ALL TREES UTILIZED FOR STREET TREE PLANTINGS SHALL BE NURSERY PRUNED TO 7' FEET (MINIMUM).
31. ALL EXISTING LANDSCAPING LOCATED ON-SITE TO REMAIN, UNLESS OTHERWISE INDICATED ON THE PLAN.
32. IF THERE ARE ANY DISCREPANCIES BETWEEN PLANT LIST AND PLAN, PLAN SHALL BE CONTROLLING.
33. ADEQUATE CLEARANCE MUST BE PROVIDED FOR ALL DRIVEWAYS, UTILITIES AND WALKWAYS.
34. PER ORDINANCE 1-339-15: "...ANY PERSON PLANNING TO REMOVE A STREET TREE WITH DBH OF 2.5 INCHES OR MORE OR ANY NON-STREET TREE WITH DBH OF SIX INCHES OR MORE ON THEIR PROPERTY SHALL SUBMIT A TREE REMOVAL APPLICATION TO THE DIRECTOR OF PUBLIC WORKS. NO TREE SHALL BE REMOVED UNTIL THE DIRECTOR OF PUBLIC WORKS OR THE DIRECTOR OF THE SHADE TREE COMMISSION HAS REVIEWED AND APPROVED THE TREE REMOVAL APPLICATION." DEPENDING ON THE FINAL CALCULATIONS OF TREES REMOVED, AN AMENDMENT TO INCLUDE MORE TREES ON THE LANDSCAPE PLANS WILL BE ISSUED.
35. PLANT QUANTITIES ON PLAN SUPERSEDE PLANT SCHEDULE IF A DIFFERENCE IN QUANTITIES OCCURS.
36. THE CONTRACTOR IS ADVISED THAT ADDITIONAL "IF AND WHERE DIRECTED" QUANTITY FOR VARIOUS TREE PLANTINGS HAVE BEEN INCLUDED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL INSTALL THE TREES AT LOCATIONS DETERMINED BY THE COUNTY, ENGINEER, AND LANDSCAPE ARCHITECT THROUGHOUT THE PROJECT SITE.





CROSS SECTION OF TYPICAL PLANT GROUPING

Estimate a tree's Protect Root Zone (PRZ) by calculating the Critical Root Radius (CRR):

1. Measure the DBH (diameter of tree at breast height, 4.5 feet above ground on the uphill side of tree) in inches.
2. Multiply measured DBH by 1.5 or 1.0. Express the result in feet.

DBH x 1.5: Critical Root Radius for older, unhealthy, or sensitive species.

DBH x 1.0: Critical Root Radius for younger, healthy or tolerant species.

As the major part of the root systems of the plant(s) to be protected are within the critical root radius / dripline zone, this entire area should be fenced off (to a maximum height of 4'-0") prior to construction and removed thereafter. For maximum protection, no vehicle trespass, excavation, fill, waste discharge or material storage should be allowed in this zone.

TREE PROTECTION DETAIL

N.T.S.

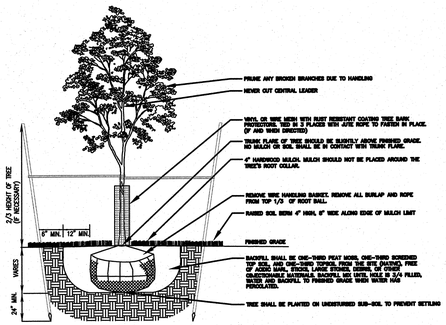
WORKING/DESIGN DRAWING NOTES:

1. THE CONTRACTOR IS HEREIN ADVISED THAT THE DESIGN DRAWINGS CONTAIN A PRELIMINARY DESIGN LAYOUT FOR THE CONSTRUCTION OF THE REINFORCED CONCRETE FOOTINGS AND REINFORCED MASONRY PIERS FOR THE STONE VENEER PILLARS THAT WILL BE REQUIRED FOR THIS PROJECT. THESE DETAILS PROVIDE FOR MINIMUM DIMENSIONS AND MINIMUM REQUIREMENTS FOR THE STRUCTURES AND STRUCTURAL ELEMENTS TO BE DESIGNED AND BUILT. AS A PART OF THE BID FOR THIS PROJECT, THE CONTRACTOR WILL BE REQUIRED TO RETAIN THE SERVICES OF A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW JERSEY TO DESIGN ALL OF THESE STRUCTURAL ELEMENTS FOR THE REINFORCED CONCRETE FOOTINGS AND REINFORCED MASONRY PIERS SPECIFIED AND TO FINALIZE ALL DIMENSIONS.
2. THE CONTRACTOR'S ENGINEER WILL BE REQUIRED TO REVIEW THE PRELIMINARY DESIGN LAYOUT FOR STRUCTURAL DESIGN LOADS, CODE COMPLIANCE (IBC, NJ LATEST EDITION AND ASCE LATEST EDITION) AND CONSTRUCTABILITY.
3. CONTRACTOR TO PERFORM A GEOTECHNICAL SUBSURFACE INVESTIGATION PROGRAM TO OBTAIN SOIL DESIGN PROPERTIES FOR THE DESIGN OF THE STRUCTURES AND STRUCTURAL ELEMENTS. THIS PROGRAM IS TO BE PERFORMED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW JERSEY RETAINED BY THE CONTRACTOR.
4. THE CONTRACTOR'S ENGINEER WILL BE REQUIRED TO SUBMIT DETAILED DESIGN CALCULATIONS, SHOP DRAWINGS AND/OR CATALOG CUTS TO THE OWNER'S ENGINEER FOR REVIEW AND APPROVAL FOR THE SPECIFIED REINFORCED CONCRETE FOOTINGS AND REINFORCED MASONRY PIERS PRIOR TO ANY FABRICATION OR CONSTRUCTION. THE CONTRACTOR'S ENGINEER'S LAYOUT SHALL BE BASED ON THE PRELIMINARY LAYOUT SHOWN ON THESE DRAWINGS.
5. UPON APPROVAL BY THE OWNER'S ENGINEER, THE CONTRACTOR'S LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW JERSEY SHALL PROVIDE SIX (6) SETS OF SIGNED AND SEALED DETAILED DOCUMENTS TO THE OWNER'S ENGINEER FOR USE BY THE CONTRACTOR DURING CONSTRUCTION. THE COSTS ASSOCIATED WITH RETAINING A LICENSED PROFESSIONAL ENGINEER, INCLUDING PROVIDING THE REQUIRED DOCUMENTS SHALL NOT BE MEASURED SEPARATELY FOR PAYMENT. THESE COSTS SHALL BE INCLUDED IN THE PRICE BID FOR THE NEW STRUCTURES, INCLUDING ALL APPURTENANCES, AS DESCRIBED HEREIN.

FOUNDATION DESIGN NOTES:

1. MINIMUM DEPTH OF FOUNDATION SHALL BE 3 FEET BELOW THE FINISHED GRADE TO MEET FROST DEPTH REQUIREMENTS, OR AS INDICATED IN THE SECTION VIEWS.
2. BACKFILL COMPRISED OF IMPORTED 3/4" QUARRY PROCESS CLEAN CRUSHED STONE SHALL BE PLACED IN A MAXIMUM 8-INCH LOOSE LIFT THICKNESS AND COMPACTED TO AT LEAST 95% OF THE OPTIMUM DENSITY AS DETERMINED BY ASTM D1557. COMPACT WITH A MINIMUM OF 4 PASSES OF A VIBRATORY PLATE OR WALK-BEHIND ROLLER COMPACTOR.
3. FOUNDATION MATERIAL SPECIFICATIONS:
   - A. FOUNDATION CONCRETE CONFORMING TO SPECIFICATIONS WITH MINIMUM FC' = 4000 PSI
   - B. REINFORCING STEEL SHALL CONFORM TO ASTM A615 GRADE 60 OR BETTER. ALL REINFORCING STEEL BARS, DOWELS AND WELDED WIRE FABRIC SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A767.
   - C. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 WITH MINIMUM YIELD STRESS OF 85000 PSI.

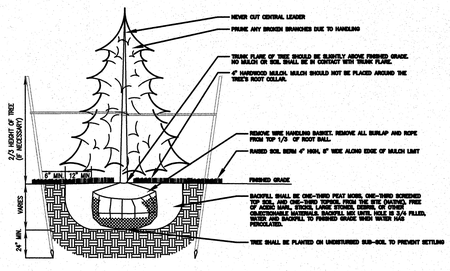
NOTE:
CONTRACTOR TO SUBMIT SAMPLES OF CULTURED STONE DURING THE SHOP SUBMITTAL PROCESS. PATTERN OF STONE VENEER USED SHALL BE STONEMONT SPLIT LEDGE OR APPROVED EQUAL. ALL MATERIAL SELECTIONS ARE SUBJECT TO THE REVIEW AND APPROVAL OF THE COUNTY AND THE ENGINEER PRIOR TO INSTALLATION.



DECIDUOUS TREE PLANTING DETAIL

N.T.S.

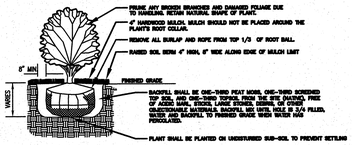
NOTES:
1. TREE STAKES ONLY TO BE USED IF NECESSARY TO CORRECT LEANING TREE.
2. TREE STAKES ARE TO BE3" O.D. CEDAR, OR APPROVED EQUAL. ALIGN WITH PREVAILING WINDS PLACED OUTSIDE OF PLANTING PIT BUT WITHIN MULCH BED WITH "ARBOR TIE', WRAPPED ONCE AROUND TREE AND TWICE AROUND STAKE, TO BE SET 1/3 TREE HEIGHT MEASURED UP FROM ROOT BALL.



CONIFER TREE PLANTING DETAIL

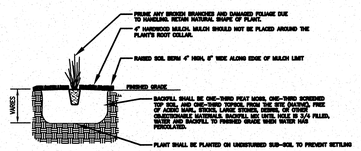
N.T.S.

NOTES:
1. TREE STAKES ONLY TO BE USED IF NECESSARY TO CORRECT LEANING TREE.
2. TREE STAKES ARE TO BE3" O.D. CEDAR, OR APPROVED EQUAL. ALIGN WITH PREVAILING WINDS PLACED OUTSIDE OF PLANTING PIT BUT WITHIN MULCH BED WITH "ARBOR TIE', WRAPPED ONCE AROUND TREE AND TWICE AROUND STAKE, TO BE SET 1/3 TREE HEIGHT MEASURED UP FROM ROOT BALL.



SHRUB PLANTING DETAIL

N.T.S.



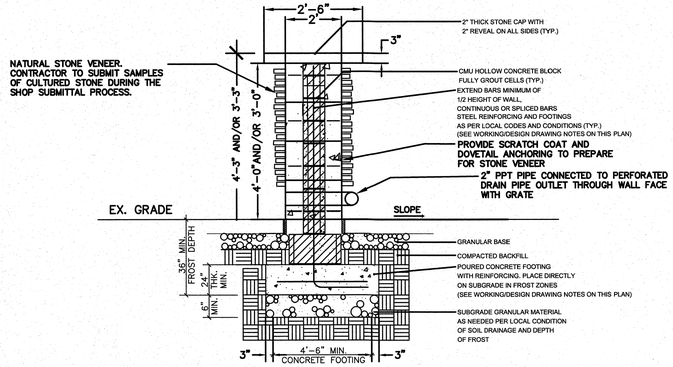
PERENNIAL PLANTING DETAIL

N.T.S.

4' HIGH COMMERCIAL STEEL GATE FENCE

N.T.S.

NOTE:
FENCE SHALL BE ECHELON II CLASSIC GATE BY MAGESTIC, MANUFACTURED BY AMERISTAR (1-888-333-3422) OR APPROVED EQUAL



STONE VENEER PILLAR SECTION

NTS

NOTE:
SIGNED AND SEALED DRAWINGS FOR BUILDING PERMITS OF ENTRY WALL SHALL BE PROVIDED BY THE CONTRACTOR. NO SEPARATE PAYMENT WILL BE MADE.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

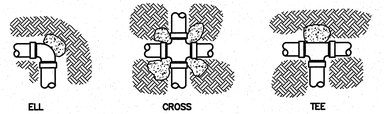
TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

LANDSCAPING PLAN AND DETAILS

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28339000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	As Shown
DATE	October 2024
DRAWN BY	AM
DESIGNED BY	AM/KT
CHECKED BY	KT
SHEET	88 of 139
DRAWING NUMBER	
REGISTER NO.	
FILE NO.	115.UN00213.P05

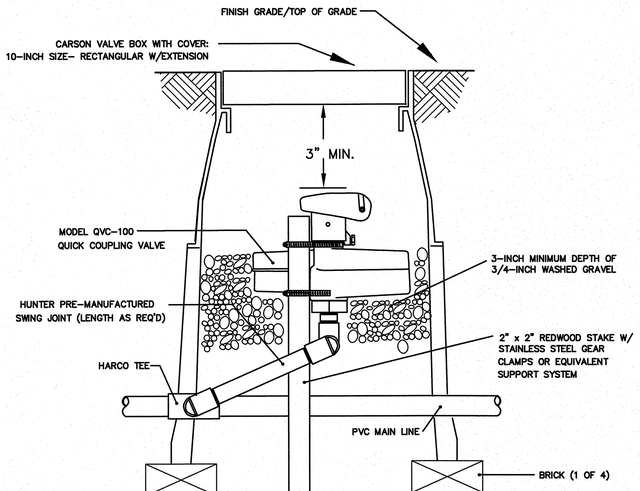


NOTES:

1. SUPPLY LINES 3-INCHES IN DIAMETER AND LARGER SHALL RECEIVE CONCRETE THRUST BLOCKS.
2. SEE SPECIFICATIONS FOR AMOUNT OF CONCRETE TO BE USED FOR THRUST BLOCK.

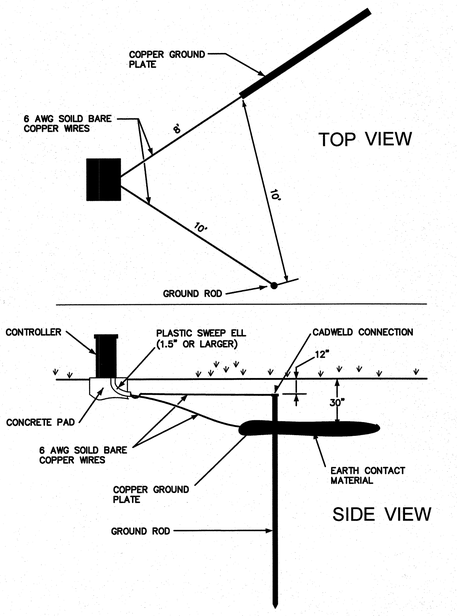
THRUST BLOCK

N.T.S.



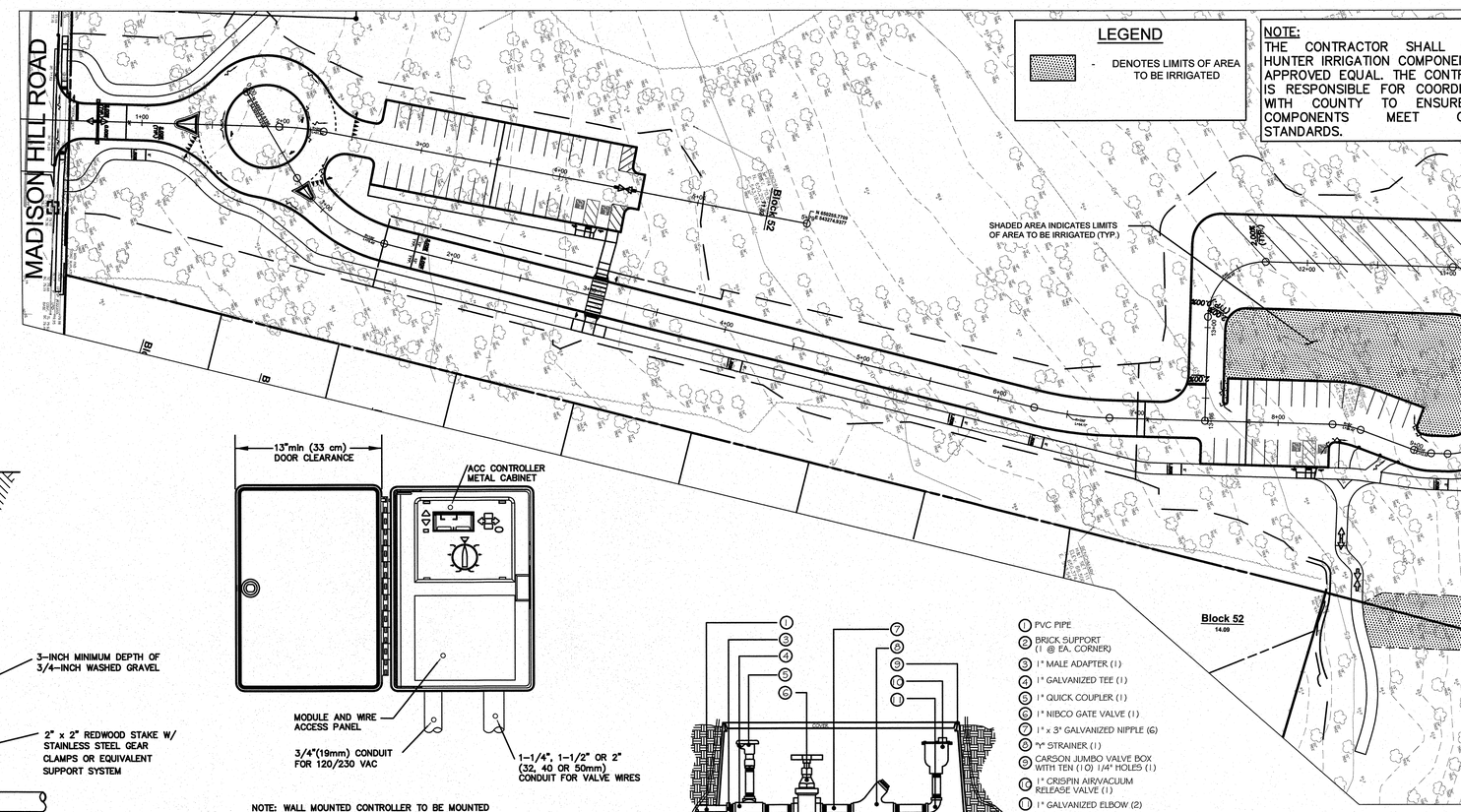
QUICK COUPLING VALVE

MODEL: HUNTER QCV-100 N.T.S.



IRRIGATION CONTROLLER GROUNDING

TYPICAL INSTALLATION N.T.S.



IRRIGATION AREA

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

NOTE: WALL MOUNTED CONTROLLER TO BE MOUNTED WITHIN SENIOR CENTER BUILDING.

HUNTER IRRIGATION SYSTEM CONTROLLER

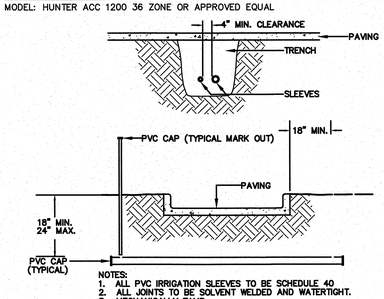
MODEL: HUNTER ACC 1200 36 ZONE OR APPROVED EQUAL N.T.S.

1. PVC PIPE
2. BRICK SUPPORT (1 @ EA. CORNER)
3. 1" MALE ADAPTER (1)
4. 1" GALVANIZED TEE (1)
5. 1" QUICK COUPLER (1)
6. 1" NIBCO GATE VALVE (1)
7. 1" x 3" GALVANIZED NIPPLE (6)
8. "Y" STRAINER (1)
9. CARSON JUMBO VALVE BOX WITH TEN (10) 1/4" HOLES (1)
10. 1" CRISPIN AIR/VACUUM RELEASE VALVE (1)
11. 1" GALVANIZED ELBOW (2)
12. 2 CU. FT. PEA GRAVEL SUMP
13. 1/5 FILTER FABRIC

NOTE: NUMBERS IN PARENTHESES DELINEATE THE TOTAL NUMBER REQUIRED FOR CONSTRUCTION

AIR/VACUUM RELEASE VALVE ASSEMBLY W/ QUICK COUPLER

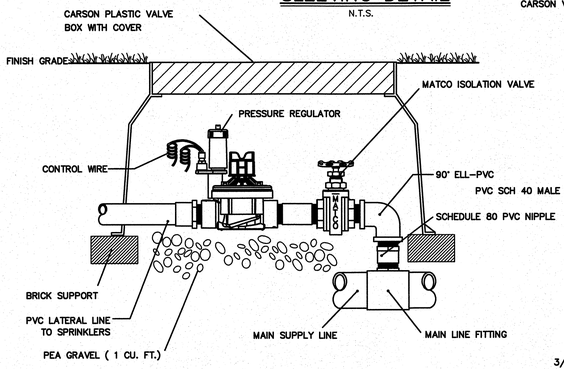
MODEL: CRISPIN IC-10 OR APPROVED EQUAL N.T.S.



NOTES:
1. ALL PVC IRRIGATION SLEEVES TO BE SCHEDULE 40
2. ALL JOINTS TO BE SOLVENT WELDED AND WATERTIGHT.
3. MECHANICALLY TAMP

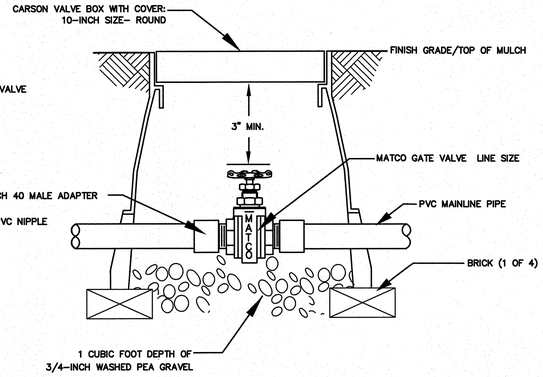
SLEEVING DETAIL

N.T.S.



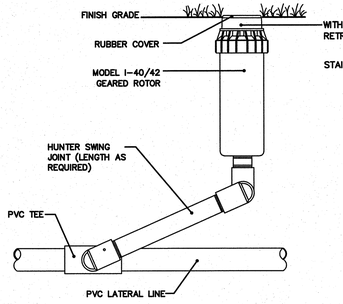
ELECTRIC VALVES

MODEL: HUNTER ICV OR APPROVED EQUAL N.T.S.



MATCO ISOLATION GATE VALVE

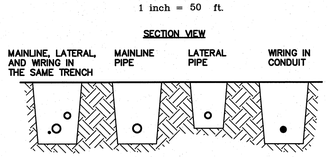
N.T.S.



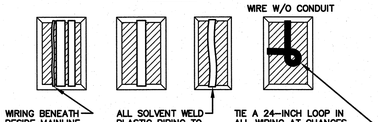
HUNTER ROTOR SPRINKLER

MODEL: HUNTER I-40/42 OR APPROVED EQUAL N.T.S.

SECTION VIEW



PLAN VIEW

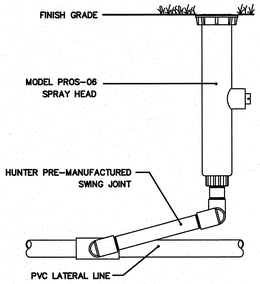


NOTES:

1. SLEEVE BELOW ALL HARDSCAPE ELEMENTS WITH CLASS 200 PVC TWICE THE DIAMETER OF THE PIPE OR WIRE BUNDLE WITHIN.
2. FOR PIPE AND WIRE BURIAL DEPTHS SEE SPECIFICATIONS.

PIPE AND WIRE TRENCHING DETAIL

N.T.S.



POP-UP SPRINKLER PRO SPRAY HEAD

MODEL: HUNTER PROS-06 APPROVED EQUAL N.T.S.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CENTRAL LAKE PARK

IRRIGATION PLAN AND DETAILS

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO.

FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY TE	DESIGNED BY TE	
CHECKED BY	SHEET 89 of 139	

1. INSTALL ALL WORK IN ACCORDANCE WITH THE CURRENT NATIONAL ELECTRIC CODE AND ALL APPLICABLE STATE AND LOCAL CODES. WHERE THE PROJECT DRAWINGS AND/OR SPECIFICATIONS DIFFER FROM THE GOVERNING CODE THE MORE STRINGENT REQUIREMENTS WILL GOVERN THE INSTALLATION.

2. CONTRACTOR SHALL PAY FOR ALL REQUIRED PERMITS AND LICENSES REQUIRED UNDER THIS CONTRACT.

3. THE CONTRACTOR SHALL VISIT AND INSPECT THE PREMISES IN ORDER TO BE FAMILIAR WITH THE EXISTING SITE CONDITIONS WHICH MAY AFFECT THE INSTALLATION OF THE WORK SHOWN ON THE PROJECT DRAWINGS. NO ADDITIONAL COMPENSATION SHALL BE GRANTED FOR THE CONTRACTOR'S FAILURE TO VISIT AND INSPECT THE SITE.

4. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL WORK AS SHOWN ON THE PROJECT DRAWINGS AND SPECIFICATIONS WITH THE FOLLOWING UNDERSTANDINGS:

A) THE PROJECT DRAWINGS ARE ONLY DIAGRAMMATIC IN NATURE AND ARE INTENDED TO OUTLINE THE BASIC SYSTEMS TO BE PROVIDED. THEREFORE MINOR DETAILS AND APPURTENANCES MAY OR MAY NOT BE SHOWN. THE OMISSION OF A MINOR COMPONENT SHALL NOT RELIEVE THE CONTRACTOR OF THEIR RESPONSIBILITY TO FURNISH AND INSTALL ALL SUCH ITEMS NECESSARY TO PROVIDE A COMPLETE, OPERATIVE, AND CODE COMPLIANT SYSTEM TO THE OWNER. IF THERE ARE ANY DOUBTS TO THE EXTENT OR SCOPE OF WORK REQUIRED THE ENGINEER SHALL BE CONTACTED TO PROVIDE CLARIFICATION DURING THE BID PHASE.

B) THE PROJECT DRAWINGS SHOW INTENDED EQUIPMENT LOCATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY MINOR ADJUSTMENTS OR RELOCATIONS NECESSARY DUE TO THE CHOICE OF EQUIPMENT AND COORDINATION CONFLICTS. ALL EQUIPMENT RELOCATIONS MUST BE APPROVED BY THE ARCHITECT OR ENGINEER.

5. WORK UNDER THIS CONTRACT INCLUDES THE FURNISHING OF EQUIPMENT, MATERIAL, TOOLS, TRANSPORTATION, SERVICES, SCAFFOLDING, SUPERVISION, LABOR AND OTHER APPURTENANCES REQUIRED FOR THE FABRICATION, INSTALLATION,OR APPLICATION AND COMPLETION OF THE WORK UNDER THIS SECTION AS SHOWN OR IMPLIED ON THE PROJECT DRAWINGS AND SPECIFICATIONS.

6. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, DIMENSIONS, EXISTING UTILITY LOCATIONS, AND ELECTRICAL EQUIPMENT REQUIREMENTS PRIOR TO STARTING WORK.

7. CONTRACTOR TO SUBMIT CUTSHEETS AND CALCULATIONS WHERE APPLICABLE FOR ANY EQUIPMENT OR DEVICES THAT DIFFER FROM THOSE SPECIFIED ON THE PROJECT DRAWINGS OR SPECIFICATIONS PRIOR TO THE START OF WORK.

8. COORDINATE ALL WORK WITH THAT OF OTHER TRADES AFFECTING, OR EFFECTED BY, WORK OF THIS SECTION. COOPERATE WITH SUCH TRADES TO ASSURE THE STEADY PROGRESS OF ALL WORK UNDER THIS CONTRACT.

9. ARRANGE ALL WORK TO PROCEED AS RAPIDLY AS POSSIBLE IN COOPERATION WITH OTHER TRADES. COOPERATE WITH OTHER TRADES AS NECESSARY TO AVOID CONFLICTS DURING CONSTRUCTION

10. ALL EQUIPMENT, MATERIALS, INSTALLATIONS AND CONSTRUCTION ACTIVITIES SHALL COMPLY WITH ALL REQUIREMENTS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION WHEREVER THEY APPLY.

11. CONTRACTOR SHALL BE RESPONSIBLE FOR PLANNING THEIR OWN WORK AND FOR ANY DAMAGE CAUSED TO THE OWNER OR OTHER CONTRACTORS BY IMPROPER WORK EXECUTION OR PLACEMENT OF RACEWAYS, WIRING, AND EQUIPMENT

12. PROVIDE TEMPORARY LIGHTING AND POWER DURING CONSTRUCTION AS REQUIRED.

13. MAINTAIN ELECTRIC SERVICE CONTINUITY TO ALL EQUIPMENT OUTSIDE OF CONSTRUCTION AREA. NOTIFY OWNER IN WRITING 48 HOURS IN ADVANCE OF ANTICIPATED UTILITY OUTAGES. OBTAIN WRITTEN PERMISSION TO CONDUCT ALL WORK REQUIRING AN OUTAGE.

14. CONDUIT RUNS ARE DIAGRAMMATIC AND EQUIPMENT LOCATIONS ARE APPROXIMATE. ELECTRICAL CONTRACTOR IS TO ROUTE CONDUIT AND TO VERIFY EXISTING CONDITIONS IN THE FIELD.

15. ALL CIRCUITS SHALL BE RUN IN RGS WHERE EXPOSED OR IN FRAMED PARTITIONS FROM THE PANEL BOARD TO DISCONNECT OR CONTROLLER, UNLESS OTHERWISE NOTED.

16. ALL CONDUIT TERMINATING AT MOTORS, SOLENOID VALVES, VIBRATING DEVICES, DUCT AND PIPE MOUNTED SWITCHES AND DEVICES SHALL TERMINATE IN FLEXIBLE METAL CONDUIT FOR INDOOR EQUIPMENT OR LIQUID-TIGHT FLEXIBLE METAL CONDUIT FOR OUTDOOR EQUIPMENT OR IN DAMP OR WET LOCATIONS.

17. ALL BRANCH CIRCUITS SHALL BE IN CONDUIT.

18. ALL WIRING TO BE COPPER WITH 600V INSULATION. ALL WIRING TO #4 AND SMALLER SHALL BE TYPE THHN/THWN, ALL WIRING LARGER THAN #4 SHALL BE XHHW, ALL WIRING UNDERGROUND TO BE TYPE XHHW-2, UNLESS OTHERWISE NOTED.

19. ALL POWER WIRING TO BE MINIMUM #12 AWG SIZE, ALL CONTROL WIRING TO BE #14 AWG UNLESS OTHERWISE NOTED

20. ALL CONDUIT TO BE 3/4" MINIMUM SIZE UNLESS OTHERWISE NOTED.

21. WIRE ALL 20A CIRCUITS USING #12 AWG, ALL 30A CIRCUITS USING #10 AWG UNLESS OTHERWISE NOTED. #12 AWG SHALL BE MINIMUM POWER WIRE SIZE.

22. SIZE BRANCH CIRCUITS, PANEL HOME RUNS, AND DEVICE CIRCUITING PER NEC 310-15. WHERE SINGLE PHASE 20A AND 30A BRANCH CIRCUITS EXCEED 100 FEET IN LENGTH INCREASE CONDUCTOR SIZE ONE SIZE FOR EVERY ADDITIONAL 100 FEET OF CONDUCTOR LENGTH UNLESS THE CONDUCTOR HAS ALREADY BEEN INCREASED DUE TO CONDUIT FILL DEGRADING. SUBMIT VOLTAGE DROP CALCULATIONS TO THE ENGINEER FOR APPROVAL.

23. ALL BRANCH CIRCUITS ARE TO CONTAIN A GREEN COLORED EQUIPMENT GROUNDING CONDUCTOR SIZED PER NEC TABLE 250.95.

24. GROUNDING AND BONDING OF ALL NON CURRENT CARRY METALLIC PARTS OF ALL ELECTRICAL EQUIPMENT AND ENCLOSURES INCLUDING CONDUITS, SUPPORTS, CONTROLLERS, RACEWAYS, TRANSFORMERS, ELECTRICAL PANELS, MOTOR FRAMES, ETC. INSTALLED OR CONNECTED UNDER THIS CONTRACT SHALL BE PROPERLY CONNECTED TO THE GROUNDING SYSTEM, REGARDLESS OF WHETHER OR NOT THE CONNECTIONS ARE SHOWN ON THE PROJECT DRAWINGS.

25. ALL CIRCUITS SHALL NOT SHARE NEUTRALS UNLESS SHOWN OTHERWISE ON THE PROJECT DRAWINGS. EACH CIRCUIT SHALL BE ROUTED WITH ITS OWN DEDICATED NEUTRAL FROM OVER CURRENT PROTECTION DEVICE TO POINT OF CONNECTION AT EQUIPMENT.

26. ALL ISOLATED GROUND CIRCUITS SHALL HAVE A DEDICATED #12 AWG CONDUCTOR INSTALLED IN ADDITION TO THE SAFETY GROUND CONDUCTOR.

27. PROVIDE INSULATING BUSHINGS FOR CONDUCTOR PROTECTION AT CONDUIT TERMINATIONS.

28. BEFORE ENERGIZING OR STARTING ANY DEVICE OR PIECE OF EQUIPMENT VERIFY THAT IT HAS BEEN INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. ADHERE TO ALL MANUFACTURER'S GUIDELINES AND START-UP REQUIREMENTS.

29. ALL DISCONNECT SWITCHES, STARTERS, OPERATORS, AND ENCLOSURES SHALL BE UL LISTED AND/OR FACTORY MUTUAL (FM) APPROVED.

30. LOCATE ELECTRICAL EQUIPMENT IN THE FIELD AS SPACE LIMITATIONS AND CONDITIONS PERMIT IN ORDER TO SATISFY MINIMUM WORKING SPACE OF NEC 110-26.

31. PROVIDE MOUNTING FRAMES AND STRUCTURAL SUPPORT FROM PLATFORMS, FLOORS, AND CEILING STEEL AS REQUIRED FOR ELECTRICAL EQUIPMENT. STRUCTURAL SUPPORT SHALL BE CONSTRUCTED TO MAINTAIN A SAFETY FACTOR OF 4 WITH A 200 LB MINIMUM.

32. LABEL ALL NEW ELECTRICAL EQUIPMENT AND PANELS WITH MINIMUM 1/2" LETTERS USING THERMAL TRANSFER LABEL SYSTEM. PROVIDE TYPE WRITTEN PANEL SCHEDULES FOR ALL PANEL BOARDS.

33. CONTRACTOR TO FOLLOW ALL OWNER SITE AND SAFETY RULES. CONTRACTOR IS RESPONSIBLE FOR DAILY SITE CLEANING FOR THEIR ACTIVITIES. BROOM CLEAN DAILY AND REMOVE ALL CONSTRUCTION DEBRIS FROM THE BUILDING AND GROUNDS DAILY.

34. UPON COMPLETION PROVIDE AN ACCURATE "MARKED-UP" SET OF PROJECT DRAWINGS REFLECTING ALL FIELD CHANGES TO THE ARCHITECT.

35. ALL TRANSFORMER WINDINGS, PANEL BUSSES AND ALL CURRENT CARRYING COMPONENTS TO BE COPPER.

36. ALL PANELS TO HAVE A MINIMUM SHORT CIRCUIT INTERRUPTING RATING OF 36,000 AIC UNLESS OTHERWISE NOTED.

37. ALL UNDERGROUND CONDUIT TO BE PVC SCHEDULE 80 WITH EXPANSION COUPLINGS EVERY 100 FT. UNLESS OTHERWISE NOTED. CONTRACTOR SHALL PROVIDE PULL-IN LINE, TO BE PLACED IN CONDUIT DURING CONSTRUCTION.

38. PROVIDE DISCONNECTS FOR ALL EQUIPMENT REQUIRED BY THE CURRENT EDITION OF THE NATIONAL ELECTRIC CODE.

39. PROVIDE ELECTRICAL TESTING IN ACCORDANCE WITH THE SPECIFICATIONS.

40. REQUIRED SUBMITTAL IN ADDITION TO REQUIREMENTS OF EACH SPECIFICATION SECTION, PARK LIGHTING FIXTURES, GENERAL ARRANGEMENT DRAWING, PANELBOARD LAYOUT, WIRING DIAGRAM AND CONDUIT RUNS LAYOUT SHALL BE REQUIRED SUBMITTAL.

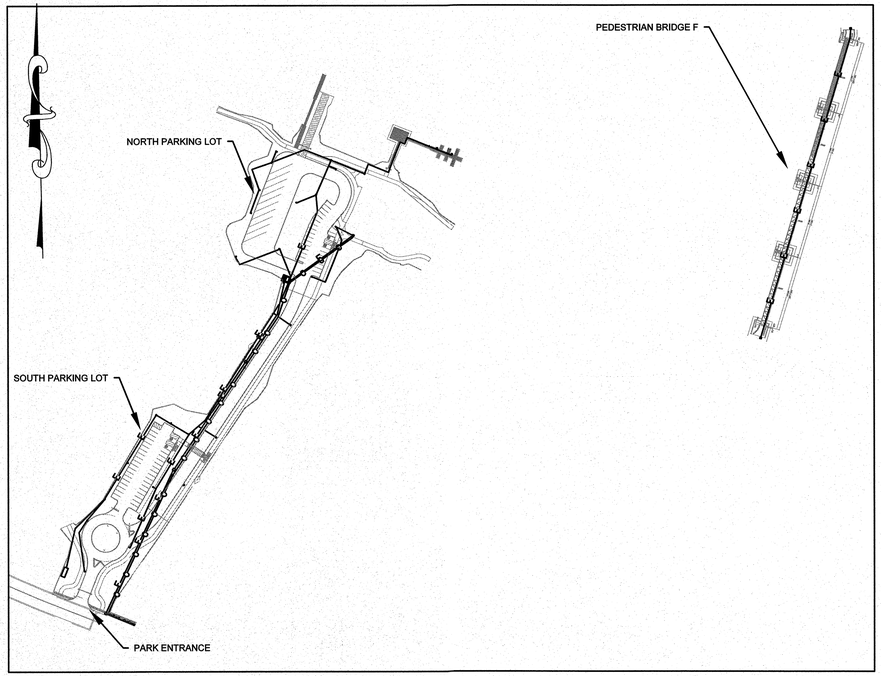
41. PROVIDE 4FT MINIMUM SEPARATION BETWEEN WATERLINE & ELECTRICAL CONDUIT.

42. CONTRACTOR SHALL CONFIRM THE SHORT CIRCUIT SUPPLIED BY THE UTILITY. FINAL APPROVALS OF ALL SHOP DRAWINGS SHALL BE CONTINGENT THAT ALL EQUIPMENT COMPLIES WITH MAXIMUM SHORT CIRCUIT REQUIREMENTS

ABBREVIATIONS:

A / AMP	AMPERAGE
AC	ALTERNATING CURRENT
ADJ	ADJACENT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ARCH	ARCHITECTURAL
ATS	AUTOMATIC TRANSFER SWITCH
C	CONDUIT
CAB	CABINET
CB	CIRCUIT BREAKER
CKT(S)	CIRCUIT(S)
COL	COLUMN
CP	CONTROL PANEL
DIA	DIAMETER
D.S.	DISCONNECT SWITCH
DWG(S)	DRAWING(S)
EF	EXHAUST FAN
ELEC	ELECTRIC / ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
EX	EXISTING
GFI	GROUND FAULT INTERRUPT
G / GND	GROUND
J / JB	JUNCTION BOX
KVA	KILOVOLT-AMP
KW	KILOWATT
LTG	LIGHTING
MTD	MOUNTED
MCB	MAIN CIRCUIT BREAKER
N	NEUTRAL
NEMA	NATIONAL ELECTRICAL MANUFACTURER ASSOCIATION
N.T.S.	NOT TO SCALE
OHM	OHMS
P	POLE(S)
PH	PHASE
PB	PULL BOX
PNL	PANEL / PANELBOARD
PRI	PRIMARY
RGS	RIGID GALVANIZED STEEL
S.D.	SERVICE DICONNECT
SEC	SECONDARY
SPEC	SPECIFICATIONS
SPD	SURGE PROTECTIVE DEVICE
SS	STAINLESS STEEL
STD	STANDARD
SW	SWITCH
TRANS	TRANSFORMER
TYP.	TYPICAL
U.O.N.	UNLESS OTHERWISE NOTED
V	VOLT
VA	VOLT-AMP
W	WATT
WP	WATERPROOF
XFMR	TRANSFORMER

ELECTRICAL SYMBOL LIST	
	GROUND CONNECTION
	TRANSFORMER
	CIRCUIT BREAKER SIZE AND POLES AS SHOWN
	BOLLARD
	UTILITY ELECTRIC SERVICE
	ELECTRICAL PANELBOARD
G	GROUND ROD
	EXISTING UTILITY POLE
E	UNDERGROUND ELECTRICAL CONDUIT
	ELECTRICAL HAND-HOLE (SIZE AS NOTED ON DRAWING)
C	UNDERGROUND TELECOMMUNICATION CONDUIT
GFCI	GFCI RECEPTACLE



1 / E-1 ELECTRICAL SITE PLAN

1" = 150'

GRAPHIC SCALE

150 0 75 150 300 600

(IN FEET)

1 inch = 150 ft.

INDEX OF ELECTRICAL DRAWINGS

SHEET NO.	DWG NO.	DESCRIPTION
90 OF139	E-1	GENERAL ELECTRICAL NOTES, ABBREVIATIONS & SYMBOL LIST
91 OF 139	E-2	PARTIAL ELECTRICAL SITE PLAN & DETAILS
92 OF 139	E-3	ELECTRICAL ENLARGED PLANS
93 OF 139	E-4	SINGLE LINE DIAGRAM
94 OF 139	E-5	ELECTRICAL DETAILS

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	CP	RL	
1.	REVISED FOR RE-BID	12/18/2024	CP/JC	RL	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

GENERAL ELECTRICAL NOTES, ABBREVIATIONS & SYMBOL LIST

CVE ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

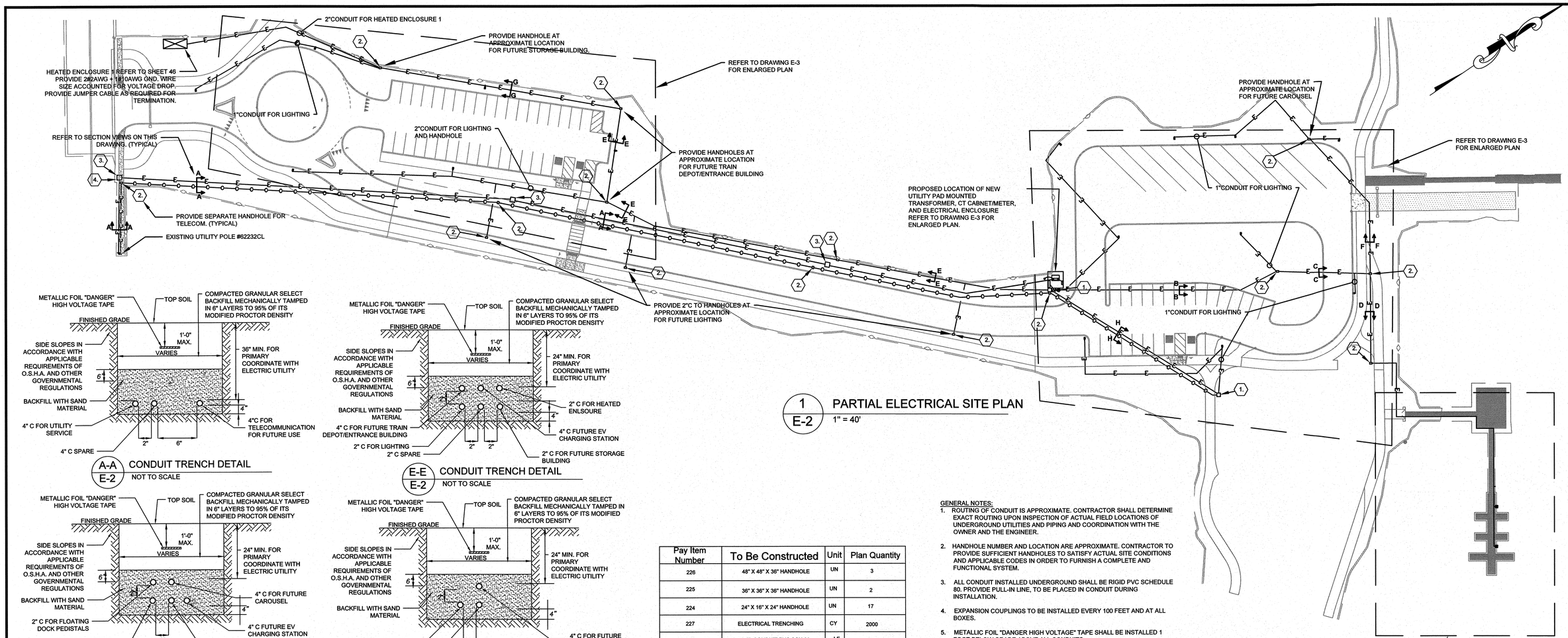
RICHARD S. LAFORTUNE, PE
NEW JERSEY PROFESSIONAL ENGINEER LIC. 41600
DATE 4/2/2025

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468
DATE

SCALE	As Shown
DATE	October 2024
DRAWN BY	CP/JVC
DESIGNED BY	CP/JVC
CHECKED BY	RL
SHEET	90 of 139

DRAWING NUMBER E-1

REGISTER NO. 115.UN00213.P05
CVE JOB NO.



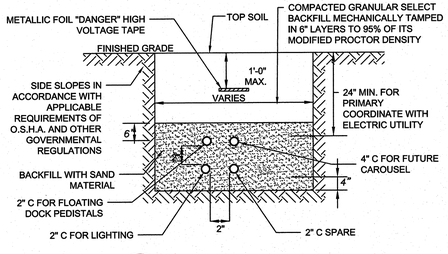
1 / E-2 PARTIAL ELECTRICAL SITE PLAN
1" = 40'

A-A / E-2 CONDUIT TRENCH DETAIL
NOT TO SCALE

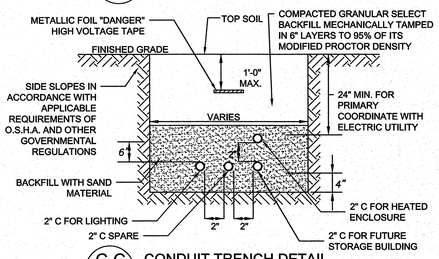
E-E / E-2 CONDUIT TRENCH DETAIL
NOT TO SCALE

B-B / E-2 CONDUIT TRENCH DETAIL
NOT TO SCALE

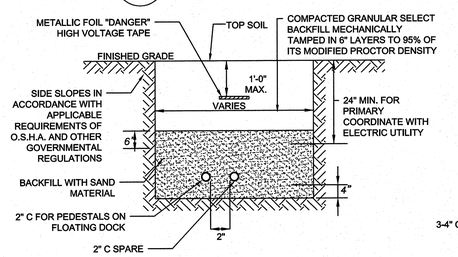
F-F / E-2 CONDUIT TRENCH DETAIL
NOT TO SCALE



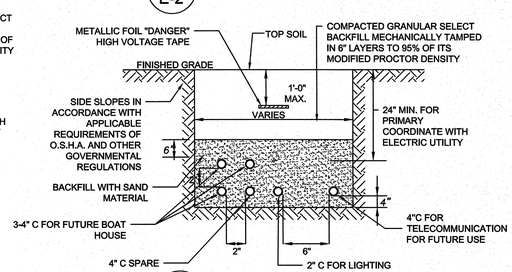
C-C / E-2 CONDUIT TRENCH DETAIL
NOT TO SCALE



G-G / E-2 CONDUIT TRENCH DETAIL
NOT TO SCALE



D-D / E-2 CONDUIT TRENCH DETAIL
NOT TO SCALE



H-H / E-2 CONDUIT TRENCH DETAIL
NOT TO SCALE

Pay Item Number	To Be Constructed	Unit	Plan Quantity
226	48" X 48" X 36" HANDHOLE	UN	3
225	36" X 36" X 36" HANDHOLE	UN	2
224	24" X 16" X 24" HANDHOLE	UN	17
227	ELECTRICAL TRENCHING	CY	2000
203	1" CONDUIT PVC SCH 80	LF	1100
202	2" CONDUIT PVC SCH 80	LF	5285
201	4" CONDUIT PVC SCH 80	LF	4290
210	800A MAIN DISTRIBUTION PANEL, 100A LIGHTING DISTRIBUTION PANEL, REIN FORCED CONCRETE PAD, WOODEN PERIMETER FENCE, & ELECTRICAL ENCLOSURE	LS	1
212	TYPE W #2/0AWG WIRE	LF	1140
213	TYPE W #6AWG WIRE	LF	570
214	XHHW-2 #10AWG WIRE	LF	4450
215	XHHW-2 #8AWG WIRE	LF	5850
217	XHHW-2 #2AWG WIRE	LF	1850
220	XHHW-2 #600KCMIL WIRE	LF	160
221	3/4" X 10' COPPER GROUND ROD	UN	1
207	4" RIGID ALUMINUM CONDUIT	LF	675
223	XHHW-2 #2/0AWG WIRE	LF	1455
209	XHHW-2 #6AWG WIRE	LF	755

KEYED NOTES:

1. PROVIDE 36" X 36" X 36" ELECTRICAL HANDHOLE FOR ALL LOCATIONS SHOWN. REFER TO DETAIL #1/E-5
2. PROVIDE 24" X 16" X 24" ELECTRICAL HANDHOLE FOR ALL LOCATIONS SHOWN. REFER TO DETAIL #1/E-5
3. PROVIDE 48" X 48" X 36" UTILITY SERVICE HANDHOLE FOR ALL LOCATIONS SHOWN. REFER TO DETAIL #1/E-5
4. IN LIEU OF HANDHOLE IN SPECIFIED LOCATION, UTILITY CAN PROVIDE NEW UTILITY POLE AS AN ALTERNATE METHOD OF NEW SERVICE INSTEAD OF USING EXISTING POLE#62232CL.

GENERAL NOTES:

1. ROUTING OF CONDUIT IS APPROXIMATE. CONTRACTOR SHALL DETERMINE EXACT ROUTING UPON INSPECTION OF ACTUAL FIELD LOCATIONS OF UNDERGROUND UTILITIES AND PIPING AND COORDINATION WITH THE OWNER AND THE ENGINEER.
2. HANDHOLE NUMBER AND LOCATION ARE APPROXIMATE. CONTRACTOR TO PROVIDE SUFFICIENT HANDHOLES TO SATISFY ACTUAL SITE CONDITIONS AND APPLICABLE CODES IN ORDER TO FURNISH A COMPLETE AND FUNCTIONAL SYSTEM.
3. ALL CONDUIT INSTALLED UNDERGROUND SHALL BE RIGID PVC SCHEDULE 80. PROVIDE PULL-IN LINE, TO BE PLACED IN CONDUIT DURING INSTALLATION.
4. EXPANSION COUPLINGS TO BE INSTALLED EVERY 100 FEET AND AT ALL BOXES.
5. METALLIC FOIL "DANGER HIGH VOLTAGE" TAPE SHALL BE INSTALLED 1 FOOT BELOW GRADE ABOVE ALL CONDUITS.
6. THE CONTRACTOR SHALL FURNISH AND INSTALL SITE LIGHTING POLES AND FIXTURES, GROUND MOUNTED FLOODLIGHT FIXTURES, CONCRETE FOUNDATIONS AND LAMPS, IN ACCORDANCE WITH CONTRACT DOCUMENTS AND AS PER MANUFACTURES RECOMMENDATIONS.
7. THE CONTRACTOR SHALL FURNISH AND INSTALL CONDUITS, WIRING, CONNECTIONS, CIRCUITS AND ALL APPURTENANCES NECESSARY TO ENERGIZE THE LIGHTING FACILITIES FOR THE SUBJECT SITE IMPROVEMENTS.
8. CONTRACTOR WILL PROVIDE THE POLE FOUNDATION COMPLETE WITH CONDUITS FOR POWER/GROUNDING AND ANCHOR BOLTS. COORDINATE THE NUMBER AND SIZE OF POWER CONDUITS REQUIRED IN EACH POLE FOUNDATION WITH THE ELECTRICAL SITE PLAN. ONE GROUNDING CONDUCTOR IS REQUIRED FOR EACH POLE.
9. CONTRACTOR SHALL PROVIDE GROUND ROD AND MAKE CONNECTION TO GROUND STUD.
10. CONTRACTOR IS HERE IN ADVISED THAT THE PROPOSED LIGHTING SYSTEM SHALL BE CONTROLLED THROUGH THE USE OF A TIMER.
11. THE CONTRACTOR WILL NOT BE PERMITTED TO INSTALL ANY BASE PAVEMENT OR SIDEWALK ON THE PROJECT UNTIL IT HAS BEEN CONFIRMED THAT THE UNDERGROUND WIRING & CONDUITS HAVE BEEN INSTALLED IN THE AFFECTED AREAS. THE CONTRACTOR WILL NOT BE PERMITTED TO INSTALL THE TOP COURSE OF PAVEMENT OR ANY TOPSOIL UNTIL SUCH A TIME AS ALL ELECTRICAL WORK ON THE PROJECT HAS BEEN COMPLETED.
12. THE CONTRACTOR SHALL COORDINATE THE LOCATION OF LIGHT POLES / CONDUIT RUNS PRIOR TO CONSTRUCTION.
13. RESTORATION OF AREAS DISTURBED SHALL BE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND AS DIRECTED BY THE ENGINEER.
14. THE CONTRACTOR WILL BE REQUIRED TO MAINTAIN AND PROTECT VEHICULAR AND PEDESTRIAN TRAFFIC DURING CONSTRUCTION OF THE PROPOSED SITE IMPROVEMENTS.
15. PRECAST ELECTRIC AND TELCO PULLBOXES. VERIFY EXACT SIZE, CONSTRUCTION, AND LOCATION WITH UTILITY COMPANY.
16. APPROXIMATE FIELD LOCATION OF UTILITY COMPANY RISER POLE, VERIFY EXACT LOCATION IN FIELD WITH UTILITY COMPANY.
17. ALL CONDUCTORS TO BE XHHW-2 COPPER EXCEPT FOR FLOATING DOCK PEDESTALS WHICH WILL USE TYPE-W CABLE.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	CP	RL	
1.	REVISED FOR RE-BID	12/18/2024	CP/JC	RL	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

PARTIAL ELECTRICAL SITE PLAN & DETAILS

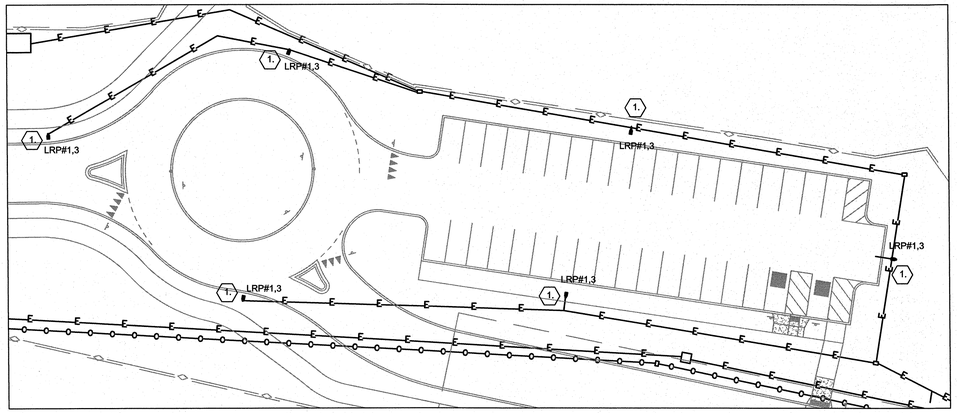
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28059000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

RICHARD S. LAFORTUNE, PE
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 41600
DATE 4/2/2025

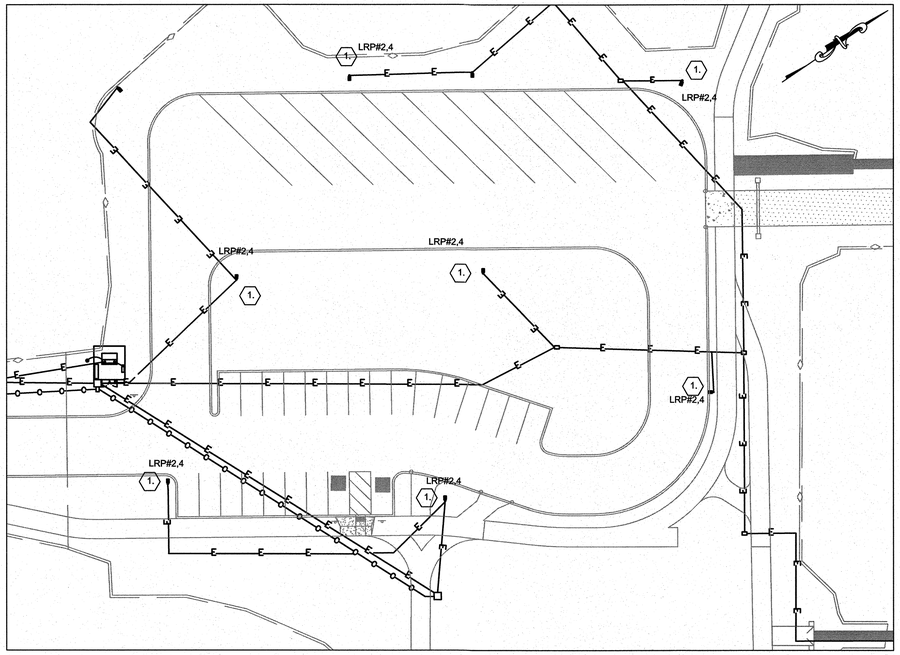
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468
DATE

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	E-2
DRAWN BY: CP/JVC	DESIGNED BY: CP/JVC	
CHECKED BY: RL	SHEET: 91 of 139	

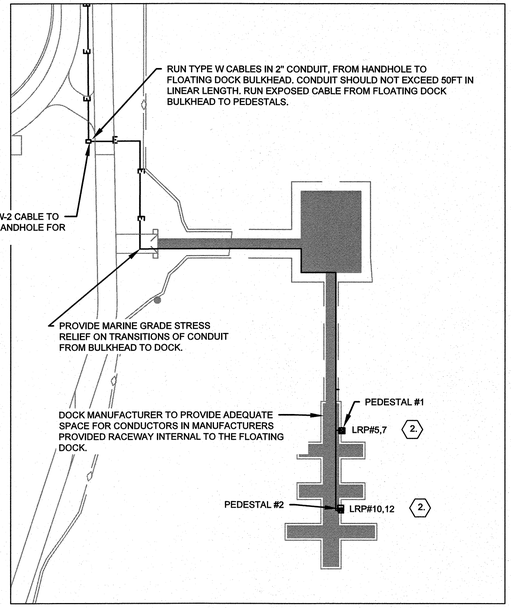
REGISTRATION NO.
FILE NO. 115.UN00213.P05



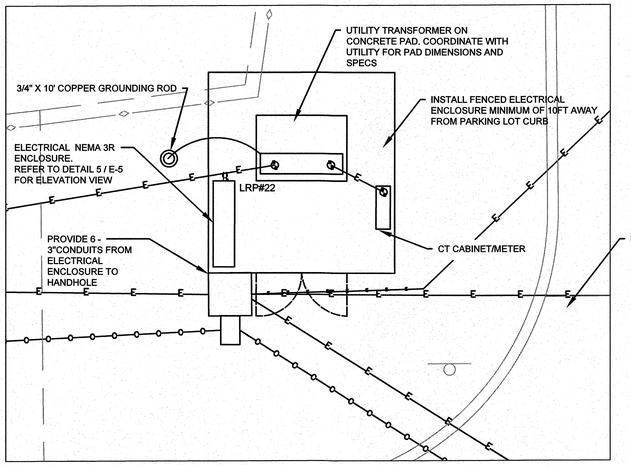
1 E-3 SOUTH PARKING LOT ENLARGED PLAN
1" = 30'



2 E-3 NORTH PARKING LOT ENLARGED PLAN
1" = 30'



3 E-3 FLOATING DOCK ENLARGED PLAN
1" = 30'



4 E-3 UTILITY TRANSFORMER ENLARGED PLAN
1' = 5'

GENERAL NOTES:

1. ALL PARKING LOT POLE MOUNTED FIXTURES ARE TO BE FED FROM LIGHTING & RECEPTACLE PANEL "LRP".
2. REFER TO LANDSCAPE DRAWINGS FOR LUMINAIRE SCHEDULE.
3. INSTALL 2 POWER PEDESTALS "HATTERAS LIGHT POWER PEDESTAL, ITEM# PP-E-H2 OR APPROVED EQUAL. PROVIDE INDIVIDUAL CIRCUIT PER PEDESTAL. CONFIRM FINAL ELECTRICAL REQUIREMENTS WITH MANUFACTURER.
4. REFER TO DRAWING E-2 FOR HANDHOLE SIZE AND TRENCHING DETAILS.

KEYED NOTES:

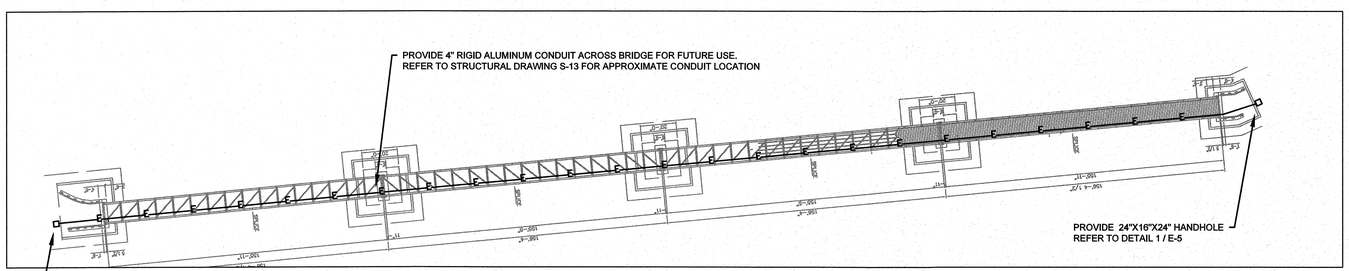
1. PROVIDE 2#8 AWG , 1#10 AWG GND FOR LIGHTING FIXTURES.
2. PROVIDE 3#2/0 AWG, 1#6 GND FOR DOCK POWER PEDESTALS.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

1 inch = 30 ft.



5 E-3 PEDESTRIAN BRIDGE F CONDUIT ROUTING PLAN
1' = 30'

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	CP	RL	
1.	REVISED FOR RE-BID	12/18/2024	CRUC	RL	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

ELECTRICAL ENLARGED PLANS

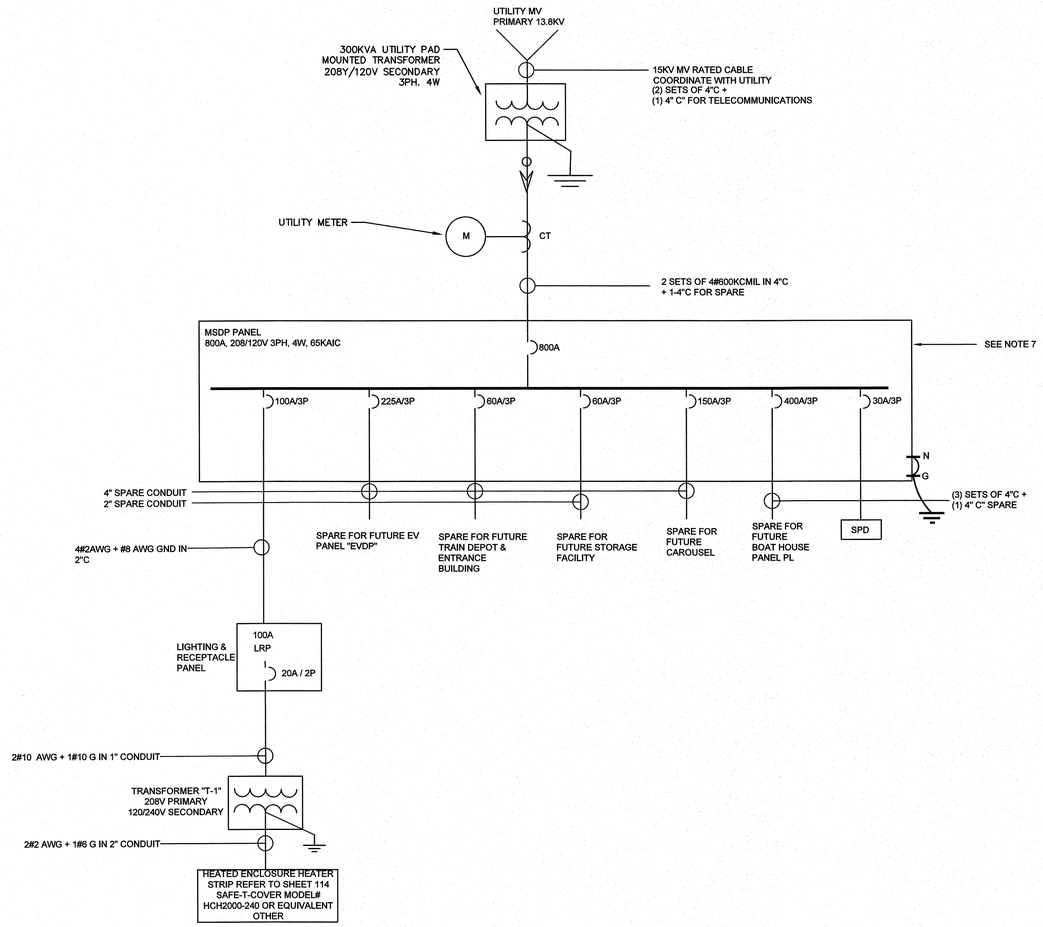
CVE ASSOCIATES
(732) 727 8000 CONSULTING AND MUNICIPAL ENGINEERS (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO. FILE NO. 115.UN00213.P05

RICHARD S. LAFORTUNE, PE
NEW JERSEY PROFESSIONAL ENGINEER LIC. 41600
DATE 4/2/2025

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468
DATE

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	E-3
DRAWN BY: CP/JVC	DESIGNED BY: CP/JVC	
CHECKED BY: RL	SHEET: 92 of 139	



1 / E-4 SINGLE LINE DIAGRAM
NOT TO SCALE

NOTES:

1. REFER TO DRAWING E-1 FOR GENERAL NOTES, SYMBOL LIST, AND LEGEND.
2. PROVIDE FIRE PROOFING FOR ALL PENETRATION AS REQUIRED
3. OVER CURRENT DEVICES OF ENTIRE DISTRIBUTION SYSTEM SHALL MEET STATED FAULT VALUES WITH FULLY RATED EQUIPMENT.
4. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER
5. CONDUCT SHORT CIRCUIT STUDY, COORDINATION AND ARC FLASH ANALYSIS FOR THE ENTIRE DISTRIBUTION SYSTEM.
6. COORDINATE UTILITY SERVICE REQUIREMENTS WITH LOCAL UTILITY PROVIDER PSEG TO PROVIDE REQUIRED CT CABINET SIZE TO ACCOUNT FOR THE NUMBER SERVICE FEEDERS INDICATED ON THE SINGLE-LINE DIAGRAM.
7. PROVIDE THE REQUIRED SET OF LUGS TO ACCOMMODATE 3 SETS OF 600KCMIL AS INDICATED ON THE SINGLE-LINE DIAGRAM. INCREASE PANEL SIZE IF NECESSARY.
8. COORDINATE KAIC RATING WITH UTILITY COMPANY FOR PANEL MSDP PANEL.

Panel Name: MSDP

LOCATION:	ELECTRICAL ROOM	Voltage	208/120V	A.I.C. Rating:	65KAIC
SUPPLY FROM:	UTILITY TRANSFORMER	Phases	3Ø	Panel Rating	800
MOUNTING:	SURFACE	Wires	4W	Main Type:	MCB
ENCLOSURE:	NEMA 3R			Main Rating:	800

CKT	Circuit Description	Poles	Trip	Load (KVA)	A	B	C	Load (KVA)	Trip	Poles	Circuit Description	CKT
1	FUTURE EV PANEL "EVDP"	3	225	16.6	16.64 12.96			13.0	150	3	FUTURE GRAND CAROUSEL	2
3				16.6		16.64 12.96		13.0				4
5				16.6			16.64 12.96	13.0				6
7	PANEL LRP	3	100	7.2	7.21 2			2.0	60	3	FUTURE STORAGE FACILITY	8
9				7.2		7.21 2		2.0				10
11				7.2			7.21 2	2.0				12
13	FUTURE BOAT HOUSE PANEL PL	3	400	27.6	27.6 2.0			2.0	60	3	FUTURE TRAIN DEPOT & ENTRANCE BUILDING	14
15				27.6		27.6 2.0		2.0				16
17				27.6			27.6 2.0	2.0				18
19	SPD	3	30	0.1	0.1 0			0.0			SPACE	20
21				0.1		0.1 0		0.0				22
23				0.1			0.1 0	0.0				24
CONNECTED LOAD	(KVA)	(Amps)			68.51	68.51	68.51	Total Load (KVA)				
	205.53	570.49			570.92	570.92	570.92	Total Amps / PH				

2 / E-4 PANEL SCHEDULE MDSP
NOT TO SCALE

Panel Name: LRP

LOCATION:	ELECTRICAL ROOM	Voltage	208/120V	A.I.C. Rating:	42KAIC
SUPPLY FROM:	MSDP	Phases	3Ø	Panel Rating	100
MOUNTING:	SURFACE	Wires	4W	Main Type:	MCB
ENCLOSURE:	NEMA 1			Main Rating:	100

CKT	Circuit Description	Poles	Trip	Load (KVA)	A	B	C	Load (KVA)	Trip	Poles	Circuit Description	CKT
1	SOUTH PARKING LOT	2	20	0.45	0.45 0.553			0.55	20	2	NORTH PARKING LOT	2
3				0.45		0.45 0.553		0.55				4
5	GFCI BREAKER, FLOATING DOCK POWER PEDESTAL #1	2	50	3.78			3.78 0	0		1	SPACE	6
7				3.78	3.78 0			0		1	SPACE	8
9	SPACE	1				0 3.78		3.78	50	2	GFCI BREAKER, FLOATING DOCK POWER PEDESTAL #2	10
11	ELECTRICAL ENCLOSURE LED LIGHT	1	20	0.035			0.035 3.78	3.78				12
13	LOW VOLTAGE TRANSFORMER T-1 TO HEATED ENCLOSURE	2	20	1	1 0.37			0.37	20	1	ELECTRICAL ENCLOSURE FAN	14
15				1		1 0.18		0.18	20	1	MAINTENACE RECEPTACLE	16
17	SPACE	1		0			0 0	0		1	SPACE	18
19	ELECTRICAL ENCLOSURE HEATER	1	20	0.5	0.5 0.37			0		1	SPACE	20
21	SPACE	1		0		0 0.18		0.18	20	1	ELECTRICAL ENCLOSURE DUPLEX	22
23	SPACE	1		0			0 0	0		1	SPACE	24
25	SPACE	1		0	0 0			0		1	SPACE	26
27	SPACE	1		0		0 0		0		1	SPACE	28
29	SPACE	1		0			0 0	0		1	SPACE	30
31	SPACE	1		0	0 0			0		1	SPACE	32
33	SPACE	1		0		0 0		0		1	SPACE	34
35	SPACE	1		0			0 0	0		1	SPACE	36
37	SPACE	1		0	0 0			0		1	SPACE	38
39	SPACE	1		0		0 0		0		1	SPACE	40
41	SPACE	1		0			0 0	0		1	SPACE	42
CONNECTED LOAD	(KVA)	(Amps)			7.02	6.14	7.60	Total Load (KVA)				
	20.76	57.63			58.53	51.19	63.29	Total Amps / PH				

3 / E-4 PANEL SCHEDULE LRP
NOT TO SCALE

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	CP	RL	
1.	REVISED FOR RE-BID	12/16/2024	CP/JC	RL	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

SINGLE LINE DIAGRAM

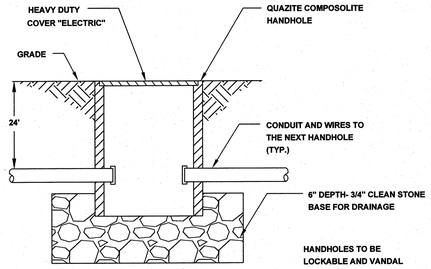
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

RICHARD S. LAFORTUNE, PE
NEW JERSEY PROFESSIONAL ENGINEER LIC. 41600
DATE 4/2/2025

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468
DATE

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	E-4
DRAWN BY: CP/JVC	DESIGNED BY: CP/JVC	
CHECKED BY: RL	SHEET: 93 of 139	

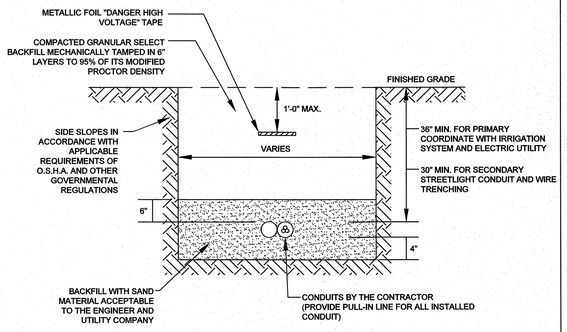
REGISTER NO.
FILE NO. 115.UN00213.P05



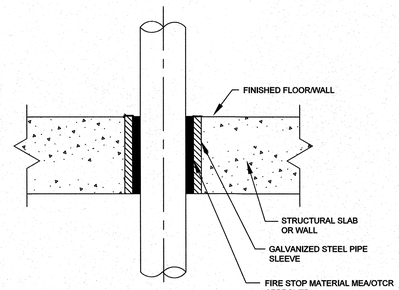
NOTES:

1. UNDERGROUND HANDHOLE SHALL BE AN OPEN BOTTOM QUAZITE ENCLOSURE WITH GASKETS AS MANUFACTURED BY HUBBELL OR APPROVED EQUAL AND COMPLY WITH ANSI/SCTE 77 TIER 15 WITH VERTICAL DESIGN LOAD RATING OF 22,500 LBS.
2. ALL COVERS SHALL BE DESIGNED TO BOLT DOWN WITH GASKETS TO REDUCE INCOMING FLUIDS AND WITH A PERMANENTLY MARKED LOGO "ELECTRIC"

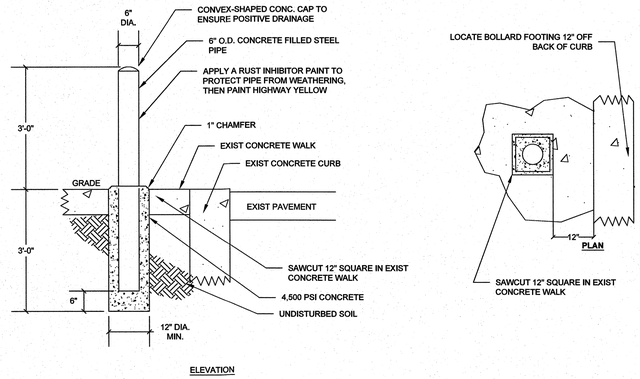
1 / E-5 DETAIL 'A' TYPICAL ELECTRICAL HANDHOLE
NOT TO SCALE



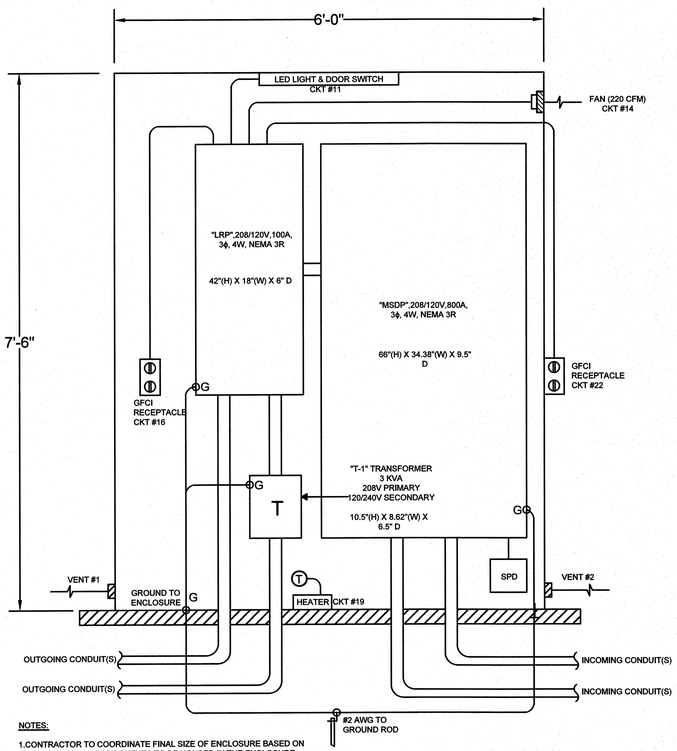
2 / E-5 TYPICAL TRENCHING DETAIL
NOT TO SCALE



3 / E-5 CONDUIT PENETRATION FIRE RATED WALL/SLAB DETAIL
NOT TO SCALE



4 / E-5 BOLLARD DETAIL
NOT TO SCALE



NOTES:

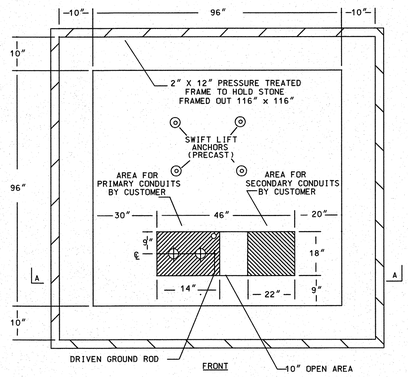
1.CONTRACTOR TO COORDINATE FINAL SIZE OF ENCLOSURE BASED ON APPROVAL OF ALL COMPONENTS TO BE HOUSED IN THE ENCLOSURE.

2. SUBMIT SHOP DRAWING INSTALLATION FOR APPROVAL.

3. REFER TO SINGLE LINE DIAGRAM #1 / E-4, FOR ALL WIRE AND CONDUIT SIZES.

4. PROVIDE SPARE CONDUITS TO HANDHOLE FOR ALL FUTURE ADDITIONS SHOWN ON SLD.

5 / E-5 PROPOSED OUTDOOR ELECTRICAL EQUIPMENT ENCLOSURE
1" = 1'



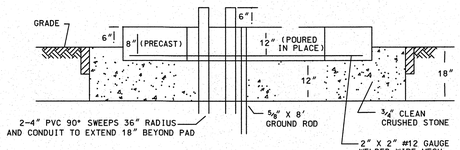
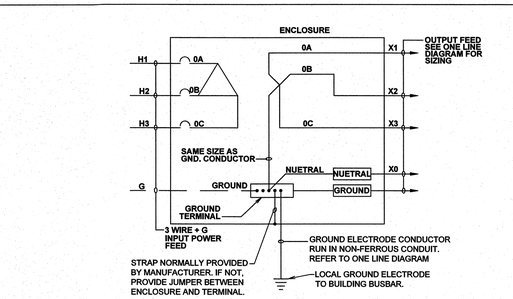
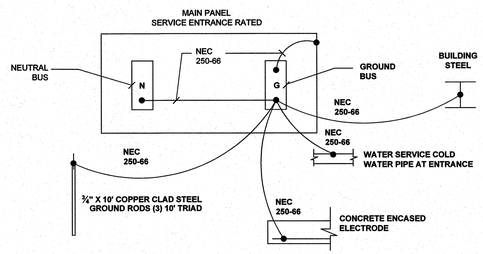


FIGURE 10.45 NOTES:
1. THE EXTENSION OF THE CONDUITS ABOVE THE SURFACE OF THE PAD SHALL BE LIMITED AS FOLLOWS:
2. MARK GRADE ON PIPES.
3. PRECAST PADS ARE PREFERRED. DEPTH OF PAD IS 8". WHEN ALLOWED. POURED IN PLACE PADS ARE 12" DEEP.

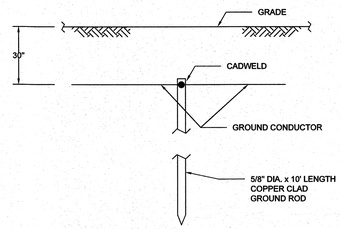
6 / E-5 PAD MOUNTED TILITY TRANSFORMER CONCRETE PAD DETAIL
PSE&G FIGURE 10.45



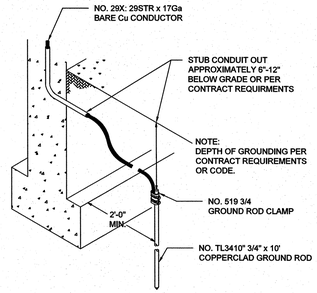
8 / E-5 TRANSFORMER GROUNDING DETAIL
NOT TO SCALE



9 / E-5 SERVICE GROUNDING DETAIL
NOT TO SCALE



10 / E-5 GROUND ROD DETAIL
NOT TO SCALE



7 / E-5 TYP. CONDUIT STUB DETAIL
NOT TO SCALE

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	CP	RL	
1.	REVISED FOR RE-BID	12/18/2024	CP/JC	RL	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

ELECTRICAL DETAILS

CVE ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28059000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

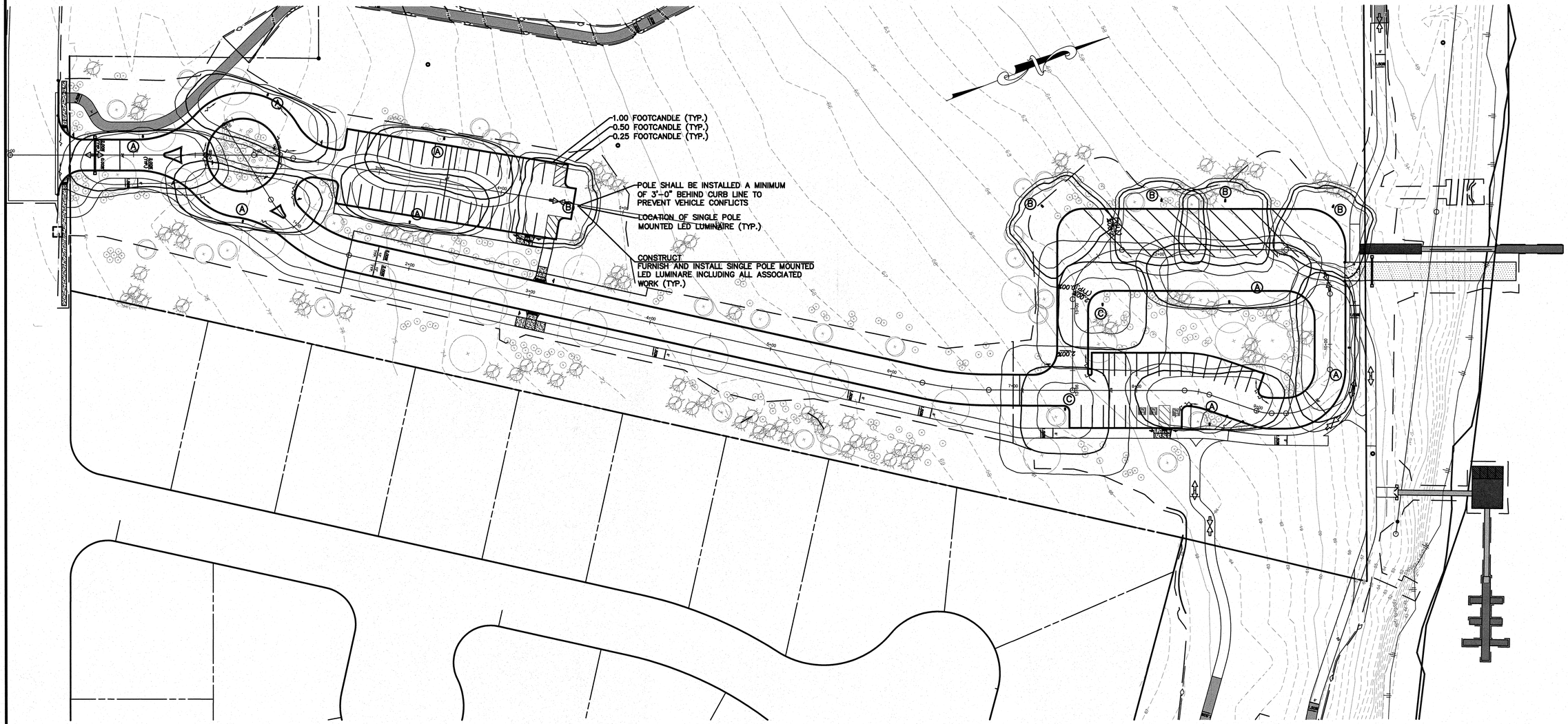
REGISTER NO. | DLE FILE NO. 115.UN00213.P05

RICHARD S. LAFORTUNE, PE
NEW JERSEY PROFESSIONAL ENGINEER LIC. 41600
DATE 4/2/2025

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468
DATE

SCALE	DATE
As Shown	October 2024
DRAWN BY	DESIGNED BY
CP/JVC	CP/JVC
CHECKED BY	SHEET
RL	94 of 139

DRAWING NUMBER: E-5



GENERAL NOTES:

1. ALL FIXTURES TO BE SELECTED BASED UPON SITE ELECTRICAL SYSTEM VOLTAGE AND PHASE.
2. CONDUIT TO BE PVC SCHEDULE 40 BELOW GRADE, RGS SWEEPS AND ABOVE GRADE, SCHEDULE 80 BELOW ROADS.
3. ALL WIRING TO BE COPPER WITH 600V INSULATION. ALL WIRING #4 AND SMALLER SHALL BE TYPE THHN/THWN. ALL WIRING LARGER THAN #4 SHALL BE XHHW. ALL WIRING UNDERGROUND TO BE TYPE XHHW-2, UNLESS OTHERWISE NOTED. ALUMINUM WIRE IS NOT PERMITTED.
4. PROVIDE CIRCUIT BREAKERS IN PROPOSED PANELS, TO BE PROVIDED BY CONTRACTOR.
5. HANDHOLES ARE TO BE PROVIDED ON ALL CIRCUITS AT A MAXIMUM DISTANCE OF 300 FT.
6. CONTRACTOR SHALL DETERMINE EXACT ROUTING OF CONDUIT UPON INSPECTION OF ACTUAL FIELD LOCATIONS OF UNDERGROUND UTILITIES / PIPING AND COORDINATION WITH THE OWNER AND THE ENGINEER. FINAL ANTICIPATED LAYOUT TO BE APPROVED BY THE PROJECT ENGINEER PRIOR TO CONSTRUCTION.
7. CONTRACTOR TO PROVIDE SUFFICIENT HANDHOLES TO SATISFY ACTUAL SITE CONDITIONS AND APPLICABLE CODES IN ORDER TO FURNISH A COMPLETE AND FUNCTIONAL SYSTEM.
8. HANDHOLES ARE TO BE LOCATED OUT OF PEDESTRIAN OR VEHICULAR TRAFFIC AREAS AS MUCH AS POSSIBLE. COORDINATE WITH OWNER BY SUBMITTING A MARKED UP DRAWING OF PROPOSED LOCATIONS.
9. METALLIC FOIL "DANGER HIGH VOLTAGE TAPE" SHALL BE PROVIDED 1'-0" BELOW GRADE ABOVE ALL ELECTRICAL CONDUITS.
10. WIRE SIZES SHALL BE UPGRADED TO COMPENSATE FOR VOLTAGE DROP. CONTRACTOR TO ENSURE EQUIPMENT TERMINATION CAPABILITIES BEFORE ORDERING EQUIPMENT. CONTRACTOR TO PROVIDE WIRE SIZES DURING SHOP SUBMITTAL PROCESS.
11. ALL CONDUCTORS TO BE COPPER WITH XHHW-2 INSULATION. CONDUIT UNDERGROUND TO BE RIGID PVC SCHEDULE 40 WITH EXPANSION COUPLINGS EVERY 100FT AND AT ALL BOXES. ABOVE GROUND CONDUIT AND SWEEPS TO BE RIGID METALLIC CONDUIT. CONTRACTOR SHALL PROVIDE PULL-IN LINE, TO BE PLACED IN CONDUIT DURING CONSTRUCTION.
12. RESTORATION OF AREAS DISTURBED SHALL BE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND AS DIRECTED BY THE ENGINEER.
13. THE CONTRACTOR WILL BE REQUIRED TO MAINTAIN AND PROTECT VEHICULAR AND PEDESTRIAN TRAFFIC DURING CONSTRUCTION OF THE PROPOSED SITE IMPROVEMENTS.

ADDITIONAL GENERAL LIGHTING NOTES:

1. THE CONTRACTOR SHALL FURNISH AND INSTALL LIGHTING IMPROVEMENTS INCLUDING LIGHT POLES AND LIGHT FIXTURES, CONCRETE FOUNDATIONS AND LAMPS, IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND AS PER MANUFACTURER'S RECOMMENDATIONS.
2. THE CONTRACTOR SHALL FURNISH AND INSTALL MOUNTS, CONDUITS, WIRING, CONNECTIONS, ENCLOSURE, CIRCUITS, PANELS AND ALL APPURTENANCES NECESSARY TO ENERGIZE THE LIGHTING FACILITIES FOR THE SUBJECT SITE IMPROVEMENTS.
3. CONTRACTOR WILL PROVIDE THE LIGHT POLE FOUNDATION COMPLETE WITH CONDUITS FOR POWER/GROUNDING AND ANCHOR BOLTS. COORDINATE THE NUMBER AND SIZE OF POWER CONDUITS REQUIRED IN EACH FOUNDATION WITH THE LIGHTING PLAN. ONE GROUNDING CONDUCTOR IS REQUIRED FOR EACH.
4. CONTRACTOR SHALL PROVIDE GROUND ROD AND MAKE CONNECTION TO GROUND STUD.
5. CONTRACTOR IS HEREIN ADVISED THAT THE PROPOSED LIGHTING SYSTEM SHALL BE CONTROLLED THROUGH THE USE OF A COMMON PHOTOCELL AND/OR AN ASTRONOMICAL TIME CLOCK. CONTRACTOR TO PROVIDE ALL NECESSARY CONTROL WIRING.
6. THE CONTRACTOR WILL NOT BE PERMITTED TO INSTALL ANY BASE PAVEMENT OR SIDEWALK ON THE PROJECT UNTIL IT HAS BEEN CONFIRMED THAT THE UNDERGROUND WIRING/CONDUITS HAVE BEEN INSTALLED IN THE AFFECTED AREAS. THE CONTRACTOR WILL NOT BE PERMITTED TO INSTALL THE TOP COURSE OF PAVEMENT OR ANY TOPSOIL UNTIL SUCH A TIME AS ALL ELECTRICAL WORK ON THE PROJECT HAS BEEN COMPLETED.
7. THE CONTRACTOR SHALL COORDINATE THE LOCATION OF LIGHT POLES/CONDUIT RUNS PRIOR TO CONSTRUCTION.
8. THE CONTRACTOR IS HEREIN ADVISED THAT A SOIL INVESTIGATION RELATED TO THE LIGHTING FACILITIES HAS NOT BEEN PERFORMED. THE CONTRACTOR SHALL MAKE ALL NECESSARY INVESTIGATIONS INCLUDING SOIL BORINGS, TEST PITS OR BY OTHER ADEQUATE MEASURES TO SATISFY HIMSELF AS TO THE EXISTING SOIL CONDITIONS INCLUDING THE CHARACTER, GROUNDWATER ELEVATIONS AND AMOUNT OF VARIOUS CLASSES OF MATERIAL TO BE ENCOUNTERED IN THE WORK TO BE PERFORMED AND FOR THE DESIGN OF THE POLE FOUNDATIONS, PRIOR TO SUBMITTING A BID.

Pay Item Number	To Be Constructed	Unit	Plan Quantity
228	Furnish and install single pole mounted LED luminare including all associated work	UN	15

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PG	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PG	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

LIGHTING PLAN AND DETAILS

CENTRAL LAKE PARK

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

DATE 4.4.25

SCALE	DATE
As Shown	October 2024
DRAWN BY	DESIGNED BY
AM	AM/KT
CHECKED BY	SHEET
KT	95 of 139

REGISTER NO.
FILE NO. 115.UN00213.P05
DRAWING NUMBER

ELECTRICAL GENERAL NOTES:

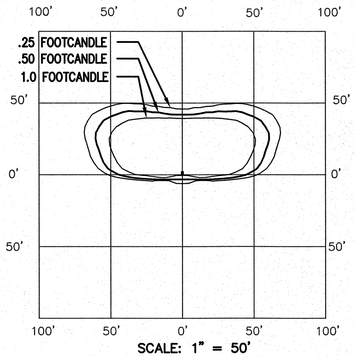
1. INSTALL ALL WORK IN ACCORDANCE WITH THE CURRENT NATIONAL ELECTRIC CODE AND ALL APPLICABLE STATE AND LOCAL CODES. WHERE THE PROJECT DRAWINGS AND/OR SPECIFICATIONS DIFFER FROM THE GOVERNING CODE THE MORE STRINGENT REQUIREMENTS WILL GOVERN THE INSTALLATION.
2. CONTRACTOR SHALL PAY FOR ALL REQUIRED PERMITS AND LICENSES REQUIRED UNDER THIS CONTRACT.
3. THE CONTRACTOR SHALL VISIT AND INSPECT THE PREMISES IN ORDER TO BE FAMILIAR WITH THE EXISTING SITE CONDITIONS WHICH MAY AFFECT THE INSTALLATION OF THE WORK SHOWN ON THE PROJECT DRAWINGS. NO ADDITIONAL COMPENSATION SHALL BE GRANTED FOR THE CONTRACTOR'S FAILURE TO VISIT AND INSPECT THE SITE.
4. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL WORK AS SHOWN ON THE PROJECT DRAWINGS AND SPECIFICATIONS WITH THE FOLLOWING UNDERSTANDINGS:
   A. THE PROJECT DRAWINGS ARE ONLY DIAGRAMMATIC IN NATURE AND ARE INTENDED TO OUTLINE THE BASIC SYSTEMS TO BE PROVIDED. THEREFORE MINOR DETAILS AND APPURTENANCES MAY OR MAY NOT BE SHOWN. THE OMISSION OF A MINOR COMPONENT SHALL NOT RELIEVE THE CONTRACTOR OF THEIR RESPONSIBILITY TO FURNISH AND INSTALL ALL SUCH ITEMS NECESSARY TO PROVIDE A COMPLETE, OPERATIVE, AND CODE COMPLIANT SYSTEM TO THE OWNER. IF THERE ARE ANY DOUBTS TO THE EXTENT OR SCOPE OF WORK REQUIRED THE ENGINEER SHALL BE CONTACTED TO PROVIDE CLARIFICATION DURING THE BID PHASE.
   B. THE PROJECT DRAWINGS SHOW INTENDED EQUIPMENT LOCATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY MINOR ADJUSTMENTS OR RELOCATIONS NECESSARY DUE TO THE CHOICE OF EQUIPMENT AND COORDINATION CONFLICTS. ALL EQUIPMENT RELOCATIONS MUST BE APPROVED BY THE ARCHITECT OR ENGINEER.
5. WORK UNDER THIS CONTRACT INCLUDES THE FURNISHING OF EQUIPMENT, MATERIAL, TOOLS, TRANSPORTATION, SERVICES, SCAFFOLDING, SUPERVISION, LABOR AND OTHER APPURTENANCES REQUIRED FOR THE FABRICATION, INSTALLATION, OR APPLICATION AND COMPLETION OF THE WORK UNDER THIS SECTION AS SHOWN OR IMPLIED ON THE PROJECT DRAWINGS AND SPECIFICATIONS.
6. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, DIMENSIONS, EXISTING UTILITY LOCATIONS, AND ELECTRICAL EQUIPMENT REQUIREMENTS PRIOR TO STARTING WORK.
7. CONTRACTOR TO SUBMIT CUT SHEETS AND CALCULATIONS WHERE APPLICABLE FOR ANY EQUIPMENT OR DEVICES THAT DIFFER FROM THOSE SPECIFIED ON THE PROJECT DRAWINGS OR SPECIFICATIONS PRIOR TO THE START OF WORK.
8. COORDINATE ALL WORK WITH THAT OF OTHER TRADES AFFECTING, OR EFFECTED BY, WORK OF THIS SECTION. COOPERATE WITH SUCH TRADES TO ASSURE THE STEADY PROGRESS OF ALL WORK UNDER THIS CONTRACT.
9. ARRANGE ALL WORK TO PROCEED AS RAPIDLY AS POSSIBLE IN COOPERATION WITH OTHER TRADES. COOPERATE WITH OTHER TRADES TO HAVE ALL WORK RACEWAY, WIRING, ETC TO THE BEST ADVANTAGE.
10. ALL EQUIPMENT, MATERIALS, INSTALLATIONS AND CONSTRUCTION ACTIVITIES SHALL COMPLY WITH ALL REQUIREMENTS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION WHEREVER THEY APPLY.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR PLANNING HIS OWN WORK AND FOR ANY DAMAGE CAUSED TO THE OWNER OR OTHER CONTRACTORS BY IMPROPER WORK EXECUTION OR PLACEMENT OF RACEWAYS, WIRING, AND EQUIPMENT.
12. PROVIDE TEMPORARY LIGHTING AND POWER DURING CONSTRUCTION AS REQUIRED.
13. MAINTAIN ELECTRIC SERVICE CONTINUITY TO ALL EQUIPMENT OUTSIDE OF CONSTRUCTION AREA. NOTIFY OWNER IN WRITING 48 HOURS IN ADVANCE OF ANTICIPATED UTILITY OUTAGES. OBTAIN WRITTEN PERMISSION TO CONDUCT ALL WORK REQUIRING AN OUTAGE.
14. CONDUIT RUNS ARE DIAGRAMMATIC AND EQUIPMENT LOCATIONS ARE APPROXIMATE. ELECTRICAL CONTRACTOR IS TO ROUTE CONDUIT AND TO VERIFY EXISTING CONDITIONS IN THE FIELD.
15. ALL CIRCUITS SHALL BE RUN IN RGS WHERE EXPOSED OR IN FRAMED PARTITIONS FROM THE PANEL BOARD TO DISCONNECT OR CONTROLLER, UNLESS OTHERWISE NOTED.
16. ALL CONDUIT TERMINATING AT MOTORS, SOLENOID VALVES, VIBRATING DEVICES, DUCT AND PIPE MOUNTED SWITCHES AND DEVICES SHALL TERMINATE IN FLEXIBLE METAL CONDUIT FOR INDOOR EQUIPMENT OR LIQUID-TIGHT FLEXIBLE METAL CONDUIT FOR OUTDOOR EQUIPMENT OR IN DAMP OR WET LOCATIONS.
17. ALL WIRING TO BE COPPER WITH 600V INSULATION. ALL WIRING #4 AND SMALLER SHALL BE TYPE THHN/THWN. ALL WIRING LARGER THAN #4 SHALL BE XHHW. ALL WIRING UNDERGROUND TO BE TYPE XHHW-2, UNLESS OTHERWISE NOTED. ALUMINUM WIRE IS NOT PERMITTED.
18. ALL POWER WIRING TO BE MINIMUM #10 AWG SIZE, ALL CONTROL WIRING TO BE #14 AWG UNLESS OTHERWISE NOTED.
19. ALL CONDUIT TO BE 2" MINIMUM SIZE UNLESS OTHERWISE NOTED.
20. SIZE BRANCH CIRCUITS, PANEL HOME RUNS, AND DEVICE CIRCUITING PER NEC 310-15. WHERE SINGLE PHASE 20A AND 30A BRANCH CIRCUITS EXCEED 100 FEET IN LENGTH INCREASE CONDUCTOR SIZE ONE SIZE FOR EVERY ADDITIONAL 100 FEET OF CONDUCTOR LENGTH UNLESS THE CONDUCTOR HAS ALREADY BEEN INCREASED DUE TO CONDUIT FILL DEGRADING. SUBMIT VOLTAGE DROP CALCULATIONS TO THE ENGINEER FOR APPROVAL.
21. ALL BRANCH CIRCUITS ARE TO CONTAIN A GREEN COLORED EQUIPMENT GROUNDING CONDUCTOR SIZED PER NEC TABLE 250.95.
22. GROUNDING AND BONDING OF ALL NON CURRENT CARRY METALLIC PARTS OF ALL ELECTRICAL EQUIPMENT AND ENCLOSURES INCLUDING CONDUITS, SUPPORTS, CONTROLLERS, RACEWAYS, TRANSFORMERS, ELECTRICAL PANELS, MOTOR FRAMES, ETC. INSTALLED OR CONNECTED UNDER THIS CONTRACT SHALL BE PROPERLY CONNECTED TO THE GROUNDING SYSTEM, REGARDLESS OF WHETHER OR NOT THE CONNECTIONS ARE SHOWN ON THE PROJECT DRAWINGS.
23. ALL CIRCUITS SHALL NOT SHARE NEUTRALS UNLESS SHOWN OTHERWISE ON THE PROJECT DRAWINGS. EACH CIRCUIT SHALL BE ROUTED WITH ITS OWN DEDICATED NEUTRAL FROM OVER CURRENT PROTECTION DEVICE TO POINT OF CONNECTION AT EQUIPMENT.
24. ALL ISOLATED GROUND CIRCUITS SHALL HAVE A DEDICATED #12 AWG CONDUCTOR INSTALLED IN ADDITION TO THE SAFETY GROUND CONDUCTOR.
25. PROVIDE INSULATING BUSHINGS FOR CONDUCTOR PROTECTION AT CONDUIT TERMINATIONS.
26. SEAL ALL FLOOR AND WALL PENETRATIONS TO MAINTAIN FIRE RATING OF WALL OR FLOOR. CONSULT SPECIFIED TECHNOLOGIES INC. PRODUCT AND APPLICATION GUIDE (OR EQUIVALENT) TO DETERMINE THE APPROPRIATE FIRE STOP SYSTEM TO BE UTILIZED FOR A GIVEN PENETRATION TYPE. PROVIDE PRODUCTS AND SEAL PENETRATION PER THE MANUFACTURER'S INSTRUCTIONS IN ORDER TO MAINTAIN THE LISTINGS OF THE SEALED PENETRATION. PROVIDE ALL NECESSARY DOCUMENTATION TO THE AUTHORITY HAVING JURISDICTION.
27. BEFORE ENERGIZING OR STARTING ANY DEVICE OR PIECE OF EQUIPMENT VERIFY THAT IT HAS BEEN INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. ADHERE TO ALL MANUFACTURER'S GUIDELINES AND START-UP REQUIREMENTS.
28. ALL DISCONNECT SWITCHES, STARTERS, OPERATORS, AND ENCLOSURES SHALL BE UL LISTED AND/OR FACTORY MUTUAL (FM) APPROVED.
29. LOCATE ELECTRICAL EQUIPMENT IN THE FIELD AS SPACE LIMITATIONS AND CONDITIONS PERMIT IN ORDER TO SATISFY MINIMUM WORKING SPACE AS PER NEC 2014.
30. PROVIDE MOUNTING FRAMES AND STRUCTURAL SUPPORT FROM PLATFORMS, FLOORS, AND CEILING STEEL AS REQUIRED FOR ELECTRICAL EQUIPMENT. STRUCTURAL SUPPORT SHALL BE CONSTRUCTED TO MAINTAIN A SAFETY FACTOR OF 4 WITH A 200 LB MINIMUM.
31. LABEL ALL NEW ELECTRICAL EQUIPMENT AND PANELS WITH MINIMUM 1/2" LETTERS USING THERMAL TRANSFER LABEL SYSTEM. PROVIDE TYPE WRITTEN PANEL SCHEDULES FOR ALL PANEL BOARDS.
32. CONTRACTOR TO FOLLOW ALL OWNER SITE AND SAFETY RULES. CONTRACTOR IS RESPONSIBLE FOR DAILY SITE CLEANING FOR THEIR ACTIVITIES. BROOM CLEAN DAILY AND REMOVE ALL CONSTRUCTION DEBRIS FROM THE BUILDING AND GROUNDS DAILY.
33. UPON COMPLETION PROVIDE AN ACCURATE "MARKED-UP" SET OF PROJECT DRAWINGS REFLECTING ALL FIELD CHANGES TO THE ENGINEER.
34. ALL UNDERGROUND CONDUIT TO BE PVC SCHEDULE 40 WITH EXPANSION COUPLINGS EVERY 100 FT. UNLESS OTHERWISE NOTED. CONTRACTOR SHALL PROVIDE PULL-IN LINE, TO BE PLACED IN CONDUIT DURING CONSTRUCTION.
35. PROVIDE DISCONNECTS FOR ALL EQUIPMENT REQUIRED BY THE CURRENT EDITION OF THE NATIONAL ELECTRIC CODE.
36. ALL SITE LIGHTING SHALL BE CONTROLLED VIA ONE (1) COMMON PHOTOCELL AND AN ASTRONOMICAL TIME CLOCK, CONNECTED TO PROPOSED LIGHTING CONTACTOR PANEL. COORDINATE LOCATION OF PHOTOCELL AND TIME CLOCK WITH OWNER OR SITE ENGINEER.

LUMINAIRE SCHEDULE								
Type	Symbol	Pole Qty	Fix Qty	MH	Pole Ht.	Arrangement	LLF	Description
Ⓐ		8	8	20'	20'	SINGLE	0.90	VP-1-160L-135-3K7-3-UNV-ASQU-BLT-BC (BEACON VIPER LED, TYPE III AREA LIGHT) POLE: SSS-A-20-40-A-10T-BLT
Ⓑ		5	5	20'	20'	SINGLE	0.90	VP-1-160L-135-3K7-4F-UNV-ASQU-BLT-BC (BEACON VIPER LED, TYPE III AREA LIGHT) POLE: SSS-A-20-40-A-10T-BLT
Ⓒ		2	2	20'	20'	SINGLE	0.90	VP-1-160L-135-3K7-5QW-UNV-ASQU-BLT-BC (BEACON VIPER LED, TYPE V WIDE AREA LIGHT) POLE: SSS-A-20-40-A-10T-BLT

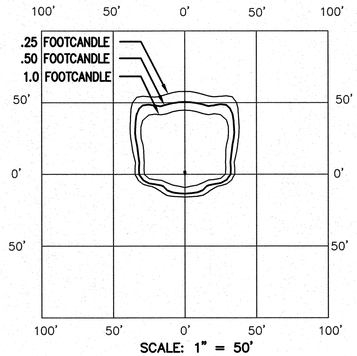
NOTES:

1. LED FIXTURES AND POLES MANUFACTURED BY BEACON LIGHTING (DIVERSIFIED LIGHTING, 973-439-1524) OR APPROVED EQUAL . CONTRACTOR SHALL COORDINATE WITH LIGHTING VENDOR TO PROVIDE SHOP DRAWINGS FOR REVIEW PRIOR TO PURCHASING, TO ENSURE LUMINAIRES, POLES, ARMS, DECORATIVE BASES, FOUNDATIONS, MOUNTING, AND ALL OPTIONS ARE APPROVED BY ENGINEER AND OWNER.
2. PROPOSED LIGHT FIXTURES WILL BE CONTROLLED WITH THE USE OF INDIVIDUAL PHOTOCELLS AND AN ASTRONOMICAL TIME CLOCK. LIGHTS SHALL REMAIN OPERATIONAL FROM DUSK UNTIL DAWN.
3. PROPOSED POLES MEET 120 MPH SUSTAINED WINDS
4. ISOLINES ARE SHOWN AT THE .25, .50, & 1.00 FOOTCANDLE LEVELS

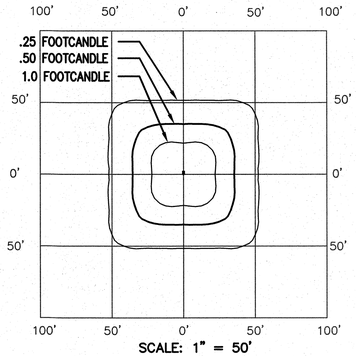
LIGHTING LEGEND



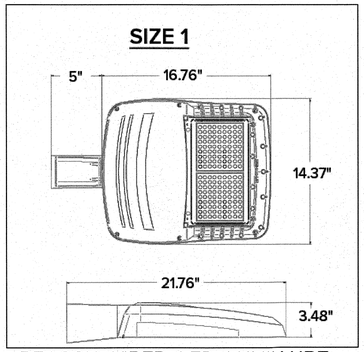
SCALE: 1" = 50'
Ⓐ



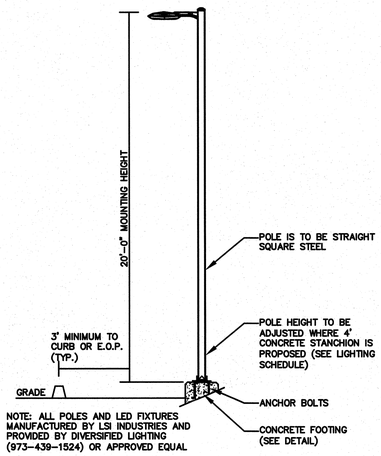
SCALE: 1" = 50'
Ⓑ



SCALE: 1" = 50'
Ⓒ

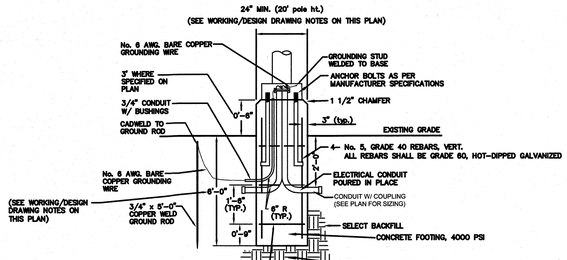


BEACON VIPER LED LUMINAIRE



LUMINAIRE POLE DETAILS

NOT TO SCALE



CONCRETE FOOTING DETAIL

NOT TO SCALE

WORKING/DESIGN DRAWING NOTES:

1. THE CONTRACTOR IS HEREIN ADVISED THAT THE DESIGN DRAWINGS CONTAIN A PRELIMINARY DESIGN LAYOUT FOR THE CONSTRUCTION OF THE REINFORCED CONCRETE FOOTINGS THAT WILL BE REQUIRED FOR THIS PROJECT. THESE DETAILS PROVIDE FOR MINIMUM DIMENSIONS AND MINIMUM REQUIREMENTS FOR THE STRUCTURES AND STRUCTURAL ELEMENTS TO BE DESIGNED AND BUILT. AS A PART OF THE BID FOR THIS PROJECT, THE CONTRACTOR WILL BE REQUIRED TO RETAIN THE SERVICES OF A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW JERSEY TO DESIGN ALL OF THESE STRUCTURAL ELEMENTS FOR THE REINFORCED CONCRETE FOOTINGS TO FINALIZE ALL DIMENSIONS.
2. THE CONTRACTOR'S ENGINEER WILL BE REQUIRED TO REVIEW THE PRELIMINARY DESIGN LAYOUT FOR STRUCTURAL DESIGN LOADS, CODE COMPLIANCE (IBC, NJ LATEST EDITION AND ASCE LATEST EDITION) AND CONSTRUCTABILITY.
3. CONTRACTOR TO PERFORM A GEOTECHNICAL SUBSURFACE INVESTIGATION PROGRAM TO OBTAIN SOIL DESIGN PROPERTIES FOR THE DESIGN OF THE STRUCTURES AND STRUCTURAL ELEMENTS. THIS PROGRAM IS TO BE PERFORMED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW JERSEY RETAINED BY THE CONTRACTOR.
4. THE CONTRACTOR'S ENGINEER WILL BE REQUIRED TO SUBMIT DETAILED DESIGN CALCULATIONS, SHOP DRAWINGS AND/OR CATALOG CUTS TO THE OWNER'S ENGINEER FOR REVIEW AND APPROVAL FOR THE SPECIFIED REINFORCED CONCRETE FOOTINGS AND REINFORCED MASONRY PIERS PRIOR TO ANY FABRICATION OR CONSTRUCTION. THE CONTRACTOR'S ENGINEER'S LAYOUT SHALL BE BASED ON THE PRELIMINARY LAYOUT SHOWN ON THESE DRAWINGS.
5. UPON APPROVAL BY THE OWNER'S ENGINEER, THE CONTRACTOR'S LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW JERSEY SHALL PROVIDE SIX (6) SETS OF SIGNED AND SEALED DETAILED DOCUMENTS TO THE OWNER'S ENGINEER FOR USE BY THE CONTRACTOR DURING CONSTRUCTION. THE COSTS ASSOCIATED WITH RETAINING A LICENSED PROFESSIONAL ENGINEER, INCLUDING PROVIDING THE REQUIRED DOCUMENTS SHALL NOT BE MEASURED SEPARATELY FOR PAYMENT. THESE COSTS SHALL BE INCLUDED IN THE PRICE BID FOR THE NEW STRUCTURES, INCLUDING ALL APPURTENANCES, AS DESCRIBED HEREIN.

FOUNDATION DESIGN NOTES:

1. MINIMUM DEPTH OF FOUNDATION SHALL BE 3 FEET BELOW THE FINISHED GRADE TO MEET FROST DEPTH REQUIREMENTS, OR AS INDICATED IN THE SECTION VIEWS.
2. BACKFILL COMPRISED OF IMPORTED 3/4" QUARRY PROCESS CLEAN CRUSHED STONE SHALL BE PLACED IN A MAXIMUM 8-INCH LOOSE LIFT THICKNESS AND COMPACTED TO AT LEAST 95% OF THE OPTIMUM DENSITY AS DETERMINED BY ASTM D1557. COMPACT WITH A MINIMUM OF 4 PASSES OF A VIBRATORY PLATE OR WALK-BEHIND ROLLER COMPACTOR.
3. FOUNDATION MATERIAL SPECIFICATIONS:
   A. FOUNDATION CONCRETE CONFORMING TO SPECIFICATIONS WITH MINIMUM FC' = 4000 PSI
   B. REINFORCING STEEL SHALL CONFORM TO ASTM A615 GRADE 60 OR BETTER. ALL REINFORCING STEEL BARS, DOWELS AND WELDED WIRE FABRIC SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A767.
   C. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 WITH MINIMUM YIELD STRESS OF 85000 PSI.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

LIGHTING PLAN AND DETAILS

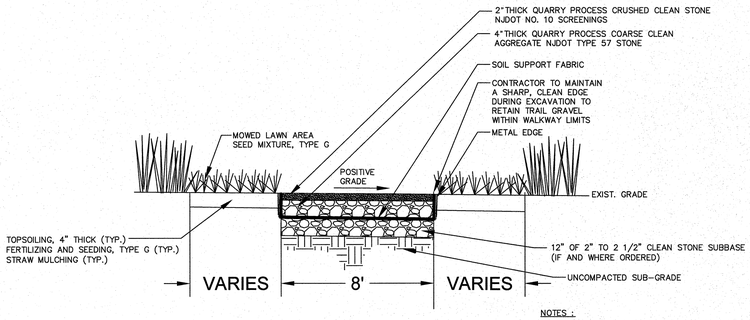
REGISTER NO.

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: AM	DESIGNED BY: AM/KT	
CHECKED BY: KT	SHEET: 96 of 139	

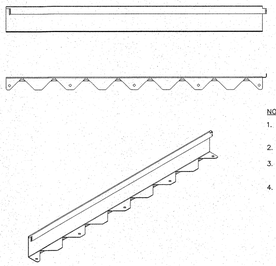


AGGREGATE WALKING TRAIL DETAIL

N.T.S.

NOTES :

1. NO BINDING AGENT SHALL BE PROVIDED FOR THE AGGREGATE WALKING TRAIL.
2. PROPOSED AGGREGATE SHALL BE "CLEAN" TO REMOVE FINES AND STONE DUST.

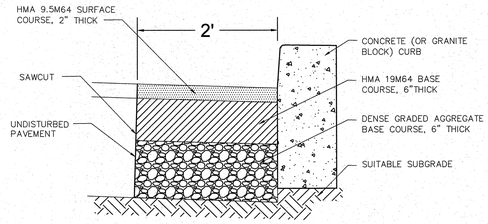


NOTES :

1. CONTRACTOR TO BACKFILL ALONG EDGING ENSURING THAT TOP EDGE IS FLUSH WITH FINISH GRADE.
2. DIMENSIONS TO BE PER MANUFACTURER'S RECOMMENDATION.
3. AGGREGATE TRAIL EDGING TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATION.
4. SHOP DRAWINGS TO BE SUBMITTED FOR REVIEW PRIOR TO INSTALLATION.

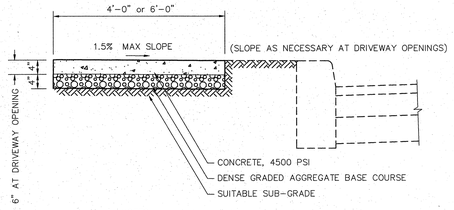
AGGREGATE WALKING TRAIL METAL EDGE

N.T.S.



PAVEMENT REPAIR DETAIL FOR CURB REPLACEMENT (NO ROAD RECONSTRUCTION)

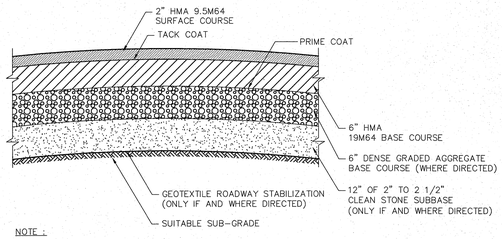
N.T.S.



NOTES :
SEE DETAILS FOR HANDICAPPED RAMP

TYPICAL SIDEWALK DETAIL

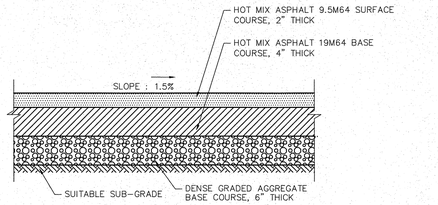
N.T.S.



NOTE :
THE CROWN OF ALL PAVEMENT SHALL BE AS INDICATED ON THE CROSS SECTIONS

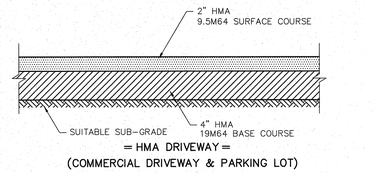
TYPICAL PAVEMENT DETAIL

N.T.S.



HMA WALKWAY DETAIL

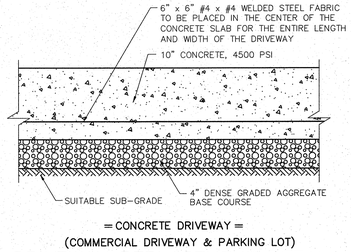
N.T.S.



= HMA DRIVEWAY =
(COMMERCIAL DRIVEWAY & PARKING LOT)

HMA COMMERCIAL DRIVEWAY DETAIL

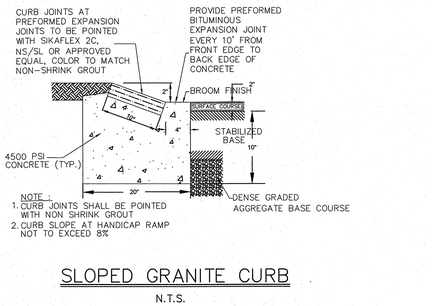
N.T.S.



= CONCRETE DRIVEWAY =
(COMMERCIAL DRIVEWAY & PARKING LOT)

DRIVEWAY REPLACEMENT DETAIL

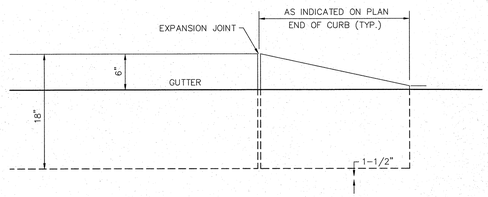
N.T.S.



NOTE :
1. CURB JOINTS SHALL BE POINTED WITH NON SHRINK GROUT
2. CURB SLOPE AT HANDICAP RAMP NOT TO EXCEED 8%

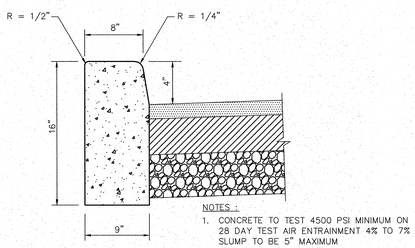
SLOPED GRANITE CURB

N.T.S.



ELEVATION
9"x 18" KNOCKOUT CURB

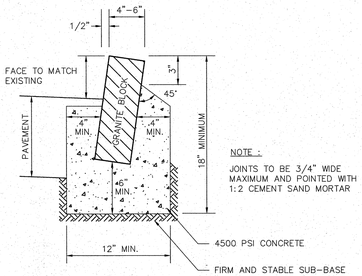
N.T.S.



NOTES :
1. CONCRETE TO TEST 4500 PSI MINIMUM ON 28 DAY TEST AIR ENTRAINMENT 4% TO 7% SLUMP TO BE 5" MAXIMUM
2. SEE DETAILS FOR HANDICAPPED RAMP

TYPICAL 9"x 18" CURB DETAIL NJDOT CURB

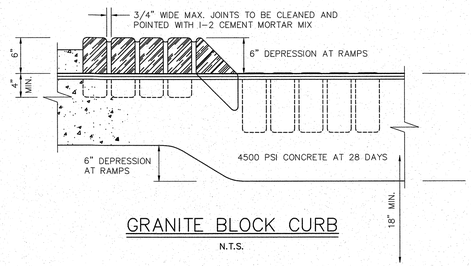
N.T.S.



NOTE :
JOINTS TO BE 3/4" WIDE MAXIMUM AND POINTED WITH 1:2 CEMENT SAND MORTAR

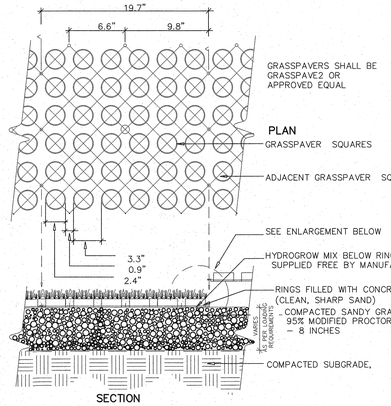
GRANITE BLOCK CURB

N.T.S.



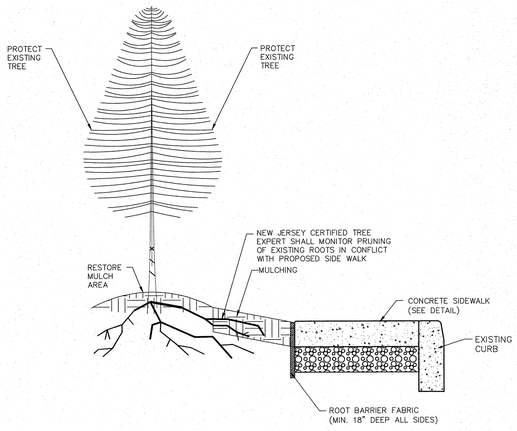
GRANITE BLOCK CURB

N.T.S.



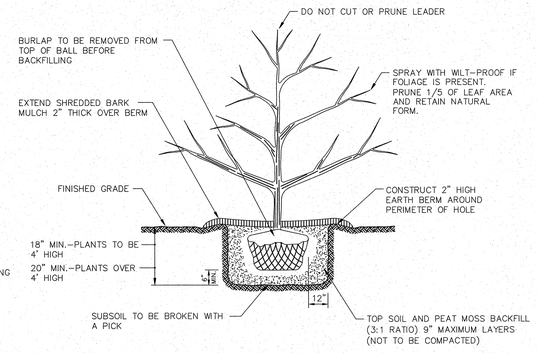
TYPICAL GRASSPAVER DETAIL

N.T.S.



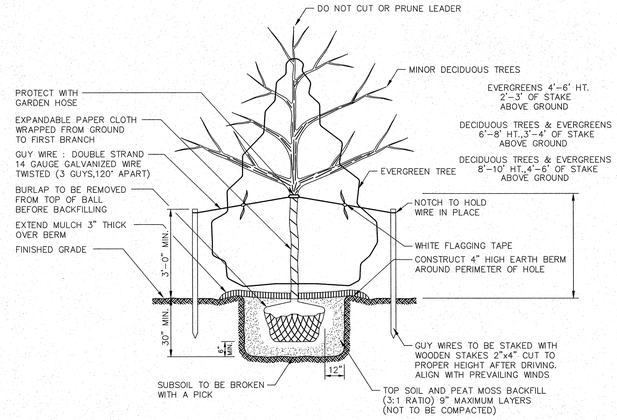
SELECTIVE ROOT PRUNING DETAIL

N.T.S.



TYPICAL SHRUB PLANTING DETAIL

N.T.S.



TYPICAL TREE PLANTING DETAIL

N.T.S.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	APPROVED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

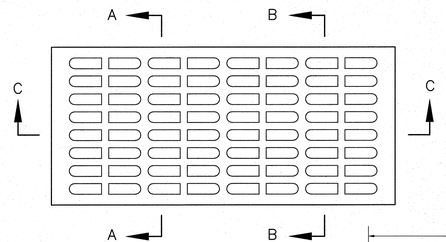
CONSTRUCTION DETAILS (1 OF 9)

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28335900
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

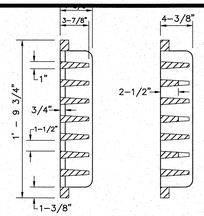
REGISTER NO.
FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

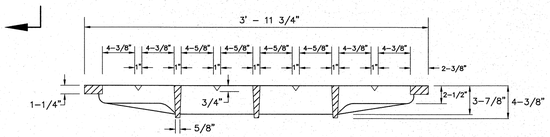
SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO/PB	
CHECKED BY: PB	SHEET: 97 of 139	



GRATE TO BE CAST IRON WITH A MIN. WEIGHT OF 325 LBS.



SECTION A–A SECTION B–B

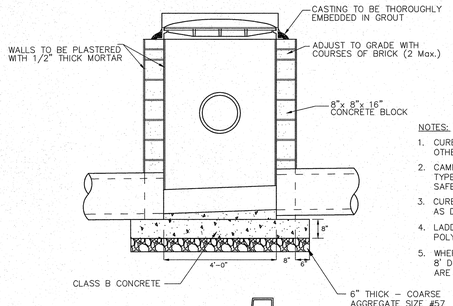


SECTION C–C

INSIDE AND OUTSIDE

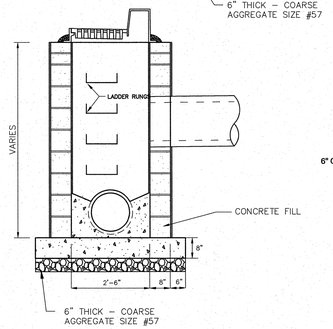
BICYCLE SAFE GRATE

N.T.S.



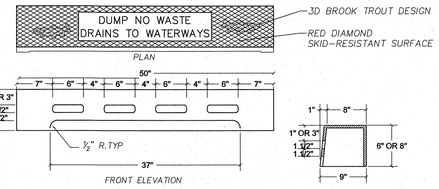
NOTES:

1. CURB FACE TO BE 8" UNLESS OTHERWISE INDICATED.
2. CAMPBELL CASTING PATTERN NO. 2618, TYPE N ECO CURB PIECE, "BICYCLE SAFE GRATE" OR APPROVED EQUAL.
3. CURB MARKING ON CASTING AS DIRECTED BY ENGINEER.
4. LADDER RUNGS SHALL BE POLYPROPYLENE AS PER DETAIL.
5. WHERE INLETS ARE GREATER THAN 8' DEEP, DOUBLE BLOCK WALLS ARE REQUIRED.



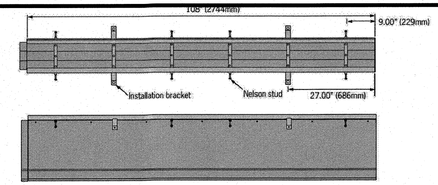
INLET TYPE "D"

N.T.S.

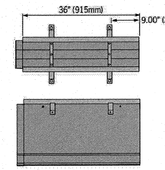


CURB PIECE TYPE 'N–ECO'

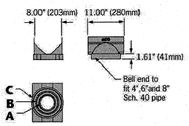
N.T.S.
CAMPBELL CASTING PATTERN NO. 2618 TYPE "N–ECO" OR APPROVED EQUAL.

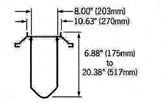


Three foot channel

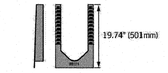


Vertical outlet adapter

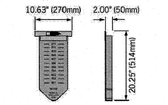




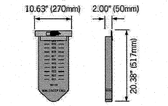
Channel Collar



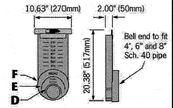
Closing cap - Female



Closing cap - Male



Outlet end cap



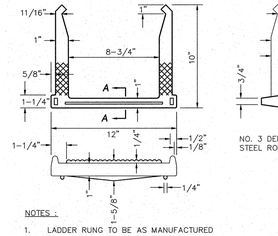
Outlet flow rates

Outlet	Product	Outlet size (Sch. 40)	Invert Depth	GPM	CFS
A	Vertical outlet - F801	4" round	7.88	154	0.34
A	Vertical outlet - F812	4" round	20.25	246	0.54
B	Vertical outlet - F801	6" round	7.88	346	0.77
B	Vertical outlet - F812	6" round	20.25	553	1.23
C	Vertical outlet - F801	8" round	7.88	616	1.37
C	Vertical outlet - F812	8" round	20.25	982	2.18
D	Outlet cap - F802	4" round	9.00	145	0.33
D	Outlet cap - F812	4" round	20.25	233	0.54
E	Outlet cap - F803	6" round	10.13	330	0.76
E	Outlet cap - F812	6" round	20.25	510	1.17
F	Outlet cap - F805	8" round	12.38	635	1.46
F	Outlet cap - F812	8" round	20.25	880	2.03

Note: These are the pipe flow rates at the specified outlet, **NOT** channel flow rates.

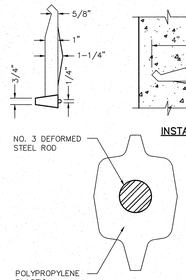
TRENCH DRAIN DETAIL
(ACO FLOWDRAIN FG200 OR APPROVED EQUAL)

N.T.S.

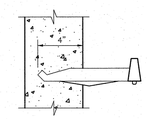


NOTES :

1. LADDER RUNG TO BE AS MANUFACTURED BY M.A. INDUSTRIES OR APPROVED EQUAL.
2. IN PRECAST MANHOLES, STEPS SHALL BE DRIVEN INTO WET CONCRETE WALL DURING MANUFACTURE.



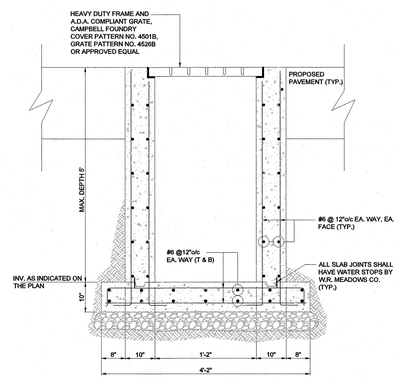
SECTION A – A



INSTALLATION

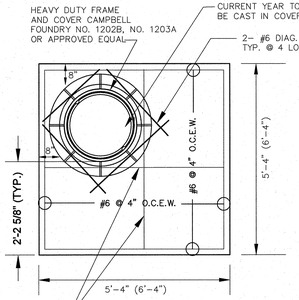
POLYPROPYLENE LADDER RUNG DETAIL

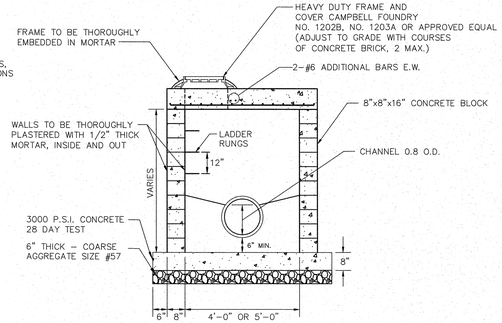
N.T.S.



TRENCH DRAIN DETAIL

N.T.S.





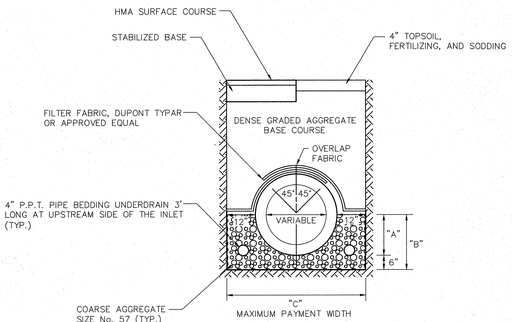
SECTION A–A

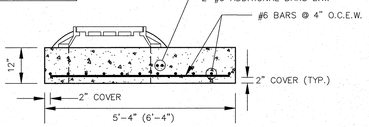
4' OR 5' SQUARE MANHOLE DETAIL

N.T.S.

NOTES:

1. LADDER RUNGS SHALL BE POLYPROPYLENE.
2. WHERE MANHOLE IS GREATER THAN 8' DEEP, DOUBLE BLOCK WALLS ARE REQUIRED.





PRECAST REINFORCED CONCRETE SLAB
4' (OR 5') SQUARE MANHOLE ONLY

N.T.S.

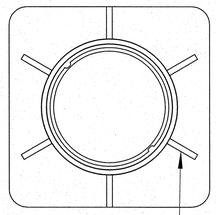
NOTE :

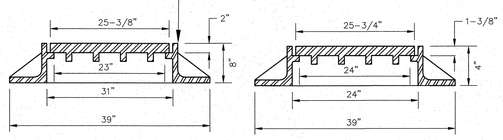
1. UNDERDRAIN SHALL BE CONNECTED TO EACH DOWN STREAM DRAINAGE STRUCTURE AND SHALL BE CAPPED AT THE UPSTREAM END.
2. FLEXIBLE WATERTIGHT GASKETS SHALL BE USED IN CONCRETE PIPE AND SHALL BE INSTALLED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER.

PIPE DIAMETER	DIMENSIONS "A"	"B"	"C"
12"	8"	14"	40"
15"	9 3/4"	15 1/2"	43 1/2"
18"	11 1/2"	17 1/2"	47"
24"	15"	21"	54"
30"	18 1/2"	24 1/2"	61"
36"	22"	28"	68"
42"	25 1/2"	31 1/2"	75"
48"	29"	35"	82"

TYPICAL PIPE BEDDING
STORM SEWER

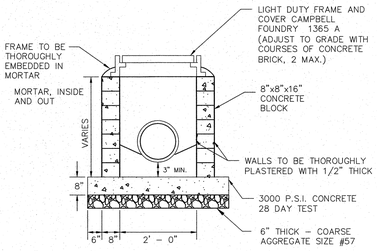
N.T.S.





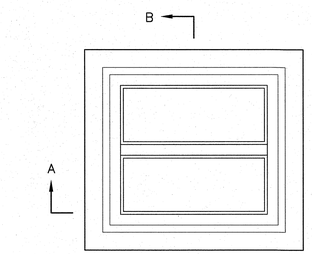
TYPICAL STORM SEWER
MANHOLE FRAME & COVER

N.T.S.



LAWN INLET DETAIL

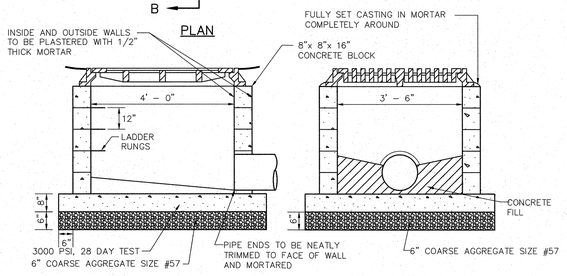
N.T.S.



NOTES:

1. CASTING SHALL BE CAMPBELL FOUNDRY CO. PATTERN NO. 3425 "BICYCLE SAFE GRATE" OR EQUAL
2. LADDER RUNGS SHALL BE POLYPROPYLENE.
3. WHERE INLETS ARE GREATER THAN 8' DEEP, DOUBLE BLOCK WALLS ARE REQUIRED.

PLAN



SECTION A–A SECTION B–B

INLET TYPE "E"

N.T.S.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	JPB/BDP	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION DETAILS (2 OF 9)

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359600
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

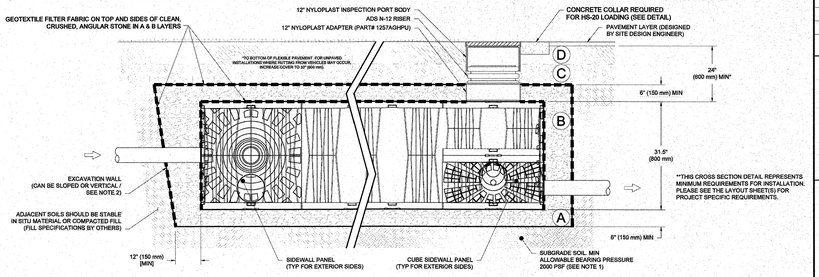
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

REGISTER NO.	
FILE NO.	115.UN00213.P05
SCALE	As Shown
DATE	October 2024
DRAWN BY	TE
DESIGNED BY	GO/PB
CHECKED BY	PB
SHEET	98 of 139
DRAWING NUMBER	

ACCEPTABLE FILL MATERIALS : AQUABOX-1

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEERS PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE AQUABOX MODULES. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145* A-1, A-2-4, A-3 OR AASHTO M43* 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE AQUABOX MODULES IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**PERIMETER STONE:** FILL SURROUNDING THE AQUABOX MODULES FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43* 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW AQUABOX MODULES FROM THE SUBGRADE UP TO THE BOTTOM OF THE AQUABOX MODULE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43* 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #57 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 57 (AASHTO M43) STONE".
2. ADS AQUABOX COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT ADS FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



NOTES:
1. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE PERFORMANCE CHARACTERISTICS OF THE SUBGRADE SOILS WITH CONSIDERATION FOR THE RANGE OF EXPECTED MOISTURE CONDITIONS. SUBGRADE PREPARATION AND/OR IMPROVEMENT SHOULD BE SPECIFIED BY THE DESIGN ENGINEER AS NECESSARY TO MEET THE PERFORMANCE REQUIREMENTS OF THE ADS AQUABOX SYSTEM.
2. EXCAVATION WALL SHOULD BE COMPLIANT WITH OSHA SAFETY STANDARDS. DEEPER EXCAVATIONS AND MULTI-LAYER AQUABOX SYSTEMS MAY REQUIRE SLOPED OR BENCHED EXCAVATIONS.
PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL.

STANDARD CROSS SECTION AQUABOX-1 | DATE: 09/20/24 | DRAWN: BMW | CHECKED: JLM | DRAWING #: 772-010 | DESCRIPTION | BASE | SEWR | SHEET 1 OF 1

Aquabox Modular Stormwater Management System | 4640 TRUEMAN BLVD HILLIARD, OH 43026 | ADS

THIS DRAWING AND ALL DESIGNS, DETAILS AND CONCEPTS CONTAINED THEREIN ARE THE PROPERTY OF ADS AND SHALL NOT BE USED IN WHOLE OR IN PART FOR ANY PROJECT WITHOUT THE WRITTEN CONSENT OF ADS. IN THE EVENT OF UNAUTHORIZED USE OF THIS DRAWING, ADS RESERVES THE RIGHT TO PURSUE ALL LEGAL REMEDIES AVAILABLE UNDER THE LAW. ANY UNAUTHORIZED USE SHALL BE AT THE SOLE RISK OF THE USER AND WITHOUT LIABILITY TO ADS. THE USER SHALL INDEMNIFY ADS AGAINST ANY LOSS, COST, OR EXPENSE ARISING FROM SUCH USE.

TECHNICAL SPECIFICATIONS AQUABOX CUBE MODULE | DRAWN: BMW | CHECKED: JLM | DATE: 09/20/24 | DRAWING #: 771-011 | Aquabox Modular Stormwater Management System | 4640 TRUEMAN BLVD HILLIARD, OH 43026 | ADS | 1

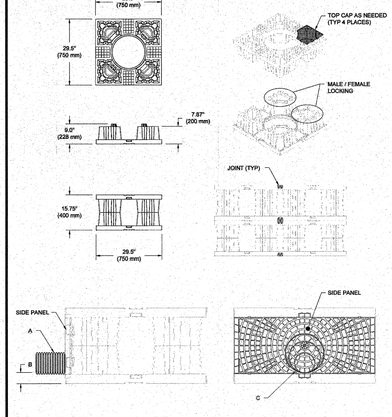
THIS DRAWING AND ALL DESIGNS, DETAILS AND CONCEPTS CONTAINED THEREIN ARE THE PROPERTY OF ADS AND SHALL NOT BE USED IN WHOLE OR IN PART FOR ANY PROJECT WITHOUT THE WRITTEN CONSENT OF ADS. IN THE EVENT OF UNAUTHORIZED USE OF THIS DRAWING, ADS RESERVES THE RIGHT TO PURSUE ALL LEGAL REMEDIES AVAILABLE UNDER THE LAW. ANY UNAUTHORIZED USE SHALL BE AT THE SOLE RISK OF THE USER AND WITHOUT LIABILITY TO ADS. THE USER SHALL INDEMNIFY ADS AGAINST ANY LOSS, COST, OR EXPENSE ARISING FROM SUCH USE.

TECHNICAL SPECIFICATIONS AQUABOX FULL MODULE | DRAWN: BMW | CHECKED: JLM | DATE: 09/20/24 | DRAWING #: 773-012 | Aquabox Modular Stormwater Management System | 4640 TRUEMAN BLVD HILLIARD, OH 43026 | ADS | 1

THIS DRAWING AND ALL DESIGNS, DETAILS AND CONCEPTS CONTAINED THEREIN ARE THE PROPERTY OF ADS AND SHALL NOT BE USED IN WHOLE OR IN PART FOR ANY PROJECT WITHOUT THE WRITTEN CONSENT OF ADS. IN THE EVENT OF UNAUTHORIZED USE OF THIS DRAWING, ADS RESERVES THE RIGHT TO PURSUE ALL LEGAL REMEDIES AVAILABLE UNDER THE LAW. ANY UNAUTHORIZED USE SHALL BE AT THE SOLE RISK OF THE USER AND WITHOUT LIABILITY TO ADS. THE USER SHALL INDEMNIFY ADS AGAINST ANY LOSS, COST, OR EXPENSE ARISING FROM SUCH USE.

ADS AQUABOX CROSS SECTION DETAIL (OR APPROVED EQUAL)
N.T.S.

AQUABOX CUBE MODULE TECHNICAL SPECIFICATION
NTS

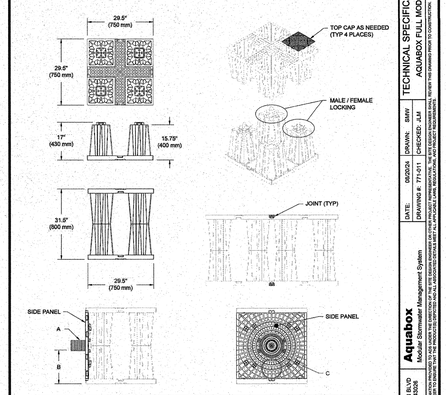


STUB CONNECTION	STUB (A)	INVERT (B)	MARKED CUT HOLE (C)
6" ADS N-12 (ECCENTRIC)	6" (150 mm)	2.5" (62 mm) 6" (150 mm)	200 mm

NOTE: ALL DIMENSIONS ARE NOMINAL

ADS AQUABOX CUBE MODULE DETAIL (OR APPROVED EQUAL)
N.T.S.

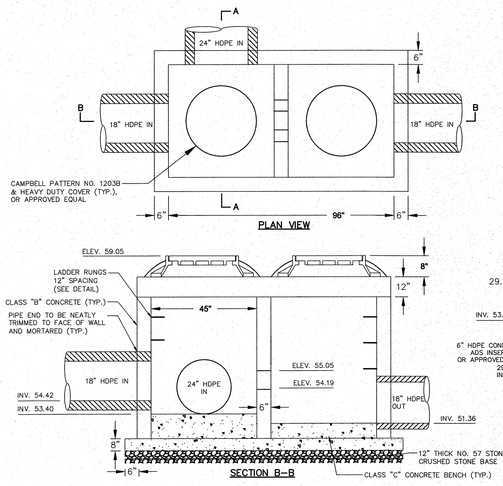
AQUABOX FULL MODULE TECHNICAL SPECIFICATION
NTS

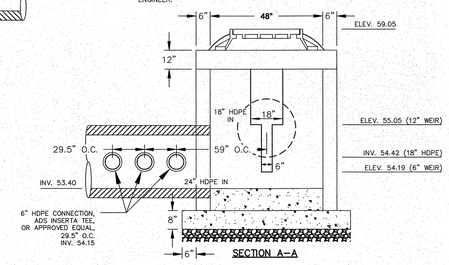


STUB CONNECTION	STUB (A)	INVERT (B)	MARKED CUT HOLE (C)
4" ADS N-12 (CONCENTRIC)	4" (100 mm)	13.1" (334 mm)	125 mm
6" ADS N-12 (ECCENTRIC)	6" (150 mm)	2.5" (63 mm) 20.3 (516 mm)	200 mm
6" ADS N-12 (CONCENTRIC)	6" (150 mm)	11.9" (300 mm)	200 mm
8" ADS N-12	8" (200 mm)	11.1" (282 mm)	250 mm
10" ADS N-12*	10" (250 mm)	10.0" (253 mm)	315 mm
12" ADS N-12*	12" (300 mm)	8.8" (223 mm)	400 mm
15" ADS N-12*	15" (375 mm)	7.8" (198 mm)	400 mm
18" ADS N-12*	18" (450 mm)	5.8" (147 mm)	500 mm

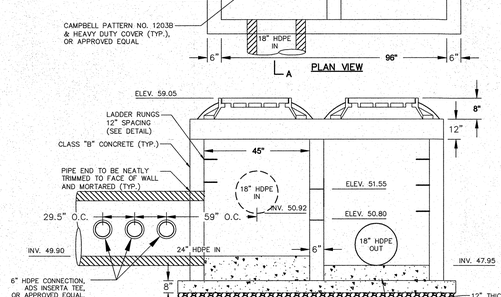
NOTE: ALL DIMENSIONS ARE NOMINAL
*10" - 18" PIPE ENDS REQUIRE FIELD CUT PER DETAIL

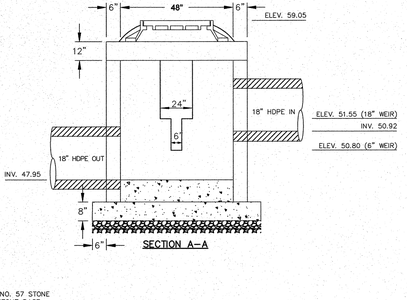
ADS AQUABOX FULL MODULE DETAIL (OR APPROVED EQUAL)
N.T.S.



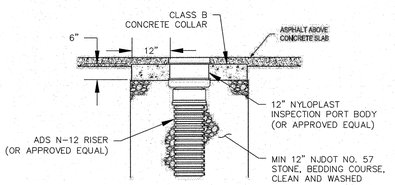


OUTLET CONTROL STRUCTURE #1 AND MANIFOLD DETAIL
N.T.S.

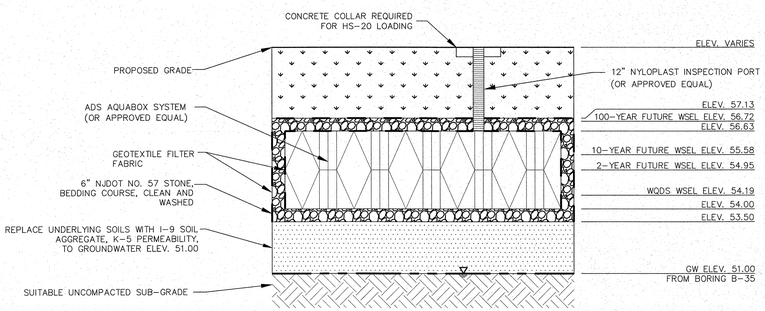




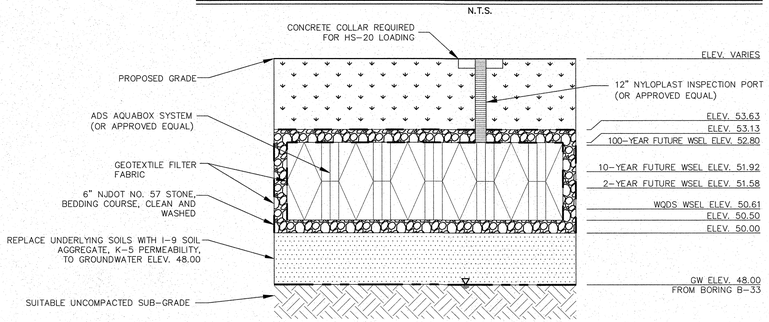
OUTLET CONTROL STRUCTURE #2 AND MANIFOLD DETAIL
N.T.S.



CONCRETE COLLAR INSTALLATION DETAIL
N.T.S.



SUBSURFACE INFILTRATION BASIN #1 CROSS SECTION DETAIL
N.T.S.



SUBSURFACE INFILTRATION BASIN #2 CROSS SECTION DETAIL
N.T.S.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/22/2025	JPB/BDP	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION DETAILS (3 OF 9)

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY	DESIGNED BY
TE	GO/PB
CHECKED BY	SHEET
PB	99 of 139

PROJECT NO. 115.UN00213.P05 | FILE NO. | DRAWING NUMBER

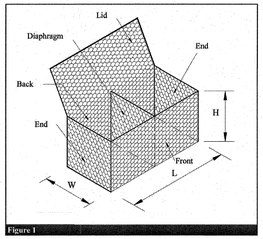


Figure 1

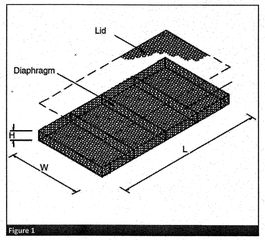


Figure 1

The tolerance on the opening of mesh 'D' being the distance between the axis of two consecutive twists, is according to ASTM A975-97

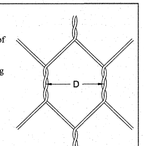


Figure 2

The tolerance on the opening of mesh 'D' being the distance between the axis of two consecutive twists, is according to EN 10223-3

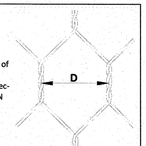


Figure 2

TYPICAL GABION BASKET AND MATTRESS DETAIL

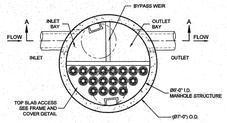
N.T.S.

NOTE: WIRE MESH TO BE PVC COATED

KRAKEN FILTER DESIGN NOTES

KRAKEN FILTER TREATMENT CAPACITY VARIES BY CARTRIDGE COUNT AND LOCALLY APPROVED SURFACE AREA SPECIFIC TO FLOWRATE, PEAK CONVEYANCE CAPACITY TO BE CALCULATED BY ENGINEER OF RECORD.
AN (8)-0' MANHOLE KRAKEN FILTER IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (18) AND IS AVAILABLE IN A LEFT INLET (AS SHOWN) OR A RIGHT INLET CONFIGURATION.
ALL PARTS AND INTERNAL ASSEMBLY PROVIDED BY CONTECH UNLESS NOTED OTHERWISE.

CARTRIDGE SELECTION			
CARTRIDGE HEIGHT	30"	20"	10"
RECOMMENDED HYDRAULIC DROP (in)	35.0"	28.5"	18.5"
SPECIFIC FLOW RATE (gpm/sf)	0.10	0.10	0.10
CARTRIDGE FLOW RATE (gpm)	17	10.6	4.9



PLAN VIEW

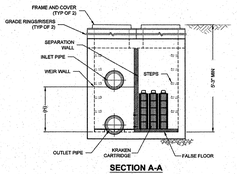


FRAME AND GRATE
(SIZE MAY VARY)
(NOT TO SCALE)



FRAME AND COVER
(30" ROUND)
(NOT TO SCALE)

SITE SPECIFIC DATA REQUIREMENTS			
STRUCTURE ID			-
WATER QUALITY FLOW RATE (cfs)			-
PEAK FLOW RATE (cfs)			-
RETURN PERIOD OF PEAK FLOW (yrs)			-
CARTRIDGE HEIGHT (SEE TABLE ABOVE)			-
NUMBER OF CARTRIDGES REQUIRED			-
CARTRIDGE FLOW RATE			-
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE #1	-	-	-
INLET PIPE #2	-	-	-
OUTLET PIPE	-	-	-
RIM ELEVATION			-
ANTI-FLOTATION BALLAST	WIDTH		HEIGHT
	-		-
NOTES/SPECIAL REQUIREMENTS:			
* PER ENGINEER OF RECORD			-



SECTION A-A

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. SEE CONTECH DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH REPRESENTATIVE, www.ContechES.com
4. KRAKEN FILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
5. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 10' AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE DETERMINED BY THE ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE KRAKEN FILTER STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH OUTLET PIPE INVERT WITH OUTLET BAY FLOOR.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
F. CONTRACTOR TO REMOVE THE TRANSFER OPENING COVER WHEN THE SYSTEM IS ACTIVATED.

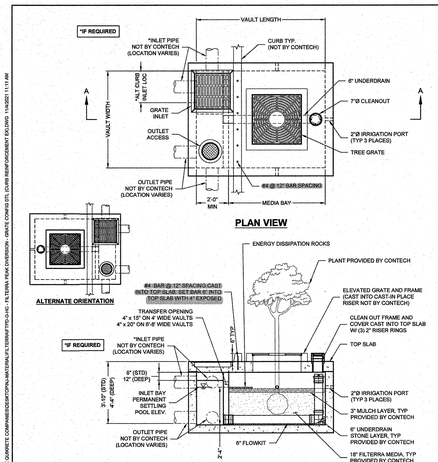
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 9,604,160;10,307,694; 10,359,496; 11,260,321; RELATED FOREIGN PATENTS OR OTHER PATENT PENDING

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

KFMH72
KRAKEN FILTER
STANDARD DETAIL

HIGH CAPACITY KRAKEN FILTER PEAK DIVERSION, KFMH72 (OR APPROVED EQUAL)

N.T.S.



INTERNAL PIPE CONFIGURATION MAY VARY DEPENDING UPON OUTLET LOCATION

FTPD-G-HC STANDARD HEIGHT CONFIGURATION

DESIGNATION (OPTIONS: -P)	AVAILABILITY	MEDIA BAY SIZE	VAULT SIZE (W x L)	WEIR LENGTH/ MAX CURB OPENING	*MAX BYPASS FLOW (CFS)	GRATE INLET/ OUTLET ACCESS SIZE	TREE GRATE QTY & SIZE
FTPD0404-G-HC	N/A CA	4 x 4	4 x 6	1'-8"	1.4	12"SQ/12"Ø	(1) 2.5' x 2.5'
FTPD0404S-G-HC	CA ONLY	4 x 4.5	4 x 6.5	1'-8"	1.4	12"SQ/12"Ø	(1) 2.5' x 2.5'
FTPD0406-G-HC	N/A DE, MD, NJ, PA, VA, WV	4 x 6	4 x 8	1'-8"	1.4	12"SQ/12"Ø	(1) 3' x 3'
FTPD0406S8-G-HC	DE, MD, NJ, PA, VA, WV ONLY	4.5 x 5.83	4.5 x 7.83	1'-8"	1.4	12"SQ/12"Ø	(1) 3' x 3'
FTPD0604-G-HC	ALL	6 x 4	6 x 6	1'-8"	1.4	24"SQ/12"Ø	(1) 2.5' x 2.5'
FTPD0606-G-HC	ALL	6 x 5	6 x 8	1'-8"	1.4	24"SQ/12"Ø	(1) 3' x 3'
FTPD0608-G-HC	ALL	6 x 8	6 x 10	1'-8"	1.4	24"SQ/12"Ø	(1) 4' x 4'
FTPD0610-G-HC	ALL	6 x 10	6 x 12	1'-8"	1.4	24"SQ/12"Ø	(1) 4' x 4'
FTPD0706-G-HC	ALL	7 x 10	7 x 13	2'-6"	2.1	24"SQ/24"Ø	(1) 4' x 4'
FTPD0810S-G-HC	ALL	8 x 10.5	8 x 14	3'-0"	2.5	24"SQ/24"Ø	(1) 4' x 4'
FTPD0812S-G-HC	N/A OR, WA	8 x 12.5	8 x 16	3'-0"	2.5	24"SQ/24"Ø	(2) 4' x 4'
FTPD0911S-G-HC	OR, WA ONLY	9 x 11.5	9 x 15	3'-0"	2.5	24"SQ/24"Ø	(2) 4' x 4'

N/A = NOT AVAILABLE

FTPD-GD-HC DEEP OPTION CONFIGURATION

DESIGNATION (OPTIONS: -P)	AVAILABILITY	MEDIA BAY SIZE	VAULT SIZE (W x L)	WEIR LENGTH/ MAX CURB OPENING	*MAX BYPASS FLOW (CFS)	GRATE INLET/ OUTLET ACCESS SIZE	TREE GRATE QTY & SIZE
FTPD0404-GD-HC	N/A CA	4 x 4	4 x 6	1'-8"	4.6	12"SQ/12"Ø	(1) 2.5' x 2.5'
FTPD0404S-GD-HC	CA ONLY	4 x 4.5	4 x 6.5	1'-8"	4.6	12"SQ/12"Ø	(1) 2.5' x 2.5'
FTPD0406-GD-HC	N/A DE, MD, NJ, PA, VA, WV	4 x 6	4 x 8	1'-8"	4.6	12"SQ/12"Ø	(1) 3' x 3'
FTPD0406S8-GD-HC	DE, MD, NJ, PA, VA, WV ONLY	4.0 x 5.83	4.5 x 7.83	1'-8"	4.6	12"SQ/12"Ø	(1) 3' x 3'
FTPD0604-GD-HC	ALL	6 x 4	6 x 6	1'-8"	4.6	24"SQ/12"Ø	(1) 2.5' x 2.5'
FTPD0606-GD-HC	ALL	6 x 5	6 x 8	1'-8"	4.6	24"SQ/12"Ø	(1) 3' x 3'
FTPD0608-GD-HC	ALL	6 x 8	6 x 10	1'-8"	4.6	24"SQ/12"Ø	(1) 4' x 4'
FTPD0610-GD-HC	ALL	6 x 10	6 x 12	1'-8"	4.6	24"SQ/12"Ø	(1) 4' x 4'
FTPD0710-GD-HC	ALL	7 x 10	7 x 13	2'-6"	6.8	24"SQ/24"Ø	(1) 4' x 4'
FTPD0810S-GD-HC	ALL	8 x 10.5	8 x 14	3'-0"	8.2	24"SQ/24"Ø	(1) 4' x 4'
FTPD0812S-GD-HC	N/A OR, WA	8 x 12.5	8 x 16	3'-0"	8.2	24"SQ/24"Ø	(2) 4' x 4'
FTPD0911S-GD-HC	OR,WA ONLY	9 x 11.5	9 x 15	3'-0"	8.2	24"SQ/24"Ø	(2) 4' x 4'

N/A = NOT AVAILABLE

*MAX BYPASS FLOW IS INTERNAL WEIR FLOW . SITE SPECIFIC ANALYSIS IS REQUIRED TO DETERMINE GRATE INLET FLOW CAPACITY

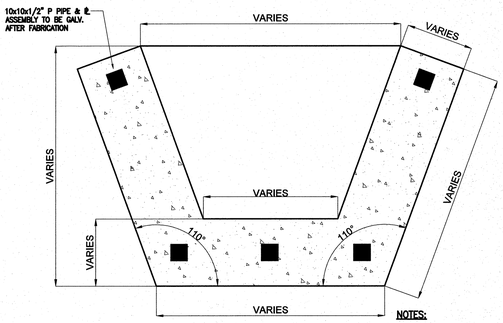
The design and information shown on this drawing is provided as a service to the project owner, engineer and contractor by Contech Engineered Solutions LLC or one of its affiliated companies ("Contech"). Unless this drawing bears the seal of a professional engineer employed by Contech, Contech makes no representations as to the accuracy or completeness of the information shown. It is the responsibility of the project owner, engineer and contractor to verify the suitability and adequacy of the design and information shown for the project in all respects. Contech's liability is limited to the terms and conditions of the sale contract. Any use or reliance on this drawing by the project owner, engineer or contractor for any purpose other than that for which it was specifically prepared by Contech is at the user's sole risk and without liability to Contech. The user shall indemnify, defend and hold Contech harmless from any claims, damages or losses, including attorneys' fees, arising from such use or reliance.

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

FILTERRA HC PEAK DIVERSION - GRATE (FTPD-G-HC) CURB REINFORCEMENT EXAMPLE (NOT STANDARD)

FILTERRA HC PEAK DIVERSION – GRATE WITH CURB REINFORCEMENT DETAIL (OR APPROVED EQUAL)

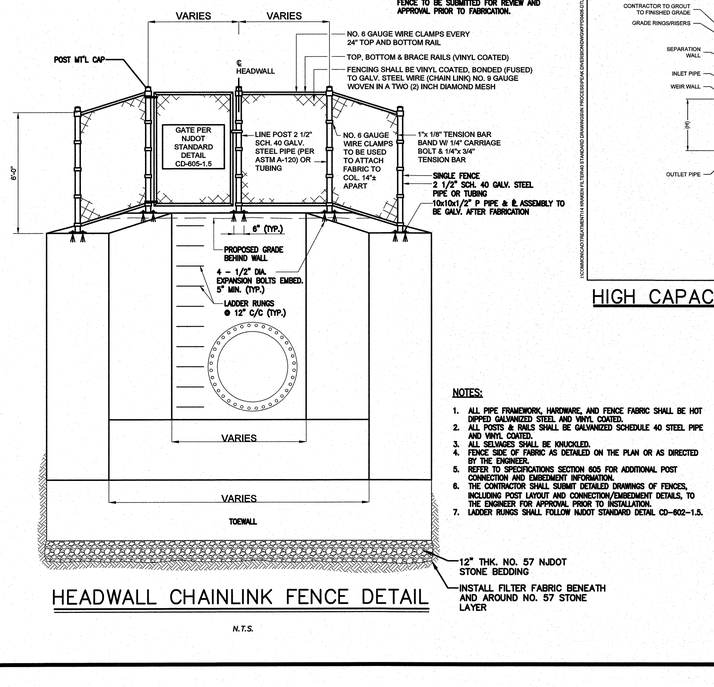
N.T.S.



PLAN VIEW

NOTES:

1. REFER TO NJ D.O.T HEADWALL DETAILS FOR DIMENSIONS.
2. SHOP DRAWINGS FOR EACH HEADWALL AND FOR THE SURFACE-MOUNTED CHAIN-LINK FENCE TO BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.

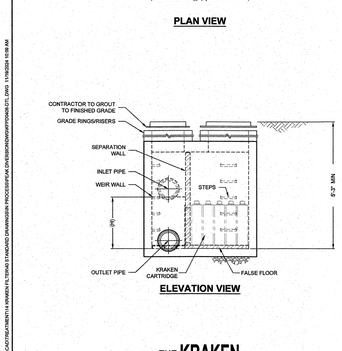


HEADWALL CHAINLINK FENCE DETAIL

N.T.S.

NOTES:

1. ALL PIPE FRAMEWORK, HARDWARE, AND FENCE FABRIC SHALL BE HOT DIPPED GALVANIZED STEEL AND VINYL COATED.
2. ALL POSTS & RAILS SHALL BE GALVANIZED SCHEDULE 40 STEEL PIPE AND VINYL COATED.
3. ALL SELVAGES SHALL BE KNUCKLED.
4. FENCE SIDE OF FABRIC AS DETAILED ON THE PLAN OR AS DIRECTED BY THE ENGINEER.
5. REFER TO SPECIFICATIONS SECTION 605 FOR ADDITIONAL POST CONNECTION AND EMBEDMENT INFORMATION.
6. THE CONTRACTOR SHALL SUBMIT DETAILED DRAWINGS OF FENCES, INCLUDING POST LAYOUT AND CONNECTION/EMBEDMENT DETAILS, TO THE ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.
7. LADDER RUNGS SHALL FOLLOW NJDOT STANDARD DETAIL CD-602-1.5.



PLAN VIEW

FRAME AND GRATE
(24" x 24")
(NOT TO SCALE)

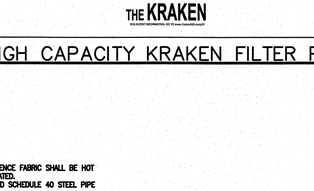


FRAME AND COVER
(24" ROUND)
(NOT TO SCALE)



FRAME AND COVER
(30" ROUND)
(NOT TO SCALE)

SITE SPECIFIC DATA REQUIREMENTS			
STRUCTURE ID			
WATER QUALITY FLOW RATE (cfs)			
PEAK FLOW RATE (cfs)			
RETURN PERIOD OF PEAK FLOW (yrs)			
CARTRIDGE FLOW RATE			
CARTRIDGE HEIGHT (30", 20", 10")			
NUMBER OF CARTRIDGES REQUIRED			
INLET BAY RIM ELEVATION			
FILTER BAY RIM ELEVATION			
PIPE DATA:	INVERT:	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
NOTES/SPECIAL REQUIREMENTS:			



ELEVATION VIEW

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. SEE CONTECH DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH REPRESENTATIVE, www.ContechES.com
4. KRAKEN FILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
5. STRUCTURE SHALL MEET AASHTO HS25 LOAD RATING, ASSUMING EARTH COVER OF 0' - 10' AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE DETERMINED BY THE ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE KRAKEN FILTER STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH OUTLET PIPE INVERT WITH OUTLET BAY FLOOR.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
F. CONTRACTOR TO REMOVE THE TRANSFER OPENING COVER WHEN THE SYSTEM IS ACTIVATED.

THE KRAKEN

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

KFPD0406 (4' x 6')
PEAK DIVERSION KRAKEN FILTER
STANDARD DETAIL

HIGH CAPACITY KRAKEN FILTER PEAK DIVERSION, KFOV0406 (OR APPROVED EQUAL)

N.T.S.

KRAKEN FILTER DESIGN NOTES

- KRAKEN FILTER TREATMENT CAPACITY VARIES BY CARTRIDGE COUNT AND LOCALLY APPROVED SURFACE AREA SPECIFIC FLOW RATE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD
- A 4' x 6' PEAK DIVERSION STYLE KRAKEN FILTER IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (23) AND IS AVAILABLE IN A LEFT INLET (AS SHOWN) OR A RIGHT INLET CONFIGURATION
- ALL PARTS AND INTERNAL ASSEMBLY PROVIDED BY CONTECH UNLESS NOTED OTHERWISE

CARTRIDGE HEIGHT	30"	20"	10"
RECOMMENDED HYDRAULIC DROP (H)	35.5"	28.5"	18.5"
SPECIFIC FLOW RATE (gpm/sf)	0.10	0.10	0.10
CARTRIDGE FLOW RATE (gpm)	17	10.6	4.9

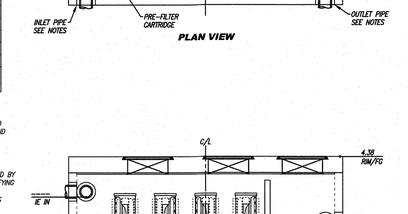
SITE SPECIFIC DATA	
PROJECT NUMBER	----
PROJECT NAME	----
PROJECT LOCATION	NEW JERSEY
STRUCTURE ID	----

TREATMENT REQUIRED	
VOLUME BASED (CF)	FLOW BASED (CFS)
N/A	1.113
TREATMENT HGL AVAILABLE (FT)	N/K
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE	0.00

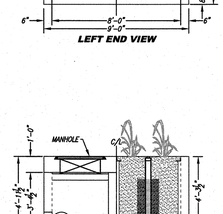
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	----	PVC	8"
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	0.00	PVC	8"

	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	4.38	4.38	4.38
SURFACE LOAD	PEDESTRIAN	N/A	PEDESTRIAN
FRAME & COVER	2EA ø30"	OPEN PLANTER	ø30"
WETLANDMEDIA VOLUME (CY)			8.70

NOTES: PRELIMINARY NOT FOR CONSTRUCTION.

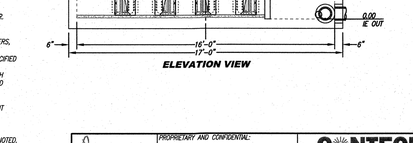


PLAN VIEW

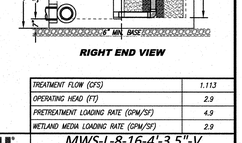


LEFT END VIEW

INSTALLATION NOTES
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS' SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
3. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
4. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO USE GROUT AND/OR BRICKS TO MATCH COVERS WITH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
5. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
6. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.



ELEVATION VIEW



RIGHT END VIEW

TREATMENT FLOW (CFS)	1.113
OPERATING HEAD (FT)	2.9
PRETREATMENT LOADING RATE (GPM/SF)	4.9
WETLAND MEDIA LOADING RATE (GPM/SF)	2.9

GENERAL NOTES
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.

PROPRIETARY AND CONFIDENTIAL:
THE INFORMATION CONTAINED IN THIS DOCUMENT IS THE SOLE PROPERTY OF CONTECH AND ITS COMPANIES. THIS DOCUMENT, NOR ANY PART THEREOF, MAY BE USED, REPRODUCED OR MODIFIED IN ANY MANNER WITH OUT THE WRITTEN CONSENT OF CONTECH.

MWS-L-8-16-4'-3.5"-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

MODULAR WETLANDS LINEAR MWS-L-8-16-4'-3.5"-V (OR APPROVED EQUAL)

N.T.S.

MODULAR WETLAND MTD SITE SPECIFIC DATA			
MTD #	AREA TREATED (AC)	DESIGN FLOW (CFS)	MEDIA BAY SIZE
11	0.55	0.93	8'X16'

CONTECH KRAKEN MTD SITE SPECIFIC DATA			
MTD #	AREA TREATED (AC)	DESIGN FLOW (CFS)	MEDIA BAY SIZE
12	0.21	0.29	6' DIA. VAULT
13	0.74	0.25	4'X6'

FILTERRA MTD SITE SPECIFIC DATA			
MTD #	AREA TREATED (AC)	DESIGN FLOW (CFS)	MEDIA BAY SIZE
1	0.180	0.25	6'X6'
2	0.584	0.58	8'X10.5'
3	0.377	0.49	7'X10'
4	0.119	0.33	6'X8'
5	0.110	0.23	6'X6'
6	0.086	0.25	6'X6'
7	0.153	0.25	6'X6'
8	0.120	0.22	6'X10'
9	0.094	0.25	6'X6'
10	0.465	0.58	8'X10.5'

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	JPB/BCP	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION DETAILS (4 OF 9)

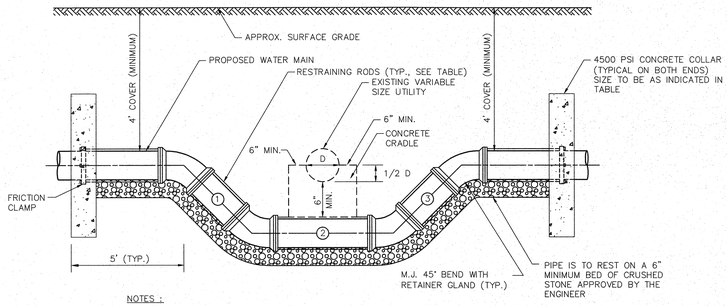
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468
10.1.24

SCALE	DATE
As Shown	October 2024
DRAWN BY: TE	DESIGNED BY: GO/PB
CHECKED BY: PB	SHEET: 100 of 139

DRAWING NUMBER

REGISTER NO.
FILE NO. 115.UN00213.P05



NOTES :

1. PIPE SECTIONS (1) AND (3) VARIABLE TO BE DETERMINED IN FIELD BY ENGINEER.
2. PIPE SECTION (2) TO BE (UTILITY PIPE OUTSIDE DIAMETER (IN FT.)+2.0') MINIMUM LENGTH.
3. CONCRETE CRADLE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4500 PSI.
4. STAINLESS STEEL RESTRAINING RODS SHALL BE UTILIZED.

WATER MAIN SIZE	RESTRAINING RODS (S.S)		CONCRETE THRUST COLLAR (2000 PSI MIN.)			WATER MAIN SIZE	RESTRAINING RODS (S.S.)		CONCRETE THRUST COLLAR (2000 PSI MIN.)		
	NO.	SIZE (IN.)	W (FT.)	H (FT.)	t (FT.)		NO.	SIZE (IN.)	W (FT.)	H (FT.)	t (FT.)
8" & LESS	2	5/8	3.5	2.5	1.5	14" to 16"	4 / 2	5/8 / 3/4	5	4	2
10" to 12"	2	5/8	4	3	1.5	18" to 20"	4	3/4	6.5	4	2

UTILITY CROSSING

N.T.S.

DIMENSIONS													
DIA.	6"	8"	10"	12"	15"	18"	21"	24"	27"	30"	36"	42"	48"	54"
T	5"	5.5"	5.5"	6"	6"	6"	6"	6"	6"	7"	8"	9"	10"	12"

NOTES:

1. PIPE CRADLE SHALL BE USED WHEN THERE IS 1'-6" OR LESS CLEARANCE BETWEEN PIPE CROSSING.

CONCRETE ENCASEMENT & CRADLE

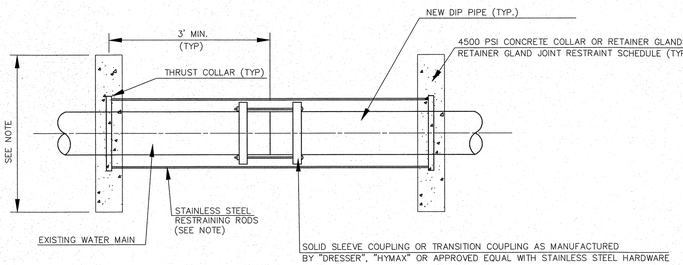
N.T.S.

NOTES:

1. RESTRAINING RODS AND CONCRETE THRUST COLLARS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAILS FOR UTILITY CROSSINGS.

WATER MAIN TEE CONNECTION DETAIL

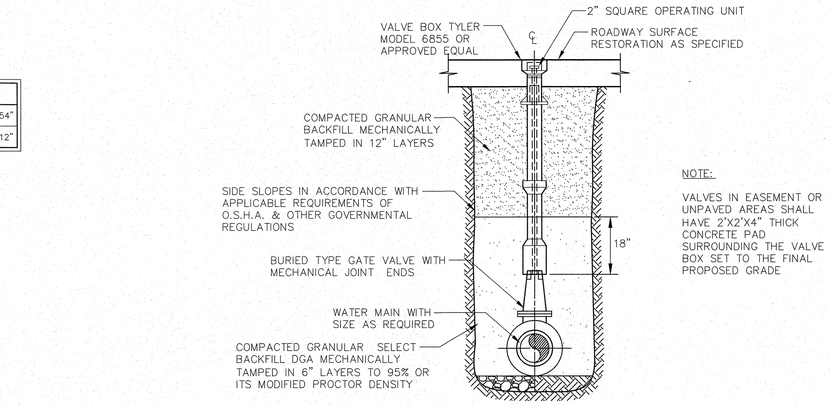
N.T.S.



NOTES:
RESTRAINING RODS AND CONCRETE THRUST COLLARS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAIL FOR UTILITY CROSSINGS.
PROVIDE M.J. REDUCER WHERE EXISTING STUB DIAMETER DIFFERS FROM NEW WATER MAINS.

WATER MAIN CONNECTION DETAIL

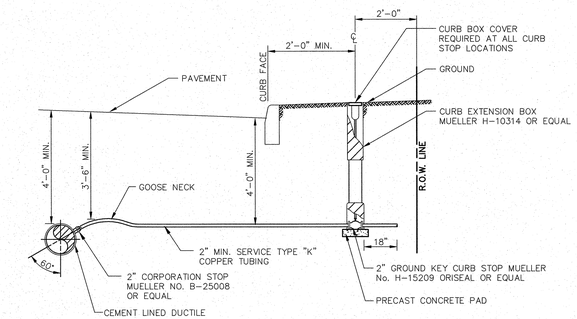
N.T.S.

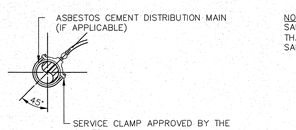


NOTE:
VALVES IN EASEMENT OR UNPAVED AREAS SHALL HAVE 2'X2'X4" THICK CONCRETE PAD SURROUNDING THE VALVE BOX SET TO THE FINAL PROPOSED GRADE

STANDARD DETAIL
UNDERGROUND GATE VALVE

N.T.S.

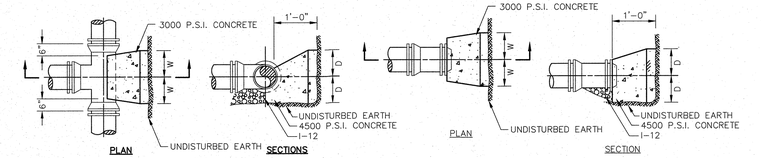




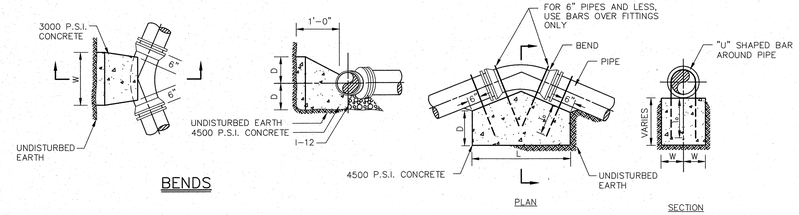
NOTE:
SADDLES REQUIRED FOR SERVICES LARGER THAN ONE (1") INCH IN DIAMETER. SADDLES SHALL BE MUELLER MODEL BR2B.

WATER SERVICE CONNECTION DETAIL

N.T.S.



— HORIZONTAL & DOWNWARD VERTICAL THRUSTS —



BENDS

— UPWARD VERTICAL THRUSTS —

THRUST BLOCK SCHEDULE									
FOR HORIZONTAL & DOWNWARD VERTICAL THRUSTS									
DESCRIPTION OF FITTINGS	MINIMUM DIMENSIONS (IN FEET)	DIAMETER OF PIPE							
		6"	8"	10"	12"	14"	16"	18"	20"
TEES	W	1.25	1.50	1.75	2.00	2.25	2.50	2.50	2.75
	D	1.25	2.00	2.25	2.50	2.75	3.00	3.25	3.50
90° BENDS	W	2.00	3.00	3.50	4.00	4.50	5.00	5.50	6.00
	D	1.50	2.00	2.25	2.50	3.00	3.50	4.00	4.50
45° BENDS	W	1.50	2.00	2.50	3.00	3.50	4.00	4.50	4.50
	D	1.00	1.25	1.75	2.00	2.50	2.75	3.00	3.25
22 1/2° BENDS	W	1.50	1.50	2.00	2.50	3.00	3.50	4.00	4.00
	D	1.00	1.00	1.50	1.50	2.00	2.00	2.50	2.50
11 1/4° BENDS	W	1.00	1.25	1.50	1.50	2.00	2.50	3.00	3.50
	D	1.00	1.00	1.25	1.25	1.50	1.50	1.75	2.00
CAPS	W	1.25	1.50	1.75	2.00	2.25	2.50	2.50	3.00
	D	1.25	2.00	2.25	2.50	2.75	3.00	3.25	3.50

NOTE : ALL W,D & L DIMENSIONS IN FEET
* – 6 "U" BARS REQUIRED

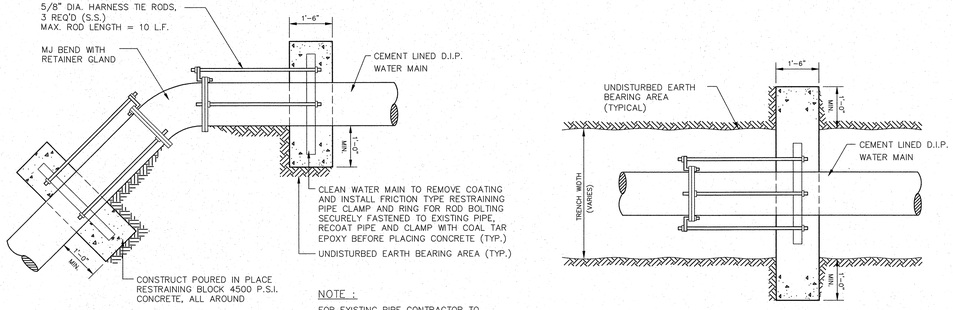
FOR UPWARD VERTICAL THRUSTS					
DESCRIPTION OF FITTINGS	MINIMUM DIMENSIONS (IN FEET)	DIAMETER OF PIPE			
		6"&8"	10"&12"	14"&16"	18"&20"
45° BENDS	L	5.00	6.00	7.00	8.00
	W	2.00	3.00	4.00	5.00
	D	3.25	4.60	5.50	5.50
	BAR #	5	6	11 *	11 *
	l_B	15"	19"	64"	64"
22 1/2° BENDS	L	3.00	5.00	5.00	5.50
	W	1.50	2.50	3.50	4.00
	D	2.75	3.75	5.00	5.50
	BAR #	5	5	10	10
	l_B	15"	15"	56"	56"
11 1/2° BENDS	L	3.00	4.00	5.00	5.50
	W	1.50	1.50	2.00	2.50
	D	1.50	2.40	2.50	4.50
	BAR #	5	5	7	7
	l_B	15"	15"	26"	26"

THRUST BLOCK NOTES :

1. BEARING AREAS SHOWN ARE BASED ON 2000 P.S.F. ALLOWABLE BEARING PRESSURE, WHERE SOILS ARE ENCOUNTERED WITH A POORER BEARING CAPACITY. THE CONTRACTOR SHALL INCREASE THE BEARING AREA AS MAY BE DIRECTED BY THE ENGINEER OR STRAP THE JOINTS IN A MANNER APPROVED BY THE ENGINEER.
2. ALL THRUST BLOCKS SHALL BE POURED DIRECTLY AGAINST THE UNDISTURBED EARTH.
3. NO JOINTS SHALL BE COVERED WITH CONCRETE.
4. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4500 P.S.I.
5. ALL THRUST BLOCKS FOR VERTICAL BENDS SHALL INCLUDE STRAPS TO SECURE FITTING TO BLOCK AND CONCRETE QUANTITY SHALL BE INCREASED AS DIRECTED BY ENGINEER.
6. ALL THRUST BLOCKS WERE DESIGNED FOR 100 P.S.I. NORMAL OPERATING PRESSURE. THE THRUST BLOCKS FOR HIGH PRESSURE LINES, IF ANY, SHALL BE INCREASED IN SIZE AS DIRECTED BY THE ENGINEER.
6. ALL BURIED FITTINGS MUST HAVE THRUST BLOCKS AND MECHANICAL JOINT RETAINER GLANDS WITH FIELD LOCK GASKETS.

THRUST BLOCK STANDARD DETAILS

N.T.S.



NOTE :
FOR EXISTING PIPE CONTRACTOR TO EXCAVATE TEST PIT TO DETERMINE DATA REQUIRED FOR FABRICATION PRIOR TO ORDERING FITTINGS (TYPICAL)

VERTICAL BEND RESTRAINT DETAILS

N.T.S.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION DETAILS (5 OF 9)

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

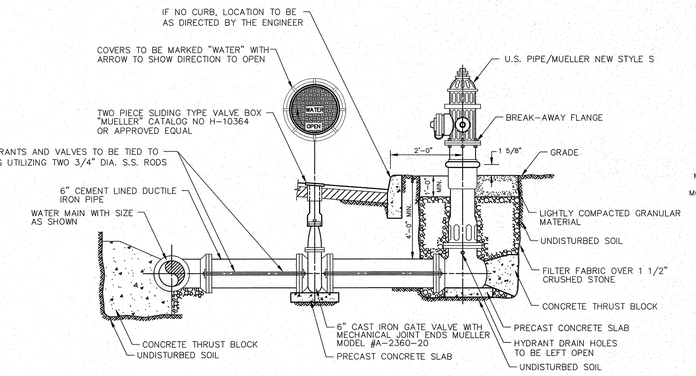
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY	DESIGNED BY
TE	GO/PB
CHECKED BY	SHEET
PB	101 of 139

DRAWING NUMBER

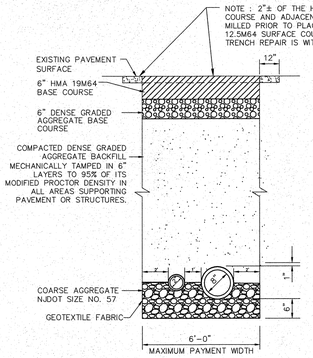
REGISTER NO.

CME NO. 115.UN00213.P05



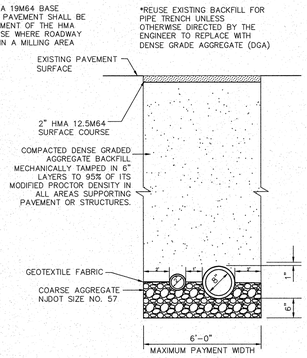
HYDRANT ASSEMBLY DETAIL

N.T.S.



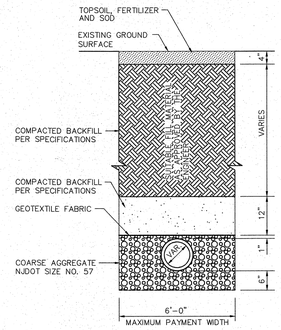
ROADWAY TRENCH REPAIR

N.T.S.



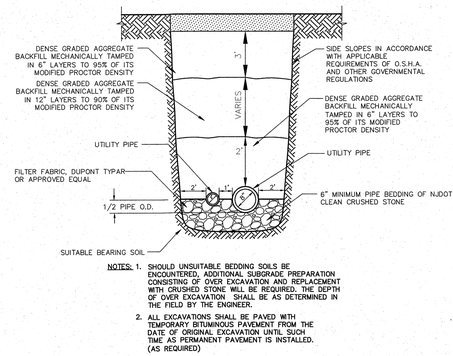
TEMPORARY TRENCH REPAIR

N.T.S.



UNPAVED TRENCH REPAIR

N.T.S.



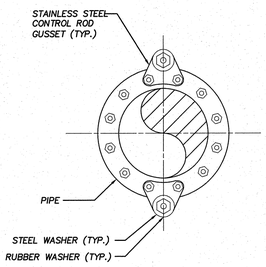
NOTES:
1. SHOULD UNSUITABLE BEDDING SOILS BE ENCOUNTERED, ADDITIONAL SUBGRADE PREPARATION CONSISTING OF OVER EXCAVATION AND REPLACEMENT WITH CRUSHED STONE WILL BE REQUIRED. THE DEPTH OF OVER EXCAVATION SHALL BE AS DETERMINED IN THE FIELD BY THE ENGINEER.
2. ALL EXCAVATIONS SHALL BE PAVED WITH TEMPORARY BITUMINOUS PAVEMENT FROM THE DATE OF ORIGINAL EXCAVATION UNTIL SUCH TIME AS PERMANENT PAVEMENT IS INSTALLED. (AS REQUIRED)

TRENCH AND BEDDING DETAIL

N.T.S.

TYPICAL BEDDING AND TRENCH DETAILS

N.T.S.



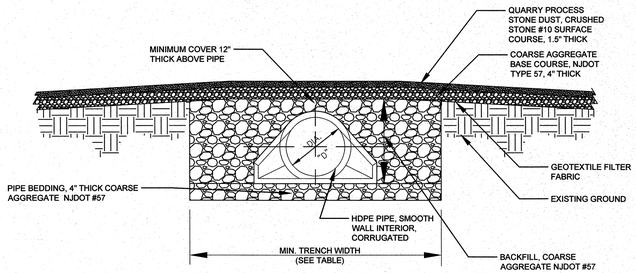
PIPE DIA.	ROD DIA.	No. OF RODS	No. OF GUSSETS	GUSSET THICKNESS
4"	5/8"	2	4	3/8"
6"	5/8"	2	4	1/2"
8"	3/4"	2	4	1/2"
10"	7/8"	2	4	3/4"
12"	1"	2	4	3/4"
14"	1"	4	8	3/4"
16"	1-1/8"	4	8	3/4"
18"	1-1/8"	4	8	3/4"
20"	1-1/8"	4	8	3/4"
24"	1-1/4"	4	8	1"
30"	1-1/2"	6	12	1-1/4"
36"	1-3/4"	6	12	1-1/2"

CONTROL ROD GUSSET DETAIL

N.T.S

PIPE DIAM.	MIN. TRENCH WIDTH
4" (100mm)	21" (533mm)
6" (150mm)	23" (584mm)
8" (200mm)	26" (660mm)
10" (250mm)	28" (711mm)
12" (300mm)	30" (762mm)
15" (375mm)	34" (864mm)
18" (450mm)	39" (991mm)
24" (600mm)	48" (1219mm)
30" (750mm)	56" (1422mm)
36" (900mm)	64" (1626mm)
42" (1050mm)	72" (1829mm)
48" (1200mm)	80" (2032mm)
60" (1500mm)	98" (2438mm)

RECOMMENDED MINIMUM TRENCH WIDTHS



TYPICAL PIPE CROSSING AND PIPE BEDDING DETAIL

N.T.S.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION DETAILS (6 OF 9)

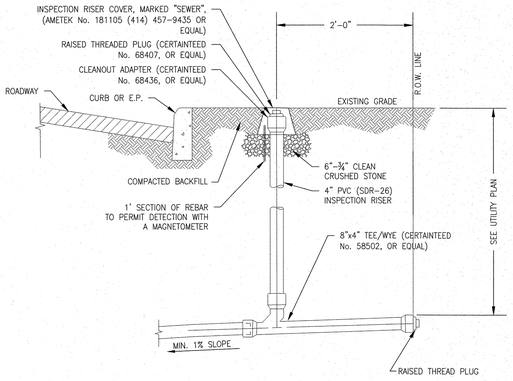
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO.

FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

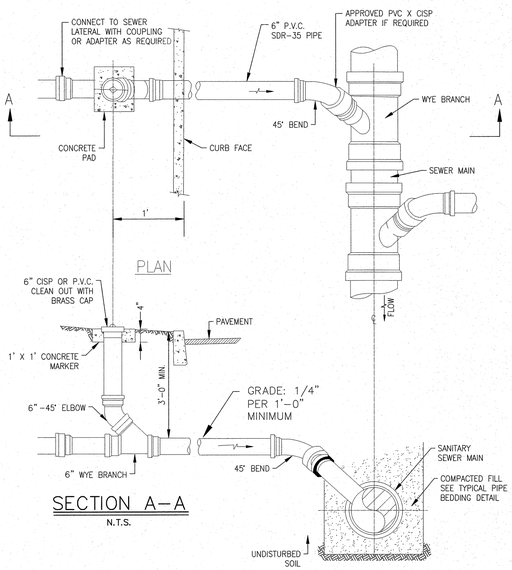
SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO/PB	
CHECKED BY: PB	SHEET: 102 of 139	



NOTES:
1.PIPE AND FITTINGS SHALL MEET ASTM 3034 (SDR SERIES), AS MANUFACTURED BY CERTAINTEED CORP. (215-341-7000) OR APPROVED EQUAL.
2. SEE TRENCH DETAILS FOR BEDDING REQUIREMENTS.
3. INSPECTION RISERS SHALL NOT BE LOCATED IN DRIVEWAYS OR SIDEWALK AREAS.

SANITARY CLEAN-OUT DETAIL

N.T.S.

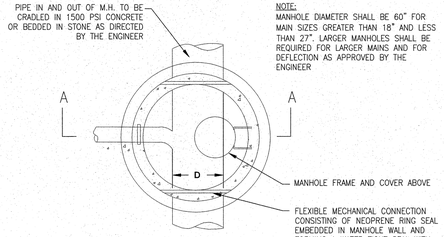


SECTION A-A

N.T.S.

SANITARY SEWER LATERAL DETAIL WITH CLEANOUT

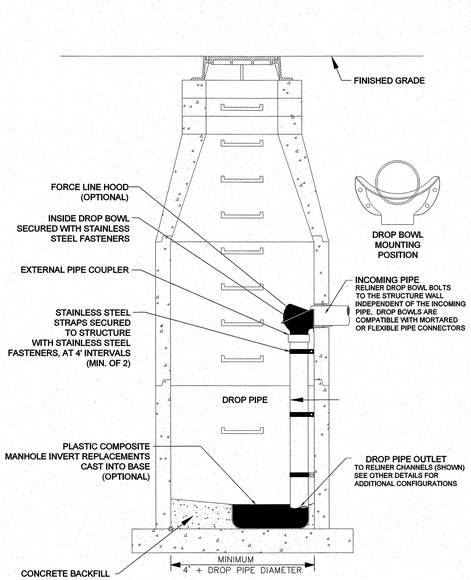
N.T.S.



NOTE:
MANHOLE DIAMETER SHALL BE 60" FOR MAIN SIZES GREATER THAN 18" AND LESS THAN 27". LARGER MANHOLES SHALL BE REQUIRED FOR LARGER MAINS AND FOR DEFLECTION AS APPROVED BY THE ENGINEER

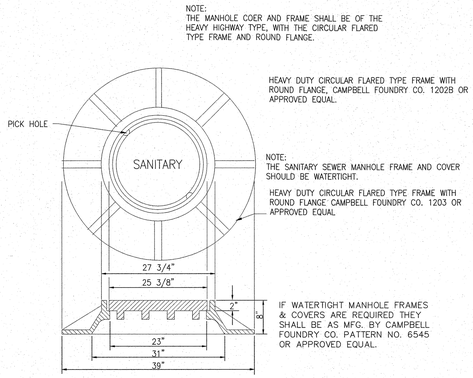
SECTIONAL PLAN

N.T.S.



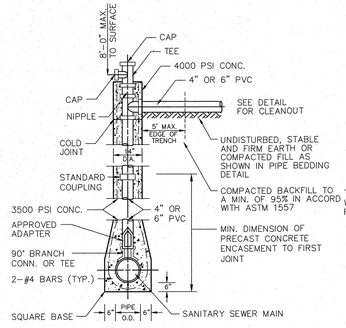
TYPICAL INTERNAL DROP MANHOLE

N.T.S.

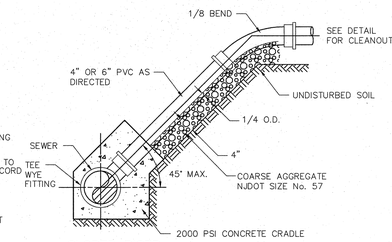


MANHOLE FRAME AND COVER (SANITARY) DETAIL

N.T.S.



VERTICAL RISER

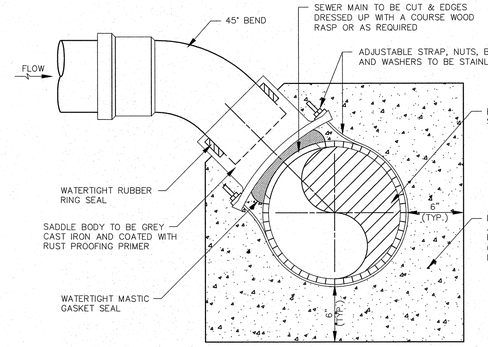


SLOPED RISER

NOTE : TYPE OF CONNECTION TO BE AS DIRECTED BY THE ENGINEER.

TYPICAL LATERAL CONNECTION WITH RISER

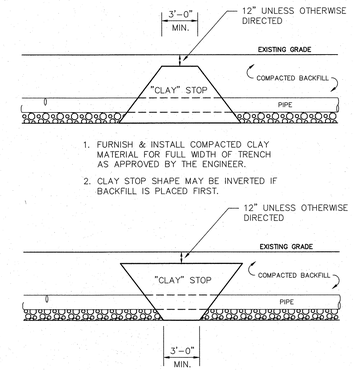
N.T.S.



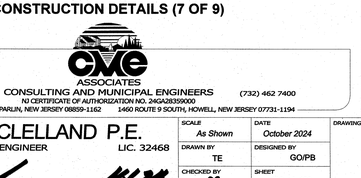
NOTES :
1. STRAP-ON SADDLE TO BE AS MANUFACTURED BY "PIONEER" OR APPROVED EQUAL.
2. STRAP-ON SADDLE TO BE USED ON EXISTING MAINS ONLY WHERE A WYE BRANCH LATERAL CONNECTION IS NOT AVAILABLE.

STRAP-ON SADDLE DETAIL

N.T.S.



1. FURNISH & INSTALL COMPACTED CLAY MATERIAL FOR FULL WIDTH OF TRENCH AS APPROVED BY THE ENGINEER.
2. CLAY STOP SHAPE MAY BE INVERTED IF BACKFILL IS PLACED FIRST.

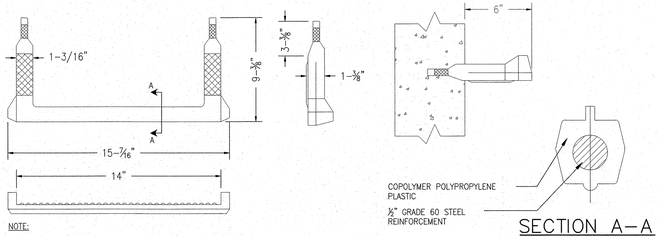


"IMPERVIOUS" TRENCH STOP

N.T.S.

CONCRETE SUPPORT BLOCK DETAIL

N.T.S.



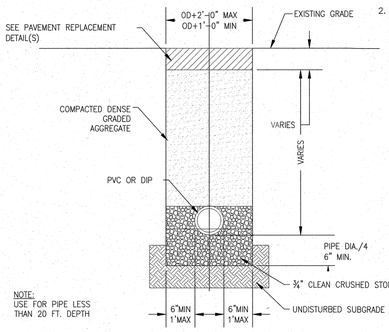
NOTE:
STEPS TO BE M.A. INDUSTRIES MODEL PS2-PF OR APPROVED EQUAL

LADDER RUNG DETAIL

N.T.S.

SECTION A-A

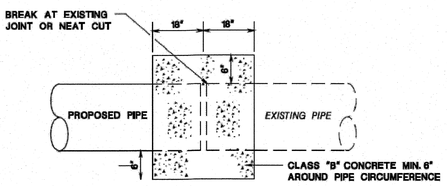
N.T.S.



NOTE:
USE FOR PIPE LESS THAN 20 FT. DEPTH

SANITARY SEWER TRENCH

N.T.S.



NOTE:
COAT ALL SURFACES TO BE ENCASED IN CONCRETE COLLAR WITH APPROVED EPOXY BONDING COMPOUND. NO SEPARATE PAYMENT WILL BE MADE FOR THE CONCRETE COLLAR. THE COST OF THE CONCRETE COLLAR SHALL BE INCLUDED IN THE COST OF THE VARIOUS PIPE ITEMS ON THE PROJECT.

CONCRETE COLLAR

(FOR JOINING PROPOSED PIPE TO EXISTING PIPE)

CD-601-2.3

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION DETAILS (7 OF 9)

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO.

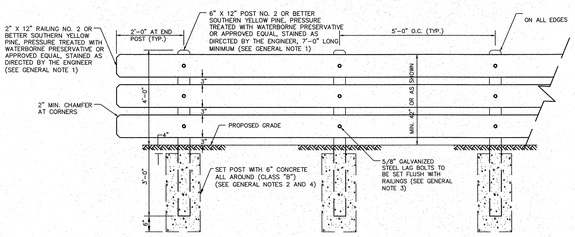
FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO/PB	
CHECKED BY: PB	SHEET: 103 of 139	

GENERAL NOTES:

1. ALL TIMBER MEMBERS SHALL BE No. 2 OR BETTER SOUTHERN YELLOW PINE AND PRESSURE TREATED WITH WATERBORNE PRESERVATIVE OR APPROVED EQUAL TO A RETENTION AS NOTED IN THE SPECIFICATION. ALL TIMBER MEMBERS SHALL BE STAINED WITH "JACOBEAN 2750" WOOD FINISH AS MANUFACTURED BY MINWAX OR APPROVED EQUAL. THE TIMBER MEMBERS SHALL NOT BE MEASURED SEPARATELY FOR PAYMENT. THE COST FOR THESE MATERIALS AND ALL LABOR, EXCAVATION, INSTALLATION, PREP WORK, ETC. ASSOCIATED WITH THESE TIMBER MEMBERS SHALL BE INCLUDED IN THE UNIT PRICE BID PER LINEAL FOOT FOR TIMBER BRIDGE APPROACH RAILING.
2. THE CONCRETE FOUNDATIONS FOR THE TIMBER POSTS SHALL NOT BE MEASURED SEPARATELY FOR PAYMENT. THE COST FOR THESE MATERIALS AND ALL LABOR, EXCAVATION, INSTALLATION, PREP WORK, TESTING, ETC. ASSOCIATED WITH THE CONCRETE FOUNDATIONS SHALL BE INCLUDED IN THE UNIT PRICE BID PER LINEAL FOOT FOR TIMBER BRIDGE APPROACH RAILING.
3. ALL HARDWARE TO BE GALVANIZED STEEL. ALL HARDWARE SHALL NOT BE MEASURED SEPARATELY FOR PAYMENT. THE COST FOR THESE MATERIALS AND ALL LABOR, INSTALLATION, PREP WORK, ETC. ASSOCIATED WITH ALL HARDWARE SHALL BE INCLUDED IN THE UNIT PRICE BID PER LINEAL FOOT FOR TIMBER BRIDGE APPROACH RAILING.
4. REMOVE EXISTING ORGANIC SOILS FOR THE CONSTRUCTION OF FOOTINGS AS DIRECTED BY THE ENGINEER. THIS EXCAVATION SHALL NOT BE MEASURED SEPARATELY FOR PAYMENT. THE COST FOR THIS WORK, INCLUDING, BUT NOT LIMITED TO, CLEARING, EXCAVATION, STOCKPILING, DISPOSAL, AND ALL OTHER COSTS ASSOCIATED WITH THIS WORK, SHALL BE INCLUDED IN THE UNIT PRICE BID PER LINEAL FOOT FOR TIMBER BRIDGE APPROACH RAILING.

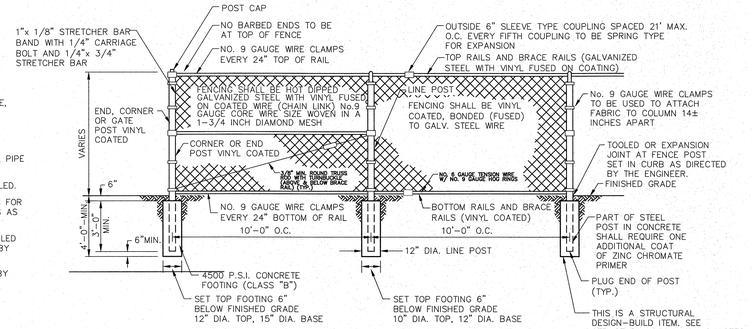


POST AND RAIL FENCE DETAIL

N.T.S.

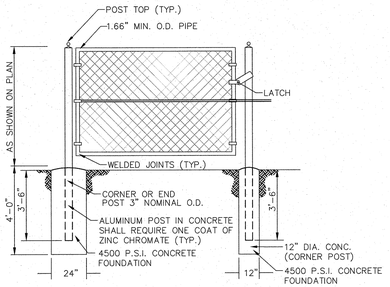
NOTES:

1. ALL PIPE FRAMEWORK, HARDWARE, AND FENCE FABRIC SHALL BE VINYL FUSED ON TO HOT DIPPED GALVANIZED STEEL.
2. ALL POSTS & RAILS SHALL BE GALVANIZED SCHEDULE 40 STEEL PIPE AND PVC COATED.
3. ALL SELVAGES SHALL BE KNUCKLED.
4. REMOVE EXISTING ORGANIC SOILS FOR THE CONSTRUCTION OF FOOTINGS AS DIRECTED BY THE ENGINEER.
5. FENCE SIDE OF FABRIC AS DETAILED ON THE PLAN OR AS DIRECTED BY THE ENGINEER.
6. COLOR SHALL BE AS DIRECTED BY THE OWNER AND ENGINEER

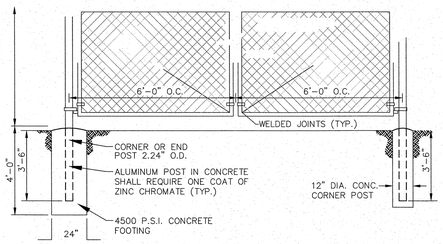


VINYL COATED FUSED ON CHAIN LINK FENCE DETAIL

N.T.S.



5' WIDE GATE ELEVATION



12' WIDE DOUBLE GATE ELEVATION

NOTES:

FINAL INSTALLATION TO PROVIDE A FULL 12' WIDE CLEARANCE FOR VEHICLE USE

CHAIN LINK FENCE & GATE DETAILS

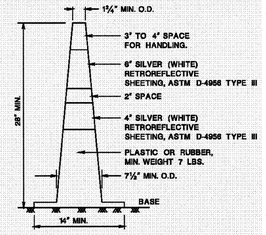
N.T.S.

NOTES:

TRAFFIC CONES MUST BE PREDOMINATELY ORANGE IN COLOR.

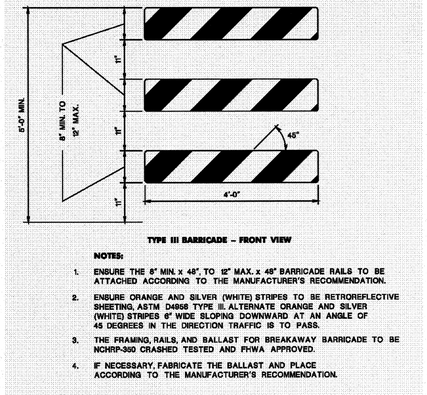
BASES MAY BE OF BREAKAWAY BALLASTED TYPE.

MINOR MANUFACTURER'S VARIATIONS MAY BE ACCEPTABLE UPON APPROVAL OF THE RE.



TRAFFIC CONES

N.T.S.



TYPE III BARRICADE – FRONT VIEW

NOTES:

1. **ENSURE THE 8" MIN. x 48", TO 12" MAX. x 48" BARRICADE RAILS TO BE ATTACHED ACCORDING TO THE MANUFACTURER'S RECOMMENDATION.**
2. **ENSURE ORANGE AND SILVER (WHITE) STRIPES TO BE RETROREFLECTIVE SHEETING, ASTM D4956 TYPE III. ALTERNATE ORANGE AND SILVER (WHITE) STRIPES 6" WIDE SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION TRAFFIC IS TO PASS.**
3. **THE FRAMING, RAILS, AND BALLAST FOR BREAKAWAY BARRICADE TO BE NCHRP-350 CRASHED TESTED AND FHWA APPROVED.**
4. **IF NECESSARY, FABRICATE THE BALLAST AND PLACE ACCORDING TO THE MANUFACTURER'S RECOMMENDATION.**

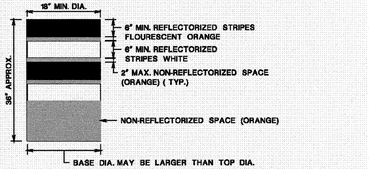
BREAKAWAY BARRICADES

N.T.S.

ENSURE DRUMS ARE MADE OF ORANGE PLASTIC WITH A MINIMUM OF FOUR ALTERNATE FLUORESCENT ORANGE AND WHITE RETROREFLECTIVE STRIPES. IF THERE ARE NON-REFLECTORIZED SPACES BETWEEN THE STRIPES, THEY ARE TO BE NO MORE THAN 4" WIDE. ENSURE RETROREFLECTIVE SHEETING FOR STRIPES CONFORMS WITH ASTM D4956 TYPE VI OR VII WITH S2 REQUIREMENTS.

ENSURE THE TOP OF THE DRUM IS NOT OPEN. CONSTRUCT DRUMS TO INHIBIT ROLLING IF KNOCKED OVER.

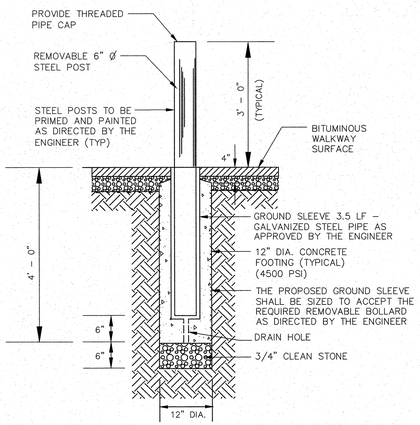
ENSURE THE REFLECTORIZED AREA OF DRUMS IS ROUND EXCEPT OTHER SHAPES, WHICH PROVIDE THE SAME VISIBILITY AS AN 18 INCH DIAMETER ROUND DRUM REGARDLESS OF ORIENTATION, MAY BE USED.



WHEN BALLAST IS REQUIRED BY THE RE, USE SAND. THE MAXIMUM WEIGHT OF THE BALLAST IS 60 LBS. AND IS TO BE LOCATED APPROXIMATELY AT GROUND LEVEL. ALTERNATE TYPES OF BALLAST MUST BE APPROVED BY THE RE.

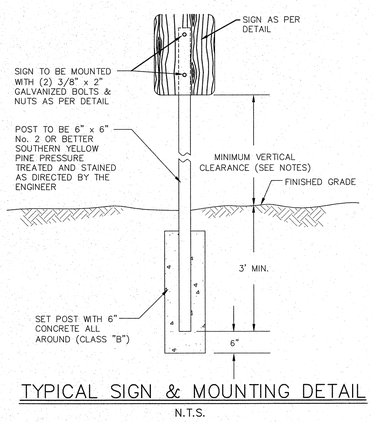
DRUMS

N.T.S.



REMOVABLE BOLLARD DETAIL

N.T.S.

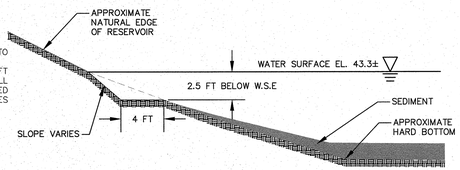


GENERAL NOTES:

1. ALL POSTS SHALL BE OF ADEQUATE LENGTH TO MEET THE REQUIREMENTS FOR ERECTION AS STATED IN THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREET AND HIGHWAYS".
2. POST SHALL BE EMBEDDED 3'–6" MAXIMUM
3. SIGN PANEL SIZES SHALL DETERMINE POST TYPE
4. THE MINIMUM VERTICAL CLEARANCE REQUIREMENTS FOR SIGNS ARE:
   - EDGE OF PAVEMENT TO BOTTOM OF SIGN AS PER SECTION DEVICES FOR STREETS AND HIGHWAYS".
   - GROUNDLINE TO BOTTOM OF SIGN SHALL BE 5 FEET MINIMUM
   - FOR SINGLE POST INSTALLATIONS. THE MINIMUM DISTANCE FROM GROUNDLINE TO THE TOP OF SIGN MUST BE 9 FEET. THE FINAL HEIGHT OF ALL SIGNS MUST MEET OR EXCEED ALL OF THE ABOVE REQUIREMENTS.
5. THE MINIMUM LATERAL CLEARANCE REQUIREMENTS FOR SIGNS SHALL BE IN ACCORDANCE WITH SECTION 2A-24 OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREET AND HIGHWAYS" AND AS DIRECTED BY THE ENGINEER.

TYPICAL SIGN & MOUNTING DETAIL

N.T.S.



NOTE:

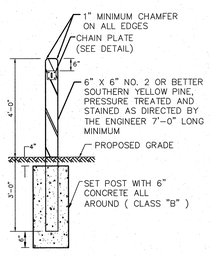
- UPPER LEDGE OMITTED DUE TO RIPARIAN IMPACTS
- SAFETY LEDGE, 4 FT WIDE, 2.5 FT BELOW W.S.E; SAFETY LEDGE SHALL BE CONSTRUCTED AND MAINTAINED ADJACENT TO LAND AND PROPERTIES AROUND PERIMETER OF RESERVOIR

TYPICAL RESERVOIR CROSS SECTION DETAIL

N.T.S.

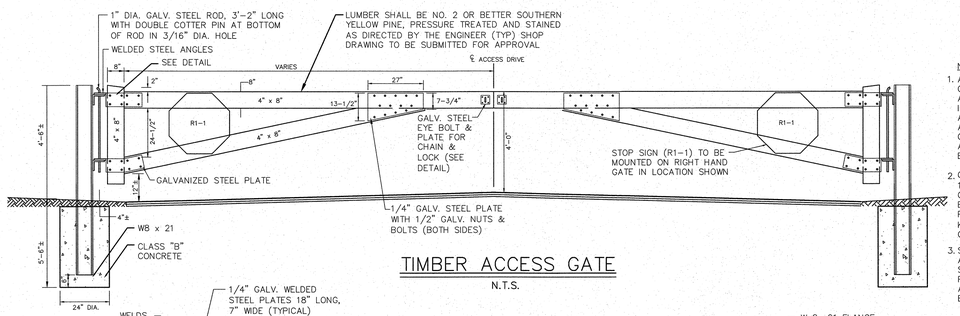
HANDICAPPED SIGN ASSEMBLY DETAIL

N.T.S.



TIE BACK POST DETAIL

N.T.S.

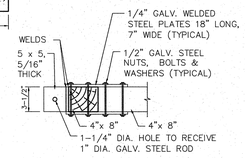


NOTE:

1. ACCESS ROAD ENTRANCE GATE INCLUDES BOTH LEFT AND RIGHT HAND GATES INCLUDING TIE BACK POSTS AND ALL APPURTENANCES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND AS DIRECTED BY THE ENGINEER
2. CONTRACTOR SHALL PROVIDE 1" LINK GALVANIZED STEEL CHAIN AND PADLOCK FOR EACH TIE BACK POST. PADLOCKS SHALL BE KEYED–ALIKE AND (5) SETS OF KEYS PROVIDED.
3. STEEL PLATES, SUPPORTS AND OTHER APPURTENANCES SHALL BE PRIMED AND PAINTED EQUAL TO LUMBER AS DIRECTED BY THE ENGINEER

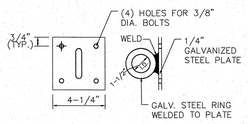
TIMBER ACCESS GATE

N.T.S.



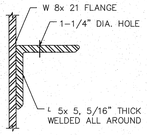
PLAN VIEW GATE DETAIL

N.T.S.



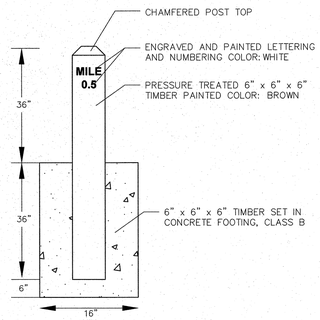
CHAIN PLATE DETAIL

N.T.S.



GATE SUPPORT

N.T.S.



NOTE:

FINAL COLOR TO BE APPROVED BY THE COUNTY

TYPICAL TRAIL MARKER SIGNAGE

N.T.S.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

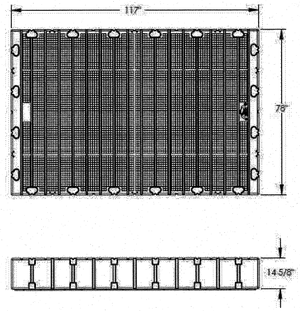
CLARK RESERVOIR IMPROVEMENTS

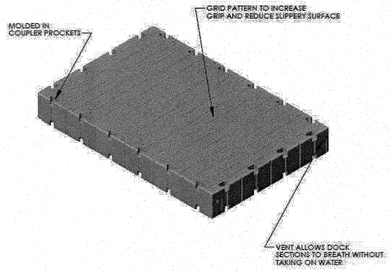
CONSTRUCTION DETAILS (8 OF 9)

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	As Shown
DATE	October 2024
DRAWN BY	TE
DESIGNED BY	GO/PB
CHECKED BY	PB
SHEET	104 of 139
DRAWING NUMBER	
REGISTER NO.	
FILE NO.	115.UN00213.P05





FLOATING DOCK SECTION DETAIL

N.T.S.

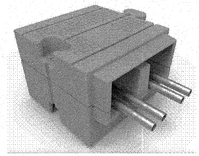
NOTE:
1. FLOATING DOCK MATERIALS AND HARDWARE REQUIRED SHALL BE MANUFACTURED AND PROVIDED BY EZ DOCKS INC. OR APPROVED EQUAL.
2. FLOAT SHELL SHALL BE FABRICATED WITH LINEAR LOW-DENSITY POLYETHYLENE (LLDPE) THAT IS UV RAY AND SLIP RESISTANT MANUFACTURED BY EZ DOCKS INC. OR APPROVED EQUAL.
3. ANCHORAGE SHALL CONSIST OF TIMBER PILES DRIVEN BUTT DOWN. WORKING/DESIGN DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL FOR THE DEPTH OF TIMBER PILES PRIOR TO CONSTRUCTION. PROVIDE DESIGN LOADS BASED ON MANUFACTURER'S ANCHOR LAYOUT FOR REVIEW OF PILE EMBEDMENT REQUIREMENTS WITH THE COUNTY AND ENGINEER



NOTE:
1. SWIM LADDER, MATERIALS AND HARDWARE REQUIRED SHALL BE MANUFACTURED AND PROVIDED BY EZ DOCKS INC. OR APPROVED EQUAL.

POLYETHYLENE SWIM LADDER DETAIL

N.T.S.



NOTE:
1. UTILITY CHANNEL MATERIALS AND HARDWARE REQUIRED SHALL BE MANUFACTURED AND PROVIDED BY EZ DOCKS INC. OR APPROVED EQUAL.

UTILITY CHANNEL (20") DETAIL

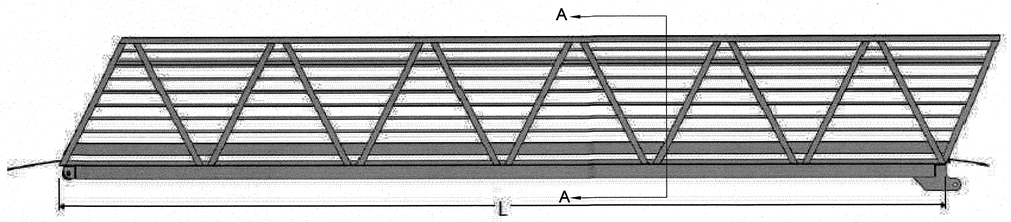
N.T.S.

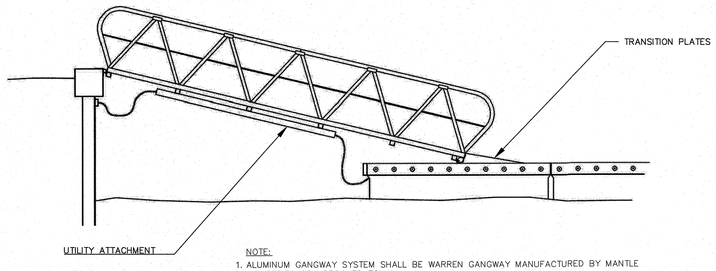


NOTE:
1. 8" NYLON TIE-UP CLEAT MATERIALS AND HARDWARE REQUIRED SHALL BE MANUFACTURED AND PROVIDED BY EZ DOCKS INC. OR APPROVED EQUAL.

8" NYLON TIE-UP CLEAT DETAIL

N.T.S.

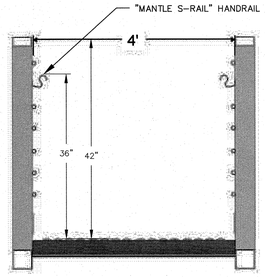




NOTE:
1. ALUMINUM GANGWAY SYSTEM SHALL BE WARREN GANGWAY MANUFACTURED BY MANTLE INDUSTRIES OR APPROVED EQUAL.
2. CONTINUOUS FULL-LENGTH INTERMEDIATE RAILS SHALL BE PROVIDED TO PREVENT PASSAGE OF A 4-INCH SPHERE, ANYWHERE BELOW THE HANDRAILS.
3. FULL WIDTH, TRANSITION PLATES SHALL BE PROVIDED AT BOTH ENDS OF THE RAMP. THE LENGTH OF BOTH SHALL BE LONG ENOUGH TO PROVIDE A SLOPE WHICH DOES NOT EXCEED THE MAXIMUM SLOPE OF THE GANGWAY.
4. UTILITY ATTACHMENT TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATION
5. FOR WATER LINES, FLEXIBLE STAINLESS STEEL HOSE CONNECTIONS SHALL SUPPLY ADEQUTE SLACK TO PERMIT THE SPECIFIED GANGWAY RANGE OF MOTION.
6. FOR ELECTRICAL, ADEQUATE SLACK SHALL BE SUPPLIED WITHIN THE UTILITY ATTACHMENT TO PERMIT THE SPECIFIED GANGWAY RANGE OF MOTION.

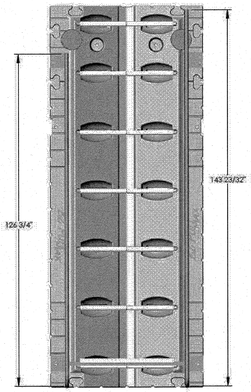
ALUMINUM GANGWAY DETAIL

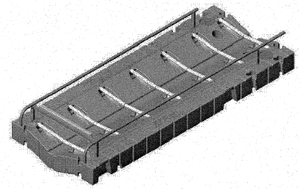
N.T.S.

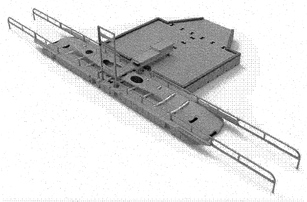


SECTION A-A

N.T.S.



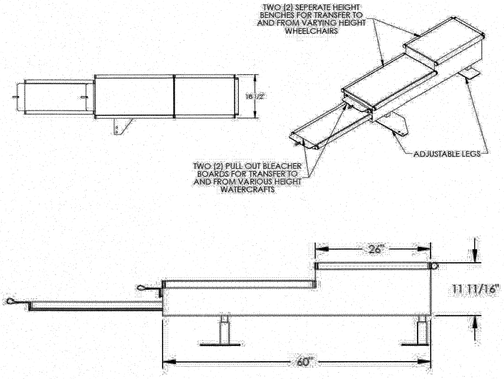




NOTE:
1. KAYAK LAUNCH, MATERIALS AND HARDWARE REQUIRED SHALL BE MANUFACTURED AND PROVIDED BY EZ DOCKS INC. OR APPROVED EQUAL.

KAYAK LAUNCH DETAIL

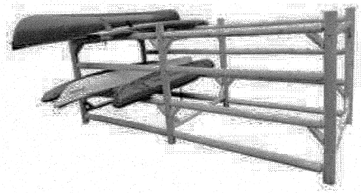
N.T.S.



ADA KAYAK LAUNCH TRANSFER BENCH DETAIL

N.T.S.

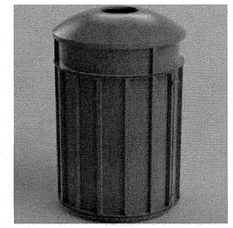
NOTE:
1. ADA KAYAK LAUNCH TRANSFER BENCH, MATERIALS AND HARDWARE REQUIRED SHALL BE MANUFACTURED AND PROVIDED BY EZ DOCKS INC. OR APPROVED EQUAL.



NOTE:
1. KAYAK STORAGE UNIT MATERIALS AND HARDWARE REQUIRED SHALL BE MANUFACTURED BY HITCH EXCLUSIVES LLC OR APPROVED EQUAL.
2. KAYAK STORAGE UNIT SHALL STORE APPROXIMATELY 24 KAYAKS.

KAYAK STORAGE UNIT DETAIL

N.T.S.



NOTE:
1. WASTE AND RECYCLING CONTAINERS SHALL BE MODEL CFTR-011, MANUFACTURED BY CUSTOM FABRICATION INC. OR APPROVED EQUAL.

WASTE AND RECYCLING CONTAINERS DETAIL

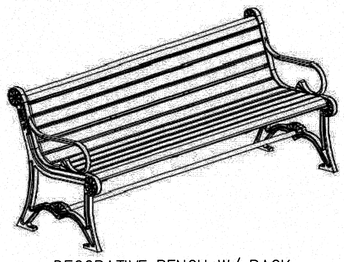
N.T.S.



WATERWAY BOAT BARRIER SYSTEM DETAIL

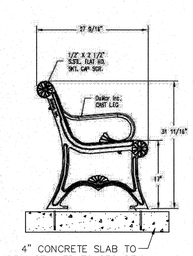
N.T.S.

NOTE:
1. WATERWAY BOAT BARRIER SYSTEM MATERIALS AND HARDWARE REQUIRED SHALL BE MANUFACTURED AND PROVIDED BY WORTHINGTON PRODUCTS, INC. OR APPROVED EQUAL.
2. LENGTH OF EACH FLOATATION UNIT SHALL BE 10 FEET.
3. THE FLOATATION UNIT SHALL BE COLORED YELLOW PER U.S. FEDERAL STANDARD 595B COLOR #FS-13655

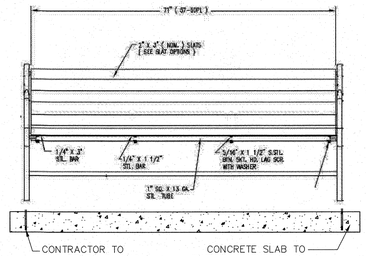


DECORATIVE BENCH W/ BACK

N.T.S.



4" CONCRETE SLAB TO BE INSTALLED TO SECURE BENCH (NO SEPARATE PAYMENT WILL BE MADE)



CONTRACTOR TO ENSURE BOLTING IS SECURED TO CONCRETE SLAB.

CONCRETE SLAB TO EXTEND A MINIMUM OF 6" OUTSIDE BENCH LIMITS

6' DECORATIVE BENCH SHALL BE BLACK POWDER COAT FINISH CAST STEEL, WITH CEDAR COLORED RECYCLED PLASTIC SLATS.

BENCH SHALL BE MODEL NUMBER 63-771-6PL, AS MANUFACTURED BY DUMOR, INC. AND SUPPLIED BY GENERAL RECREATION, INC. (800-726-4793) OR APPROVED EQUAL.

NOTE: DETAILS ARE FOR BIDDING PURPOSES ONLY. CONTRACTOR SHALL PROVIDE SHOP SUBMITTALS PRIOR TO CONSTRUCTION.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	
1.	REVISED FOR RE-BID	01/10/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION DETAILS (9 OF 9)

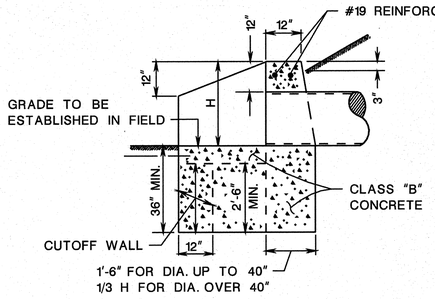
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

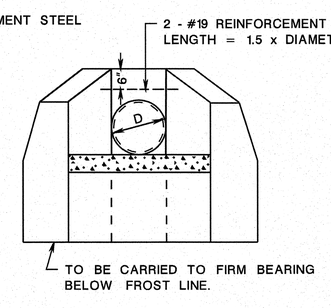
REGISTER NO.

FILE NO. 115.UN00213.P05

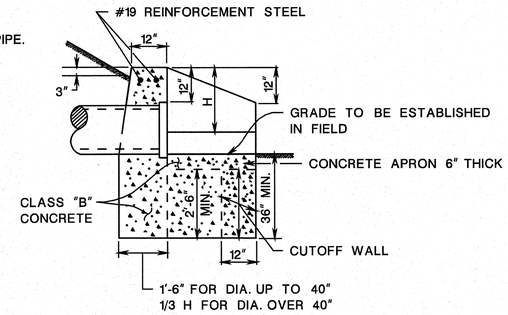
SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO/PB	
CHECKED BY: PB	SHEET: 105 of 139	



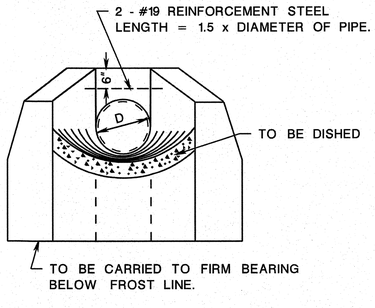
OUTLET END



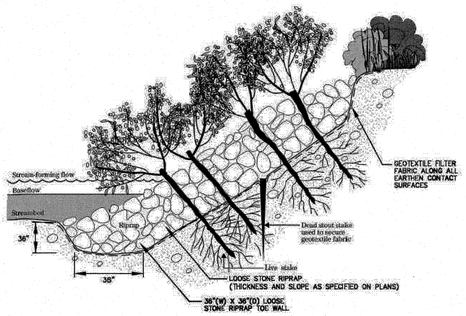
END VIEW OF OUTLET END



INLET END



END VIEW OF INLET END ONLY

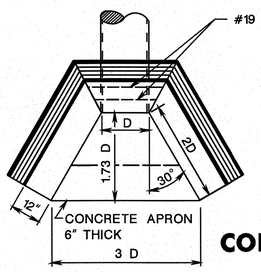


VEGETATED STONE RIPRAP DETAIL

N.T.S.

VOLUME OF CONCRETE IN HEADWALLS AND APRONS IN CUBIC YARDS

PIPE DIA.	CORR. STEEL PIPE	REIN. CONC. PIPE	APRONS
12"	1.6	1.7	0.4
15"	2.0	2.1	0.5
18"	2.4	2.5	0.6
21"	2.8	3.0	0.8
24"	3.3	3.4	0.9
27"	3.7	4.0	1.1
30"	4.2	4.5	1.2
36"	5.3	5.6	1.5
42"	7.2	7.9	1.9
48"	9.4	10.4	2.3
54"	12.0	13.3	2.7



PLAN

CONCRETE HEADWALL AND APRON

N.T.S.

GENERAL NOTES:

1. ALL EDGES TO BE CHAMFERED 1 INCH.
2. THE FINISHING OF CONCRETE HEADWALLS WILL NOT BE REQUIRED FOR HEADWALLS AT THE BOTTOM OF EMBANKMENTS IN RURAL AREAS.
3. FOR MORE THAN ONE PIPE, SET THE PIPES A MINIMUM OF ONE FOOT APART (OUTSIDE BARREL TO OUTSIDE BARREL); THERE IS TO BE 12 INCHES ABOVE THE TOP OF A PIPE IN A WINGWALL: THE TERMINUS OF THE WINGWALL TO BE 2 X DIAMETER FROM THE CENTERLINE OF THE PIPE IN A WINGWALL.
4. SET THE TERMINUS FOR OUTLET AND INLET APRONS BY EXTENDING THE PIPE GRADE AHEAD AND BACK, RESPECTIVELY.
5. FOR ARCH PIPE, THE SPAN TO BE SUBSTITUTED FOR D.

NOTE:
REINFORCEMENT STEEL IS IN METRIC UNITS.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

STORMWATER CONSTRUCTION DETAILS

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28039000

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: BDP	DESIGNED BY: SCB/BDP	
CHECKED BY: PB	SHEET: 106 of 139	

REGISTER NO.
FILE NO. 115.UN00213.P05

PIPE DIAMETER (INCHES)	STEEL GA.	ALUM. GA.	DIMENSIONS (INCHES)	
			L	C
12	16	16	21	36
15	16	16	26	44
18	16	16	31	52
21	16	16	36	60
24	16	16	41	68
30	14	14	51	84
36	14	12	60	100
42	12	12	69	116
48	12	12	78	126
54	12	12	84	138
60	12	12	87	150
66	12	12	87	156
72	12	12	87	162
78	12	12	87	168
84	12	12	87	174

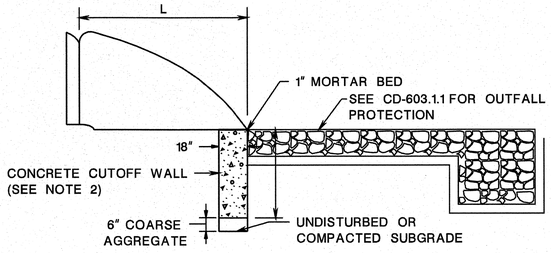
ROUND PIPE

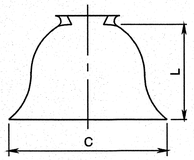
ARCH PIPE DIMENSION (INCHES)		STEEL GA.	ALUM. GA.	DIMENSIONS (INCHES)	
SPAN	RISE			L	C
17	13	16	16	19	44
21	15	16	16	23	50
24	18	16	16	28	58
28	20	16	16	32	66
35	24	14	14	39	80
42	29	14	14	46	99
49	33	12	12	53	111
57	38	12	12	63	126
64	43	12	12	70	138
71	47	12	12	77	150
77	52	12	12	77	162
83	57	12	12	77	174

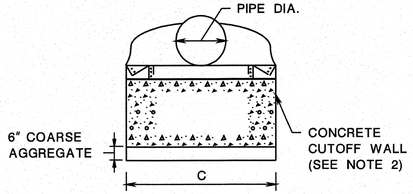
ARCH PIPE

NOTES:

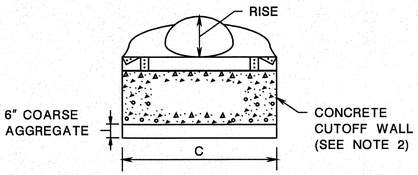
1. MINOR VARIATIONS TO THE ABOVE DIMENSIONS ARE ACCEPTABLE WITH THE EXCEPTION OF THE INSIDE DIAMETER DIMENSION.
2. A 1 INCH THICK MORTAR BED AND A 6 INCH DEEP LAYER OF COURSE AGGREGATE ARE REQUIRED WHEN A PRECAST CONCRETE CUTOFF WALL IS USED.
3. REFER TO NOTE 3, CD-601-2.2 FOR SIZE OF CONCRETE CUTOFF WALL.







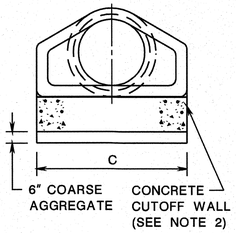
ELEVATION

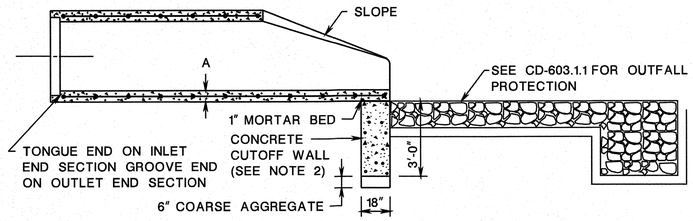


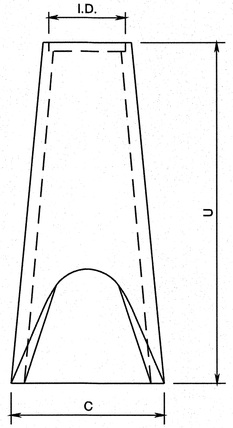
ELEVATION

CORRUGATED ALLUMINUM ALLOY END SECTION

CD-601-2.1







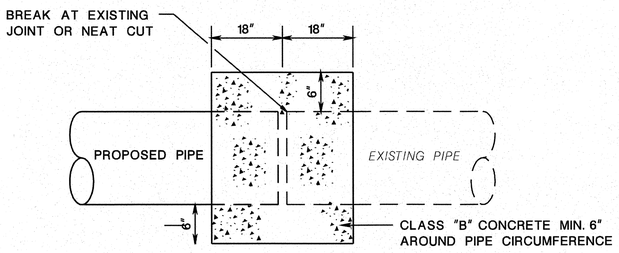
DIMENSIONS (INCHES)												
I.D.	12	15	18	21	24	27	30	36	42	48	54	60
A	2	2¼	2½	2¾	3	3¼	3½	4	4½	5	5½	6
U	72	72	72	72	72	72	72	96	96	96	96	96
C	28	34.5	41	47.5	54	60.5	67	80	87	94	101	108

NOTES:

1. MINOR VARIATIONS TO THE ABOVE DIMENSIONS ARE ACCEPTABLE WITH THE EXCEPTION OF THE INSIDE DIAMETER DIMENSION.
2. A 1 INCH THICK MORTAR BED AND A 6 INCH DEEP LAYER OF COARSE AGGREGATE ARE REQUIRED WHEN A PRECAST CONCRETE CUTOFF WALL IS USED.
3. THE WIDTH OF THE CONCRETE CUTOFF WALL TO BE EQUAL TO THE MAXIMUM WIDTH OF THE END SECTION AS INDICATED ON THE DETAIL BY DIMENSION "C". HOWEVER, IF THE ACTUAL MAXIMUM WIDTH EXCEEDS THE CHART VALUE OF "C", THE WIDTH OF THE CONCRETE CUTOFF WALL TO BE EQUAL TO THE ACTUAL MAXIMUM WIDTH OF THE END SECTION.

REINFORCED CONCRETE END SECTION

CD-601-2.2



NOTE:

COAT ALL SURFACES TO BE ENCASED IN CONCRETE COLLAR WITH APPROVED EPOXY BONDING COMPOUND. NO SEPARATE PAYMENT WILL BE MADE FOR THE CONCRETE COLLAR. THE COST OF THE CONCRETE COLLAR SHALL BE INCLUDED IN THE COST OF THE VARIOUS PIPE ITEMS ON THE PROJECT.

CONCRETE COLLAR

(FOR JOINING PROPOSED PIPE TO EXISTING PIPE)

CD-601-2.3

PIPE END SECTIONS

N.T.S.

CD-601-2

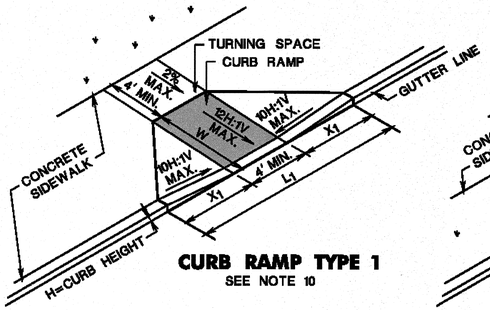
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

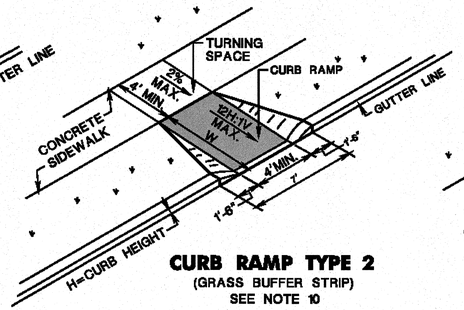
107
139

BDC18D-01-ORIGINAL SHEET

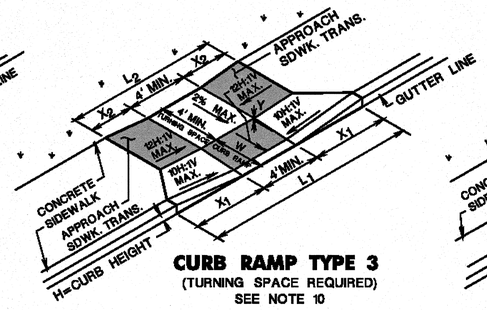
ID=TP2VILL date=28-SEP-2016 11:06 scale=63.073306:1.000000 pen table=\\NJDOTPRJWS\VAsystem\NJDOTWS\Projects\NJDOTEng\Upload\TBLs\Roadway\Details_11x17.tbl
file=



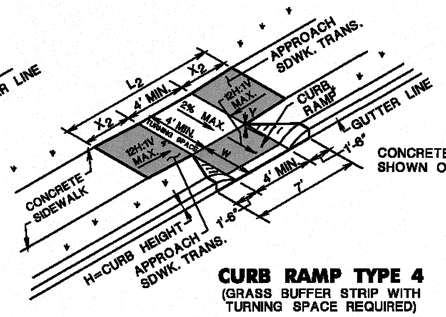
CURB RAMP TYPE 1
SEE NOTE 10



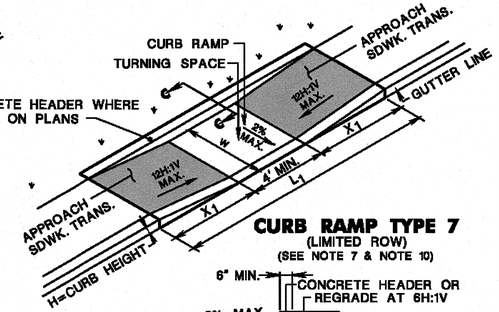
CURB RAMP TYPE 2
(GRASS BUFFER STRIP)
SEE NOTE 10



CURB RAMP TYPE 3
(TURNING SPACE REQUIRED)
SEE NOTE 10

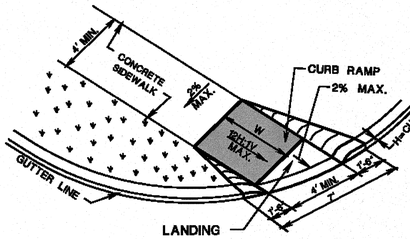


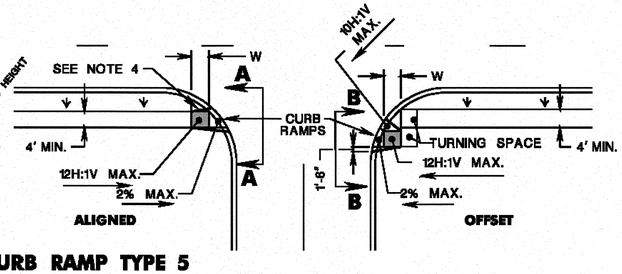
CURB RAMP TYPE 4
(GRASS BUFFER STRIP WITH TURNING SPACE REQUIRED)
SEE NOTE 10



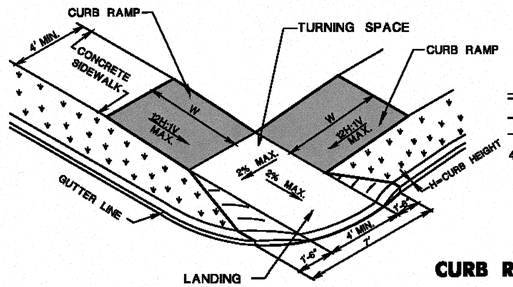
CURB RAMP TYPE 7
(LIMITED ROW)
(SEE NOTE 7 & NOTE 10)

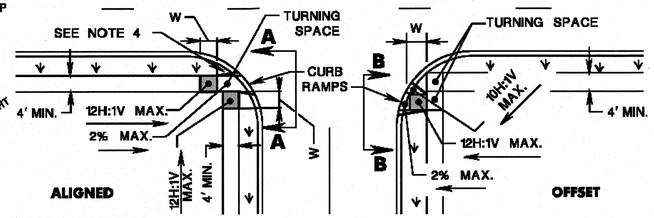
SECTION C-C



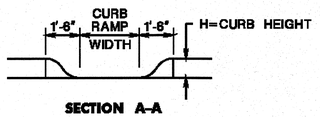


CURB RAMP TYPE 5

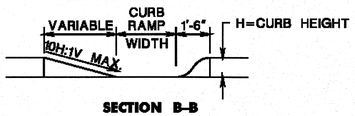




CURB RAMP TYPE 6

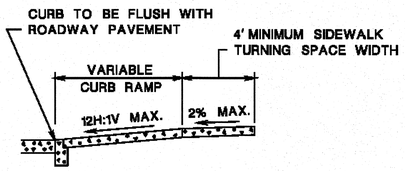


SECTION A-A

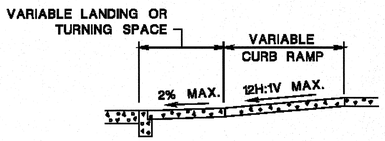


SECTION B-B

NOTE:
CURB RAMP OPENING TO BE FLUSH WITH ROADWAY PAVEMENT (CURB RAMP TYPES 5 & 6).



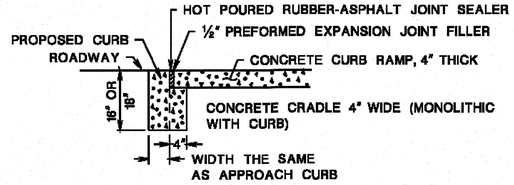
SECTION THROUGH CURB RAMPS 1 THROUGH 4



SECTION THROUGH CURB RAMPS 5 AND 6

NOTES:

1. KEEP TURNING SPACE, APPROACH SIDEWALK TRANSITIONS, AND CURB RAMP CLEAR OF OBSTRUCTIONS THAT PROTRUDE ABOVE THE SURFACE.
2. FOR DIMENSIONS SEE CD-606-3 AND CD-606-4
3. CURB (DROPPED CURB) GUTTERLINE TO BE FLUSH WITH ROADWAY PAVEMENT THE ENTIRE WIDTH OF THE RAMP (4 FEET MIN.) AT ALL CURB RAMPS.
4. FOR CURB RAMP TYPES 5 AND 6, IF A GRASS BUFFER DOES NOT EXIST, SLOPE CURB TO EQUAL SLOPE OF ADJACENT CURB RAMP.
5. SIDEWALK AND CURB RAMP WITHIN AREA ENCLOSED BY HEAVY LINES INDICATES THE PAY LIMIT FOR CONCRETE SIDEWALK OF THE APPROPRIATE ADJACENT THICKNESS.
6. CURB AND HEADER WITHIN AREA ENCLOSED BY HEAVY LINES INDICATES THE PAY LIMIT FOR VERTICAL CURB OR SLOPING CURB OF THE APPROPRIATE ADJACENT SIZE AND KIND.
7. WHERE THE DISTANCE FROM THE GUTTER LINE TO THE OUTSIDE EDGE OF SIDEWALK IS 6 FEET OR LESS, USE CURB RAMP TYPE 7, INSTEAD OF CURB RAMP TYPE 1 THROUGH 4.
8. CROSSWALKS AND STOP LINES MAY BE MARKED OR UNMARKED. SEE PLANS.
9. THE 12H:1V MAX SLOPE IS THE RUNNING SLOPE FOR CURB RAMPS, BUT ONLY THE 12H:1V SLOPE MEASURED AS X_2 IS THE RUNNING SLOPE FOR TYPE 3 AND TYPE 4 CURB RAMPS. ENSURE THE RUNNING SLOPE OF CURB RAMPS DOES NOT REQUIRE ITS LENGTH TO EXCEED 15 FEET. THE RUNNING SLOPE MAY EXCEED THE 12H:1V MAX SLOPE SO AS NOT TO EXCEED THE 15 FEET MAXIMUM LENGTH.
10. CURB RAMP TYPE 1 THROUGH 7 ARE NORMALLY PLACED ON THE RADIUS RETURN AT THE INTERSECTION AND ON A TANGENT SECTION AS DRAWN.



DROPPED CURB AND CRADLE

CONCRETE SIDEWALK
(PUBLIC SIDEWALK CURB RAMP)
N.T.S.

CD-606-1

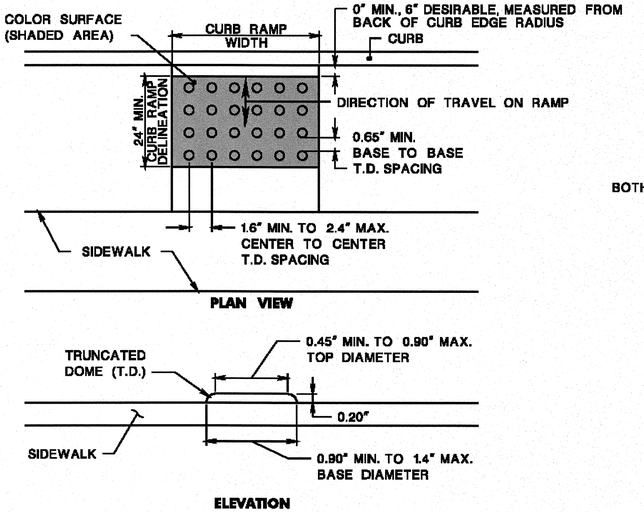
NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

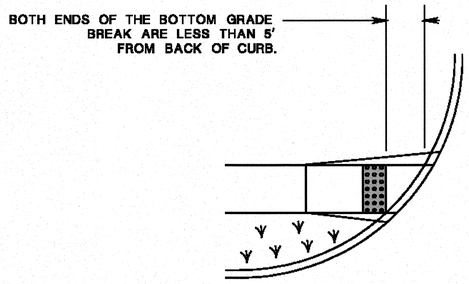
CURB RAMPS

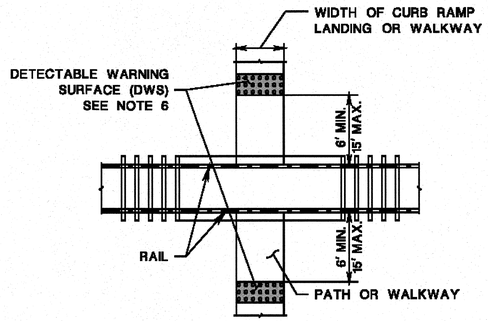
CD-606-1.1

ID= TPAYLL date=28-SEP-2016 11:07 pen table=\\NJDOTPRTWS\Vlaystam\NJDOTWS\Projects\NJDOTEng\Upks\TSEs\Roadway\Details_22x17.tbl scale=63.073906:1.000000
BDC16D-01-ORIGINAL SHEET
file=

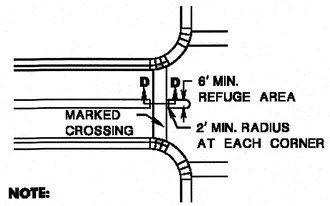


DETECTABLE WARNING SURFACE

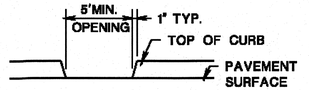




PEDESTRIAN RAILROAD CROSSING

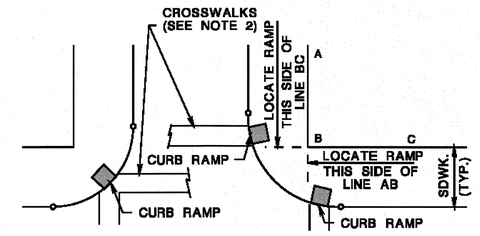


NOTE:
WHERE PRACTICAL, END LEFT TURN ISLAND OR DIVISIONAL ISLAND BEFORE CROSSWALK TO ELIMINATE CUT-THROUGH

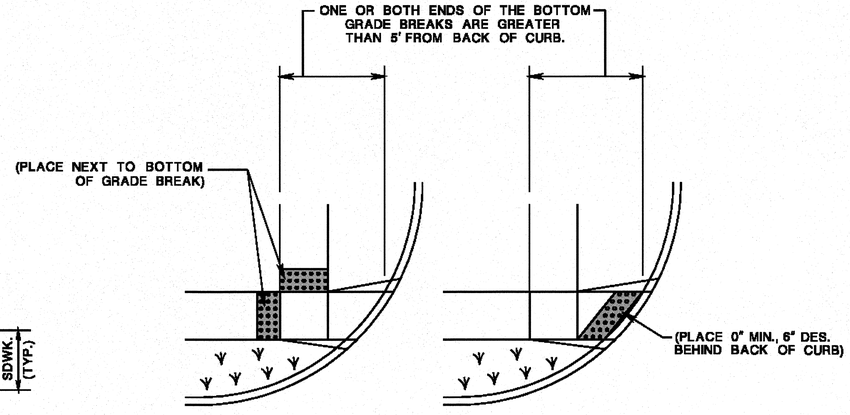


NOTE:
5'MIN. WIDE OPENING TO BE FLUSH WITH ROADWAY PAVEMENT

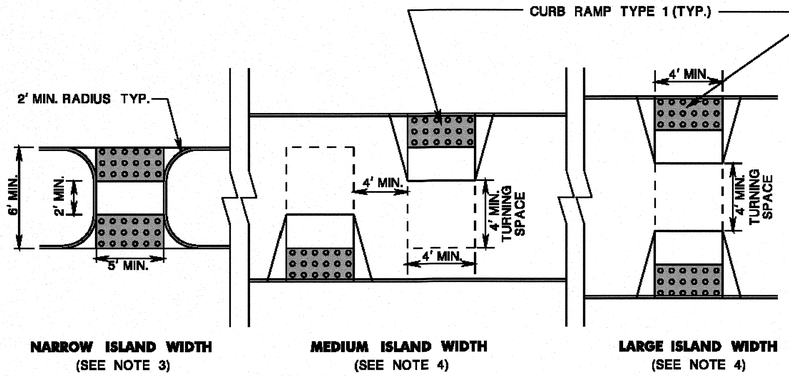
PEDESTRIAN REFUGE ISLAND WALKWAY OPENING AT INTERSECTIONS



LOCATION OF CURB RAMP TYPES 1, 2, 3, 4, & 7 FOR CROSSING PARALLEL AND PERPENDICULAR TO HIGHWAY



PLACEMENT OF DETECTABLE WARNING SURFACE FOR CURB RAMP TYPE 5 AND 6



PEDESTRIAN REFUGE ISLAND

NOTES:

1. KEEP TURNING SPACE, APPROACH SIDEWALK TRANSITIONS, AND CURB RAMP CLEAR OF OBSTRUCTIONS THAT PROTRUDE ABOVE THE SURFACE.
2. CROSSWALKS AND STOP LINES MAY BE MARKED OR UNMARKED, SEE PLANS.
3. FOR NARROW ISLAND WIDTH, SEE PEDESTRIAN REFUGE ISLAND WALKWAY OPENING AT INTERSECTIONS DETAIL.
4. FOR MEDIUM AND LARGE ISLAND WIDTH, SEE CURB RAMP TYPE 1 ON CD-606-1.
5. CONSTRUCT CURB RAMP TYPES 1, 2, 3, 4, & 7 PERPENDICULAR TO CURBLINE, AS SHOWN.
6. IF A CURB RAMP IS REQUIRED, THE LOCATION OF THE DETECTABLE WARNING SURFACE MUST BE AT THE BOTTOM OF THE RAMP AND WITHIN THE REQUIRED DISTANCE FROM THE RAIL.
7. A STANDARD DETECTABLE WARNING (DWS) SURFACE IS NOT AVAILABLE TO FIT THIS APPLICATION, AND THEREFORE ONE WILL NEED TO BE CUSTOMIZED. THE DWS SHOULD COVER THE ENTIRE WIDTH OF THE RAMP. THE ROWS OF DOMES ON THE DWS SHOULD FOLLOW THE DIRECTION OF TRAVEL OF THE RAMP, SO PEDESTRIANS WHO USE MOBILE DEVICES CAN TRACK BETWEEN THE DOMES.

DETECTABLE WARNING SURFACE

N.T.S.

CD-606-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

CD-606-2.1

ID=TPXVILL date=28-SEP-2016 11:07 pen table=\\NJDOTPRIWS\Vegyakma\NJDOTWS\Projects\NJDOTEng\Uplot\TSEs\Roadway\Details_22x17.tbl scale=83.07393061000000
BDC18D-01-ORIGINAL SHEET
file=

CURB RAMP TYPE 1

0.0 % GUTTER LINE PROFILE

H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET
3	3	2.50	2.50	9.00
4	4	3.33	3.33	10.67
5	5	4.17	4.17	12.33
6	6	5.00	5.00	14.00
7	7	5.83	5.83	15.67
8	8	6.67	6.67	17.33
9	9	7.50	7.50	19.00

1.0 % GUTTER LINE PROFILE

H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET
3	3	2.78	2.27	9.05
4	4	3.70	3.03	10.73
5	5	4.63	3.79	12.42
6	6	5.56	4.55	14.10
7	7	6.48	5.30	15.78
8	8	7.41	6.06	17.47
9	9	8.33	6.82	19.15

2.0 % GUTTER LINE PROFILE

H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET
3	3	3.13	2.08	9.21
4	4	4.17	2.78	10.94
5	5	5.21	3.47	12.68
6	6	6.25	4.17	14.42
7	7	7.29	4.86	16.15
8	8	8.33	5.56	17.89
9	9	9.38	6.25	19.63

3.0 % GUTTER LINE PROFILE

H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET
3	3	3.57	1.92	9.49
4	4	4.76	2.56	11.33
5	5	5.95	3.21	13.16
6	6	7.14	3.85	14.99
7	7	8.33	4.49	16.82
8	8	9.52	5.13	18.65
9	9	10.71	5.77	20.48

4.0 % GUTTER LINE PROFILE

H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET
3	3	4.17	1.79	9.95
4	4	5.56	2.38	11.94
5	5	6.94	2.98	13.92
6	6	8.33	3.57	15.90
7	7	9.72	4.17	17.89
8	8	11.11	4.76	19.87
9	9	12.50	5.36	21.86

5.0 % GUTTER LINE PROFILE

H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET
3	3	5.00	1.67	10.67
4	4	6.67	2.22	12.89
5	5	8.33	2.78	15.11
6	6	10.00	3.33	17.33
7	7	11.67	3.89	19.56
8	8	13.33	4.44	21.78
9	9	15.00	5.00	24.00

6.0 % GUTTER LINE PROFILE

H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET
3	3	6.25	1.56	11.81
4	4	8.33	2.08	14.42
5	5	10.42	2.60	17.02
6	6	12.50	3.13	19.63
7	7	14.58	3.65	22.23
8	8	15.00	4.17	23.17
9	9	15.00	4.69	23.69

7.0 % GUTTER LINE PROFILE

H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET
3	3	8.33	1.47	13.80
4	4	11.11	1.96	17.07
5	5	13.89	2.45	20.34
6	6	15.00	2.94	21.94
7	7	15.00	3.43	22.43
8	8	15.00	3.92	22.92
9	9	15.00	4.41	23.41

CURB RAMP TYPE 3

0.0 % GUTTER LINE PROFILE

H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET	Y INCHES	X_{2U} FEET	X_{2L} FEET	L_2 FEET
3	2.75	2.50	2.50	9.00	2.75	0.91	0.91	5.82
4		3.33	3.33	10.67		1.91	1.91	7.82
5		4.17	4.17	12.33		2.91	2.91	9.82
6		5.00	5.00	14.00		3.91	3.91	11.83
7		5.83	5.83	15.67		4.91	4.91	13.83
8		6.67	6.67	17.33		5.91	5.91	15.83
9		7.50	7.50	19.00		6.91	6.91	17.83
3	3.0	*	*	*	3.0	*	*	*
4		3.33	3.33	10.67		1.72	1.72	7.44
5		4.17	4.17	12.33		2.72	2.72	9.44
6		5.00	5.00	14.00		3.72	3.72	11.45
7		5.83	5.83	15.67		4.72	4.72	13.45
8		6.67	6.67	17.33		5.72	5.72	15.45
9		7.50	7.50	19.00		6.72	6.72	17.45
3	3.5	*	*	*	3.5	*	*	*
4		3.33	3.33	10.67		1.34	1.34	6.68
5		4.17	4.17	12.33		2.34	2.34	8.68
6		5.00	5.00	14.00		3.34	3.34	10.69
7		5.83	5.83	15.67		4.34	4.34	12.69
8		6.67	6.67	17.33		5.34	5.34	14.69
9		7.50	7.50	19.00		6.34	6.34	16.69
3	4.0	*	*	*	4.0	*	*	*
4		*	*	*		*	*	*
5		4.17	4.17	12.33		1.96	1.96	7.92
6		5.00	5.00	14.00		2.96	2.96	9.93
7		5.83	5.83	15.67		3.96	3.96	11.93
8		6.67	6.67	17.33		4.96	4.96	13.93
9		7.50	7.50	19.00		5.96	5.96	15.93

1.0 % GUTTER LINE PROFILE

H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET	Y INCHES	X_{2U} FEET	X_{2L} FEET	L_2 FEET
3	2.75	2.78	2.27	9.05	2.75	1.04	0.81	5.85
4		3.70	3.03	10.73		2.17	1.71	7.88
5		4.63	3.79	12.42		3.31	2.60	9.91
6		5.56	4.55	14.10		4.45	3.49	11.94
7		6.48	5.30	15.78		5.58	4.39	13.97
8		7.41	6.06	17.47		6.72	5.28	16.00
9		8.33	6.82	19.15		7.86	6.17	18.03
3	3.0	2.78	2.27	9.05	3.0	0.82	0.64	5.46
4		3.70	3.03	10.73		1.96	1.54	7.49
5		4.63	3.79	12.42		3.09	2.43	9.52
6		5.56	4.55	14.10		4.23	3.32	11.55
7		6.48	5.30	15.78		5.37	4.22	13.58
8		7.41	6.06	17.47		6.50	5.11	15.61
9		8.33	6.82	19.15		7.64	6.00	17.64
3	3.5	2.78	2.27	9.05	3.5	0.39	0.30	4.69
4		3.70	3.03	10.73		1.53	1.20	6.72
5		4.63	3.79	12.42		2.66	2.09	8.75
6		5.56	4.55	14.10		3.80	2.98	10.78
7		6.48	5.30	15.78		4.94	3.88	12.81
8		7.41	6.06	17.47		6.07	4.77	14.84
9		8.33	6.82	19.15		7.21	5.66	16.87
3	4.0	*	*	*	4.0	*	*	*
4		3.70	3.03	10.73		1.09	0.86	5.95
5		4.63	3.79	12.42		2.23	1.75	7.98
6		5.56	4.55	14.10		3.37	2.65	10.01
7		6.48	5.30	15.78		4.50	3.54	12.04
8		7.41	6.06	17.47		5.64	4.43	14.07
9		8.33	6.82	19.15		6.78	5.32	16.10

2.0 % GUTTER LINE PROFILE

H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET	Y INCHES	X_{2U} FEET	X_{2L} FEET	L_2 FEET
3	2.75	3.13	2.08	9.21	2.75	1.20	0.73	5.93
4		4.17	2.78	10.94		2.52	1.54	8.06
5		5.21	3.47	12.68		3.83	2.35	10.18
6		6.25	4.17	14.42		5.15	3.16	12.30
7		7.29	4.86	16.15		6.47	3.96	14.43
8		8.33	5.56	17.89		7.78	4.77	16.55
9		9.38	6.25	19.63		9.10	5.58	18.67
3	3.0	3.13	2.08	9.21	3.0	0.95	0.58	5.53
4		4.17	2.78	10.94		2.27	1.39	7.65
5		5.21	3.47	12.68		3.58	2.20	9.78
6		6.25	4.17	14.42		4.90	3.00	11.90
7		7.29	4.86	16.15		6.22	3.81	14.02
8		8.33	5.56	17.89		7.53	4.62	16.15
9		9.38	6.25	19.63		8.85	5.42	18.27
3	3.5	3.13	2.08	9.21	3.5	0.45	0.28	4.72
4		4.17	2.78	10.94		1.77	1.08	6.85
5		5.21	3.47	12.68		3.08	1.89	8.97
6		6.25	4.17	14.42		4.40	2.70	11.09
7		7.29	4.86	16.15		5.72	3.50	13.22
8		8.33	5.56	17.89		7.03	4.31	15.34
9		9.38	6.25	19.63		8.35	5.12	17.46
3	4.0	*	*	*	4.0	*	*	*
4		4.17	2.78	10.94		1.27	0.78	6.04
5		5.21	3.47	12.68		2.58	1.58	8.16
6		6.25	4.17	14.42		3.90	2.39	10.29
7		7.29	4.86	16.15		5.22	3.20	12.41
8		8.33	5.56	17.89		6.53	4.00	14.53
9		9.38	6.25	19.63		7.85	4.81	16.66

3.0 % GUTTER LINE PROFILE

H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET	Y INCHES	X_{2U} FEET	X_{2L} FEET	L_2 FEET
3	2.75	3.57	1.92	9.49	2.75	1.42	0.67	6.09
4		4.76	2.56	11.33		2.99	1.41	8.39
5		5.95	3.21	13.16		4.55	2.14	10.69
6		7.14	3.85	14.99		6.11	2.88	12.99
7		8.33	4.49	16.82		7.68	3.61	15.29
8		9.52	5.13	18.65		9.24	4.35	17.59
9		10.71	5.77	20.48		10.81	5.08	19.89
3	3.0	3.57	1.92	9.49	3.0	1.13	0.53	5.66
4		4.76	2.56	11.33		2.69	1.27	7.96
5		5.95	3.21	13.16		4.25	2.00	10.26
6		7.14	3.85	14.99		5.82	2.74	12.55
7		8.33	4.49	16.82		7.38	3.47	14.85
8		9.52	5.13	18.65		8.94	4.21	17.15
9		10.71	5.77	20.48		10.51	4.94	19.45
3	3.5	3.57	1.92	9.49	3.5	0.53	0.25	4.78
4		4.76	2.56	11.33		2.10	0.99	7.08
5		5.95	3.21	13.16		3.66	1.72	9.38
6		7.14	3.85	14.99		5.22	2.46	11.68
7		8.33	4.49	16.82		6.79	3.19	13.98
8		9.52	5.13	18.65		8.35	3.93	16.28
9		10.71	5.77	20.48		9.91	4.66	18.58
3	4.0	*	*	*	4.0	*	*	*
4		4.76	2.56	11.33		1.50	0.71	6.21
5		5.95	3.21	13.16		3.07	1.44	8.51
6		7.14	3.85	14.99		4.63	2.18	10.81
7		8.33	4.49	16.82		6.19	2.91	13.11
8		9.52	5.13	18.65		7.76	3.65	15.41
9		10.71	5.77	20.48		9.32	4.38	17.71

4.0 % GUTTER LINE PROFILE

H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET	Y INCHES	X_{2U} FEET	X_{2L} FEET	L_2 FEET
3	2.75	4.17	1.79	9.95	2.75	1.75	0.62	6.37
4		5.56	2.38	11.94		3.68	1.29	8.97
5		6.94	2.98	13.92		5.60	1.97	11.57
6		8.33	3.57	15.90		7.53	2.64	14.17
7		9.72	4.17	17.89		9.45	3.32	16.77
8		11.11	4.76	19.87		11.38	4.00	19.37
9		12.50	5.36	21.86		13.30	4.67	21.97
3	3.0	4.17	1.79	9.95	3.0	1.39	0.49	5.88
4		5.56	2.38	11.94		3.31	1.16	8.48
5		6.94	2.98	13.92		5.24	1.84	11.08
6		8.33	3.57	15.90		7.16	2.52	13.68
7		9.72	4.17	17.89		9.09	3.19	16.28
8		11.11	4.76	19.87		11.01	3.87	18.88
9		12.50	5.36	21.86		12.94	4.54	21.48
3	3.5	4.17	1.79	9.95	3.5	0.66	0.23	4.89
4		5.56	2.38	11.94		2.58	0.91	7.49
5		6.94	2.98	13.92		4.51	1.58	10.09
6		8.33	3.57	15.90		6.43	2.26	12.69
7		9.72	4.17	17.89		8.36	2.93	15.29
8		11.11	4.76	19.87		10.28	3.61	17.89
9		12.50	5.36	21.86		12.20	4.29	20.49
3	4.0	*	*	*	4.0	*	*	*
4		5.56	2.38	11.94		1.85	0.65	6.50
5		6.94	2.98	13.92		3.78	1.33	9.10
6		8.33	3.57	15.90		5.70	2.00	11.70
7		9.72	4.17	17.89		7.62	2.68	14.30
8		11.11	4.76	19.87		9.55	3.35	16.90
9		12.50	5.36	21.86		11.47	4.03	19.50

5.0 % GUTTER LINE PROFILE

H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET	Y INCHES	X_{2U} FEET	X_{2L} FEET	L_2 FEET
3	2.75	5.00	1.67	10.67	2.75	2.28	0.57	6.85
4		6.67	2.22	12.89		4.78	1.19	9.98
5		8.33	2.78	15.11		7.29	1.82	13.10
6		10.00	3.33	17.33		9.79	2.45	16.23
7		11.67	3.89	19.56		12.29	3.07	19.36
8		13.33	4.44	21.78		14.79	3.70	22.49
9		15.00	5.00	24.00		15.00	4.32	23.32
3	3.0	5.00	1.67	10.67	3.0	1.80	0.45	6.26
4		6.67	2.22	12.89		4.31	1.08	9.38
5		8.33	2.78	15.11		6.81	1.70	12.51
6		10.00	3.33	17.33		9.31	2.33	15.64
7		11.67	3.89	19.56		11.81	2.95	18.77
8		13.33	4.44	21.78		14.32	3.58	21.89
9		15.00	5.00	24.00		15.00	4.20	23.20
3	3.5	5.00	1.67	10.67	3.5	0.85	0.21	5.07
4		6.67	2.22	12.89		3.36	0.84	8.20
5		8.33	2.78	15.11		5.86	1.46	11.32
6		10.00	3.33	17.33		8.36	2.09	14.45
7		11.67	3.89	19.56		10.86	2.71	17.58
8		13.33	4.44	21.78		13.37	3.34	20.71
9		15.00	5.00	24.00		15.00	3.96	22.96
3	4.0	*	*	*	4.0	*	*	*
4		6.67	2.22	12.89		2.41	0.60	7.01
5		8.33	2.78	15.11		4.91	1.23	10.14
6		10.00	3.33	17.33		7.41	1.85	13.26
7		11.67	3.89	19.56		9.91	2.48	16.39
8		13.33	4.44	21.78		12.42	3.10	19.52
9		15.00	5.00	24.00		14.92	3.73	22.65

6.0 % GUTTER LINE PROFILE

H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET	Y INCHES	X_{2U} FEET	X_{2L} FEET	L_2 FEET
3	2.75	6.25	1.56	11.81	2.75	3.26	0.53	7.79
4		8.33	2.08	14.42		6.84	1.11	11.95
5		10.42	2.60	17.02		10.41	1.69	16.10
6		12.50	3.13	19.63		13.99	2.27	20.26
7		14.58	3.65	22.23		15.00	2.86	21.86
8		15.00	4.17	23.17		15.00	3.44	22.44
9		15.00	4.69	23.69		15.00	4.02	23.02
3	3.0	6.25	1.56	11.81	3.0	2.58	0.42	7.00
4		8.33	2.08	14.42		6.16	1.00	11.16
5		10.42	2.60	17.02		9.73	1.58	15.31
6		12.50	3.13	19.63		13.31	2.16	19.47
7		14.58	3.65	22.23		15.00	2.75	21.75
8		15.00	4.17	23.17		15.00	3.33	22.33
9		15.00	4.69	23.69		15.00	3.91	22.91
3	3.5	6.25	1.56	11.81	3.5	1.22	0.20	5.42
4		8.33	2.08	14.42		4.80	0.78	9.58
5		10.42	2.60	17.02		8.37	1.36	13.74
6		12.50	3.13	19.63		11.95	1.94	17.89
7		14.58	3.65	22.23		15.00	2.52	21.52
8		15.00	4.17	23.17		15.00	3.11	22.11
9		15.00	4.69	23.69		15.00	3.69	22.69
3	4.0	*	*	*	4.0	*	*	*
4		8.33	2.08	14.42		3.44	0.56	8.00
5		10.42	2.60	17.02		7.02	1.14	12.16
6		12.50	3.13	19.63		10.59	1.72	16.31
7		14.58	3.65	22.23		14.17	2.30	20.47
8		15.00	4.17	23.17		15.00	2.89	21.89
9		15.00	4.69	23.69		15.00	3.47	22.47

7.0 % GUTTER LINE PROFILE

H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET	Y INCHES	X_{2U} FEET	X_{2L} FEET	L_2 FEET
3	2.75	8.33	1.47	13.80	2.75	5.71	0.50	10.20
4		11.11	1.96	17.07		11.97	1.04	17.01
5		13.89	2.45	20.34		15.00	1.58	20.58
6		15.00	2.94	21.94		15.00	2.13	21.13
7		15.00	3.43	22.43		15.00	2.67	21.67
8		15.00	3.92	22.92		15.00	3.21	22.21
9		15.00	4.41	23.41		15.00	3.76	22.76
3	3.0	8.33	1.47	13.80	3.0	4.52	0.39	8.91
4		11.11	1.96	17.07		10.78	0.94	15.72
5		13.89	2.45	20.34		15.00	1.48	20.48
6		15.00	2.94	21.94		15.00	2.02	21.02
7		15.00	3.43	22.43		15.00	2.57	21.57
8		15.00	3.92	22.92		15.00	3.11	22.11
9		15.00	4.41	23.41		15.00	3.65	22.65
3	3.5	8.33	1.47	13.80	3.5	2.14	0.19	6.32
4		11.11	1.96	17.07		8.40	0.73	13.13
5		13.89	2.45	20.34		14.67	1.27	19.94
6		15.00	2.94	21.94		15.00	1.82	20.82
7		15.00	3.43	22.43		15.00	2.36	21.36
8		15.00	3.92	22.92		15.00	2.90	21.90
9		15.00	4.41	23.41		15.00	3.45	22.45
3	4.0	8.33	1.47	13.80	4.0	1.50	0.71	6.21
4		11.11	1.96	17.07		12.29	1.07	17.36
5		13.89	2.45	20.34		15.00	1.61	20.61
6		15.00	2.94	21.94		15.00	2.15	21.15
7		15.00	3.43	22.43		15.00	2.70	21.70
8		15.00	3.92	22.92		15.00	3.24	22.24
9		15.00	4.41	23.41		15.00	3.78	22.78

CURB RAMP TYPE 2

0-8 % GUTTER LINE PROFILE

H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET
3	3	1.50	1.50	7.00
4	4	1.50	1.50	7.00
5	5	1.50	1.50	7.00
6	6	1.50	1.50	7.00
7	7	1.50	1.50	7.00
8	8	1.50	1.50	7.00
9	9	1.50	1.50	7.00

NOTES:

1. FOR CURB RAMP TYPES, SEE CD-606-1.
2. THE ABOVE TABLES ARE BASED ON THE SPECIFIC GUTTER PROFILE REFERENCED. THEY DO NOT TAKE INTO ACCOUNT VARIATIONS IN THE GUTTER PROFILE. THE ABOVE TABLES TO BE USED BY THE DESIGNERS AND CONTRACTORS TO GET APPROXIMATE DIMENSIONS OF THE CURB RAMP AT EACH LOCATION. FINAL DIMENSIONS WILL BE DETERMINED BY ACTUAL MEASUREMENTS IN THE FIELD DURING CONSTRUCTION.
3. THE 12H:1V MAX SLOPE IS THE RUNNING SLOPE FOR CURB RAMPS, BUT ONLY THE 12H:1V SLOPE MEASURED AS X IS THE RUNNING SLOPE FOR TYPE 3 AND TYPE 4 CURB RAMPS. ENSURE THE RUNNING SLOPE OF CURB RAMPS DOES NOT REQUIRE ITS LENGTH TO EXCEED 15 FEET. THE RUNNING SLOPE MAY EXCEED THE 12H:1V MAX SLOPE SO AS NOT TO EXCEED THE 15 FEET MAXIMUM LENGTH. THE TABLES ALREADY APPLY THE 15 FEET RULE FOR THOSE CALCULATED LENGTHS WHICH EXCEED 15 FEET.
4. DIMENSIONS SHOWN IN TABLES ARE FOR 3 INCH TO 9 INCH CURB HEIGHTS. WHERE THE CURB HEIGHTS ARE OTHER THAN WHAT IS PROVIDED IN THE TABLES, THE DIMENSIONS OF THE RAMPS WILL HAVE TO BE CALCULATED BASED ON CROSS SLOPES SHOWN.

LEGEND

U = UPPER SIDE OF GUTTER LINE PROFILE

L = LOWER SIDE OF GUTTER LINE PROFILE

FOR THE OTHER ABBREVIATIONS - REFER TO CD-606-1

* TYPE 3 RAMP IS NOT APPLICABLE, USE TYPE 1

** TYPE 4 RAMP IS NOT APPLICABLE, USE TYPE 2

CONCRETE SIDEWALK

(PUBLIC SIDEWALK CURB RAMP TABLES)

N.T.S.

CD-606-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

CD-606-3.1

110
139

ID=TP2AYILL date=28-SEP-2016 11:08 scale=63.073306:1.000000 pen table=\NJDOTPRIWS\VSsystem\NJDOTWS\Projects\NJDOTWS\Projects\NJDOTEng\plot\TBLs\Roadway\Details_11x17.tbl
BDC16D-01-ORIGINAL SHEET
file=

ID=TP2VILL date=28-SEP-2016 11:08 scale=63.073306:1.000000 pen table=\\NJDOTTRJWS\VAsystem\NJDOTEng\plot\TBLs\Roadway\Details_11x17.tbl
BDC16D-01-ORIGINAL SHEET
file=

CURB RAMP TYPE 4

0.0 % GUTTER LINE PROFILE					
H INCHES	W FEET	Y INCHES	X_{2U} FEET	X_{2L} FEET	L_2 FEET
3	2.75	2.75	0.91	0.91	5.82
4			1.91	1.91	7.82
5			2.91	2.91	9.82
6			3.91	3.91	11.82
7			4.91	4.91	13.83
8			5.91	5.91	15.83
9			6.91	6.91	17.83
3	3.0	3.0	**	**	**
4			1.72	1.72	7.44
5			2.72	2.72	9.44
6			3.72	3.72	11.45
7			4.72	4.72	13.45
8			5.72	5.72	15.45
9			6.72	6.72	17.45
3	3.5	3.5	**	**	**
4			1.34	1.34	6.68
5			2.34	2.34	8.68
6			3.34	3.34	10.69
7			4.34	4.34	12.69
8			5.34	5.34	14.69
9			6.34	6.34	16.69
3	4.0	4.0	**	**	**
4			**	**	**
5			1.96	1.96	7.92
6			2.96	2.96	9.93
7			3.96	3.96	11.93
8			4.96	4.96	13.93
9			5.96	5.96	15.93

1.0 % GUTTER LINE PROFILE					
H INCHES	W FEET	Y INCHES	X_{2U} FEET	X_{2L} FEET	L_2 FEET
3	2.75	2.75	1.04	0.81	5.85
4			2.17	1.71	7.88
5			3.31	2.60	9.91
6			4.45	3.49	11.94
7			5.58	4.39	13.97
8			6.72	5.28	16.00
9			7.86	6.17	18.03
3	3.0	3.0	0.82	0.64	5.46
4			1.96	1.54	7.49
5			3.09	2.43	9.52
6			4.23	3.32	11.55
7			5.37	4.22	13.58
8			6.50	5.11	15.61
9			7.64	6.00	17.64
3	3.5	3.5	0.39	0.30	4.69
4			1.53	1.20	6.72
5			2.66	2.09	8.75
6			3.80	2.98	10.78
7			4.94	3.88	12.81
8			6.07	4.77	14.84
9			7.21	5.66	16.87
3	4.0	4.0	**	**	**
4			1.09	0.86	5.95
5			2.23	1.75	7.98
6			3.37	2.65	10.01
7			4.50	3.54	12.04
8			5.64	4.43	14.07
9			6.78	5.32	16.10

2.0 % GUTTER LINE PROFILE					
H INCHES	W FEET	Y INCHES	X_{2U} FEET	X_{2L} FEET	L_2 FEET
3	2.75	2.75	1.20	0.73	5.93
4			2.52	1.54	8.06
5			3.83	2.35	10.18
6			5.15	3.16	12.30
7			6.47	3.96	14.43
8			7.78	4.77	16.55
9			9.10	5.58	18.67
3	3.0	3.0	0.95	0.58	5.53
4			2.27	1.39	7.65
5			3.58	2.20	9.78
6			4.90	3.00	11.90
7			6.22	3.81	14.02
8			7.53	4.62	16.15
9			8.85	5.42	18.27
3	3.5	3.5	0.45	0.28	4.72
4			1.77	1.08	6.85
5			3.08	1.89	8.97
6			4.40	2.70	11.09
7			5.72	3.50	13.22
8			7.03	4.31	15.34
9			8.35	5.12	17.46
3	4.0	4.0	**	**	**
4			1.27	0.78	6.04
5			2.58	1.58	8.16
6			3.90	2.39	10.29
7			5.22	3.20	12.41
8			6.53	4.00	14.53
9			7.85	4.81	16.66

3.0 % GUTTER LINE PROFILE					
H INCHES	W FEET	Y INCHES	X_{2U} FEET	X_{2L} FEET	L_2 FEET
3	2.75	2.75	1.42	0.67	6.09
4			2.99	1.41	8.39
5			4.55	2.14	10.69
6			6.11	2.88	12.99
7			7.68	3.61	15.29
8			9.24	4.35	17.59
9			10.81	5.08	19.89
3	3.0	3.0	1.13	0.53	5.66
4			2.69	1.27	7.96
5			4.25	2.00	10.26
6			5.82	2.74	12.55
7			7.38	3.47	14.85
8			8.94	4.21	17.15
9			10.51	4.94	19.45
3	3.5	3.5	0.53	0.25	4.78
4			2.10	0.99	7.08
5			3.66	1.72	9.38
6			5.22	2.46	11.68
7			6.79	3.19	13.98
8			8.35	3.93	16.28
9			9.91	4.66	18.58
3	4.0	4.0	**	**	**
4			1.50	0.71	6.21
5			3.07	1.44	8.51
6			4.63	2.18	10.81
7			6.19	2.91	13.11
8			7.76	3.65	15.41
9			9.32	4.38	17.71

4.0 % GUTTER LINE PROFILE					
H INCHES	W FEET	Y INCHES	X_{2U} FEET	X_{2L} FEET	L_2 FEET
3	2.75	2.75	1.75	0.62	6.37
4			3.68	1.29	8.97
5			5.60	1.97	11.57
6			7.53	2.64	14.17
7			9.45	3.32	16.77
8			11.38	4.00	19.37
9			13.30	4.67	21.97
3	3.0	3.0	1.39	0.49	5.88
4			3.31	1.16	8.48
5			5.24	1.84	11.08
6			7.16	2.52	13.68
7			9.09	3.19	16.28
8			11.01	3.87	18.88
9			12.94	4.54	21.48
3	3.5	3.5	0.66	0.23	4.89
4			2.58	0.91	7.49
5			4.51	1.58	10.09
6			6.43	2.26	12.69
7			8.36	2.93	15.29
8			10.28	3.61	17.89
9			12.20	4.29	20.49
3	4.0	4.0	**	**	**
4			1.85	0.65	6.50
5			3.78	1.33	9.10
6			5.70	2.00	11.70
7			7.62	2.68	14.30
8			9.55	3.35	16.90
9			11.47	4.03	19.50

5.0 % GUTTER LINE PROFILE					
H INCHES	W FEET	Y INCHES	X_{2U} FEET	X_{2L} FEET	L_2 FEET
3	2.75	2.75	2.28	0.57	6.85
4			4.78	1.19	9.98
5			7.29	1.82	13.10
6			9.79	2.45	16.23
7			12.29	3.07	19.36
8			14.79	3.70	22.49
9			15.00	4.32	23.32
3	3.0	3.0	1.80	0.45	6.26
4			4.31	1.08	9.38
5			6.81	1.70	12.51
6			9.31	2.33	15.64
7			11.81	2.95	18.77
8			14.32	3.58	21.89
9			15.00	4.20	23.20
3	3.5	3.5	0.85	0.21	5.07
4			3.36	0.84	8.20
5			5.86	1.46	11.32
6			8.36	2.09	14.45
7			10.86	2.71	17.58
8			13.37	3.34	20.71
9			15.00	3.96	22.96
3	4.0	4.0	**	**	**
4			2.41	0.60	7.01
5			4.91	1.23	10.14
6			7.41	1.85	13.26
7			9.91	2.48	16.39
8			12.42	3.10	19.52
9			14.92	3.73	22.65

6.0 % GUTTER LINE PROFILE					
H INCHES	W FEET	Y INCHES	X_{2U} FEET	X_{2L} FEET	L_2 FEET
3	2.75	2.75	3.26	0.53	7.79
4			6.84	1.11	11.95
5			10.41	1.69	16.10
6			13.99	2.27	20.26
7			15.00	2.86	21.86
8			15.00	3.44	22.44
9			15.00	4.02	23.02
3	3.0	3.0	2.58	0.42	7.00
4			6.16	1.00	11.16
5			9.73	1.58	15.31
6			13.31	2.16	19.47
7			15.00	2.75	21.75
8			15.00	3.33	22.33
9			15.00	3.91	22.91
3	3.5	3.5	1.22	0.20	5.42
4			4.80	0.78	9.58
5			8.37	1.36	13.74
6			11.95	1.94	17.89
7			15.00	2.52	21.52
8			15.00	3.11	22.11
9			15.00	3.69	22.69
3	4.0	4.0	**	**	**
4			3.44	0.56	8.00
5			7.02	1.14	12.16
6			10.59	1.72	16.31
7			14.17	2.30	20.47
8			15.00	2.89	21.89
9			15.00	3.47	22.47

7.0 % GUTTER LINE PROFILE					
H INCHES	W FEET	Y INCHES	X_{2U} FEET	X_{2L} FEET	L_2 FEET
3	2.75	2.75	5.71	0.50	10.20
4			11.97	1.04	17.01
5			15.00	1.58	20.58
6			15.00	2.13	21.13
7			15.00	2.67	21.67
8			15.00	3.21	22.21
9			15.00	3.76	22.76
3	3.0	3.0	4.52	0.39	8.91
4			10.78	0.94	15.72
5			15.00	1.48	20.48
6			15.00	2.02	21.02
7			15.00	2.57	21.57
8			15.00	3.11	22.11
9			15.00	3.65	22.65
3	3.5	3.5	2.14	0.19	6.32
4			8.40	0.73	13.13
5			14.67	1.27	19.94
6			15.00	1.82	20.82
7			15.00	2.36	21.36
8			15.00	2.90	21.90
9			15.00	3.45	22.45
3	4.0	4.0	**	**	**
4			6.03	0.52	10.55
5			12.29	1.07	17.36
6			15.00	1.61	20.61
7			15.00	2.15	21.15
8			15.00	2.70	21.70
9			15.00	3.24	22.24

NOTES:

1. FOR CURB RAMP TYPES, SEE CD-606-1.
2. THE ABOVE TABLES ARE BASED ON THE SPECIFIC GUTTER PROFILE REFERENCED. THEY DO NOT TAKE INTO ACCOUNT VARIATIONS IN THE GUTTER PROFILE. THE ABOVE TABLES TO BE USED BY THE DESIGNERS AND CONTRACTORS TO GET APPROXIMATE DIMENSIONS OF THE CURB RAMP AT EACH LOCATION. FINAL DIMENSIONS WILL BE DETERMINED BY ACTUAL MEASUREMENTS IN THE FIELD DURING CONSTRUCTION.
3. THE 12H:1V MAX SLOPE IS THE RUNNING SLOPE FOR CURB RAMPS, BUT ONLY THE 12H:1V SLOPE MEASURED AS X IS THE RUNNING SLOPE FOR TYPE 3 AND TYPE 4 CURB RAMPS. ENSURE THE RUNNING SLOPE OF CURB RAMPS DOES NOT REQUIRE ITS LENGTH TO EXCEED 15 FEET. THE RUNNING SLOPE MAY EXCEED THE 12H:1V MAX SLOPE SO AS NOT TO EXCEED THE 15 FEET MAXIMUM LENGTH. THE TABLES ALREADY APPLY THE 15 FEET RULE FOR THOSE CALCULATED LENGTHS WHICH EXCEED 15 FEET.
4. DIMENSIONS SHOWN IN TABLES ARE FOR 3 INCH TO 9 INCH CURB HEIGHTS. WHERE THE CURB HEIGHTS ARE OTHER THAN WHAT IS PROVIDED IN THE TABLES, THE DIMENSIONS OF THE RAMPS WILL HAVE TO BE CALCULATED BASED ON CROSS SLOPES SHOWN.

LEGEND

U = UPPER SIDE OF GUTTER LINE PROFILE

L = LOWER SIDE OF GUTTER LINE PROFILE

FOR THE OTHER ABBREVIATIONS - REFER TO CD-606-1

* TYPE 3 RAMP IS NOT APPLICABLE, USE TYPE 1

** TYPE 4 RAMP IS NOT APPLICABLE, USE TYPE 2

CD-606-4.1

CURB RAMP TYPE 7

0.0 % GUTTER LINE PROFILE				
H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET
3	4' MIN. 7' MAX.	3.00	3.00	10.00
4		4.00	4.00	12.00
5		5.00	5.00	14.00
6		6.00	6.00	16.00
7		7.00	7.00	18.01
8		8.00	8.00	20.01
9		9.00	9.00	22.01

1.0 % GUTTER LINE PROFILE				
H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET
3	4' MIN. 7' MAX.	3.41	2.68	10.09
4		4.55	3.57	12.12
5		5.68	4.47	14.15
6		6.82	5.36	16.18
7		7.96	6.25	18.21
8		9.10	7.15	20.24
9		10.23	8.04	22.27

2.0 % GUTTER LINE PROFILE				
H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET
3	4' MIN. 7' MAX.	3.95	2.42	10.37
4		5.27	3.23	12.49
5		6.58	4.03	14.62
6		7.90	4.84	16.74
7		9.22	5.65	18.86
8		10.53	6.45	20.99
9		11.85	7.26	23.11

3.0 % GUTTER LINE PROFILE				
H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L_1 FEET
3	4' MIN. 7' MAX.	4.69	2.21	10.90
4		6.25	2.94	13.20
5		7.82	3.68	15.49
6		9.38	4.41	17.79
7		10.94	5.15	20.09
8		12.51	5.88	22.39
9		14.07	6.62	24.69

4.0 % GUTTER LINE PROFILE				
H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L1 FEET
3	4' MIN. 7' MAX.	5.77	2.03	11.80
4		7.70	2.70	14.40
5		9.62	3.38	17.00
6		11.55	4.06	19.60
7		13.47	4.73	22.20
8		15.40	5.41	24.80
9		17.32	6.08	27.40

5.0 % GUTTER LINE PROFILE				
H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L1 FEET
3	4' MIN. 7' MAX.	7.51	1.88	13.38
4		10.01	2.50	16.51
5		12.51	3.13	19.64
6		15.00	3.75	22.75
7		15.00	4.38	23.38
8		15.00	5.00	24.00
9		15.00	5.63	24.63

6.0 % GUTTER LINE PROFILE				
H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L1 FEET
3	4' MIN. 7' MAX.	10.73	1.74	16.47
4		14.31	2.33	20.63
5		15.00	2.91	21.91
6		15.00	3.49	22.49
7		15.00	4.07	23.07
8		15.00	4.65	23.65
9		15.00	5.23	24.23

7.0 % GUTTER LINE PROFILE				
H INCHES	W FEET	X_{1U} FEET	X_{1L} FEET	L1 FEET
3	4' MIN. 7' MAX.	15.00	1.63	20.63
4		15.00	2.17	21.17
5		15.00	2.72	21.72
6		15.00	3.26	22.26
7		15.00	3.81	22.81
8		15.00	4.35	23.35
9		15.00	4.89	23.89

CONCRETE SIDEWALK

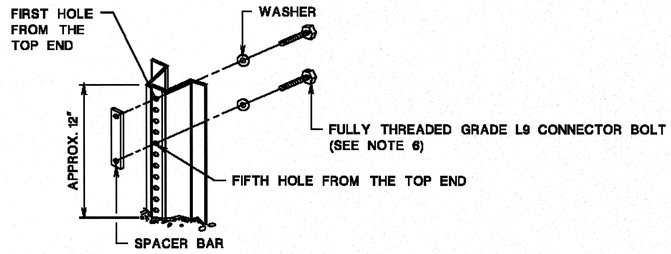
(PUBLIC SIDEWALK CURB RAMP TABLES)

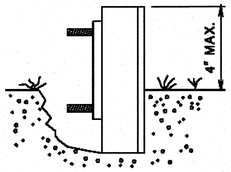
N.T.S.

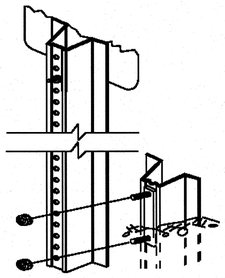
CD-606-4

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS



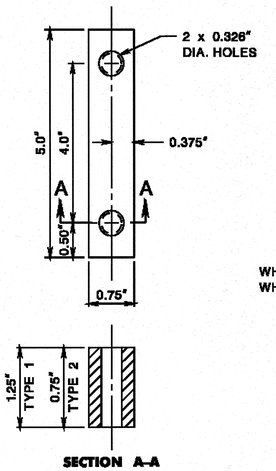




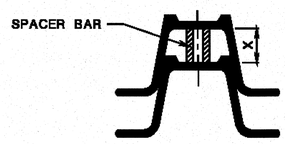
NOTES:

1. DRIVE ANCHOR POST ASSEMBLY TO WITHIN APPROXIMATELY 12 INCHES ABOVE GROUND LEVEL. PLACE BOLT AND WASHER IN FIRST AND FIFTH HOLES FROM THE TOP END, AND SECURE BOLTS ONTO SPACER.
2. DRIVE ANCHOR POST ASSEMBLY TO WITHIN A MAXIMUM OF 4 INCHES ABOVE GROUND LEVEL.
3. DIG OUT AROUND BACK OF ANCHOR POST ASSEMBLY TO ALLOW ROOM FOR TOP POST TO BE ATTACHED.
4. NEST TOP POST ASSEMBLY ONTO PROTRUDING ANCHOR POST ASSEMBLY BOLTS, THROUGH THE FIRST AND FIFTH HOLES FROM THE BOTTOM OF THE TOP POST.
5. PLACE AND TIGHTEN A SELF-LOCKING FLANGE NUT ON EACH BOLT. WHEN INSTALLATION IS COMPLETE, TOP OF GROUND POST NOT TO EXCEED 4 INCHES ABOVE GROUND LEVEL.
6. SIZE OF CONNECTOR BOLT FOR TYPE 1, 5/16" x 1½"
   SIZE OF CONNECTOR BOLT FOR TYPE 2, 5/16" x 2"
7. THE CONNECTOR BOLTS ARE TO BE FULLY THREADED. EACH CONNECTOR BOLT AND NUT TO BE CLEARLY STAMPED WITH MANUFACTURER'S IDENTIFYING MARK.

ANCHOR POST ASSEMBLY SIGN SUPPORTS



SECTION A-A



WHEN X IS GREATER THAN 0.75", USE TYPE 1 SPACER BAR
WHEN X IS 0.75" OR LESS, USE TYPE 2 SPACER BAR

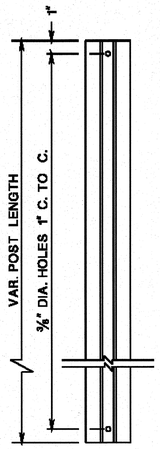
SPACER BAR

CD-612-5.1

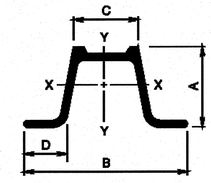
WEIGHT * LBS./FT.	DIMENSIONS (IN)				AREA IN.^{2}	X-X AXIS **		Y-Y AXIS	
	"A"	"B"	"C"	"D"		I(IN.^{4})	S(IN.^{3})	I(IN.^{4})	S(IN.^{3})
2.50	1.516	3.062	1.278	0.669	0.760	0.228	0.313	0.539	0.352
4.00	1.968	3.500	1.336	0.834	1.187	0.611	0.707	1.161	0.664

* ± 5%
** GOVERNING SECTION

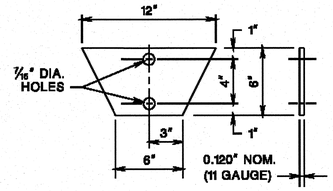
TYPE 1 STEEL U-POST PROPERTIES



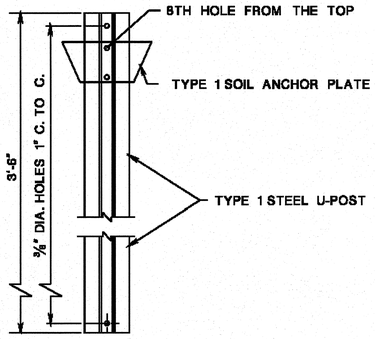
TOP POST U-POST



TYPE 1 STEEL U-POST



TYPE 1 SOIL ANCHOR PLATE



TYPE 1 ANCHOR POST ASSEMBLY

NOTES:

1. ANCHOR POST AND TOP POST TO BE OF EQUAL WEIGHT / FEET.
2. SOIL ANCHOR PLATE TO BE ATTACHED TO ALL ANCHOR POSTS.
3. THE MATERIAL FOR THE SOIL ANCHOR PLATES TO BE CARBON SHEET STEEL.
4. THE STEEL "U" POST TO BE GRADE 60.

CD-612-5.2

STEEL U-POST SIGN SUPPORTS

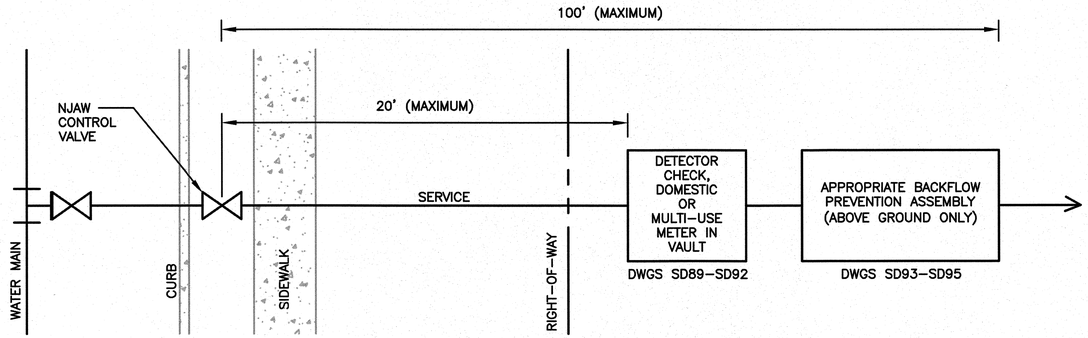
N.T.S.

CD-612-5

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

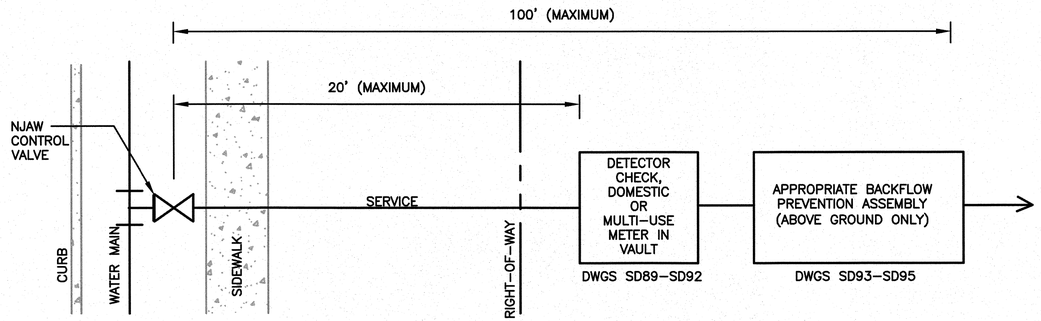
BDC160-01-ORIGINAL SHEET
file=
ID=TP2VILL date=28-SEP-2016 11:10 scale=63.073306:1.000000 pen table=\\NJDOTPRJWS\V8system\NJDOTWS\Projects\NJDOTEng\Iplot\TBLs\Roadway\Details_11x17.tbl



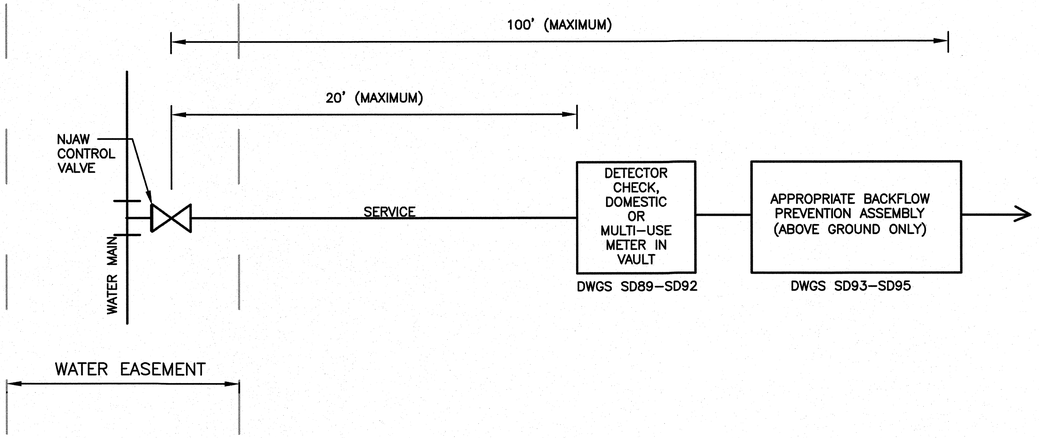
VAULT & ENCLOSURE LOCATION– MAIN IN STREET

NOTES:

1. ALL METERS (3" & LARGER) SHALL BE INSTALLED IN A CONCRETE VAULT.
2. ALL BACKFLOW PREVENTION DEVICES SHALL BE INSTALLED IN AN ABOVEGROUND ENCLOSURE, IMMEDIATELY ADJACENT (I.E. AS CLOSE AS PRACTICABLE) TO THE DISCHARGE SIDE OF THE METER.
3. NOT WITHSTANDING THE ABOVE, IF A METER VAULT AND HEATED BP ENCLOSURE ARE INSTALLED, BOTH STRUCTURES SHALL BE INSTALLED WITHIN 100 FEET OF THE NJAW CONTROL VALVE (MAXIMUM).
4. NJAW MAY WAIVE HEATED BP ENCLOSURE AND ALLOW BACKFLOW PREVENTER INSTALLATION IN BUILDING IF THE 100 FOOT REQUIREMENT IS MAINTAINED.
5. THE INSTALLATION MUST ALSO MEET ALL APPLICABLE CODE & REGULATORY REQUIREMENTS INCLUDING THE NATIONAL STANDARD PLUMBING CODE AND NEW JERSEY STATUTES AND REGULATIONS.



VAULT & ENCLOSURE LOCATION– MAIN BEHIND CURB



VAULT & ENCLOSURE LOCATION– MAIN IN EASEMENT

NEW JERSEY AMERICAN WATER

REVISIONS		REVISIONS	
△		△	
△		△	
△		△	
△		△	
△		△	

NJ LICENSED PROFESSIONAL ENGINEER

AMERICAN WATER ENGINEERING
3906 CHURCH RD.
MT. LAUREL, NJ 08054

AMERICAN WATER

DRAWN BY D. JOBE
PROJECT ENG'R E. SCHWARTZ

DATE 08-24-18

PROJECT

STANDARD DETAIL
DOMESTIC, FIRE & MULTI-USE SERVICE LOCATION SCHEMATIC

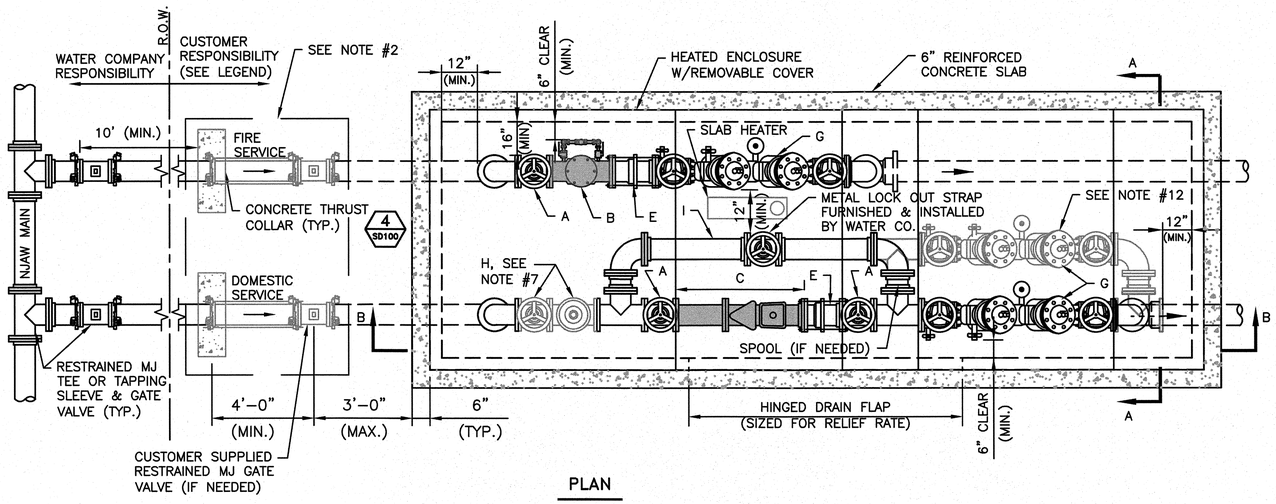
NEW JERSEY AMERICAN WATER

USE APPROVED DRAWINGS ONLY FOR CONSTRUCTION PURPOSES

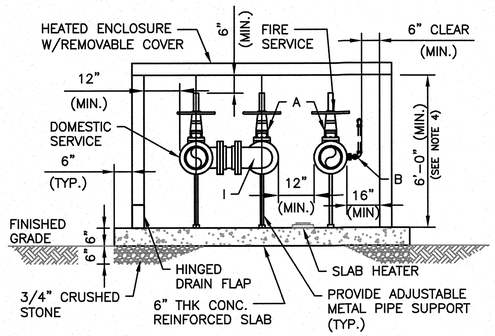
USE DIMENSIONS ONLY
SCALE NOT TO SCALE

0201-0601-SD88

02010601SD88

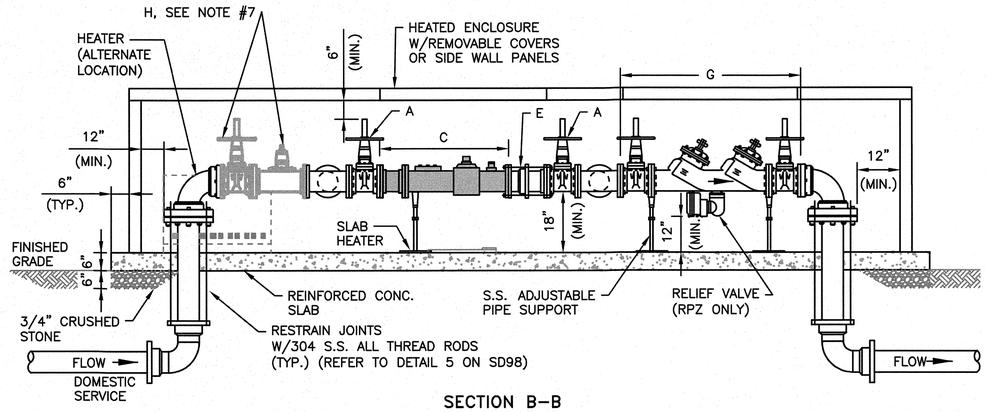


PLAN



SECTION A–A

N.T.S.



SECTION B–B

N.T.S.

NOTES:

1. IN LIEU OF PROVIDING A VAULT FOR LARGE METER(S) (3" & LARGER) AND AN ABOVEGOUND, HEATED ENCLOSURE FOR A BACKFLOW PREVENTER ASSEMBLY, NJAW MAY ALLOW BOTH THE METER ASSEMBLY AND THE BACKFLOW PREVENTER ASSEMBLY TO BE INSTALLED IN A SINGLE ABOVEGROUND, HEATED ENCLOSURE. IF APPROVED BY NJAW, THE ENCLOSURE AND ALL APPURTENANCES ARE TO BE FURNISHED AND INSTALLED BY CUSTOMER, UNLESS SPECIFICALLY INDICATED OTHERWISE IN THE LEGEND. ALL ENCLOSURE AND PIPING CONSTRUCTION IS SUBJECT TO WATER COMPANY APPROVAL PRIOR TO SERVICE.
2. IF ENCLOSURE IS >20 FEET FROM NJAW SHUTOFF VALVE, CUSTOMER IS REQUIRED TO FURNISH & INSTALL AN ADDITIONAL RESTRAINED MECHANICAL JOINT GATE VALVE & VALVE BOX WITHIN 3 FEET OF THE ENCLOSURE. IF VAULT IS <20 FEET FROM NJAW SHUTOFF VALVE, CUSTOMER SHALL INSTALL A SOLID, GASKETED, MECHANICAL JOINT SLEEVE RESTRAINED WITH WEDGE ACTION RESTRAINING GLANDS WITHIN 3 FEET OF VAULT.
3. EXTERIOR VALVES & FITTINGS SHALL BE RESTRAINED WITH WEDGE ACTION RESTRAINING GLANDS, THRUST COLLARS AND/OR 304 STAINLESS STEEL RODS/NUTS AND CLAMPS.
4. BASED ON THE LARGEST SIZE GATE VALVE REQUIRED, THE MINIMUM ENCLOSURE HEIGHT (INTERIOR DIMENSION) SHALL BE AS INDICATED BELOW. LENGTH AND WIDTH SHALL BE AS INDICATED ON STANDARD DETAIL SD101:

GV SIZE	ENCLOSURE HEIGHT
2" TO 8"	6'–0"
10"	6'–6"
12"	7'–0"

5. ENCLOSURE PIPING TO BE DUCTILE IRON MEETING ANSI/AWWA C115/A21.15, OR TYPE K DRAWN (HARD) TEMPER COPPER MEETING ASTM–B88. THE USE OF FLANGED COUPLING ADAPTERS IS STRICTLY PROHIBITED.
6. NO DETECTOR CHECK VALVES WILL BE MADE AVAILABLE TO THE CUSTOMER BY NJAW PRIOR TO THE INSPECTION BY NJAW.
7. THE CUSTOMER MUST INSTALL A WATER PRESSURE REDUCING VALVE WHERE REQUIRED BY STATE OF NEW JERSEY PLUMBING CODE. INSTALLATION RECOMMENDED WHERE AVERAGE PRESSURE IS GREATER THAN 80 PSI. WHERE A PRV IS REQUIRED IT SHALL BE PRECEEDED BY AN ADDITIONAL OS&Y GATE VALVE.
8. BACKFLOW PREVENTER ASSEMBLY SHALL NOT BE SUBJECT TO FLOODING.
9. BACKFLOW PREVENTER MUST BE INSTALLED ABOVE NATURAL GROUND, ABOVE THE 100 YEAR FLOOD LEVEL, UNLESS OTHERWISE APPROVED BY NJAW.
10. ENCLOSURE MUST MEET OSHA 29 CRF 1910.145 AND ASSE 1060 CLASS 1.
11. INSULATED HEATED ENCLOSURE CHARACTERISTICS:
    A. ENCLOSURE–5052–H32 MARINE GRADE ALUMINUM (0.050/18 GAUGE), MILL FINISH, OR 1/8" POLYESTER RESIN REINFORCED WITH FIBERGLASS STRAND
    B. INSULATION– 1–1/2" (R9) POLYISOCYANURATE FOAM
    C. HEATING SYSTEM– SLAB OR WALL MOUNT THERMOSTATICALLY CONTROLLED ELECTRIC HEATER MEETING SECTION 49 OF UL–2021 FOR DAMP OR WET LOCATIONS, WITH GFI RECEPTACLE, U.L. 943 NEMA 3R MOUNTED 8" (MIN.) ABOVE SLAB.
    D. HEATER(S) SHALL BE PROVIDED AS NECESSARY TO MAINTAIN TEMPERATURE ABOVE 40° F AT ALL TIMES.
12. CUSTOMERS THAT REQUIRE UNINTERRUPTED SUPPLY OF POTABLE WATER MUST INSTALL REDUNDANT BACKFLOW PREVENTER ASSEMBLIES.
13. ENCLOSURE MUST BE A SUFFICIENT SIZE TO HOUSE ALL REQUIRED PIPING. ENCLOSURE SHALL BE LOCKABLE. ACCESS PANELS SHALL BE ABOVE THE CENTERLINE OF THE ASSEMBLIES, OR IN SIDE WALLS. ENCLOSURE TO HAVE HINGED ONE–WAY DRAIN FLAP SIZED FOR FULL PORT BACKFLOW DISCHARGE TO SURROUNDING GRADE. REFER TO DRAWING SD101.

LEGEND:

COMPONENTS SHADED IN GRAY TO BE FURNISHED BY WATER CO.

A– OS&Y GATE VALVE WITH FLANGED ENDS (FURNISHED & INSTALLED BY CUSTOMER)

B– DETECTOR CHECK VALVE W/ BYPASS METER (FURNISHED BY WATER CO., INSTALLED BY CUSTOMER)

C– DOMESTIC COMPOUND METER ASSEMBLY– METERS WITH FLANGED ENDS (FURNISHED BY WATER CO., INSTALLED BY CUSTOMER)

E– DISMANTLING JOINT TO HAVE FLANGED ENDS WITH JOINT RESTRAINT (FURNISHED & INSTALLED BY CUSTOMER)

G– BACKFLOW PREVENTER ASSEMBLY (FURNISHED & INSTALLED BY CUSTOMER)

H– PRESSURE REDUCING VALVE & OS&Y GATE VALVE (IF REQUIRED FURNISHED & INSTALLED BY CUSTOMER– SEE NOTE #7)

I– BYPASS SIZE SHALL BE NO GREATER THAN ONE STANDARD PIPE SIZE SMALLER THAN DOMESTIC SERVICE SIZE AND SHALL HAVE METAL STRAP FOR LOCKING OUT BYPASS VALVE (STRAP FURNISHED & INSTALLED BY WATER CO.)

NEW JERSEY AMERICAN WATER

REVISIONS		REVISIONS	
△		△	
△		△	
△		△	
△		△	
△		△	

NJ LICENSED PROFESSIONAL ENGINEER NO.

AMERICAN WATER ENGINEERING
3906 CHURCH RD.
MT. LAUREL, NJ 08054

AMERICAN WATER

DRAWN BY R. BEATTY
PROJECT ENG'R E. SCHWARTZ

DATE 08–24–18

PROJECT

STANDARD DETAIL
DOMESTIC & FIRE SERVICE METERS & BACKFLOW PREVENTERS IN HEATED ENCLOSURE

NEW JERSEY AMERICAN WATER	STANDARDS	USE DIMENSIONS ONLY SCALE AS SHOWN
USE APPROVED DRAWINGS ONLY FOR CONSTRUCTION PURPOSES	114 of 139	0201–0601–SD95

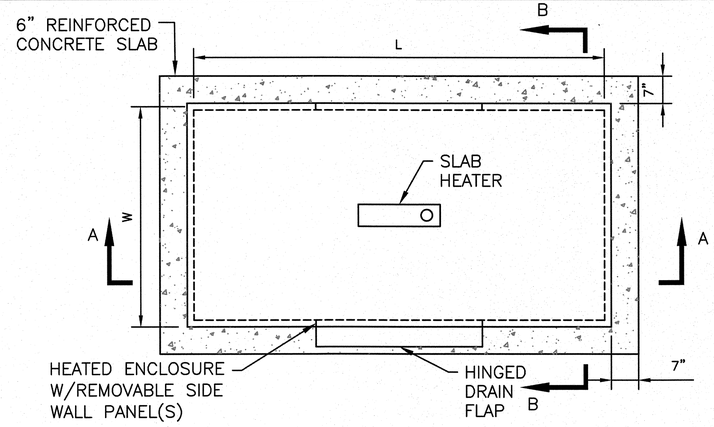
02010601SD92

Service Size (in)	INTERIOR DIMENSIONS FOR FIRE & DOMESTIC BP ENCLOSURE (DWG SD93) Length (ft)	Width (ft)	Height (ft)
2	8.00	5.00	6.50
3	8.00	6.00	6.50
4	10.00	6.00	6.50
6	11.00	6.00	6.50
8	12.00	7.00	6.50
10	14.00	7.00	7.00

Service Size (in)	INTERIOR DIMENSIONS FOR SINGLE SERVICE BP ENCLOSURES (DWG SD94) Length (ft)	Width (ft)	Height (ft)
2	8.00	3.00	6.50
3	8.00	3.00	6.50
4	10.00	3.00	6.50
6	11.00	3.00	6.50
8	12.00	4.00	6.50
10	14.00	4.00	7.00

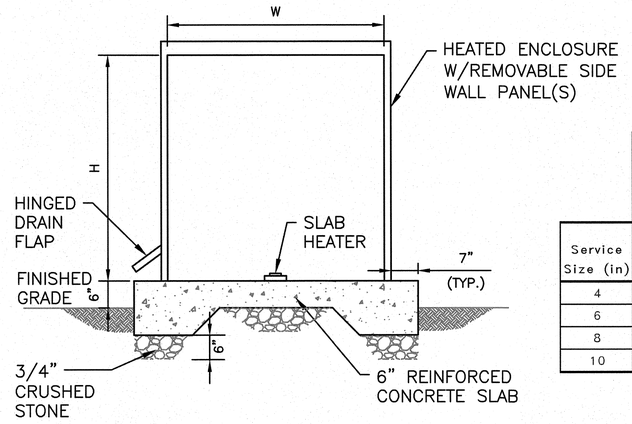
Service Size (in)	INTERIOR DIMENSIONS FOR FIRE & DOMESTIC METER & BP ENCLOSURE (DWG SD95) Without PRV Assembly Length (ft)	Width (ft)	Height (ft)	With PRV Assembly Length (ft)	Width (ft)	Height (ft)
2	12.00	5.00	6.50	13.00	5.00	6.50
3	13.00	6.00	6.50	15.00	6.00	6.50
4	15.00	6.00	6.50	17.00	6.00	6.50
6	18.00	7.00	6.50	20.00	7.00	6.50
8	20.00	8.00	6.50	23.00	8.00	6.50
10	24.00	8.00	7.00	27.00	8.00	7.00

Service Size (in)	INTERIOR DIMENSIONS FOR DOMESTIC METER & BP ENCLOSURE (DWG SD96) Without PRV Assembly Length (ft)	Width (ft)	Height (ft)	With PRV Assembly Length (ft)	Width (ft)	Height (ft)
2	12.00	4.00	6.50	13.00	4.00	6.50
3	13.00	4.00	6.50	15.00	4.00	6.50
4	15.00	4.00	6.50	17.00	4.00	6.50
6	18.00	5.00	6.50	20.00	5.00	6.50
8	20.00	5.00	6.50	23.00	5.00	6.50
10	24.00	6.00	7.00	27.00	6.00	7.00



ENCLOSURE PLAN

N.T.S.

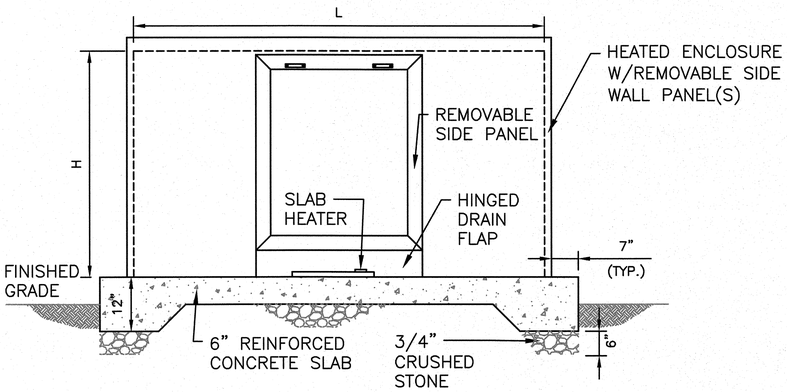


SECTION B–B

N.T.S.

Service Size (in)	INTERIOR DIMENSIONS FOR MULTI–USE METER & BP ENCLOSURE (DWG SD98) Without PRV Assembly Length (ft)	Width (ft)	Height (ft)	With PRV Assembly Length (ft)	Width (ft)	Height (ft)
4	16.00	4.00	6.50	18.00	4.00	6.50
6	19.00	5.00	6.50	22.00	5.00	6.50
8	22.00	5.00	6.50	25.00	5.00	6.50
10	26.00	6.00	7.00	29.00	6.00	7.00

Service Size	INTERIOR DIMENSIONS FOR FIRE METER & BP ENCLOSURE (DWG SD97) Length (ft)	Width (ft)	Height (ft)
2	10.00	3.00	6.50
3	10.00	4.00	6.50
4	12.00	4.00	6.50
6	14.00	4.00	6.50
8	15.00	5.00	6.50
10	18.00	6.00	7.00



SECTION A–A

N.T.S.

CONCRETE SLAB NOTES:

1. CONCRETE SLAB SHALL BE DESIGNED BASED ON SOIL BEARING PRESSURE OF 2,500 PSF.
2. EFFECTS OF ALL VERTICAL LOADS ANTICIPATED ON THE FINISHED STRUCTURE & SLAB SHALL BE INCLUDED IN THE ANALYSIS AND DESIGN. LOADING FROM PIPING AND EQUIPMENT, SUPERSTRUCTURES, WIND AND SNOW SHALL BE INCLUDED AS APPROPRIATE.
3. ALL ALUMINUM IN CONTACT WITH CONCRETE SHALL BE PAINTED WITH 2 COATS OF COAL TAR EPOXY OR ISOLATED FROM THE CONCRETE WITH 1/8" THICK NEOPRENE PADDING. ALL STEEL THRUST RESTRAINT ANGLES SHALL BE WIRE BRUSHED AND PAINTED WITH 2 COATS OF COAL TAR EPOXY.
4. ALL CONCRETE ANCHORS AND HARDWARE SHALL BE STAINLESS STEEL.
5. PROVIDE COMMON KEYED LOCKS FOR ALL HATCHES, ND QUICK DISCONNECT CAPS ASSOCIATED WITH THIS PROJECT.
6. DESIGN SHALL FOLLOW ACI 318–14 USING LOAD FACTOR DESIGN.
7. CONCRETE: fc = 4,000 PSI AT 28 DAYS. TYPE III CEMENT. AIR ENTRAINMENT 7% ± 2%. ASTM C33 NO. 57 OR NO. 67 COARSE AGGREGATE.
8. REINFORCEMENT: WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185. BAR REINFORCEMENT SHALL BE GRADE 60, CONFORMING TO ASTM A615..

GENERAL NOTES:

1. THE ENCLOSURE DIMENSIONS NOTED ABOVE ARE APPROXIMATE MINIMUM REQUIREMENTS BASED ON THE EQUIPMENT AND LAYOUTS SHOWN ON DRAWINGS SD93 THROUGH SD98.
2. THE DESIGN ENGINEER SHALL MAKE HIS OWN DETERMINATION TO ENSURE THAT THE REQUIRED CLEARANCES NOTED ON THE ENCLOSURE DRAWINGS ARE ACHIEVED BASED ON THE ACTUAL SERVICE SIZE(S), EQUIPMENT AND FITTINGS PROPOSED.
3. THE TABLES PROVIDED ABOVE ARE BASED ON THE LARGEST SERVICE SIZE ENTERING THE ENCLOSURE.
4. ENCLOSURE MUST MEET OSHA 29 CRF 1910.145 AND ASSE 1060 CLASS 1.
5. INSULATED HEATED ENCLOSURE CHARACTERISTICS.
   A. ENCLOSURE–5052–H32 MARINE GRADE ALUMINUM (0.050/18 GAUGE), MILL FINISH, OR 1/8" POLYESTER RESIN REINFORCED WITH FIBERGLASS STRAND
   B. INSULATION– 1–1/2" (R9) POLYISOCYANURATE FOAM
   C. HEATING SYSTEM– SLAB OR WALL MOUNT THERMOSTATICALLY CONTROLLED ELECTRIC HEATER MEETING SECTION 49 OF UL–2021 FOR DAMP OR WET LOCATIONS, WITH GFI RECEPTACLE, U.L. 943 NEMA 3R MOUNTED 8" (MIN.) ABOVE SLAB.
   D. HEATER(S) SHALL BE PROVIDED AS NECESSARY TO MAINTAIN TEMPERATURE ABOVE 40° F AT ALL TIMES.
6. ENCLOSURE MUST BE A SUFFICIENT SIZE TO HOUSE ALL REQUIRED PIPING. ENCLOSURE SHALL BE LOCKABLE. ACCESS PANELS SHALL BE ABOVE THE CENTERLINE OF THE ASSEMBLY, OR IN SIDE WALLS IN SUFFICIENT NUMBER AND LOCATION TO FACILITATE MAINTENANCE & REPAIRS ON ALL COMPONENTS. ENCLOSURE TO HAVE HINGED ONE–WAY DRAIN FLAP.
7. ENCLOSURE DIMENSIONS ARE MEASURED TO THE INSIDE WALLS.

NEW JERSEY AMERICAN WATER

REVISIONS		REVISIONS	
△		△	
△		△	
△		△	
△		△	
△		△	

NJ LICENSED PROFESSIONAL ENGINEER NO.

AMERICAN WATER ENGINEERING
3906 CHURCH RD.
MT. LAUREL, NJ 08054

AMERICAN WATER

DRAWN BY D. JOBE
PROJECT ENG'R E. SCHWARTZ

DATE 08–24–18

PROJECT

STANDARD DETAIL

HEATED ENCLOSURE

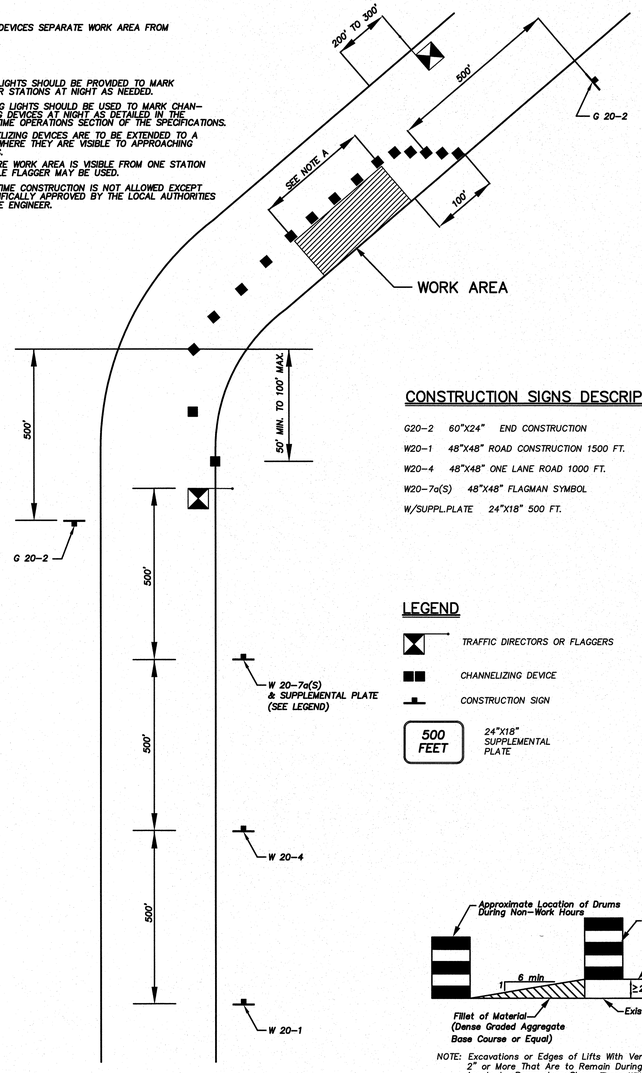
NEW JERSEY AMERICAN WATER	STANDARDS	USE DIMENSIONS ONLY SCALE AS SHOWN
USE APPROVED DRAWINGS ONLY FOR CONSTRUCTION PURPOSES	115 of 139	0201–0601–SD101

02010601SD101

NOTE A:
CHANNELIZING DEVICES SEPARATE WORK AREA FROM TRAVELED WAY

NOTE:

1. *FLOOD LIGHTS SHOULD BE PROVIDED TO MARK FLAGGER STATIONS AT NIGHT AS NEEDED.*
2. *WARNING LIGHTS SHOULD BE USED TO MARK CHANNELIZING DEVICES AT NIGHT AS DETAILED IN THE NIGHT TIME OPERATIONS SECTION OF THE SPECIFICATIONS.*
3. *CHANNELIZING DEVICES ARE TO BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.*
4. *IF ENTIRE WORK AREA IS VISIBLE FROM ONE STATION A SINGLE FLAGGER MAY BE USED.*
5. *NIGHT TIME CONSTRUCTION IS NOT ALLOWED EXCEPT IF SPECIFICALLY APPROVED BY THE LOCAL AUTHORITIES AND THE ENGINEER.*



MINIMUM REQUIREMENTS FOR TEMPORARY LANE CLOSURE

CONSTRUCTION SIGNS DESCRIPTION:

G20-2 60"X24" END CONSTRUCTION
W20-1 48"X48" ROAD CONSTRUCTION 1500 FT.
W20-4 48"X48" ONE LANE ROAD 1000 FT.
W20-7a(S) 48"X48" FLAGMAN SYMBOL
W/SUPPL.PLATE 24"X18" 500 FT.

LEGEND

TRAFFIC DIRECTORS OR FLAGGERS
CHANNELIZING DEVICE
CONSTRUCTION SIGN
500 FEET — *24"X18" SUPPLEMENTAL PLATE*

NOTE: Excavations or Edges of Lifts With Vertical Drop-Offs of 2" or More That Are to Remain During Non-Work Hours Are to be Ramped as Shown.There Will be no Separate Payment for the Construction of the Escape Ramp.

ESCAPE RAMP DETAIL
N.T.S.

TRAFFIC CONTROL COORDINATION:

1. PRIOR TO THE START OF CONSTRUCTION, THE ENGINEER SHALL BE NOTIFIED OF THE SINGLE SUPERVISORY LEVEL INDIVIDUAL, TRAINED IN THE PRINCIPLES OF SAFE TRAFFIC CONTROL, WHO, ALONG WITH THE DIRECTION OF THE POLICE DEPARTMENT'S TRAFFIC SAFETY DIVISION, WILL BE ASSIGNED THE RESPONSIBILITY AND AUTHORITY FOR THE IMPLEMENTATION AND MAINTENANCE OF THE TRAFFIC CONTROL.
2. THE PERSON ASSIGNED SHALL MAKE A CHECK OF ALL TRAFFIC CONTROL DEVICES IN USE ON THE ENTIRE PROJECT AT LEAST TWICE A DAY ON WORKING DAYS AND ONCE A DAY ON NON-WORKING DAYS. CONTRACTOR SHALL FILE THE NAME AND TELEPHONE NUMBER OF THE PERSON ASSIGNED TO PROVIDE SERVICES.

TRAFFIC CONTROL DEVICES:

1. TRAFFIC CONTROL DEVICES SHALL BE KEPT CLEAN AND MAINTAINED IN GOOD CONDITION INCLUDING REPLACEMENT IF LOST, STOLEN, OR DAMAGED UNTIL NO LONGER REQUIRED FOR THE PROJECT. ALL TRAFFIC CONTROL DEVICES SHALL COMPLY WITH THE DETAILS SHOWN ON THE PLANS, SUPPLEMENTARY SPECIFICATIONS, THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND STANDARD DETAILS FOR TRAFFIC CONTROL DEVICES AS DEVELOPED BY THE NEW JERSEY DEPARTMENT OF TRANSPORTATION.
2. TRAFFIC CONTROL DEVICES SHALL ALSO BE PLACED AS DIRECTED BY THE ENGINEER TO PROVIDE TRAFFIC CONTROL FOR PERSONNEL DOING INSPECTIONS, SAMPLING, TESTING, OR TAKING MEASUREMENTS REQUIRED FOR THE PROJECT.

CONSTRUCTION SIGNS:

1. CONSTRUCTION SIGNS SHALL BE INSTALLED BY THE CONTRACTOR AS REQUIRED BY THE M.U.T.C.D. AND THE POLICE DEPARTMENT AS THE FIRST ORDER OF WORK FOR CONSTRUCTION SIGNS FOR PROJECTS AND SHALL BE MAINTAINED SO AS TO PROVIDE MAXIMUM VISIBILITY AND LEGIBILITY AT ALL TIME.
2. WHEN CONSTRUCTION SIGNS CONFLICT WITH EXISTING SIGNS, THE EXISTING SIGN SHALL BE COVERED. WHEN CONSTRUCTION SIGNS ARE NO LONGER REQUIRED, THEY SHALL BE REMOVED. IF THEY ARE TEMPORARILY NOT REQUIRED, SUCH AS OVERNIGHT, THEY SHALL EITHER BE TEMPORARILY REMOVED OR COVERED.
3. EACH ADVANCE WARNING SIGN (W20-1) SHALL BE LIGHTED 24 HOURS A DAY WITH DUAL ALTERNATE FLASH HIGH INTENSITY WARNING LIGHTS OF EITHER THE STROBE OR INCANDESCENT TYPE AS SELECTED BY THE CONTRACTOR.

CONSTRUCTION STAGING PLAN:

1. THE CONSTRUCTION STAGING PLAN IS BASED ON THE MINIMUM REQUIREMENTS PROVIDED IN THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). THE CONTRACTOR SHALL WORK IN ACCORDANCE WITH THE PROVISIONS OF THE PLAN AND THE MUTCD AND SHALL ONLY DEVIATE FROM THE PLAN AFTER APPROVAL.
2. APPROVAL OF THE ENGINEER AND CONSENT OF THE LOCAL AUTHORITIES HAVING JURISDICTION SHALL FIRST BE OBTAINED FOR REROUTING TRAFFIC OVER DETOURS THAT ARE NOT SHOWN ON THE PLANS. ALL NECESSARY ARRANGEMENTS SHALL BE MADE WITH SUCH AUTHORITIES REGARDING THE ESTABLISHMENT, MAINTENANCE AND REPAIR OF SUCH DETOURS, THE REGULATION AND DIRECTION OF TRAFFIC THEREON, AND SIGNING. ADEQUATE DIRECTIONAL AND DETOUR SIGNS, ACCEPTABLE TO THE LOCAL AUTHORITIES, SHALL BE FURNISHED AND ERECTED AT THE LOCATIONS WHERE SUCH AUTHORITIES MAY DIRECT.
3. CONSTRUCTION STAGING PLANS SHALL BE USED IN CONJUNCTION WITH THE SPECIFICATIONS - SECTION 159. IF A CONFLICT ARISES BETWEEN THE PLANS AND SPECIFICATIONS, THE SPECIFICATIONS SHALL GOVERN UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
4. ITEMS AND QUANTITIES SHOWN ARE INTENDED ONLY AS A GUIDE TO THE CONTRACTOR AND ARE SUGGESTED MINIMUMS FOR THE CLOSURE OF ONE LANE OF TRAFFIC.

SUGGESTED GENERAL SEQUENCE OF CONSTRUCTION

1. PROVIDE MINIMUM 24 HOUR ADVANCE NOTIFICATION TO THE LOCAL POLICE DEPARTMENT AND THE ENGINEER PRIOR TO MODIFICATION OF EXISTING TRAFFIC PATTERNS.
2. INSTALL "ADVANCE WARNING" SIGNS.
3. ESTABLISH DETOUR ROUTES, IF AND WHERE APPROVED BY THE ENGINEER AND/OR THE TRAFFIC SAFETY DIRECTOR, WHERE APPLICABLE.
4. INSTALL TEMPORARY TRAFFIC CONTROL DEVICES AS APPLICABLE.
5. COMPLETE INSTALLATION OF IMPROVEMENTS.
6. REMOVE TEMPORARY TRAFFIC CONTROL DEVICES, DETOUR SIGNS AND "ADVANCE WARNING SIGNS".

GENERAL NOTES:

1. VEHICULAR AND PEDESTRIAN TRAFFIC IS TO BE MAINTAINED OVER THE EXISTING ROADWAYS AND INTO EXISTING DRIVEWAYS WITHIN THE SCOPE OF THE PROJECT AT ALL TIMES.
   TRAFFIC CONTROL IS TO BE COORDINATED WITH LOCAL AUTHORITIES.
2. FINAL RESPONSIBILITY FOR THE INSTALLATION OF ADEQUATE PRECAUTIONS AND FOR THE PROTECTION OF THE TRAVELING PUBLIC AND HIS OWN PERSONNEL, SHALL REST WITH THE CONTRACTOR.
3. ALTERNATE ONE-WAY TRAFFIC CONTROL MAY BE REQUIRED DURING CONSTRUCTION OPERATIONS. PERMISSION FOR COMPLETE STOPPAGE OF ONE DIRECTION OF TRAFFIC MUST BE OBTAINED FROM THE LOCAL POLICE AND THE ENGINEER AT LEAST THREE (3) DAYS PRIOR TO STOPPAGE. ALTERNATE ONE WAY TRAFFIC CONTROL WILL BE AFFECTED BY TWO UNIFORM TRAFFIC DIRECTORS, ONE AT EACH END OF THE WORK AREA. ALL TEMPORARY TRAFFIC LANES SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 11 FEET.
4. SITE FOR THE STORAGE OF EQUIPMENT AND MATERIALS DURING THE PROGRESS OF THE WORK SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
5. COMPLIANCE WITH ALL PRESCRIBED SAFETY PRECAUTIONS CONTAINED HEREIN SHALL NOT RELIEVE THE CONTRACTOR OF HIS PRIMARY RESPONSIBILITY TO TAKE ALL NECESSARY MEASURES TO PROTECT AND SAFEGUARD THE PUBLIC NOR RELIEVE HIM OF ANY RESPONSIBILITIES DESCRIBED IN THE CONTRACT AGREEMENTS.
6. IF THE LOCAL POLICE DEPARTMENT NOTIFIES THE CONTRACTOR OR HIS SUPERINTENDENT OR THE ENGINEER OF ANY HAZARDOUS CONDITION OR VIOLATION OF TRAFFIC CONTROL IN THE WORK AREA REGULATIONS, ALL OPERATIONS SHALL BE IMMEDIATELY DISCONTINUED AND IMMEDIATE REMEDIAL ACTION SHALL BE TAKEN TO THE SATISFACTION OF THE LOCAL POLICE BEFORE WORK IS RESUMED. ALL COSTS INCURRED AS A RESULT OF SUCH ACTION SHALL BE BORNE BY THE CONTRACTOR WITHOUT RECOURSE AGAINST THE OWNER.
7. REDUCTION OF THE NUMBER OF LANES AVAILABLE FOR TRAFFIC OR REDUCTION OF EXISTING WIDTHS OF TRAVELED WAY WILL NOT BE PERMITTED UNTIL AFTER 9:00 A.M. AND SHALL BE REMOVED PRIOR TO 3:00 P.M. UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
8. WORK WHICH WILL INTERFERE WITH TRAFFIC OR RESTRICT THE WIDTH OF TRAVELED WAY AVAILABLE FOR TRAFFIC SHALL NOT BE PERFORMED ON SATURDAYS, SUNDAYS, OR LEGAL HOLIDAYS UNLESS OTHERWISE DIRECTED BY THE ENGINEER
9. PRIOR TO BEGINNING A SEASONAL SHUTDOWN OR ANY OTHER PROLONGED WORK STOPPAGE, OR WHEN WORK IS SUSPENDED BY THE ENGINEER, ALL EXCAVATED AREAS WITHIN THE TRAVELED WAY OR ADJACENT THERETO SHALL BE BROUGHT TO A GRADE COMPATIBLE WITH THE EXISTING TRAVELED WAY OR TO FINISHED GRADE, AS APPROVED.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE WITHIN THE PROJECT LIMITS UNTIL ACCEPTANCE. THIS MAINTENANCE SHALL CONSIST OF CONTINUOUS AND EFFECTIVE WORK PROSECUTED DAY BY DAY, WITH ADEQUATE EQUIPMENT AND FORCES TO THE END THAT THE ROADWAY IS KEPT IN SATISFACTORY CONDITION AT ALL TIMES.
11. IN THE CASE OF A CONTRACT REQUIRING THE PLACING OF A COURSE UPON A COURSE OF SUBGRADE PREVIOUSLY CONSTRUCTED, THE CONTRACTOR SHALL MAINTAIN THE PREVIOUS COURSE OF SUBGRADE DURING ALL CONSTRUCTION OPERATIONS.
12. THE CONTRACTOR SHALL BACKFILL ALL EXCAVATED AREAS WITHIN THE ROADWAY TO A GRADE COMPATIBLE WITH THE EXISTING TRAVELED WAY AT SUCH TIMES HE IS NOT ACTIVELY WORKING. THIS SHALL INCLUDE NIGHTS, WEEKENDS AND PERIODS OF SHUTDOWNS.
13. COMPETENT, TRAINED AND UNIFORMED TRAFFIC DIRECTORS SHALL BE EMPLOYED AT EVERY POINT WHERE CONTRACTOR'S EQUIPMENT IS WORKING IMMEDIATELY ADJACENT TO, OR IS ENTERING, LEAVING OR CROSSING ACTIVE TRAFFIC LANES. TRAFFIC DIRECTORS SHALL BE EMPLOYED CONTINUOUSLY FOR THE FULL TIME SUCH CONDITIONS EXIST AS DETERMINED BY THE ENGINEER.

    POLICE TRAFFIC DIRECTORS SHALL BE OFF-DUTY POLICE OFFICERS FROM WITHIN THE TOWNSHIP WHERE THE WORK IS BEING PERFORMED. POLICE TRAFFIC DIRECTORS SHALL BE LOCATED WHERE SHOWN ON THE PLANS OR AT SPECIFIC LOCATIONS DESIGNATED BY THE POLICE DEPARTMENT OR ENGINEER DURING CONSTRUCTION HOURS. THE TOWNSHIP SHALL BE CONTACTED IN ORDER TO OBTAIN THE SERVICES OF POLICE TRAFFIC DIRECTORS AND THE NAME, ADDRESS AND TELEPHONE NUMBER OF THEIR LOCAL REPRESENTATIVE.
14. THE OWNERS OF ADJOINING PROPERTIES SHALL BE GIVEN A WRITTEN NOTICE AT LEAST ONE WEEK PRIOR TO THE BEGINNING OF ANY WORK WHICH INTERFERES WITH THE OWNERS NORMAL PASSAGE.
15. ANY CHANGES TO THE TRAFFIC CONTROL PLANS WILL REQUIRE COORDINATION/APPROVAL FROM NJDOT OPERATIONS.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVISED
1.	REVISED FOR RE-BID	04/02/2025	TE/DK	PB	

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CONSTRUCTION STAGING PLAN

REGISTER NO.

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28039000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	
DRAWN BY: TE	DESIGNED BY: GO/PB	
CHECKED BY: PB	SHEET: 116 of 139	

GENERAL CONSTRUCTION NOTES:

1. THE VARIOUS NOTES CONTAINED ON THESE DRAWINGS ARE APPLICABLE TO THE STRUCTURAL DRAWINGS. WHERE THERE IS A CONFLICT BETWEEN THESE NOTES, SPECIFICATIONS AND THE STRUCTURAL DRAWINGS, THE MOST STRINGENT REQUIREMENT SHALL GOVERN.

2. THE STRUCTURAL DESIGN OF THIS PROJECT IS IN ACCORDANCE WITH THE STATE OF NEW JERSEY UNIFORM CONSTRUCTION CODE CHAPTER 23, TITLE 5, AND IS BASED UPON APPROPRIATE PORTIONS OF THE LATEST EDITIONS OF THE FOLLOWING, AS REQUIRED:
   A. THE INTERNATIONAL BUILDING CODE–NEW JERSEY EDITION (CURRENT EDITION).
   B. ACI "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318).
   C. ACI "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE ENVIRONMENTAL STRUCTURES" (ACI 350).
   D. "BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES AND SPECIFICATIONS FOR MASONRY STRUCTURES" ACI–ASCE 530.
   E. "NATIONAL DESIGN SPECIFICATION FOR STRESS–GRADE LUMBER AND ITS FASTENINGS" BY THE NATIONAL FOREST PRODUCTS ASSOCIATION.
   F. SPECIFICATIONS FOR ALUMINUM STRUCTURES.
   G. AMERICAN INSTITUTE OF STEEL CONSTRUCTION. STEEL CONSTRUCTION MANUAL AISC.
   H. AMERICAN SOCIETY OF CIVIL ENGINEERS MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, ASCE 7–16.
   I. N.C.M.A. DESIGN MANUAL FOR SEGMENTAL RETAINING WALLS

3. THE CONTRACTOR IS RESPONSIBLE FOR CONFORMING TO ALL APPLICABLE SAFETY CODES AND REGULATIONS, CURRENTLY IN FORCE, DURING THE ENTIRE CONSTRUCTION PHASE.

4. THE STRUCTURE, AS SHOWN ON THE CONTRACT DRAWINGS, IS STRUCTURALLY STABLE ONLY AFTER ITS COMPLETION. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL TEMPORARY BRACING AND SHORING REQUIRED TO MAINTAIN AND PROTECT ALL FOUNDATION EXCAVATIONS, FORMS, WALLS AND THE STRUCTURE'S MATERIALS DURING THE CONSTRUCTION PHASE OF THE PROJECT FROM THE EFFECTS OF GRAVITY, WIND, SEISMIC, SOIL, TEMPERATURE, CONSTRUCTION AND OTHER MISCELLANEOUS FORCES AND LOADINGS THAT MAY BE IMPOSED.

5. WHERE SUCH TEMPORARY SHORING AND/OR BRACING IS DEEMED TO BE NECESSARY BY THE CONTRACTOR, OR INDICATED ON THE DRAWINGS, OR DIRECTED BY THE ENGINEER, IT SHALL BE DESIGNED AND INSPECTED BY A LICENSED PROFESSIONAL ENGINEER, CURRENTLY REGISTERED IN THE STATE OF NEW JERSEY, EMPLOYED BY THE CONTRACTOR.

6. EACH CONTRACTOR IS RESPONSIBLE FOR, AND SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, CLEARANCES, LOCATION OF EXISTING UTILITIES, AND OTHER DETAILS CONCERNING HIS WORK BEFORE PROCEEDING WITH SAID WORK. ANY DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER.

7. THE GENERAL CONSTRUCTION CONTRACTOR SHALL VERIFY THE ELEVATIONS OF ANY EXISTING STRUCTURES, CLEARANCES TO NEW CONSTRUCTION, AND THE LOCATION OF ANY EXISTING UTILITIES, AND SHALL REPORT HIS FINDINGS, IN WRITING, TO THE ENGINEER.

8. THE CONTRACTOR SHALL NOT COMMENCE ANY WORK UNTIL HE OBTAINS, AT HIS OWN EXPENSE, ALL REQUIRED INSURANCE COVERAGE AND SUBMITS COPIES OF SAME TO THE ENGINEER FOR REVIEW AND APPROVAL.

9. THE CONTRACTOR SHALL OBTAIN, AT HIS OWN EXPENSE, ALL PERMITS FROM: FEDERAL, STATE, COUNTY, MUNICIPAL, OR OTHER REGULATORY AGENCY, WHICH MAY BE REQUIRED FOR CONSTRUCTION OF THIS PROJECT.

10. THE CONTRACTOR SHALL DO EVERYTHING NECESSARY TO COMPLETE THE WORK IN ACCORDANCE WITH THE TERMS OF HIS CONTRACT, INCLUDING ALL GENERAL AND DETAILED ITEMS. THE WORK TO BE COMPLETED UNDER ANY ITEM SHALL NOT BE LIMITED TO EXACT EXTENT MENTIONED OR DESCRIBED, BUT SHALL INCLUDE ALL INCIDENTAL WORK NECESSARY OR CUSTOMARILY DONE IN THE COMPLETION OF ANY PARTICULAR ITEM.

11. THE CONTRACTOR SHALL SUPPLY AND INSTALL ONLY SUCH MATERIALS AS SPECIFIED IN THE PROJECT SPECIFICATIONS AND/OR NOTED ON THE CONTRACT DRAWINGS. WHERE ANY CONFLICT MAY OCCUR REGARDING MATERIAL AND/OR METHODS OF INSTALLATION, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN. THE ENGINEER'S DECISION SHALL GOVERN. REVIEW AND ACCEPTANCE OF ANY SHOP DRAWING, PRODUCT DATA SHEET, CERTIFICATIONS, ETC., BY THE ENGINEER, DOES NOT EXCLUDE THE CONTRACTOR FROM CONFORMING WITH ALL REQUIREMENTS OF THE SPECIFICATIONS AND CONTRACT DOCUMENTS. THE ENGINEER SHALL BE INFORMED, BY THE CONTRACTOR IN WRITING, OF ANY NONCONFORMANCE AND OBTAIN WRITTEN CONCURRENCE OF SAME, BEFORE PROCEEDING WITH CONSTRUCTION.

12. DETAILS SHOWN IN ANY SECTION APPLY TO ALL SIMILAR SECTIONS UNLESS OTHERWISE NOTED.

13. EACH CONTRACTOR SHALL FULLY BRACE AND OTHERWISE PROTECT HIS WORK IN PROGRESS UNTIL THE STRUCTURE(S) AND/OR STRUCTURAL ELEMENT(S) IS(ARE) COMPLETED.

14. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN SAFE AND ADEQUATE TEMPORARY RELIEF AGAINST HYDROSTATIC UPLIFT DUE TO A HIGH GROUNDWATER LEVEL FOR THE DURATION OF THE PROJECT UNTIL THE NECESSARY CONSTRUCTION IS COMPLETED. NO SEPARATE MEASUREMENT WILL BE MADE FOR DEWATERING SYSTEMS. ALL COSTS ASSOCIATED WITH DEWATERING SHALL BE INCLUDED IN THE COST OF THE VARIOUS FOUNDATIONS, UNLESS NOTED OTHERWISE.

15. THE CONTRACTOR SHALL REVIEW THE CONTRACT DRAWINGS OF ALL OTHER TRADES; OBTAIN THE LOCATION AND SIZE OF ALL OPENINGS IN WALLS, FLOORS, ROOFS, ETC., THAT ARE REQUIRED BY OTHER TRADES, AND SHALL INCLUDE IN HIS BID THE COST OF FRAMING AROUND THESE OPENINGS. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR REVIEW OF SUCH DETAILS OF OPENING SIZES AND REINFORCEMENT, AS REQUIRED TO FRAME THE OPENINGS.

16. THE CONTRACTOR SHALL SUBMIT TO ALL OTHER TRADES FOR THEIR REVIEW AND APPROVAL, COPIES OF THE VARIOUS SHOP DRAWINGS SHOWING THE LOCATION AND SIZE OF ALL OPENINGS EACH TRADE REQUIRES. IF THE OTHER TRADES DO NOT SUBMIT SUCH REQUIRED INFORMATION TO THE CONTRACTOR IN SUFFICIENT TIME FOR HIM TO COMPLETE HIS DETAIL DRAWINGS PRIOR TO INSTALLATION OF THE WORK, OR THE TRADES EITHER SUBMIT OR APPROVE INFORMATION AND/OR DETAILS THAT IS LATER PROVEN TO BE INCORRECT, THEN THE TRADE REQUIRING SUCH AN OPENING IN A WALL, FLOOR, ROOF, ETC. SHALL PROVIDE, REPLACE, REMOVE AND/OR ADJUST SUCH OPENINGS AT THE TRADE'S OWN EXPENSE. IF SUCH ALTERATION WORK AFFECTS THE STRUCTURAL SYSTEM THEN ALL PROPOSED REVISIONS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO ANY MODIFICATIONS TO THE PROJECT. ALL COSTS OF ANY REVIEW, REDESIGN, INSPECTION, CONSTRUCTION, ETC. SHALL BE PAID FOR BY THE TRADE CAUSING SUCH CHANGES.

17. THE CONTRACTOR AND ALL AFFECTED TRADES SHALL REFER TO THE EQUIPMENT SCHEDULES AS SHOWN ON THE ELECTRICAL CONTRACT DRAWINGS WHERE APPLICABLE.

18. FOR THE LOCATION AND DETAIL OF ALL DRAINS, SEE THE PLUMBING AND EQUIPMENT CONTRACT DRAWINGS, AS REQUIRED.

19. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN SUFFICIENT TIME TO ALLOW FOR ANY NECESSARY INSPECTION AND/OR TESTING OF HIS WORK PRIOR TO INSTALLATION. THE CONTRACTOR SHALL SUPPLY ANY ASSISTANCE AND WORK SPACE NECESSARY TO PERFORM SUCH OPERATIONS. NO WORK REQUIRING INSPECTION AND/OR TESTING PRIOR TO INSTALLATION SHALL BE INSTALLED UNTIL THE INSPECTOR HAS COMPLETED HIS OPERATIONS AND ACCEPTED THE ITEMS BEING REVIEWED. FAILURE OF THE CONTRACTOR TO NOTIFY THE ENGINEER MAY RESULT IN INSTALLED CONSTRUCTION BEING REJECTED OR SUBJECT TO REMOVAL. ANY ADDITIONAL TESTING AND/OR INSPECTION TO CONFIRM THE ADEQUACY OF THE INSTALLED CONSTRUCTION WILL BE UNDERTAKEN AT THE CONTRACTOR'S EXPENSE.

20. WHEN DISCREPANCIES, DEVIATIONS FROM THE CONTRACT DRAWINGS, OR DEFICIENT MATERIAL IS DISCOVERED, THE CONTRACTOR SHALL IMMEDIATELY REPAIR AND/OR CORRECT SUCH TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR SHALL BEAR THE COST OF ALL NECESSARY REDESIGN, MATERIALS, INSPECTION, ETC. ASSOCIATED WITH THE REPAIR AND/OR CORRECTIVE MEASURES.

21. UPON COMPLETION OF THE PROJECT, IF THE WORK COMPLETED IS NOT ACCEPTABLE TO THE ENGINEER, HE WILL ADVISE THE CONTRACTOR IN WRITING AS TO THE PARTICULAR DEFECTS TO BE CORRECTED BEFORE FINAL ACCEPTANCE OF THE PROJECT WILL BE MADE. THE FINAL INSPECTION WILL BE MADE UPON NOTIFICATION BY THE CONTRACTOR THAT THE PROJECT IS COMPLETED.

22. THE CONTRACTOR SHALL GUARANTEE HIS WORK AND THAT OF HIS SUBCONTRACTORS, FOR A PERIOD OF ONE YEAR AFTER THE DATE OF COMPLETION OF THE PROJECT.

23. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION TO BE USED AND FOR THE SEQUENCES AND PROCEDURES TO BE USED BY HIM.

24. SHOP DRAWINGS

IF NO CHANGES OR DEVIATIONS FROM THE CONTRACT DRAWINGS ARE PROPOSED, THEN THE CONTRACTOR IS REQUIRED TO SUBMIT FOR THE ENGINEER'S REVIEW AND APPROVAL CERTIFIED SHOP DRAWINGS FOR ALL CONCRETE REINFORCING STEEL PLACEMENT, INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING: FLOOR SLABS, WALLS, FOOTINGS, ABUTMENTS, WINGWALLS, RETAINING WALLS, PARAPETS, BARRIERS, DECKS, APPROACH SLABS, SIDEWALKS, CURBS, PRESTRESSED CONCRETE BOX BEAMS AND DIAPHRAGMS. THE CONTRACT DRAWINGS WILL NOT BE PERMITTED AS A SUBSTITUTE FOR THESE REQUIRED SHOP DRAWINGS UNDER ANY CIRCUMSTANCE. IF THE CONTRACTOR PROPOSES ANY CHANGE OR DEVIATION FROM THE CONTRACT DRAWINGS, THEN THESE SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW JERSEY RETAINED BY THE CONTRACTOR. CONSTRUCTION WILL NOT BE ALLOWED TO PROCEED WITHOUT APPROVED SHOP DRAWINGS.

25. UTILITIES:

A. UTILITY LOCATIONS SHOWN ON THE STRUCTURAL DRAWINGS ARE FROM ABOVE GROUND OBSERVATIONS AND/OR RECORD INFORMATION PROVIDED BY THE VARIOUS UTILITY COMPANIES.

B. THE INFORMATION SHOWN ON THESE PLANS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND AND OTHER UTILITIES IS BASED ON INFORMATION AVAILABLE AT THE TIME OF THE DESIGN AND IS NOT GUARANTEED TO BE ACCURATE NOR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND AND OTHER UTILITIES WITHIN THE PROJECT LIMITS AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE POTENTIAL FOR CONFLICTS IN ORDER TO AVOID DISRUPTION OF SERVICE.

C. NEW JERSEY ONE–CALL MUST BE CONTACTED AT 1–800–272–1000 AT LEAST THREE (3) FULL WORKING DAYS, BUT NOT MORE THAN TEN (10) DAYS, PRIOR TO THE PLANNED START DATE OF THE DIGGING OPERATIONS.

D. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ARRANGE FOR ALL UTILITY WORK ESSENTIAL FOR THE COMPLETION OF THE PROJECT AND TO COORDINATE THE WORK CARRIED ON BY THE PUBLIC UTILITIES WITH HIS OWN WORK. THE CONTRACTOR SHALL COOPERATE WITH UTILITY COMPANIES IN THE REMOVAL, RELOCATIONS AND REPLACEMENT OF UTILITIES. LOCATION OF RELOCATED UTILITIES SHALL BE VERIFIED WITH RESPECTIVE UTILITY COMPANIES. WHENEVER UNDERGROUND UTILITIES ARE ENCOUNTERED, THE CONTRACTOR SHALL TAKE SPECIAL PRECAUTIONS TO PREVENT BREAKAGE AND INTERRUPTION OF SERVICE.

E. THERE MAY BE VARIOUS OVERHEAD FACILITIES WITHIN THE PROJECT LIMITS. THE CONTRACTOR SHALL COORDINATE THE TEMPORARY AND/OR PERMANENT RELOCATIONS OF THESE FACILITIES BY THE UTILITY COMPANIES, AS NECESSARY. THE CONTRACTOR SHALL STAGE HIS WORK TO ALLOW THE REMOVAL OF OVERHEAD FACILITIES PRIOR TO THE START OF ANY WORK REQUIRING THE USE OF CRANES AND SHALL MEET ALL OSHA STANDARDS. THE CONTRACTOR SHALL ALSO CONSIDER THE IMPACT OF THE OVERHEAD UTILITIES WHEN SCHEDULING OPERATIONS AND SELECTING EQUIPMENT TO PERFORM THE WORK REQUIRED FOR THIS PROJECT. PARTICULAR ATTENTION SHALL BE GIVEN TO THE TEMPORARY SHEETING/COFFERDAMS, PILES AND/OR BEAM ERECTION TO BE CONSTRUCTED IN THE VICINITY OF THE OVERHEAD UTILITIES. NO CLAIM FOR ADDITIONAL COMPENSATION OR EXTENSION IN CONTRACT TIME WILL BE CONSIDERED FOR PROBLEMS OR DELAYS ENCOUNTERED AS A RESULT OF WORKING IN THE VICINITY OF THE OVERHEAD UTILITIES.

F. THERE MAY BE VARIOUS UNDERGROUND SEWER, GAS AND OTHER LINES WITHIN THE PROJECT LIMITS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ALL UTILITY SERVICE FLOWS AND PRESSURES FOR THESE LINES UNLESS WRITTEN APPROVAL BY THE RESPONSIBLE UTILITY PERMITS HIM TO DO OTHERWISE. NO SEPARATE PAYMENT WILL BE MADE FOR COORDINATION WITH THE UTILITY OR FOR THE TEMPORARY SUPPORT OF EXISTING FACILITIES. ALL COSTS SHALL BE INCLUDED IN THE LUMP SUM BID FOR THE ITEM "CLEARING SITE."

G. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO ADEQUATELY PROTECT THE EXISTING STRUCTURES, FACILITIES, UTILITIES AND/OR EQUIPMENT THAT ARE TO REMAIN. ANY DAMAGE WHATSOEVER TO THE EXISTING STRUCTURES, FACILITIES, UTILITIES AND/OR EQUIPMENT THAT ARE TO REMAIN RESULTING FROM THE CONTRACTOR'S WORK SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE ENGINEER.

SHOP DRAWINGS AND SUBMITTALS:

1. REPRODUCTION OF THE CONTRACT DRAWINGS FOR USE AS A SHOP DRAWING WILL NOT BE PERMITTED.

2. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SO AS TO ALLOW SUFFICIENT TIME FOR THE ENGINEER TO REVIEW AND COMMENT (SEE THE SPECIFICATIONS FOR REQUIREMENTS).

3. CONTRACTOR SHALL SUBMIT AN ELECTRONIC COPY OF EACH SHOP DRAWING AND/OR CALCULATIONS TO BE REVIEWED.

4. NO SHOP DRAWING WILL BE ACCEPTED FOR REVIEW BY THE ENGINEER THAT HAS NOT BEEN CHECKED BY BOTH THE SUPPLIER OF THE MATERIAL AND THE CONTRACTOR INSTALLING SUCH MATERIAL. THE SUPPLIER'S CHECKER'S INITIALS SHALL APPEAR IN HIS TITLE BOX AND THE CONTRACTOR SHALL STAMP, DATE AND INITIAL VERIFICATION THAT HE HAS REVIEWED THE VARIOUS SHOP DRAWINGS AND FOUND THEM TO BE CORRECT IN ALL DETAIL AS TO CONFORMANCE WITH THE CONTRACT DRAWINGS.

5. A 6"X6" SPACE SHALL BE LEFT BLANK ON EACH SHOP DRAWING SUBMITTED BY THE VARIOUS MATERIAL SUPPLIERS FOR THE ENGINEER'S REVIEW STAMP AND COMMENTS.

6. ALL NECESSARY DIMENSIONAL COORDINATION SHALL BE DONE BY THE CONTRACTOR AND HIS MATERIAL SUPPLIER'S DETAILER.

7. IF AND WHERE REQUIRED, THE CONTRACTOR AND HIS MATERIAL SUPPLIER'S DETAILER SHALL DO ALL NECESSARY COORDINATION WITH THE VARIOUS CONTRACT DRAWINGS (ELECTRICAL, PLUMBING, ARCHITECTURAL, HVAC, ETC.) AND THE VARIOUS OTHER TRADES, AS REQUIRED, FOR ATTACHMENTS, OPENINGS, FRAMES, PLATFORMS, CLIPS, CURBS, EMBEDDED ITEMS, CONNECTIONS, HUNG EQUIPMENT AND DUCTWORK OR PIPING THAT AFFECT OR ARE ATTACHED TO EACH STRUCTURAL FRAMING. ALL SUCH ITEMS SHALL BE SHOWN AND LOCATED ON THE VARIOUS SHOP DRAWINGS.

8. IF AND WHERE REQUIRED, THE CONTRACTOR SHALL SEND TO THE VARIOUS OTHER TRADES ONE COPY OF EACH MATERIAL SUPPLIER'S ERECTION DRAWINGS SO THAT THEY MAY TRANSMIT INFORMATION, AS DEFINED IN NOTE #7, FOR USE IN PREPARING THE VARIOUS SHOP DRAWINGS. THE CONTRACTOR SHALL SEND A COPY OF THE LETTERS OF TRANSMITTAL OF THE COPY TO THE ENGINEER.

9. ANY SHOP DRAWING SUBMISSION THAT IS NOT IN CONFORMANCE WITH THE ABOVE NOTES AND THE SPECIFICATIONS WILL BE REJECTED.

10. THE CONTRACTOR SHALL HAVE ON THE SITE SHOP DRAWINGS THAT HAVE BEEN SATISFACTORILY REVIEWED BY THE ENGINEER AND THAT HE HAS CONFIRMED, BEFORE BEGINNING ANY INSTALLATION OF THE VARIOUS ITEMS DETAILED ON THE SHOP DRAWINGS. A CLEAN SET OF ERECTION AND DETAIL DRAWINGS, WITH NO MARKINGS, SHALL BE AVAILABLE ON THE SITE FOR USE AS NEEDED.

11. PRINCIPAL STRUCTURAL SUBMITTALS SHALL INCLUDE, BUT ARE NOT LIMITED TO, THE SUBMITTALS INCLUDED ON THE PARTIAL LIST OF TECHNICAL SUBMITTALS (ON THIS DRAWING):

STRUCTURAL DESIGN LOADS

THE FOLLOWING STRUCTURAL DESIGN NOTES ARE ONLY APPLICABLE TO NEW STRUCTURES BEING DESIGNED AS PART OF THIS CONTRACT. EXISTING STRUCTURES TO REMAIN WERE NOT ANALYZED OR CHECKED AGAINST THESE DESIGN LOADS.

1. BUILDING DESIGN CODE SPECIFICATIONS:

   A. N.J.A.C. CHAPTER 23 UNIFORM CONSTRUCTION
   B. THE INTERNATIONAL BUILDING CODE, NEW JERSEY EDITION
   C. REFERENCE STANDARD FOR LOAD CALCULATIONS: ASCE 7
   D. REFERENCE STANDARD FOR WOOD CONSTRUCTION: NATIONAL DESIGN SPEC. (NDS) FOR WOOD CONSTRUCTION
   E. REFERENCE STANDARDS FOR TIMBER PILES: (a) ASTM D25 STANDARD SPEC. FOR ROUND TIMBER PILES
      (b) ASTM D2899–12 STANDARD PRACTICE FOR ESTABLISHING ALLOWABLE STRESSES FOR ROUND TIMBER PILE

2. CONSTRUCTION SPECIFICATIONS:

   A. PROJECT SPECIFICATION MANUAL UNLESS NOTED OTHERWISE.
   B. NJDOT SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AS MODIFIED BY THE PROJECT SPECIFICATIONS, IF AND WHERE INDICATED.

3. BUILDING CRITERIA:

BUILDING USE GROUP:	B	IBC–NJ Ed.
CONSTRUCTION TYPE:	TYPE III	IBC–NJ Ed.
OCCUPANCY LOAD:	N.A.	
OCCUPANCY OR RISK CATEGORY:	III	ASCE 7 Tab. 1.5–1, IBC–NJ Ed.

4. DESIGN LOADS

   A. DEAD LOAD:

DEAD LOADS SHALL INCLUDE THE UNIT WEIGHT OF ALL MATERIALS IMPOSING LOADS ON THE DESIGN STRUCTURE, INCLUDING BUT NOT LIMITED TO THE FOLLOWING: PAVEMENTS, EARTH LOADS, LANDSCAPE FIXTURES, RAILINGS, FENCES, BUILDING, EQUIPMENT, ETC. THE FOLLOWING MINIMUM UNIT WEIGHTS SHALL APPLY, UNLESS NOTED OTHERWISE (SEE EQUIPMENT LOADS, WHERE NECESSARY, FOR MORE INFORMATION):

CONCRETE:	150 PCF
STEEL:	490 PCF
ALUMINUM:	171 PCF
BACKFILL:	120 PCF SATURATED WEIGHT

EQUIPMENT DEAD LOADS: SEE MECHANICAL EQUIPMENT DRAWINGS AND APPROVED SHOP DRAWINGS FOR LOADS (WHERE REQUIRED). EQUIPMENT LOADS USED IN THE DESIGN OF THE PROJECT ARE SHOWN ON THE CONTRACT DRAWINGS. IF THE PROPOSED EQUIPMENT INCLUDES A CRANE, THE MAXIMUM CAPACITY OF THE CRANE, AS INDICATED ON THE CONTRACT WEIGHTS SHOWN ARE MAXIMUM OPERATING WEIGHTS AND INCLUDE MISCELLANEOUS LOADS. THE CONTRACTOR SHALL VERIFY THAT THE WEIGHT OF EQUIPMENT TO BE INSTALLED DOES NOT EXCEED THE WEIGHT NOTED ON THE CONTRACT DRAWINGS THE REQUIRED REINFORCEMENT FOR CONCENTRATED LOADS MUST BE ADHERED TO.

EQUIPMENT: N/A

   B. LIVE LOAD:

DESIGN LIVE LOAD FOR ALL STRUCTURES, U.N.O.: 100 PSF ASCE 7 Tab. 4.3–1, IBC–NJ Ed.

   C. SNOW LOAD:

GROUND SNOW LOAD, Pg = 25 PSF	ASCE 7 Fig. 7.2–1, p 52, IBC2021–NJ Ed.
SNOW LOAD RISK CATEGORY: III	
SNOW EXPOSURE FACTOR, Ce = 1.0	ASCE 7 Tab. 7.3–1
SNOW LOAD IMPORTANCE FACTOR, I = 1.10	ASCE 7 Tab. 1.5–2
THERMAL FACTOR, Ct = 1.0	ASCE 7 Tab. 7.3–2
FLAT ROOF SNOW LOAD, Pf =0.7CeCtIPg = 19.25 PSF	ASCE 7 Sect. 7.3
HIP/ OR GABLE ROOF FACTOR, Cs = 1.0	ASCE 7 Sect. 7.4.1, Fig. 7.4–1
SLOPED ROOF SNOW LOAD, Ps = CsPf = 19.25 PSF	ASCE 7 Sect. 7.4

   D. WIND DESIGN DATA:

BASIC WIND SPEED (3–SECOND GUST) = 124 MPH	ASCE 7, Fig. 26.5–1D
WIND LOAD RISK CATEGORY: III	IBC–NJ Ed.
WIND EXPOSURE CATEGORY: C	ASCE 7, Sect. 26.7.3
INTERNAL PRESSURE COEF., GCpi = NA	ASCE 7, Sect. 26.13 & Tab. 26.13–1

   E. SEISMIC DESIGN DATA:

SEISMIC OCCUPANCY IMPORTANCE FACTOR, I = 1.25	ASCE 7 Tab. 1.5–2
RISK CATEGORY – III	ASCE 7 Tab. 1.5–1, IBC–NJ Ed.
MAPPED SPECTRAL RESPONSE ACCELERATIONS:	
Ss = 0.275 x g	IBC–NJ Ed.
S1 = 0.058 x g	ASCE 7, Sec. 11.4.2, Fig. 22–1 & 2
SITE CLASS = D	
Fa = 1.58	IBC–NJ Ed.
Fv = 2.4	ASCE 7, Tab. 11.4–1 & 2
MODIFIED SPECTRAL RESPONSE ACCELERATIONS:	IBC–NJ Ed.
SMS = 0.435 x g	ASCE 7 Sec. 11.4.4
SM1 = 0.139 x g	
DESIGN SPECTRAL RESPONSE COEFFICIENTS:	IBC–NJ Ed.
SDS = 0.29 x g	ASCE 7 Sec. 11.4.5
SD1 = 0.093 x g	
PEAK GROUND ACCELERATION: PGA = 0.168	IBC–NJ Ed., ASCE 7, Sec. 11.8
SEISMIC DESIGN CATEGORY = B	IBC–NJ Ed.
	ASCE7, Tab. 11.6–1 & 2

PARTIAL STRUCTURAL TECHNICAL SUBMITTALS LIST

	SPECIFICATION REF.
VIBRATION AND SETTLEMENT AND MOVEMENT MONITORING	SECTION 162
VIBRATION MONITORING AND CONTROL SPECIALIST AND STAFF QUALIFICATIONS	SECTION 162
SETTLEMENT AND MOVEMENT MONITORING AND CONTROL SPECIALIST AND STAFF QUALIFICATIONS	SECTION 162
STRUCTURAL INSPECTION/EVALUATION ENGINEER AND STAFF QUALIFICATIONS	SECTION 162
PRECONSTRUCTION STRUCTURAL SURVEY REPORT	SECTION 162
VIBRATION MONITORING AND CONTROL PLAN	SECTION 162
DAILY INSTRUMENT LOGS	SECTION 162
VIBRATION MONITORING REPORT	SECTION 162
SETTLEMENT AND MOVEMENT MONITORING PLAN	SECTION 162
VIDEO AND PHOTOGRAPH MONITORING PLAN	SECTION 162
CONTINGENCY PLAN	SECTION 162
INITIAL SETTLEMENT AND MOVEMENT MONITORING READINGS	SECTION 162
PERIODIC SETTLEMENT AND MOVEMENT MONITORING READINGS	SECTION 162
END OF CONSTRUCTION SETTLEMENT AND MOVEMENT MONITORING READINGS	SECTION 162
POST CONSTRUCTION STRUCTURAL INSPECTION SURVEY REPORT (90 DAYS AFTER COMPLETION)	SECTION 162
POST CONSTRUCTION SETTLEMENT AND MOVEMENT READINGS (90 DAYS AFTER COMPLETION)	SECTION 162
EARTHWORK CONTRACTOR'S QUALIFICATIONS	SECTIONS 202/203
TESTING LABORATORY QUALIFICATIONS	SECTIONS 202/203
CONTRACTOR'S SUPPORT OF EXCAVATION – DESIGN ENGINEER'S QUALIFICATIONS	SECTIONS 202/203/501
CONTRACTOR'S DEWATERING ENGINEER'S QUALIFICATIONS	SECTIONS 202/203
CONTRACTOR'S ANALYTICAL LABORATORY QUALIFICATIONS FOR EXCAVATED SOILS, ROCK AND GROUNDWATER	SECTIONS 202/203
CONTRACTOR'S PROCEDURES FOR EXCAVATION, INCLUDING EXCAVATION STAGING PLANS	SECTIONS 202/203
CONTRACTOR'S PROCEDURES FOR HANDLING, STOCKPILING, AND ANALYTICAL TESTING OF EXCAVATED SOILS	SECTIONS 202/203
CONTRACTOR'S PROCEDURES FOR LOADING, TRANSPORTING AND DISPOSAL OF REGULATED WASTE	SECTIONS 202/203
CONTRACTORS DEWATERING PLANS AND PROCEDURES	SECTIONS 202/203
EXCAVATION PROCEDURES, EQUIPMENT AND STAGING PLANS	SECTIONS 202/203
FACILITY LETTER OF ACCEPTANCE FOR REGULATED MATERIAL	SECTIONS 202/203
BILLS OF LADING FOR EACH LOAD OF REGULATED MATERIALS	SECTIONS 202/203
CERTIFICATE OF ACCEPTANCE FOR EACH LOAD INCLUDING WEIGHT SLIPS	SECTIONS 202/203
SOIL AGGREGATE AND SITE SUBGRADE MATERIAL COMPACTION TEST RESULTS (ASTM D1557)	SECTIONS 202/203
SOIL AGGREGATE GRAIN SIZE ANALYSES (ASTM D422)	SECTIONS 202/203
COARSE AGGREGATE GRAIN SIZE ANALYSES (ASTM D422)	SECTIONS 202/203
DENSE GRADED AGGREGATE GRAIN SIZE AND COMPACTION TEST RESULTS	SECTIONS 202/203
MATERIAL SUPPLIER CERTIFICATES INDICATING MATERIALS ARE UNCONTAMINATED	SECTIONS 202/203
FIELD DENSITY TEST RESULTS	SECTIONS 202/203
PILE MANUFACTURER'S EXPERIENCE AND QUALIFICATIONS	SECTION 502
PILE INSTALLATION CONTRACTOR'S EXPERIENCE AND QUALIFICATIONS	SECTION 502
PILE CONTRACTOR'S ENGINEER'S EXPERIENCE AND QUALIFICATIONS	SECTION 502
PILE INSTALLATION EQUIPMENT AND PROCEDURAL SUBMITTALS	SECTION 502
PILE TESTING AGENCY AND PILE DATA ANALYZER PROCEDURES	SECTION 502
PILE MATERIAL CERTIFICATES AND MILL CERTIFICATES	SECTION 502
PILE LAYOUT AND NUMBERING PLANS	SECTION 502
WAVE EQUATION ANALYSES (WEAP) OF DRIVING CRITERIA AND PILE STRESSES	SECTION 502
PILE DATA ANALYZER TEST RESULTS	SECTION 502
PILE DRIVING LOGS WITH CERTIFICATION	SECTION 502
AS–DRIVEN PILE INSTALLATION RESURVEY	SECTION 502
QUALIFICATIONS OF TEST ENGINEER AND TESTING PERSONNEL (IF AND WHERE REQUIRED)	SECTION 502
SHEET PILE CONTRACTOR'S EXPERIENCE AND QUALIFICATIONS	SECTIONS 501/502
SHEET PILE MANUFACTURER'S EXPERIENCE AND QUALIFICATIONS	SECTIONS 501/502
SHEET PILE LAYOUT SURVEYOR QUALIFICATIONS	SECTIONS 501/502
CONTRACTOR'S STAFF QUALIFICATIONS	SECTIONS 501/502
SHEET PILE SECTION AND INTERLOCK PROPERTIES	SECTIONS 501/502
SHEET PILE LAYOUT PLAN AND CORNER DETAILS	SECTIONS 501/502
SHEET PILE INSTALLATION PROCEDURES	SECTIONS 501/502
MATERIAL CERTIFICATES AND MILL REPORTS FOR SHEET PILING, BEARING PILES, AND ANCHORAGES	SECTIONS 501/502
MILL TEST RESULTS FOR STRUCTURAL STEEL	SECTIONS 501/502
SHOP DRAWINGS FOR FABRICATION OF INTERLOCKS ON COMBINATION WALL BEARING PILES	SECTIONS 501/502
DETAILS OF INSTALLATION TEMPLATES	SECTIONS 501/502
EQUIPMENT SUBMITTALS FOR CRANES AND DRIVING EQUIPMENT	SECTIONS 501/502
PROCEDURES FOR COMBINATION WALL INSTALLATION	SECTIONS 501/502
AS BUILT SURVEY DATA INCLUDING ALIGNMENT AND DEPTH	SECTIONS 501/502
PROCEDURES FOR PROTECTION OF OVERHEAD AND BURIED UTILITIES	SECTIONS 501/502
QUALIFICATIONS OF DESIGN–BUILD ENGINEER FOR FOUNDATIONS WHERE INDICATED	SECTION 504
DESIGN–BUILD FOUNDATION CERTIFIED WORKING DRAWINGS	SECTION 504
PRODUCT DATA AND MATERIAL TEST REPORTS FOR CONCRETE WORK	SECTION 504
REINFORCING STEEL SHOP DRAWINGS FOR REINFORCED CONCRETE	SECTION 504
QUALIFICATIONS DATA FOR CONCRETE CONTRACTOR AND READY MIX SUPPLIER	SECTION 504
QUALIFICATIONS DATA FO

EARTHWORK AND FOUNDATION PREPARATION

1. EARTHWORK SHALL CONFORM TO THE PROJECT SPECIFICATIONS. WHERE A DIFFERENCE OCCURS BETWEEN THE DRAWINGS, THE DRAWING NOTES AND SPECIFICATIONS, THE MORE STRINGENT PROVISION OF THE DRAWINGS OR SPECIFICATIONS SHALL APPLY.
2. SUBSURFACE CONDITIONS HAVE BEEN INFERRED FROM THE BORING LOGS PERFORMED BY ENVIRONMENTAL TECHNICAL DRILLING, INC. AND INSPECTED BY CME BETWEEN FEBRUARY AND JULY 2024. NO WARRANTY IS MADE, EITHER EXPRESSED OR IMPLIED THAT CONDITIONS ENCOUNTERED IN THE EXCAVATIONS WILL CONFORM TO THE INFERRED CONDITIONS. CONDITIONS BETWEEN OR BEYOND BORINGS MAY VARY FROM THE INFERRED CONDITIONS. THE CONTRACTOR SHALL PROCEED WITH CAUTION AND REPORT ANY VARIATIONS FROM THE ANTICIPATED CONDITIONS TO THE ENGINEER FOR EVALUATION PRIOR TO PROCEEDING WITH THE CONSTRUCTION.
3. EARTHWORK AND FOUNDATION CONSTRUCTION SHALL CONFORM TO ALL SAFETY REGULATIONS HAVING JURISDICTION. THE CONTRACTOR SHALL RETAIN AN EXPERIENCED LICENSED PROFESSIONAL ENGINEER, REGISTERED IN THE STATE OF NEW JERSEY, TO DESIGN ALL REQUIRED TEMPORARY EXCAVATION SUPPORT SYSTEMS. THESE SYSTEMS SHALL BE DESIGNED TO MAINTAIN THE STABILITY OF FOUNDATION EXCAVATIONS, EARTH AND ROCK SYSTEM EXCAVATIONS AND/OR SLOPE SUPPORTING SYSTEMS. ALL SUCH SIGNED AND SEALED DESIGNS MUST BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO THE START OF CONSTRUCTION. UNLESS OTHERWISE NOTED, THE EXCAVATION SUPPORT SYSTEMS SHALL NOT BE MEASURED. THE COST OF EXCAVATION SUPPORT SHALL BE INCLUDED IN THE PRICE BID FOR CORRESPONDING EXCAVATION ITEMS, WHERE APPLICABLE.
4. COORDINATE THE FOUNDATION CONSTRUCTION WITH THE FOLLOWING, AS REQUIRED: SITE WORK, GRADING, EXCAVATION SUPPORT WORK, ROADWAY, DRAINAGE AND/OR UTILITY PLANS FOR THE FACILITY AT THE PROJECT SITE.
5. SUBMIT QUALIFICATIONS OF TESTING LABORATORY FOR SOIL MECHANICS LABORATORY AND FIELD TESTING OF SOILS AND COARSE AGGREGATES, IF AND WHEN REQUIRED.
6. IF AND WHERE REQUIRED, PERFORM TEST PITS ADJACENT TO EXISTING STRUCTURAL FOUNDATION(S) TO THE DEPTH OF BOTTOM(S) OF EXISTING FOOTING(S) IN ORDER TO DETERMINE THE BASE ELEVATION(S) AND CONDITION OF THE FOOTING(S) ADJACENT TO THE NEW STRUCTURE OR TO THE ELEVATION OF THE NEW FOUNDATION, WHICHEVER IS HIGHER. TEST PITS SHALL BE OBSERVED BY THE ENGINEER. FINAL REQUIREMENTS FOR UNDERPINNING, IF AND WHERE REQUIRED, AND/OR CONSTRUCTION ARE DEPENDENT ON ELEVATION AND CONDITION OF BELOW GRADE STRUCTURES AND SHALL BE ESTABLISHED BASED ON FINAL REVIEW OF CONDITIONS ENCOUNTERED.
7. EXCAVATE TO LINE AND GRADE REQUIRED FOR CONSTRUCTION OF FOUNDATIONS AND SLABS ON GRADE.
8. IF AND WHERE INDICATED, PROOF ROLLING AND COMPACTION OF EXPOSED SUBGRADES SHALL BE OBSERVED AND EVALUATED BY THE ENGINEER AND TESTED BY THE APPROVED TESTING AGENCY RETAINED BY THE CONTRACTOR. TESTING WILL NOT BE MEASURED SEPARATELY FOR PAYMENT, UNLESS OTHERWISE NOTED ON THE PLANS. THE COST FOR TESTING SHALL BE INCLUDED IN THE COSTS FOR THE ITEMS REQUIRING SAME. MOISTURE CONDITION AND COMPACT EXPOSED SUBGRADES FOR SLABS AND FOUNDATIONS AND/OR EMBANKMENT FILLS, AS REQUIRED, TO A MINIMUM OF 95 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY THE ASTM D1557 TEST PROCEDURE AND/OR ASTMD698 TEST PROCEDURE, AS REQUIRED. REMOVE SOILS THAT ARE OBSERVED TO YIELD OR UNCOMPACTIBLE SOILS TO THE DEPTH ESTABLISHED BY THE ENGINEER. EXCAVATIONS BELOW THE LINE AND GRADE FOR THE FOUNDATIONS SHALL BE BACKFILLED WITH CONTROLLED COMPACTED FILL OR COARSE AGGREGATE BASED ON THE EVALUATION OF THE ENGINEER.
9. EARTHWORK MATERIALS
   - A. SOIL AGGREGATES AND COARSE AGGREGATES FOR PROJECT EARTHWORK SHALL CONFORM TO THE GRADATIONS AND MATERIAL REQUIREMENTS GIVEN IN SECTION 901 OF THE NJDOT 2019 STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION UNLESS NOTED OTHERWISE HEREIN OR IN THE SPECIFICATIONS.
   - B. THE CONTRACTOR IS ADVISED THAT ALL SOIL AND STONE MATERIALS MUST BE CERTIFIED CLEAN BY THE SUBMISSION OF ACCEPTABLE TEST RESULTS, SHALL COMPLY WITH NJDOT QUALIFIED PRODUCT LIST AND APPROVED BY THE ENGINEER PRIOR TO DELIVERY OF THE MATERIALS TO THE SITE.
   - C. ALL SOIL MATERIALS SHALL BE MOISTURE CONDITIONED AS REQUIRED TO ACHIEVE THE SPECIFIED DEGREE OF COMPACTION.
   - D. EXCAVATED SITE SOILS CONFORMING TO THE GRADATION FOR STANDARD SOIL AGGREGATE I-14 MODIFIED TO PERMIT A MAXIMUM OF 20 PERCENT OF FINES OF LOW PLASTICITY SHALL BE MOISTURE CONDITIONED AND USED IN THE BACKFILLS.
   - E. IMPORTED STRUCTURAL FILLS, IF REQUIRED, SHALL CONFORM TO NJDOT STANDARD SIZE I-11 OR I-13, UNLESS OTHERWISE NOTED ON THE DRAWINGS.
   - F. DENSE GRADED AGGREGATES SHALL BE QUARRY PROCESSED BROKEN STONE MATERIALS CONFORMING TO THE NJDOT SPECIFICATIONS.
   - G. COARSE AGGREGATE BASE MATERIALS FOR CONCRETE STRUCTURAL FOUNDATIONS, SLABS, WORKING MATS, DRAINAGE FILLS AND/OR APRONS SHALL BE BROKEN STONE CONFORMING TO THE STANDARD SIZE COARSE AGGREGATE NO. 57 (1" TO NO. 4).
   - H. CONTROLLED LOW STRENGTH MATERIALS CONFORMING TO THE NJDOT STANDARD SPECIFICATION SHALL BE USED ONLY, IF AND WHERE INDICATED. IN ADDITION, THE MATERIAL SHALL BE USED IF AND WHERE DIRECTED OR REQUIRED DUE TO OVER EXCAVATION AND WHERE INDICATED FOR AREAS THAT ARE DIFFICULT TO ACCESS FOR COMPACTION.
10. PROTECT SUBGRADES FROM SOFTENING DUE TO SURFACE WATER INFILTRATION, GROUNDWATER OR FROST. NO FILL OR CONCRETE SHALL BE PLACED ON SATURATED OR FROZEN GROUND. RECOMPACT MATERIALS THAT HAVE BEEN DISTURBED BY THE CONSTRUCTION OR DETERIORATED DUE TO EXPOSURE TO FROST OR SATURATION.
11. COMPACT STRUCTURAL SOIL AGGREGATE FILLS, BACKFILLS AND/OR EMBANKMENT SOIL AGGREGATE FILLS, AS REQUIRED, IN MAXIMUM 8 INCH THICK LOOSE LIFTS AND COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED IN ACCORDANCE WITH THE ASTM D1557 TEST PROCEDURE OR THE ASTM D698 TEST PROCEDURE, AS APPLICABLE.
12. COMPACT COARSE AGGREGATE FILLS WITH A MINIMUM OF FOUR (4) PASSES OF A VIBRATORY PLATE COMPACTOR OR ROLLER WITH MINIMUM STATIC WEIGHT OF 500 POUNDS.
13. PERFORM ALL EARTHWORK OPERATIONS IN CONFORMANCE WITH THE PERMITS AND SOIL EROSION AND SEDIMENT CONTROL MEASURES.
14. SUBMIT EXCAVATION SCHEDULE TO ENGINEER FOR REVIEW. SCHEDULE SHALL BE PLANNED TO MAINTAIN ACCESS TO ROADWAY AND MAINTAIN EXISTING FACILITY IN OPERATION TO THE FULLEST EXTENT POSSIBLE. COORDINATE EXCAVATION SCHEDULES WITH SUBMITTALS FOR PRE-ENGINEERED STRUCTURES, WHERE APPLICABLE, SO THAT MODIFICATIONS TO THE FOUNDATION LAYOUT ARE FINALIZED PRIOR TO CONSTRUCTION OF FOUNDATIONS.
15. STRIP EXISTING PAVEMENT, EQUIPMENT PADS, ABANDONED FOUNDATIONS AND DISPOSE OF MATERIALS, AS REQUIRED. SECURE EXISTING DRAINAGE AND UTILITY SYSTEMS.
16. NO PAYMENT SHALL BE MADE FOR UNAUTHORIZED EXCAVATION BELOW THE LINES AND GRADES ESTABLISHED FOR THE CONSTRUCTION OF FOUNDATIONS AND SLABS ON GRADE AND SUB-FLOOR UTILITY SYSTEMS. AREAS OF UNAUTHORIZED EXCAVATION SHALL BE BACKFILLED WITH CONTROLLED LOW STRENGTH MATERIAL, COMPACTED DENSE GRADED AGGREGATE OR LEAN CONCRETE, AS DETERMINED BY THE ENGINEER.
17. SLAB SUBGRADE SHALL BE PROOFROLLED WITH A LOADED 10 WHEEL TRUCK OR CONCRETE TRUCK PRIOR TO PLACEMENT OF FORMS AND REINFORCING. AREAS NOTED TO RUT OR YIELD SHALL BE EXCAVATED AND RECOMPACTED.
18. PLACE CRUSHED STONE AND/OR SEAL CONCRETE WORKING MATS, AS APPLICABLE AND AS REQUIRED BY SITE CONDITIONS. THE COST OF THESE MATERIALS WILL NOT BE MEASURED SEPARATELY FOR PAYMENT, UNLESS OTHERWISE NOTED ON THE PLANS. THE COST FOR THESE ITEMS SHALL BE INCLUDED IN THE COSTS FOR THE ITEMS REQUIRING SAME.
19. UNDERPINNING, ONLY IF AND WHERE DIRECTED:
   - A. UNDERPINNING OF EXISTING STRUCTURE FOUNDATIONS AND/OR SLABS SHALL BE PERFORMED BY THE CONTRACTOR IF AND WHERE INDICATED ON THE DRAWINGS AND/OR AS DIRECTED BY THE ENGINEER.
   - B. THE CONTRACTOR SHALL SUBMIT LATERAL AND VERTICAL SUPPORT DETAILS FOR THE EXISTING WALLS AND/OR FOOTINGS, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW JERSEY, RETAINED BY THE CONTRACTOR, TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO THE START OF CONSTRUCTION. MAXIMUM DEPTH OF UNDERCUT SHALL BE 2 FEET AND MAXIMUM LENGTH OF UNDERPINNING SHALL BE 6 FEET.
   - C. THE CONTRACTOR SHALL SUPPORT THE SIDES OF EXCAVATION, AS REQUIRED, TO PRECLUDE SLOUGHING OF THE SIDES. INSTALL LAGGING AS REQUIRED.
   - D. THE CONTRACTOR SHALL PLACE REINFORCING IN ACCORDANCE WITH THE FOUNDATION DESIGN DETAILS.
   - E. THE CONTRACTOR SHALL PLACE CONCRETE TO A HEIGHT OF APPROXIMATELY 2 INCHES FROM THE BASE OF THE FOUNDATION AND RESUPPORT THE EXISTING WALLS USING DRY PACK OR LATEX MODIFIED NON-SHRINK GROUT.

STEEL NOTES

1. STEEL CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE AISC "STEEL CONSTRUCTION MANUAL", AND SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH AISC "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" AS ADOPTED IN 2016.
2. MATERIALS FOR STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM SPECIFICATIONS:

COLUMNS OR GIRDERS	– A 572, GRADE 50 OR A992
PLATES AND MISC. STEEL	– A 36
STRUCTURAL TUBE	– A 500, GRADE B
STRUCTURAL PIPE	– A 501 OR A53, TYPE E OR S, GRADE B
COLD FORMED STEEL	– A 607 C1 GRADE 55

3. ALL BOLTED CONNECTIONS SHALL BE MADE USING ASTM F3125 GRADE A490 H.S. BOLTS, 3/4" DIAMETER, UNLESS OTHERWISE NOTED ON THE PLANS.
4. ANCHOR BOLTS SHALL BE OF A36 OR A307 STEEL.
5. ONLY IF INDICATED ON THE PLANS, ALL STEEL SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 – STANDARD SPECIFICATION FOR ZINC (HOT DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS. DAMAGED COATINGS SHALL BE REPAIRED IN ACCORDANCE WITH ASTM A780 – STANDARD PRACTICE FOR REPAIR OF DAMAGED AND UNCOATED AREAS OF HOT–DIP GALVANIZED COATINGS. ALL FASTENERS FOR GALVANIZED STEEL STRUCTURAL MEMBERS SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A153 STANDARD SPECIFICATION FOR ZINC COATING(HOT –DIP) ON IRON AND STEEL HARDWARE. IF AND WHERE INDICATED FASTENERS MAY BE STAINLESS STEEL IN LIEU OF GALVANIZED STEEL.
6. ALL STRUCTURAL STEEL SHALL BE SHOP PAINTED WITH TNEMEC SERIES 10V PRIMER OR APPROVED EQUAL 2.0 MILS IN THICKNESS, EXCEPT WHERE STEEL IS TO RECEIVE SPRAY APPLIED FIREPROOFING. ALL WELDS AND BARE SPOTS SHALL RECEIVE TOUCHUP PAINT. ALL STEEL WITH EXTERIOR EXPOSURE SHALL RECEIVE A SHOP PAINTED THEMEC SERIES 66 OR 161 PRIMER AND A FIELD APPLIED FINISH COAT AFTER PRIMER TOUCH UP. FINISH COAT SHALL BE EPOXY BASED WITH THICKNESS OF 2.0 MILS.
7. SHOP AND ERECTION DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW AND APPROVAL. NO FABRICATION OF STEEL SHALL COMMENCE WITHOUT APPROVED SHOP DRAWINGS. SHOP DRAWINGS ARE PREPARED AND USED BY THE CONTRACTOR AS INSTRUMENTS TO SEQUENCE HIS WORK AND TO FACILITATE FABRICATION AND ERECTION. REVIEW OF SHOP DRAWINGS SHALL BE FOR GENERAL DETAIL AND ARRANGEMENT ONLY. CONTRACTOR SHALL BEAR FULL RESPONSIBILITY FOR DIMENSIONS, PROPER FIT AND DETAILED DESIGN OF CONNECTIONS. THEIR APPROVAL BY THE STRUCTURAL ENGINEER IS NOT TO BE CONSTRUED AS A WAIVER OF CONSTRUCTION CONTRACT REQUIREMENTS OR RESPONSIBILITIES, UNLESS THE CONTRACTOR HAS BEEN GRANTED A DEVIATION IN WRITING.
8. CONNECTIONS SHALL BE DESIGNED FOR MAXIMUM SAFE UNIFORM LOAD FOR THE SPAN OF THE MEMBER, OR FOR SHEARS SHOWN ON THE DRAWINGS x 1.10, UNLESS OTHERWISE DETAILED.
9. DURING ERECTION, APPROVED TEMPORARY BRACING SHALL BE INSTALLED AS REQUIRED TO PREVENT DISTORTION OR DAMAGE TO THE FRAMEWORK DUE TO ERECTION FORCES.
10. STEEL SHOP DRAWINGS SHALL BE COORDINATED WITH STAIR DETAILS. IF HANGER RODS ARE USED, PROVIDE STIFFENER PLATE 1/4" THICK MIN. ALONGSIDE HANGER LOCATION.
11. WELDED STUD SHEAR CONNECTORS SHALL SATISFY ALL APPLICABLE REQUIREMENTS OF THE AASHTO/AWS D1.5M/D1.5 BRIDGE WELDING CODE, AND SHALL HAVE A SPECIFIED MINIMUM YIELD AND TENSILE STRENGTH OF 50.0 KSI AND 60.0 KSI, RESPECTIVELY.

STRUCTURAL WELDING NOTES (NOT INCLUDING PROCESS PIPING OR EQUIPMENT)

1. ALL WELDING SHALL BE PERFORMED IN ACCORDANCE WITH STANDARDS OF THE AMERICAN WELDING SOCIETY. ELECTRODES MUST MEET E70XX SERIES REQUIREMENTS, LOW HYDROGEN, WITH MINIMUM TENSILE STRESS OF 70,000 PSI. ELECTRODES SHALL BE PRODUCED AND STORED IN ACCORDANCE WITH AWS D1.1 SECTIONS 4.5 OR 4.12.
2. STEEL ERECTOR SHALL PROVIDE A FIRE WATCH DURING ALL FIELD WELDING OPERATIONS.
3. ALL WELDERS ARE TO BE LICENSED AND CERTIFIED TO AWS STANDARDS OR THOSE REQUIRED BY APPLICABLE BUILDING CODE.
4. ALL WELDS SHALL BE VISUALLY INSPECTED. ALL GROOVE WELDS SHALL RECEIVE RADIOGRAPHIC OR ULTRASONIC TESTING. MAGNETIC PARTICLE TEST 20% OF ALL FILLET WELDS. ALL TESTING SHALL BE PERFORMED BY A CERTIFIED TESTING LABORATORY RETAINED BY THE CONTRACTOR.
5. REPORTS OF EACH TEST SHALL BE GIVEN TO THE STRUCTURAL ENGINEER. NO FAILED WELD SHALL BE PERMITTED TO REMAIN IN SERVICE. IT IS THE RESPONSIBILITY OF THE TESTING LABORATORY TO PROVIDE TIMELY NOTICE OF FAILED TESTS TO THE CONTRACTOR.
6. WELDING SHALL PROGRESS IN A MANNER WHICH BALANCES THE STRESSES IN THE MEMBERS, IN ACCORDANCE WITH AWS.
7. PREHEATING REQUIREMENTS FOR BASE METAL SHALL FOLLOW AWS GUIDELINES.

ALUMINUM NOTES

1. ALL ALUMINUM ALLOY MEMBERS, FABRICATION THEREOF, AND ERECTION OF, SHALL CONFORM TO "SPECIFICATIONS FOR ALUMINUM STRUCTURES" BY THE ALUMINUM ASSOCIATION, LATEST EDITION, UNLESS NOTED OTHERWISE.
2. ALUMINUM ALLOY FOR ALL ROLLED SECTIONS, PLATES AND ANGLES SHALL BE ALLOY 6061-T6 UNLESS OTHERWISE SPECIFIED.
3. ALUMINUM ALLOY FOR PIPE SHALL BE ALLOY 6063-T832 UNLESS OTHERWISE SPECIFIED.
4. ALUMINUM ALLOY FOR GRATING SHALL BE ALLOY 6063-T6 UNLESS OTHERWISE SPECIFIED.
5. ALL FASTENINGS BETWEEN ALUMINUM MEMBERS AND DISSIMILAR METALS SHALL BE MADE WITH STAINLESS STEEL BOLTS UNLESS OTHERWISE NOTED. ALL CONTACT SURFACES OF ALL MEMBERS SHALL BE PAINTED WITH ZINC CHROMATE PRIMER.
6. ALL ALUMINUM SURFACES TO BE PLACED IN CONTACT WITH WOOD, CONCRETE, OR MASONRY SHALL BE GIVEN A HEAVY COAT OF AN ALKALI RESISTANT BITUMASTIC PAINT.

PIPING, PIPELINE APPURTENANCES, VALVES, SUPPORTS, HANGERS, STRUTS, BLOCKING AND ANCHORAGE NOTES

1. PIPING TRADE CONTRACTORS SHALL REFER TO THE APPLICABLE DIVISIONS OF THE CONTRACT SPECIFICATIONS FOR SUPPORTS, BLOCKING, ANCHORAGE AND RESTRAINING OF ALL PIPING, VALVES AND PIPING APPURTENANCES.
2. PIPING TRADE CONTRACTORS SHALL REVIEW WITH THE ENGINEER AND THE CONTRACTOR ALL LOCATION AND ARRANGEMENT OF PIPING, OPENINGS, PIPE SLEEVES, AND TRENCHES AS REQUIRED TO COMPLETE HIS WORK AND SHALL NOT PROCEED WITH THE INSTALLATION OF SAME UNTIL SUCH HAS BEEN REVIEWED AND WILL NOT IMPAIR THE STRUCTURAL INTEGRITY OF THE CONCRETE MEMBERS.
3. PIPING TRADE CONTRACTORS SHALL PROVIDE AND COORDINATE THE INSTALLATION OF ALL ITEMS TO BE EMBEDDED IN THE CONCRETE SYSTEM AND SHALL COOPERATE SO AS NOT TO DELAY THE CONSTRUCTION WORK. SUCH ITEMS SHALL INCLUDE ALL PIPES, SLEEVES, BOLTS, STRUTS, HANGERS AND FITTINGS, ETC., THAT ARE TO BE EMBEDDED IN THE CONCRETE SYSTEM.

ELECTRICAL CONDUIT NOTES

1. ELECTRICAL TRADE CONTRACTOR SHALL REVIEW WITH THE ENGINEER AND THE CONTRACTOR HIS PROPOSED LOCATION AND METHOD OF INSTALLATION OF CONDUITS IN CONCRETE CONSTRUCTION AND SHALL NOT PROCEED WITH INSTALLATION OF SAME UNTIL ARRANGEMENT OF CONDUITS AND OPENINGS HAS BEEN AGREED UPON.
2. NO CONDUITS SHALL BE SO LOCATED AND INSTALLED THAT WILL IMPAIR THE STRUCTURAL INTEGRITY OF THE CONCRETE MEMBERS.
3. THE CONTRACTOR SHALL CONFIRM ALL CONDUIT LOCATIONS FOR ELECTRICAL WIRING AND/OR PLUMBING OR DRAINAGE PIPES IN NEW CONCRETE MATS, WALLS OR SLABS PRIOR TO POURING THE SLAB CONCRETE. CORING THROUGH SLABS IS DISCOURAGED.
4. NO CONDUIT WITH AN OUTSIDE DIAMETER LARGER THAN ONE–THIRD OF THE CONCRETE SLAB THICKNESS WILL BE PERMITTED TO BE INSTALLED IN THE SLAB SYSTEM WITHOUT REVIEW OF PENETRATION DETAILS.
5. ALL CONDUIT CROSS–OVERS SHALL BE SO LOCATED SO THEY DO NOT VERTICALLY DISPLACE ANY MAIN REINFORCING BARS OR OTHERWISE IMPAIR THE STRUCTURAL INTEGRITY OF THE FRAMING SYSTEM (SEE NOTE 1).
6. ALL CONDUITS SHALL BE SPACED A MINIMUM OF THREE CONDUIT DIAMETERS CENTER TO CENTER. LARGER SPACING OF CONDUIT IS PREFERRED.
7. CONTINUOUS ROWS OF CONDUIT SHALL NOT BE PLACED PARALLEL TO THE BEARING EDGES OF CONCRETE SLABS WITHIN A DISTANCE EQUAL TO THE SLAB THICKNESS FROM THE FACE OF THE BEARING EDGE.

WOOD FRAMING NOTES

1. ALL WOOD FRAMING DESIGN SHALL CONFORM TO THE 2018 EDITION OF THE NATIONAL DESIGN SPECIFICATIONS. ALL THE TYPES OF WOODS USED FOR THIS PROJECT SHALL BE PRESSURE TREATED AS PER THE USE CATEGORY SYSTEM PROVIDED BY AWPA STANDARD U1–24, U.O.N.
2. ALL SOLID SAWN DIMENSION LUMBER SHALL BE MARINE GRADE SOUTHERN PINE, GRADE "NO. 1 DENSE" OR BETTER. MINIMUM ALLOWABLE STRESSES (MOISTURE CONTENT LESS THAN OR EQUAL TO 19%) FOR NORMAL LOAD DURATION SHALL BE AS GIVEN HEREIN:

2" TO 4" THICK, 10" WIDE	2" TO 4" THICK, 12" WIDE
STRESS IN EXTREME FIBER IN BENDING "Fb" – 1200 PSI	STRESS IN EXTREME FIBER IN BENDING "Fb" – 1100 PSI
TENSION PARALLEL TO GRAIN "Ft" – 800 PSI	TENSION PARALLEL TO GRAIN "Ft" – 750 PSI
SHEAR PARALLEL TO GRAIN "Fv" – 175 PSI	SHEAR PARALLEL TO GRAIN "Fv" – 175 PSI
COMPRESSION PERPENDICULAR TO GRAIN "Fc" – 660 PSI	COMPRESSION PERPENDICULAR TO GRAIN "Fc" – 660 PSI
COMPRESSION PARALLEL TO GRAIN "Fc" – 1550 PSI	COMPRESSION PARALLEL TO GRAIN "Fc" – 1500 PSI
MODULUS OF ELASTICITY "E" – 1,800,000 PSI "Emin" – 660,000 PSI	MODULUS OF ELASTICITY "E" – 1,800,000 PSI "Emin" – 660,000 PSI

3. STRUCTURAL COMPOSITE LUMBER BEAMS USED FOR STRUCTURAL FRAMING SHALL BE "TREATED PARALLAM PLUS PSL BEAMS" WITH AWPA USE CATEGORY UC3B OR BETTER. MINIMUM ALLOWABLE DESIGN PROPERTIES (FOR 100% LOAD DURATION) SHALL BE AS GIVEN HEREIN:

3 1/2" BEAM WITH 9 1/4" DEPTH	3 1/2" BEAM WITH 11 7/8" DEPTH
MOMENT – 8070 FT–LBS	MOMENT – 12935 FT–LBS
SHEAR – 3885 LBS	SHEAR – 4990 LBS
MOMENT OF INERTIA– 231 IN^4	MOMENT OF INERTIA– 488 IN^4
WEIGHT – 11.7 PLF	WEIGHT – 15.1 PLF

4. ALL TIMBER PILES USED IN THIS PROJECT SHALL BE SOUTHERN PINE 12"ø ROUND PILES WITH MINIMUM TIP DIAMETER OF 10". REFERENCE DESIGN VALUES FOR TREATED ROUND TIMBER PILES GRADED PER ASTM D25 SHALL BE AS GIVEN HEREIN:

   BENDING
   F_b =1950 PSI
   SHEAR PARALLEL TO GRAIN
   F_v = 180 PSI
   COMPRESSION PERPENDICULAR TO GRAIN
   $F_{c\perp}$ = 440 PSI
   COMPRESSION PARALLEL TO GRAIN
   $F_{c\ all}$ = 1250 PSI
   MODULUS OF ELASTICITY
   "E" – 1,500,000 PSI
   "E_{min}" – 600,000 PSI
   SPECIFIC GRAVITY
   G = 0.55
5. MANUFACTURER SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR REVIEW. SUCH SHOP DRAWINGS SHALL SHOW FULL DIMENSIONS OF EACH MEMBER, SPECIES OF WOOD USED, STRESS GRADE OF LUMBER, TYPE OF GLUE USED AND OTHER VARIABLES.
6. ALL MEMBERS MUST BE ADEQUATELY BRACED DURING INSTALLATION, UNTIL COMPLETE STRUCTURAL SYSTEM HAS BEEN INSTALLED.
7. ALL METAL CONNECTORS, HANGERS, TIES, HOLDDOWNS, ANCHORS, PLATES, SEISMIC CONNECTORS, ETC., SHALL BE MADE WITH STAINLESS STEEL/ GALVANIZED STEEL MANUF., BY SIMPSON STRONG–TIE CO., OR ACCEPTABLE EQUAL. SHOP DRAWINGS OR CATALOGUE CUTS SHOWING THE CAPACITY OF EACH UNIT SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
8. ALL NAILS USED SHALL BE GALVANIZED COMMON WIRE NAILS OF THE SIZES SHOWN ON THE CONTRACT DRAWINGS OR REQUIRED BY THE CONNECTORS, U.N.O.
9. "X" BRIDGING SHALL BE AS SPACED ON THE CONTRACT DRAWINGS AND MAY BE EITHER WOOD OR METAL, U.N.O.

MISCELLANEOUS CARPENTRY

1. REFER TO PROJECT SPECIFICATIONS FOR DETAILED REQUIREMENTS FOR CARPENTRY.
2. CONFORM TO PROJECT SAFETY REQUIREMENTS FOR SCAFFOLDING CONSTRUCTION, AND WORK ALONG THE EDGES OF THE ROOF, WHERE APPLICABLE.
3. TIMBER CONSTRUCTION: TIMBER SHALL CONFORM TO THE LATEST COPY OF THE NATIONAL DESIGN SPECIFICATIONS FOR STRESS–GRADE LUMBER BY THE NATIONAL FOREST PRODUCTS ASSOCIATION, FOR MATERIAL PROPERTIES, MANUFACTURE AND ATTACHMENTS.
4. LUMBER STANDARDS: COMPLY WITH DOC PS20 "AMERICAN SOFTWOOD LUMBER STANDARD AND WITH GRADING RULES OF INSPECTION AGENCIES.
5. WOOD NAILERS, WOOD CURBS AND/OR WOOD COPING FRAMING:
   - A. WOOD CANTS, NAILERS, CURBS, BLOCKING AND/OR COPING WHICH SHALL BE COVERED AFTER INSTALLATION SHALL BE PRESSURE TREATED TO MINIMUM RETENTION OF 0.25 PCF AND KILN DRIED TO MOISTURE OF 19%.
   - B. WOOD NAILERS, CURBS, BLOCKING AND/OR COPING SHALL BE FABRICATED USING TREATED SOUTHERN PINE LUMBER GRADE NO. 1 OR BETTER.
   - C. NAILS, BOLTS AND LAG SCREWS SHALL BE STAINLESS STEEL OR HOT DIP GALVANIZED. SCREWS SHALL BE STAINLESS STEEL.
   - D. REMOVE AND REPLACE DETERIORATED NAILERS, IF AND WHERE ENCOUNTERED.

SELECTIVE DEMOLITION NOTES:

1. CONFORM TO THE REQUIREMENTS OF THE PROJECT SPECIFICATION AND ALL REGULATIONS HAVING JURISDICTION.
2. IF AND WHERE REQUIRED, COORDINATE WITH THE OWNER AND ENGINEER TO PERFORM TEST CORES PRIOR TO SELECTIVE DEMOLITION.
3. PROVIDE BARRICADES AS REQUIRED TO MAINTAIN SAFE ACCESS TO THE CONSTRUCTION SITE. SUBMIT SHOP DRAWINGS FOR PROTECTIVE STRUCTURES AND/OR BARRICADES. PROJECT SAFETY IS THE RESPONSIBILITY OF THE CONTRACTOR. SUBMITTAL TO THE ENGINEER SHALL NOT RELIEVE THE CONTRACTOR OF HIS SOLE OBLIGATION TO MAINTAIN PROJECT SAFETY IN ACCORDANCE WITH ALL REGULATIONS HAVING JURISDICTION.
4. CONTAIN, STOCKPILE, AND DISPOSE OF ALL DEMOLITION DEBRIS IN ACCORDANCE WITH ALL REGULATIONS HAVING JURISDICTION.

LIST OF ABBREVIATIONS

AASHTO	AMERICAN ASSOCIATION OF STATE AND HIGHWAY TRANSPORTATION OFFICIALS	LBS.	POUNDS
ACI	AMERICAN CONCRETE INSTITUTE	L.F.	LINEAR FEET
ADD'L	ADDITIONAL	L.G.	LONG
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	LL	LIVE LOAD
ALT.	ALTERNATE	LLH	LONG LEG HORIZONTAL
ALUM.	ALUMINUM	LLV	LONG LEG VERTICAL
&	AND	∠('s)	ANGLE(S)
@	AT	LP	LOW POINT
APP'D	APPROVED	LRFD	LOAD AND RESISTANCE FACTOR DESIGN
APPROX.	APPROXIMATE	LT.	LEFT
ARCH.	ARCHITECTURAL	LT. WT.	LIGHTWEIGHT
ASTM	AMERICAN SOCIETY OF TESTING MATERIALS	MANUF.	MANUFACTURER
AVG.	AVERAGE	MAS.	MASONRY
AWS	AMERICAN WELDING SOCIETY	MAX.	MAXIMUM
BF	BACK FACE	MECH.	MECHANICAL
BET.	BETWEEN	MET.	METRIC
BLDG	BUILDING	MIN.	MINIMUM
BM, BMS	BEAM(S)	MPH	MILES PER HOUR
B.O.F.	BOTTOM OF FOOTING	MATL.	MATERIAL
BOTT, B	BOTTOM	MTL.	METAL
BP	BASE OF BEARING PLATE	N	NORTH
BRG	BEARING	NAVD	NORTH AMERICAN VERTICAL DATUM
BW	BOTTOM OF WALL	NGVD	NATIONAL GEODETIC VERTICAL DATUM
CFM	CUBIC FEET PER MINUTE	NJDOT	NEW JERSEY DEPARTMENT OF TRANSPORTATION
CFS	CUBIC FEET PER SECOND	NO., #	NUMBER
C.I.P.	CAST IN PLACE	N.T.S.	NOT TO SCALE
C.J.	CONTROL JOINT	N.W.	NORMAL WEIGHT
C, CL, ℄	CENTER LINE	o/c	ON CENTER
CLR	CLEAR	O.D.	OUTSIDE DIAMETER
CMU	CONCRETE MASONRY UNIT	O.F.	OUTSIDE FACE
CO	CLEANOUT	OPNG.(S)	OPENING(S)
COL.	COLUMN	OPP.	OPPOSITE
CONC.	CONCRETE	OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
CONN.	CONNECT/CONNECTION	OVH'D	OVERHEAD
CONSTR.	CONSTRUCTION	P	PIER
CONT.	CONTINUOUS	PART'N	PARTITION
CONTR.	CONTRACTOR	PCF	POUNDS PER CUBIC FOOT
COORD.	COORDINATE	PERP.	PERPEDICULAR
CORP.	CORPORATION	PL, ℙ	PLATE
COV.	COVER	PPT	PERFORATED POLYETHYLENE TUBING
CTR.	CENTER	PROJ.	PROJECTION
CY	CUBIC YARD	PSF	POUNDS PER SQUARE FOOT
DEG.	DEGREE	PSI	POUNDS PER SQUARE INCH
DELAM.	DELAMINATION	QTY.	QUANTITY
DEMO.	DEMOLITION; DEMOLISH	RCP	REINFORCED CONCRETE PIPE
DET.('S)	DETAIL(S)	RCSC	RESEARCH COUNCIL ON STEEL CONNECTIONS
DIAG.	DIAGONAL	RD	ROOF DRAIN
DIA, ø	DIAMETER	REF.	REFERENCE
DIM., DIM'S	DIMENSION(S)	REV.	REVISION
DL	DEAD LOAD	REINF.	REINFORCEMENT
DN	DOWN	REQ'D	REQUIRED
DO	DITTO	RF	REAR FACE
DS	DOWNSTREAM	R.O.W.	RIGHT OF WAY
DWG.(S)	DRAWING(S)	RT.	RIGHT
DWL(S)	DOWEL(S)	RTU	ROOF TOP UNIT
E.F.	EACH FACE	S	SIDE
E.J.	EXP

CAST–IN–PLACE CONCRETE:

1. ALL REINFORCED CAST–IN–PLACE REINFORCED CONCRETE SHALL CONFORM TO THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI STANDARD 318–CURRENT EDITION) AND THE "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURE" (ACI STANDARD 315), EXCEPT AS SPECIFICALLY MODIFIED BY THE CONTRACT DRAWINGS AND SPECIFICATIONS.
2. ALL REINFORCING STEEL SHALL BE INTERMEDIATE GRADE, NEW DEFORMED BILLET–STEEL REINFORCING, CONFORMING TO ASTM SPECIFICATION ASTM A615, GRADE 60 UNLESS NOTED OTHERWISE.
3. ALL WELDED WIRE FABRIC USED ON THE PROJECT SHALL CONFORM TO ASTM SPECIFICATION A–185.
4. ALL REINFORCING STEEL BARS, DOWELS, WELDED WIRE FABRIC, AND/OR SUPPORT CHAIRS SHALL BE EITHER ZINC–COATED (GALVANIZED) IN ACCORDANCE WITH ASTM A 767 OR CONTINUOUS HOT–DIP GALVANIZED IN ACCORDANCE WITH ASTM A 1094. UNCOATED OR BLACK BARS WILL NOT BE PERMITTED. BRICKS OR OTHER MASONRY SUPPORTS FOR THE REBAR MATS WILL NOT BE PERMITTED.
5. ALL DETAILING, BENDING, PLACEMENT AND SUPPORT OF REINFORCING STEEL SHALL CONFORM TO THE STANDARDS CITED IN NOTE #1, EXCEPT AS MAY BE MODIFIED BY THESE NOTES, CONTRACT DRAWINGS AND SPECIFICATIONS.
6. ALL REINFORCING SHALL BE LAP SPLICED, BENT AND DEVELOPED AS PER THE TYPICAL DETAILS. CONTINUOUS BOTTOM REINFORCING SHALL BE LAP SPLICED AT SUPPORT POINTS AND CONTINUOUS TOP REINFORCING SHALL BE LAP SPLICED MIDWAY BETWEEN SUPPORTS. REINFORCING SHALL NOT BE RE–BENT ONCE PLACED WITHOUT THE PERMISSION OF THE ENGINEER.
7. CLEAR CONCRETE COVER OVER MAIN REINFORCING SHALL BE AS CALLED FOR IN THE TYPICAL DETAILS, UNLESS SHOWN OTHERWISE ON THE CONTRACT DRAWINGS.
8. ALL OF THE STANDARD AND/OR SPECIAL ACCESSORIES REQUIRED TO SUPPORT, HOLD AND TIE REINFORCEMENT IN ITS PROPER POSITION SHALL BE PROVIDED AND INSTALLED BY THE CONCRETE CONTRACTOR. THIS INCLUDES SUPPORT BARS AND/OR INDIVIDUAL HIGH CHAIRS FOR THE TOP LAYER OF REINFORCING AND BOLSTERS FOR THE BOTTOM LAYER OF REINFORCING. REINFORCING SHALL BE WIRED IN PLACE AS REQUIRED. ANY SPECIAL SUPPORTS AS REQUIRED SHALL BE DESIGNED AND DETAILED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR REVIEW AND ACCEPTANCE PRIOR TO INSTALLATION OF THE SAME BY THE CONTRACTOR.
9. WHERE REINFORCED SLABS ARE GREATER THAN 12" IN THICKNESS, INDIVIDUAL HIGH CHAIRS SHALL BE PROVIDED TO SUPPORT THE TOP REINFORCING. SUCH HIGH CHAIRS SHALL ADEQUATELY SUPPORT ALL CONSTRUCTION LOADINGS AND SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND ACCEPTANCE BEFORE BEING INSTALLED.
10. ALL STRUCTURAL MEMBERS SHALL BE CAST MONOLITHICALLY FULL DEPTH, UNLESS SHOWN OTHERWISE ON THE CONTRACT DRAWINGS.
11. VERTICAL CONSTRUCTION JOINTS IN WALLS WHERE NOT SPECIFICALLY SHOWN ON THE CONTRACT DRAWINGS SHALL BE LOCATED AT THE MIDPOINT BETWEEN PIERS, BUTTRESSES AND/OR INTERSECTING WALLS AND A MINIMUM OF 4'–0" FROM ANY OPENINGS ON THE WALLS.
12. HORIZONTAL CONSTRUCTION JOINTS WILL NOT BE PERMITTED IN CONCRETE WALLS UNLESS SPECIFICALLY DETAILED ON THE CONTRACT DRAWINGS.
13. ALL CONSTRUCTION JOINTS IN FRAMED SLABS AND BEAMS SHALL BE LOCATED AT OR ADJACENT TO THE MIDSPAN OF THE MEMBERS. FOR FURTHER REQUIREMENTS, SEE THE TYPICAL DETAILS.
14. IMMEDIATELY BEFORE PLACING NEW CONCRETE, ALL CONSTRUCTION JOINTS SHALL RECEIVE A COATING OF A BONDING AGENT.
15. ALL EXPOSED CONCRETE EDGES SHALL BE GROUND TO A 3/8" RADIUS OR CHAMFERED AS PER THE CONTRACT DRAWINGS.
16. PROVIDE ADDITIONAL REINFORCING, AS PER THE TYPICAL DETAILS, FOR ALL OPENINGS IN CONCRETE WALLS AND/OR SLABS, UNLESS SHOWN OTHERWISE ON THE CONTRACT DRAWINGS.
17. THE SPACING OF REINFORCING, AS SHOWN ON THE CONTRACT DRAWINGS, IS THE MAXIMUM PERMITTED. THIS SPACING MAY BE REDUCED FOR CONSTRUCTION CONSIDERATIONS, BUT SHALL NOT BE EXCEEDED.
18. AT FRAMED CONSTRUCTION AREAS, IF INDICATED ON THE PROJECT PLANS, THE CONTRACTOR SHALL ADJUST THE SHORING, USING SURVEYING INSTRUMENTS, PRIOR TO PLACING ANY CONCRETE AND IMMEDIATELY AFTER THE PLACING OF SAID CONCRETE. NO ADJUSTMENT OF FORM ELEVATIONS WILL BE PERMITTED AFTER THE CONCRETE HAS ATTAINED ITS INITIAL SET. THE CONTRACTOR SHALL CAMBER FORMS, AS REQUIRED, TO COMPENSATE FOR THE FORMWORK DEFLECTION CAUSED BY THE PLACEMENT OF CONCRETE AND ANY DEFLECTION OF THE SLABS AND BEAMS AFTER THE REMOVAL OF THE FORMS.
19. SLAB FINISHES SHALL CONFORM TO THE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS. EXCEPT WHERE NOTED OTHERWISE, SLAB / WALL FINISH SHALL CONFORM WITH THE REQUIREMENTS FOR NON–SLIP BROOM FINISH AS SPECIFIED WITHIN THE CONTRACT SPECIFICATIONS.

CONCRETE PROPORTIONING, PLACEMENT AND CURING:

1. ALL CONCRETE USED ON THIS PROJECT FOR NON–BRIDGE AND NON–CULVERT STRUCTURES SHALL HAVE MINIMUM 28–DAY ULTIMATE COMPRESSIVE STRENGTHS (fc') AS NOTED BELOW. FOR CONCRETE PROPERTIES TO BE USED ON BRIDGE STRUCTURES, REFER TO THE GENERAL PEDESTRIAN BRIDGE DESIGN NOTES SECTION. SUCH STRENGTHS SHALL BE DETERMINED, IN ACCORDANCE WITH ACI REQUIREMENTS, BY A CERTIFIED TESTING LABORATORY TO BE RETAINED BY THE CONTRACTOR. FOR FURTHER REQUIREMENTS, SEE THE SPECIFICATIONS AND SPECIAL INSPECTION NOTES.

   fc' = 4,000 PSI. CONCRETE HAVING THIS ULTIMATE COMPRESSIVE STRENGTH SHALL BE USED THROUGHOUT THE PROJECT UNLESS NOTED OTHERWISE ON THE CONTRACT DRAWINGS.

   MAXIMUM WATER/ CEMENT RATIO = 0.45, MINIMUM 580 POUNDS OF CEMENT PER CUBIC YARD OF CONCRETE.
2. ALL NORMAL WEIGHT CONCRETE, REGARDLESS OF SPECIFIED DESIGN STRENGTH, SHALL CONTAIN STONE OR GRAVEL AGGREGATE SUCH THAT THE WEIGHT OF THE HARDENED CONCRETE IS 145 POUNDS PER CUBIC FOOT (± 3%) WITH THE INCLUSION OF ENTRAINED AIR. FOR FURTHER REQUIREMENTS SEE THE SPECIFICATIONS.
3. ALL CONCRETE EXPOSED TO THE ATMOSPHERE SHALL CONTAIN 6% (± 1.5%) ENTRAINED AIR.
4. ALL CEMENT USED SHALL BE ONE OF THE FOLLOWING:
   A. PORTLAND CEMENT, TYPE I CONFORMING TO ASTM C–150.
   B. BLENDED CEMENT, TYPE IL CONFORMING TO ASTM C–595.
5. SLAG CEMENT, FLY ASH AND SILICA FUME SHALL NOT BE USED IN ANY MIX DESIGN AND WILL NOT BE PERMITTED.
6. ALL AGGREGATES, BOTH FINE AND COARSE, SHALL CONFORM TO ASTM C33. UNLESS NOTED OTHERWISE, COARSE AGGREGATE SHALL BE TYPE 57.
7. ADMIXTURES USED SHALL NOT CONTAIN ANY FREE CHLORIDE IONS IN ANY AMOUNT GREATER THAN NORMALLY CONTAINED IN POTABLE WATER.
8. ALL WATER USED IN THE CONCRETE MIX SHALL BE POTABLE.
9. MAXIMUM SLUMP OF CONCRETE, AT POINT OF DISCHARGE, SHALL NOT EXCEED 3 INCHES (± 1 INCH).
10. CONTRACTOR MAY ELECT TO USE A HIGH RANGE WATER REDUCING ADMIXTURE (SUPERPLASTICIZER) TO FACILITATE PLACEMENT OF CONCRETE. MAXIMUM SLUMP, AFTER INTRODUCTION OF SUPERPLASTICIZER, SHALL NOT EXCEED 8 INCHES.
11. WHENEVER THE AMBIENT TEMPERATURE IS GREATER THAN 90 DEGREES FAHRENHEIT, THE CONTRACTOR SHALL FOLLOW THE PROCEDURES OF ACI 305, HOT WEATHER CONCRETING, UNLESS OTHERWISE NOTED.
12. WHENEVER THE MEAN AVERAGE AMBIENT TEMPERATURE IS BELOW 40 DEGREES FAHRENHEIT, FOR THREE CONSECUTIVE DAYS, THE CONTRACTOR SHALL FOLLOW THE PROCEDURES OF ACI 306, COLD WEATHER CONCRETING, UNLESS OTHERWISE NOTED.
13. IMMEDIATELY AFTER FINISHING OPERATIONS ARE COMPLETED, ALL EXTERIOR CAST–IN–PLACE CONCRETE SHALL RECEIVE AN APPLICATION OF KUREX VOX WHITE PIGMENTED CURING COMPOUND, MANUFACTURED BY THE EUCLID CHEMICAL COMPANY OR EQUAL. THE CURING COMPOUND SHALL BE APPLIED AS PER THE MANUFACTURER'S INSTRUCTIONS.
14. CONCRETE CYLINDERS SHALL BE COLLECTED AND PREPARED IN ACCORDANCE WITH APPLICABLE CODES AND STANDARDS BY A CERTIFIED TESTING LABORATORY RETAINED BY THE CONTRACTOR UNLESS NOTED OTHERWISE IN THE CONTRACT DOCUMENTS. TESTING WILL NOT BE MEASURED SEPARATELY FOR PAYMENT, UNLESS OTHERWISE NOTED ON THE PLANS. THE COST FOR TESTING SHALL BE INCLUDED IN THE COSTS FOR THE ITEMS REQUIRING SAME.

MASONRY:

1. ALL MASONRY CONSTRUCTION AND MATERIALS USED SHALL CONFORM TO THE "BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES AND SPECIFICATIONS FOR MASONRY STRUCTURES" ACI–ASCE 530.1.
2. HOLLOW LOAD BEARING MASONRY UNITS SHALL CONFORM TO ASTM C90, GRADE N, TYPE 1 AND BE MADE WITH NORMAL WEIGHT AGGREGATES UNLESS LIGHT WEIGHT AGGREGATES ARE INDICATED IN THE SCHEDULE. FOR FINISH REQUIREMENTS, SEE THE CONTRACT DRAWINGS.
3. CONCRETE MASONRY UNITS SHALL HAVE A MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF 1900 PSI ON THE NET AREA.
4. WHERE SHOWN ON THE CONTRACT DRAWINGS, AND/OR SECTIONS, THE MASONRY UNIT CORES SHALL BE FILLED SOLID WITH GROUT. PROVIDE MINIMUM 3"X3" CLEANOUTS, WHERE REQUIRED, AT THE BOTTOM OF EACH LIFT. CLOSE AND BRACE CLEANOUTS AFTER CLEANING CORES.
5. ALL MASONRY UNITS, DIRECTLY BELOW LINTEL BEARING LOCATIONS, SHALL BE FILLED SOLID WITH GROUT FOR THE FULL HEIGHT OF THE WALL.
6. ALL MASONRY UNITS, EACH SIDE OF OPENINGS, SHALL BE FILLED SOLID WITH GROUT FOR A WIDTH OF 2'–0", FULL HEIGHT OF MASONRY. PROVIDE ONE #5 VERTICAL REINFORCING, MINIMUM, WHERE NO OTHER REINFORCING IS CALLED FOR.
7. GROUT SHALL BE PLACED IN LIFTS WITH A MAXIMUM HEIGHT OF FIVE FEET.
8. GROUT SHALL BE CONSOLIDATED WITH MECHANICAL VIBRATION AFTER PLACING AND REVIBRATED AFTER INITIAL WATER LOSS AND SETTLEMENT HAS OCCURRED AND BEFORE INITIAL STIFFENING.
9. ALL MASONRY WALLS SHALL BE RUNNING BOND CONSTRUCTION, UNLESS SHOWN OTHERWISE ON THE CONTRACT DRAWINGS. ALL MORTAR JOINTS SHALL BE FULL BED JOINTS. FOR FURTHER FINISH REQUIREMENTS, SEE THE CONTRACT DRAWINGS.
10. TRUSS TYPE (HEAVY DUTY) MASONRY WALL REINFORCING, DUR–O–WAL OR EQUAL, CONFORMING TO ASTM A82 SHALL BE PROVIDED IN ALL MASONRY WALLS AS FOLLOWS:
    A. IN THE FIRST TWO BED JOINTS ABOVE A BEARING JOINT
    B. IN EVERY SECOND BED JOINT, EXCEPT AS NOTED
    C. IN THE TOP THREE BED JOINTS BELOW ANY FRAMING LEVEL–BEARING WALL CONSTRUCTION
11. MASONRY BOND BEAM SHALL BE PROVIDED IN THE COURSE OF MASONRY DIRECTLY BELOW A FRAMING LEVEL LOCATION, IN ALL MASONRY WALLS, BOTH BEARING AND NON–BEARING. UNLESS NOTED OTHERWISE ON THE CONTRACT DRAWINGS, THE BOND BEAM SHALL BE REINFORCED WITH TWO #5 CONTINUOUS REINFORCING AND FILLED WITH PEA GRAVEL CONCRETE HAVING AN ULTIMATE COMPRESSIVE STRENGTH OF 4,000 PSI.
12. THE MAXIMUM SHELL THICKNESS OF THE BOND BEAM MASONRY UNITS SHALL NOT EXCEED 1–1/2".
13. WHERE MASONRY UNITS ABUT CONCRETE WALLS, BEAMS OR COLUMNS AND/OR STRUCTURAL STEEL BEAMS OR COLUMNS, PROVIDE ANCHORS AS PER THE TYPICAL DETAILS.
14. WHEN EITHER THE AMBIENT TEMPERATURE IS 100 DEGREES OR HIGHER, OR THE AMBIENT TEMPERATURE IS 90 OR HIGHER WITH A WIND VELOCITY OF 8 MPH OR GREATER, THE CONTRACTOR SHALL FOLLOW THE HOT WEATHER PROCEDURES AS REQUIRED BY ACI 530.1.
15. WHERE MASONRY WALLS ARE REINFORCED, DOWELS SHALL BE PROVIDED FROM THE FOUNDATION WALL AND THE REINFORCING SHALL EXTEND INTO ANY BOND BEAMS OR CONCRETE CONSTRUCTION, AS PER THE TYPICAL DETAILS.
16. THE CONTRACTOR SHALL COVER THE TOP OF ALL UNFINISHED MASONRY WORK EACH NIGHT AS WEATHER PROTECTION.
17. WHEN EITHER THE AMBIENT TEMPERATURE OR THE TEMPERATURE OF THE MASONRY UNITS FALLS BELOW 40 DEGREES FAHRENHEIT, THE CONTRACTOR SHALL FOLLOW THE COLD WEATHER PROCEDURES AS REQUIRED BY ACI 530.1.

MASONRY MORTAR AND GROUT:

1. ALL MORTAR FOR NEW MASONRY SHALL CONFORM TO THE REQUIREMENTS OF ASTM C270.
2. CEMENT USED IN MASONRY MORTAR SHALL BE PORTLAND CEMENT, TYPE I OR III, CONFORMING TO ASTM C150.
3. CONCRETE REPAIR MORTAR SHALL BE POLYMER MODIFIED PORTLAND CEMENT REPAIR MORTAR CONFORMING TO THE MANUFACTURER'S SPECIFICATIONS FOR SIKATOP 123 OR EQUAL. REPAIR MORTAR SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
4. UNLESS NOTED OTHERWISE, ALL MORTAR USED ON THE PROJECT SHALL BE TYPE S OR TYPE M MORTAR. CONTRACTOR SHALL SUBMIT PROPOSED MIX PROPORTIONS TO THE ENGINEER FOR REVIEW AND ACCEPTANCE BEFORE COMMENCING CONSTRUCTION.
5. ALL MORTAR INGREDIENTS SHALL BE MIXED FOR THREE TO FIVE MINUTES IN A MECHANICAL BATCH MIXER.
6. MORTAR SHALL BE RETEMPERED OR REMIXED, AS REQUIRED, TO MAINTAIN WORKABILITY. ANY MORTAR THAT HAS BEGUN TO STIFFEN OR HAS NOT BEEN USED WITHIN 2–1/2 HOURS AFTER MIXING SHALL BE DISCARDED.
7. CHLORIDE CONTAINING ADMIXTURES SHALL NOT BE USED IN THE MAKING OF MORTAR.
8. ALL MORTAR JOINTS FOR HOLLOW CMU UNITS SHALL BE AS FOLLOWS:
   A. ALL HEAD AND BED JOINTS SHALL BE 3/8" THICK; BED JOINT OVER FOUNDATION MAY VARY FROM 1/4" TO 3/4" IN THICKNESS.
   B. WEBS IN ALL COURSES OF PIERS, PILASTERS AND COLUMNS SHALL BE FULLY MORTARED.
   C. ALL COLLAR JOINTS, LESS THAN 3/4" IN THICKNESS, SHALL BE FILLED.
   D. HEAD JOINTS SHALL BE MORTARED FOR A DISTANCE EQUAL TO THE FACE SHELL THICKNESS OF THE UNIT, FROM EACH FACE OF THE UNIT.
9. ALL GROUT USED ON THE PROJECT SHALL CONFORM TO THE REQUIREMENTS OF ASTM C476.
10. GROUT SHALL BE PEA GRAVEL GROUT WITH A MINIMUM ULTIMATE COMPRESSIVE STRENGTH, F'c, OF 2,000 PSI AT 28 DAYS. MAXIMUM DENSITY OF GROUT TO BE 105 PCF. SLUMP AT POINT OF PLACEMENT TO BE 9" +/– 1". GROUT SHALL BE PLACED WITHIN 1–1/2 HOURS AFTER MIXING.
11. WHERE CMU CELLS ARE TO BE FILLED WITH GROUT, ALL MORTAR PROTRUSIONS GREATER THAN 1/2" SHALL BE REMOVED. DO NOT ALLOW MORTAR TO FALL TO BOTTOM OF WALL WHERE NO CLEANOUTS ARE PRESENT.

STRUCTURAL ANCHORING SYSTEMS:

1. UNLESS NOTED OTHERWISE ON THE CONTRACT DRAWINGS, THE CONTRACTOR MAY FURNISH AND INSTALL THE HILTI HIT HY–200 THREADED ROD ANCHORING SYSTEM (OR EQUIVALENT SYSTEM ACCEPTED BY THE ENGINEER). ANCHORS DEVELOPED IN MULTI–WYTHE BRICK AND HOLLOW STRUCTURAL CLAY TILE MASONRY SHALL BE INSTALLED USING HILTI HY20 RESIN SYSTEM WITH SCREEN TUBE DESIGNED FOR ANCHORAGE.
2. UNLESS NOTED OTHERWISE ON THE CONTRACT DRAWINGS, ALL ANCHORS IN CONCRETE SHALL BE HILTI HOT–DIPPED GALVANIZED OR STAINLESS STEEL KWIK BOLTS TZ2 (OR EQUIVALENT SYSTEM ACCEPTED BY THE ENGINEER). MINIMUM EMBEDMENT OF ANCHOR SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.
3. MINIMUM DEPTH OF DRILLED HOLE TO BE EMBEDMENT LENGTH PLUS DIAMETER OF ANCHOR.
4. ALL ANCHORS USED IN MASONRY WALLS SHALL BE HILTI HAS–E THREADED RODS WITH COMPATIBLE NUTS AND WASHERS FOR THREADED ROD ANCHORS. ANCHORING POINTS IN MASONRY WALLS SHALL BE GROUTED SOLID WHERE ACCESSIBLE. ANCHORS IN HOLLOW MASONRY SHALL BE SET USING THE HY20 SYSTEM WITH SCREEN TUBES.
5. CONCRETE SHALL DEVELOP A MINIMUM ULTIMATE COMPRESSIVE STRENGTH, AS VERIFIED BY COMPRESSION TESTS, OF 3,500 PSI PRIOR TO THE INSTALLATION OF ANY ANCHORING SYSTEM.
6. MASONRY GROUT SHALL DEVELOP A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 1500 PSI PRIOR TO THE INSTALLATION OF ANY ANCHORING SYSTEM.
7. INSTALLATION OF ANY ANCHORING SYSTEM USED SHALL BE AS PER THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
8. UNLESS NOTED OTHERWISE ON THE CONTRACT DRAWINGS, ALL ANCHORING SYSTEMS SHALL BE INSTALLED SUCH THAT THE MANUFACTURER'S WRITTEN MINIMUM SPACING AND EDGE DISTANCE REQUIREMENTS TO DEVELOP THE MAXIMUM LOAD CAPACITY OF THE ANCHOR ARE ADHERED TO.

REINFORCING DEVELOPMENT AND TENSION LAP SPLICE LENGTHS

BAR SIZE		LAP CLASS	CONC. COVER = 0.75 IN MIN SP.=1.5+db IN				CONC. COVER = 1 IN MIN SP.=2.0+db IN				CONC. COVER = 1.5 IN MIN SP.=3.0+db IN				CONC. COVER = 2 IN MIN SP.=4.0+db IN			
			GALVANIZED		EPOXY COATED		GALVANIZED		EPOXY COATED		GALVANIZED		EPOXY COATED		GALVANIZED		EPOXY COATED	
ENGL.	MET.		TOP	OTHERS	TOP	OTHERS	TOP	OTHERS	TOP	OTHERS	TOP	OTHERS	TOP	OTHERS	TOP	OTHERS	TOP	OTHERS
#3	10	A	12	12	15	13	12	12	15	13	12	12	14	12	12	12	14	12
		B	16	16	19	17	16	16	19	17	16	16	18	16	16	16	18	16
#4	13	A	19	15	24	22	15	12	20	17	15	12	18	14	15	12	18	14
		B	24	19	32	28	20	16	25	22	20	16	23	18	20	16	23	18
#5	16	A	28	21	36	32	22	17	29	26	19	15	24	22	19	15	22	17
		B	36	28	47	41	29	22	38	33	24	19	32	28	24	19	29	22
#6	19	A	37	29	49	43	31	24	40	35	22	17	29	26	22	17	29	26
		B	48	37	63	56	40	31	52	46	29	22	38	34	29	22	38	34
#7	22	A	60	46	78	69	50	38	65	57	37	28	48	42	33	25	43	38
		B	78	60	102	90	64	50	84	74	48	37	62	55	42	33	55	49
#8	25	A	74	57	97	86	62	48	81	71	47	36	61	54	37	29	49	43
		B	96	74	126	111	80	62	105	93	60	47	79	70	48	37	63	56
#9	29	A	90	69	117	104	76	58	99	87	57	44	75	66	46	36	60	53
		B	117	90	153	135	98	76	128	113	74	57	97	86	60	46	78	69
#10	32	A	108	83	141	125	92	70	120	106	70	54	92	81	57	44	74	66
		B	140	108	183	162	119	92	155	137	91	70	119	105	74	57	97	85
#11	36	A	127	98	166	146	108	83	141	125	84	64	109	97	68	53	89	79
		B	165	127	215	190	141	108	184	162	109	84	142	125	89	68	116	102

BAR LAP SPLICE NOTES:

1. TABULATED VALUES ARE BASED ON GRADE 60 REINFORCING AND NORMAL WEIGHT CONCRETE.
2. WHEN BAR SPACING CONTROLS LAP LENGTHS, BAR SPACING USED TO DETERMINE LAP SPLICE LENGTH SHALL BE GREATER THAN TWICE THE EQUIVALENT TABULAR CONCRETE COVER PLUS THE BAR DIAMETER.
3. TENSION DEVELOPMENT LENGTHS AND TENSION LAP SPLICE LENGTHS ARE CALCULATED PER THE ACI STANDARD 318–CURRENT EDITION.
4. LAP SPLICES SHALL BE USED FOR MINIMUM 28 DAY ULTIMATE COMPRESSIVE STRENGTH OF NORMAL WEIGHT CONCRETE 4,000 PSI AND ALL SPECIFIED PROJECT STRENGTHS UP TO 5,000 PSI.
5. WHERE LESS THAN HALF OF THE REINFORCING SHOWN IS LAP SPLICED AT ANY ONE LOCATION, A CLASS A SPLICE MAY BE USED. ALL SPLICES SHALL BE CONSIDERED CLASS B, UNLESS OTHERWISE NOTED.
6. MINIMUM STRAIGHT TENSION DEVELOPMENT LENGTH FOR REINFORCING CAST–IN–PLACE SHALL BE EQUAL TO OR GREATER THAN THE CLASS A LAP LENGTH, UNLESS OTHERWISE NOTED ON THE DETAILS.
7. TOP REINFORCING IS ANY HORIZONTAL REINFORCING WITH MORE THAN 12 INCHES OF CONCRETE BELOW THE BAR.
8. TABULAR LENGTHS ARE BASED ON A MINIMUM CENTER–TO–CENTER BAR SPACING OF TWICE THE CLEAR CONCRETE COVER PLUS ONE BAR DIAMETER.
9. FOR LIGHT WEIGHT AGGREGATE CONCRETE, MULTIPLY THE TABULATED VALUES BY 1.3.

TYPICAL COVER FOR REINFORCING BARS

REINFORCING CLEAR COVER SHALL BE A MINIMUM OF ONE BAR DIAMETER OR THE VALUES SHOWN BELOW, WHICHEVER IS GREATER, UNLESS SHOWN OTHERWISE.

FOUNDATION ELEMENTS:	
SURFACES CAST AGAINST SOIL (BOTTOM)	3"
AGAINST FORMED SURFACES (TOP AND SIDES)	2"
WALLS:	
SURFACES EXPOSED TO SOIL OR WEATHER	
#6 THROUGH #18 BARS	2"
#5 BAR, W31 OR D31 WIRE OR SMALLER	1 1/2"
SURFACES NOT EXPOSED TO SOIL OR WEATHER	
#14 AND #18 BARS	1 1/2"
#11 BAR OR SMALLER	3/4"
SLABS: (UNLESS NOTED OTHERWISE)	
SURFACES EXPOSED TO SOIL OR WEATHER	
#6 THROUGH #18 BARS	2"
#5 BAR, W31 OR D31 WIRE OR SMALLER	1 1/2"
SURFACES NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	
#14 AND #18 BARS	1 1/2"
#11 BAR OR SMALLER	3/4"
BEAMS: (CLEAR DISTANCE TO STIRRUPS)	
SURFACES EXPOSED TO SOIL OR WEATHER	
#6 THROUGH #18 BARS	2"
#5 BAR	1 1/2"
SURFACES NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	
ALL BARS	1 1/2"
COLUMNS: (CLEAR DISTANCE TO TIES)	
SURFACES EXPOSED TO SOIL OR WEATHER	
#6 THROUGH #18 BARS	2"
#5 BAR	1 1/2"
SURFACES NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	
ALL BARS	1 1/2"
OTHER SURFACES:	
SURFACES CAST AGAINST SOIL	3"
SURFACES EXPOSED TO SOIL OR WEATHER	
#6 THROUGH #18 BARS	2"
#5 BAR, W31 OR D31 WIRE OR SMALLER	1 1/2"
SURFACES NOT EXPOSED TO SOIL OR WEATHER	3/4" MIN.

COMPRESSION DOWEL EMBEDMENT AND LAP SPLICE LENGTHS

BAR SIZE		MINIMUM COMPRESSION LAP (INCHES)	MINIMUM DOWEL EMBEDMENT (INCHES)
NUMBER	METRIC		
#3	10	12"	9"
#4	13	15"	12"
#5	16	19"	14"
#6	19	23"	17"
#7	22	26"	20"
#8	25	30"	22"
#9	29	34"	25"
#10	32	38"	28"
#11	36	42"	31"
#14	43	–	38"
#18	57	–	50"

COMPRESSION DOWEL NOTES:

1. ALL REINFORCING TO CONFORM TO ASTM A615–GRADE 60.
2. TABULATED VALUES ARE BASED ON UNCOATED REINFORCING BARS. APPLICABLE FACTORS ARE REQUIRED FOR EPOXY COATED REINFORCING BARS.
3. MIN. 28 DAY ULTIMATE COMPRESSIVE STRENGTH OF NORMAL WEIGHT PROJECT CAST–IN PLACE CONCRETE – 4,000 PSI OR BETTER.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVIEWED
1	REVISED FOR RE-BID	04/02/2025	JS	MJM	MJM

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

GENERAL STRUCTURAL DESIGN NOTES (3 OF 4)

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28539000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	As Shown
DATE	October 2024
DRAWN BY	RT/JS/GT
DESIGNED BY	RT/JS/GT
CHECKED BY	MM
SHEET	119 of 139

REGISTER NO. 115.UN00213.P05
PLT NO.
DRAWING NUMBER S-3

PILE FOUNDATION NOTES

1. THESE NOTES APPLY TO ALL PROPOSED PILE FOUNDATIONS FOR THIS PROJECT. REFER TO DRAWINGS IN THIS SET FOR PILE LAYOUTS FOR EACH STRUCTURE.
2. SEE SECTION 502 OF THE PROJECT SPECIFICATION MANUAL AND OF THE 2019 NJDOT STANDARD SPECIFICATIONS FOR DETAILED PROJECT PILE FOUNDATION REQUIREMENTS. WHEREVER THERE IS A CONFLICT BETWEEN THE SPECIFICATION AND THESE DRAWINGS THE MORE STRINGENT REQUIREMENT SHALL BE APPLIED PENDING REVIEW WITH THE ENGINEER.
3. THE CONTRACTOR SHALL COORDINATE THE PILE INSTALLATION WITH THE DESIGN LAYOUT AND PREPARE A PILE NUMBERING AND LAYOUT SHOP DRAWING.
4. THE CONTRACTOR SHALL REVIEW THE LOCATION OF SUPPORT OF EXCAVATION PILES AND ADJUST PROPOSED PILE LOCATIONS, IF AND WHERE NECESSARY AND AS DIRECTED BY THE ENGINEER.
5. THE CONTRACTOR SHALL SUBMIT HIS DRIVING PROCEDURES AND EQUIPMENT DESCRIPTION PRIOR TO PILE TESTING AND CONSTRUCTION.
6. SUBSURFACE CONDITIONS HAVE BEEN INFERRED FROM SUBSURFACE EXPLORATIONS PERFORMED THROUGHOUT THE SITE AND SOIL BORINGS SHOULD BE REVIEWED ON A SITE-SPECIFIC BASIS. FOR THE PURPOSE OF DESIGN, IT HAS BEEN CONSIDERED THAT A FRAGMENTED SHALE LAYER OCCURS AT VARYING ELEVATIONS THROUGHOUT THE SITE AND THAT OVERLYING STRATA GENERALLY CONSIST OF CLAYEY SILT AND SAND LAYERS CONTAINING VARIABLE PROPORTIONS OF GRAVEL AND POTENTIAL COBBLES AND BOULDERS WHICH MAY OR MAY NOT HAVE BEEN DETECTED OR ENCOUNTERED IN THE TEST BORINGS. IT SHOULD BE ANTICIPATED THAT ACTUAL CONDITIONS WILL VARY. REQUIRED LENGTH OF PILES SHALL BE DETERMINED BY FIELD TESTING AS DESCRIBED IN NOTE 7.
7. BASE PILE LENGTHS VARY FOR THE PROPOSED STRUCTURES. THE BASE PILE LENGTHS HAVE BEEN ESTIMATED USING STATIC PILE BEARING EQUATION PROCEDURES AND ASSUME THAT PILES DRIVEN TO THE SERVICE LOAD DESIGN CAPACITIES WOULD PENETRATE INTO THE UNDERLYING EXISTING CLAYEY SILT OR SAND LAYERS OR TO THE FRAGMENTED SHALE LAYER IF APPLICABLE. ACTUAL DRIVEN LENGTHS ARE ANTICIPATED TO VARY AND WILL BE DETERMINED BY THE PILE DRIVING CRITERIA IN THE FIELD.
8. PILE CAPACITY AND TESTING
   - A. PILES SHALL BE DRIVEN TO BEAR WITHIN THE FRAGMENTED SHALE LAYER IF APPLICABLE. PILES SHALL BE DRIVEN TO DEVELOP THE MINIMUM GROSS SERVICE LOAD CAPACITIES AND THE MINIMUM ULTIMATE CAPACITIES AS INDICATED ON THE INDIVIDUAL PLAN SHEETS AS DETERMINED BY TEST PILE DRIVING AND TESTING WITH THE PILE DATA ANALYZER IN ACCORDANCE WITH ASTM D4945.
   - B. A MINIMUM OF 8 DYNAMIC PILE DRIVING TESTS SHALL BE PERFORMED THROUGHOUT THE SITE, UNLESS OTHERWISE NOTED. TEST PILES SHALL BE DRIVEN AT DESIGNATED PRODUCTION PILE LOCATIONS PRIOR TO COMMENCING PRODUCTION PILE DRIVING. TENTATIVE PDA TEST LOCATIONS ARE SHOWN ON THE CONTRACT DRAWINGS. FINAL TEST PILE LOCATIONS WILL BE DETERMINED BY REVIEW OF THE DRIVING SEQUENCE BY THE CONTRACTOR AND ENGINEER. TEST PILE DRIVING SHALL BE PERFORMED USING THE PILE DRIVING HAMMER, LEADS AND EQUIPMENT TO BE USED IN THE INSTALLATION OF PRODUCTION PILES.
   - C. DRIVING CRITERIA TO DEVELOP THE REQUIRED GROSS CAPACITY SHALL BE DETERMINED USING THE PILE DATA ANALYZER AND CAPWAP METHOD OR WAVE EQUATION IN ACCORDANCE WITH ASTM D4945.
   - D. STATIC PILE TESTING SHALL NOT BE PERFORMED EXCEPT IF AND WHERE ORDERED BY THE ENGINEER DUE TO CONDITIONS ENCOUNTERED IN THE DRIVING OF THE PILES.
9. PILE MATERIALS
   - A. FOUNDATION PILES FOR BRIDGE "F" PIERS SHALL BE STEEL H-PILES.
   - B. PILES FOR THE DPW COMBINATION WALL SHALL BE W 30 X 211 STEEL PILES.
   - C. PILES FOR THE BOARDWALKS AND PIERS SHALL BE 12" DIAMETER TIMBER PILES.
   - D. REFER TO PROJECT SPECIFICATIONS AND INDIVIDUAL PLAN SHEETS FOR MORE INFORMATION.
10. PILE INSTALLATION PROCEDURES
    - A. PRECONSTRUCTION SURVEYS OF STRUCTURES ADJACENT TO THE PILE DRIVING AND PREPARATION FOR VIBRATION AND SETTLEMENT MONITORING SHALL BE ESTABLISHED BEFORE DRIVING PILE FOUNDATIONS. SEE SPECIFICATION SECTION 162 FOR MORE INFORMATION.
    - B. PROVIDE DRIVING TEMPLATES AS REQUIRED FOR INSTALLATION OF COMBINATION SHEET PILE WHERE INDICATED ON THE DRAWINGS.
    - C. PILE DRIVING SHALL BE INSPECTED BY THE ENGINEER. THE CONTRACTOR SHALL MAINTAIN RECORDS OF THE DRIVEN PILING IN ADDITION TO RECORDS MADE BY THE ENGINEER.
    - D. PILES SHALL BE DRIVEN USING SINGLE OR DOUBLE ACTING STEAM OR AIR HAMMERS, DIESEL IMPACT HAMMERS, OR HYDRAULIC HAMMERS MOUNTED IN RIGID LEADS. HAMMER ENERGIES SHALL RANGE BETWEEN A MINIMUM OF 24,000 FOOT POUNDS AND 32,000 FOOT POUNDS PER BLOW FOR STEEL PILES AND BETWEEN A MINIMUM OF 10,000 FOOT POUNDS AND 15,000 FOOT POUNDS PER BLOW FOR TIMBER PILES, OR AS REQUIRED BY DESIGN.
    - E. PILE CAPACITIES SHALL BE DETERMINED IN THE FIELD BASED ON THE DRIVING CRITERIA ESTABLISHED BY DYNAMIC PILE TESTING IN ACCORDANCE WITH ASTM D4945.
    - F. PILE DRIVING CONTROL SHALL CONSIDER THAT TOLERANCES SHALL BE A MAXIMUM DEVIATION OF 6 INCHES FROM PLAN LOCATION AND 2 PERCENT FROM PLUMB UNLESS TIGHTER TOLERANCES ARE NOTED OTHERWISE.
    - G. DRIVEN PILES SHALL BE INSPECTED FOR DAMAGE AND SWEEP PRIOR TO PLACEMENT OF CONCRETE. DAMAGED PILES SHALL BE REJECTED AS PROVIDED IN THE SPECIFICATIONS.
    - H. THE NEED FOR PRE-AUGERING FOR TIMBER PILING SHOULD BE REVIEWED ON A LOCATION TO LOCATION BASIS. REFER TO THE NOTES ON THE FISHING PIER DRAWINGS FOR MORE INFORMATION.
    - I. REINFORCED PILE TIPS ARE NOT ANTICIPATED. HOWEVER, REINFORCED PILE TIPS MAY BE UTILIZED BY THE CONTRACTOR AT THEIR OWN DISCRETION AT NO ADDITIONAL COST TO THE OWNER.

TENTATIVE PILE DRIVING CRITERIA (STEEL PILES)

HAMMER ENERGY (FT.– LBS.)	TENTATIVE DRIVING RESISTANCE (NOTE) (BLOWS/FT.)	REFUSAL
24000	48	5 blows per 1/4"
32000	36	5 blows per 1/4"

TENTATIVE PILE DRIVING CRITERIA (TIMBER PILES)

HAMMER ENERGY (FT.– LBS.)	TENTATIVE DRIVING RESISTANCE (NOTE) (BLOWS/FT.)	REFUSAL
10000	48	2 blows per 1/4"
15000	25	2 blows per 3/8"

NOTE: THE TENTATIVE DRIVING CRITERIA IS PRESENTED TO INDICATE THE RANGE OF DRIVING CRITERIA CONSIDERED IN THE DESIGN, AND ARE NOT FOR CONSTRUCTION. INITIAL DRIVING CRITERIA SHALL BE DETERMINED BY THE PILE DRIVING ANALYSIS SPECIALIST AND MODIFIED AS REQUIRED BY HIGH STRAIN DYNAMIC TESTING OF TEST PILES AND ANALYSIS BY THE CAPWAP EQUATION AS OUTLINED BY THE SPECIFICATIONS.

GENERAL PEDESTRIAN BRIDGE DESIGN NOTES:

1. DESIGN SPECIFICATIONS:
   - a. 2020 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION, AS MODIFIED BY SECTION 3 OF THE 2016 NJDOT DESIGN MANUAL FOR BRIDGES AND STRUCTURES, 6TH EDITION.
   - b. AASHTO LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES, 2009 (WITH 2015 REVISIONS)
2. CONSTRUCTION SPECIFICATIONS:
   - a. 2019 NJDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AND ALL AMENDMENTS, AS MODIFIED BY THE SPECIAL PROVISIONS AND THE OWNER'S SUPPLEMENTARY SPECIFICATIONS, IF APPLICABLE.
3. LIVE LOAD:
   - a. PREFABRICATED PEDESTRIAN BRIDGES: 90 PSF UNIFORM PEDESTRIAN LIVE LOAD
     10,000 LB AASHTO LRFD H5 VEHICULAR LIVE LOAD
4. SEISMIC DESIGN NOTES:
   - (1) SEISMIC PERFORMANCE ZONE I
   - (2) BRIDGE OPERATIONAL CATEGORY: OTHER BRIDGE
   - (3) PEAK GROUND ACCELERATION (PGA) = 0.096 x g
   - (4) SPECTRAL ACCELERATION COEFFICIENTS
     SHORT PERIOD (0.2 SEC) ACCELERATION COEFFICIENT (Ss) = 0.178 x g
     1 SECOND PERIOD ACCELERATION COEFFICIENT (S1) = 0.037 x g
   - (5) SITE CLASSIFICATION: "D" STIFF SOIL PROFILE
     Fpga = 1.6 As = Fpga x PGA = 0.153 x g
     Fa = 1.6 Sds = Fa x Ss = 0.284 x g
     Fv = 2.400 Sd1 = Fv x S1 = 0.089 x g
5. CONCRETE DESIGN STRESSES:
   - a. IN ACCORDANCE WITH SECTION 27.1 OF THE NJDOT DESIGN MANUAL FOR BRIDGES AND STRUCTURES, 6TH EDITION, THE CONCRETE CLASSES ARE DEFINED AS FOLLOWS:
     - (1) CLASS A ..... CIP APPROACH SLABS
     - (2) CLASS B ..... CIP ABUTMENTS, WINGWALLS, FOOTINGS
     - (3) CLASS HPC-1 ..... CIP DECKS, SIDEWALKS, CONCRETE PATCH, PARAPETS, CURBS AND PYLONS
     - (4) CLASS P ..... PRECAST BEAMS AND CULVERTS
   - b. IN ACCORDANCE WITH TABLES 903.03.06-3, 903.05.02-1 AND 903.05.04-1 OF THE 2019 NJDOT STANDARD SPECIFICATIONS, THE FOLLOWING ARE THE SPECIFIED MINIMUM COMPRESSIVE STRENGTHS REQUIRED FOR CAST-IN-PLACE (CIP) AND PRECAST CONCRETE ($f'c$):
     - (1) CLASS DESIGN STRENGTHS:
       CLASS A ..... 4,600 PSI
       CLASS B ..... 3,700 PSI
       CLASS HPC-1 ..... 4,400 PSI
       CLASS P ..... 5,500 PSI
     - (2) VERIFICATION STRENGTHS:
       CLASS A ..... 5,400 PSI
       CLASS B ..... 4,500 PSI
       CLASS HPC-1 ..... 5,400 PSI
       CLASS P ..... 6,000 PSI
     - (3) ALLOWABLE STRESS, EXTREME FIBER IN COMPRESSION (fc):
       CLASS A ..... 1,600 PSI
       CLASS B ..... 1,200 PSI
       CLASS HPC-1 ..... 1,600 PSI
       CLASS P ..... 2,000 PSI
7. REINFORCEMENT STEEL:
   - a. ASTM A615 (GRADE 60), fy = 60,000 PSI, fs = 24,000 PSI
   - b. ALL REINFORCING STEEL BARS, DOWELS, WELDED WIRE FABRIC AND/OR SUPPORT CHAIRS TO BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A767. ELECTRO PLATED GALVANIZING IS NOT ACCEPTABLE AND WILL BE REJECTED.
   - c. BRICKS OR OTHER MASONRY SUPPORTS FOR THE REBAR MATS WILL NOT BE PERMITTED.
   - d. SHOP DRAWINGS SHOWING REINFORCEMENT DETAILS, CONNECTION HARDWARE, ELEVATIONS, PLANS, DETAILING, ETC. SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
8. BORINGS:

⊕ – INDICATES APPROXIMATE LOCATION OF THE PROJECT BORINGS.

9. ELEVATION DATUM:
   - a. NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 1988)
   - b. SEE EXISTING CONDITIONS PLANS FOR DATUM CONVERSION INFORMATION.
10. STRUCTURAL STEEL
    - a. STRUCTURAL STEEL SHALL CONFORM TO AASHTO M270, GRADE 50 (ASTM A 709, GRADE 50) DESIGNATION, EXCEPT WHERE NOTED OTHERWISE.
    - b. STEEL SHEET PILING SHALL CONFORM TO ASTM A572 GRADE 50.
    - c. ANCHOR RODS FOR PREFABRICATED PEDESTRIAN BRIDGES SHALL CONFORM TO ASTM F1554, GRADE 105.
11. FOUNDATION DESIGN CRITERIA:
    - a. ABUTMENTS, WINGWALLS AND/OR CULVERTS: FOUNDATIONS SHALL BE SUPPORTED ON SPREAD FOOTINGS. MAXIMUM ALLOWABLE BEARING CAPACITY = 4000 PSF (AT THE DEPTHS INDICATED ON THE DRAWINGS).
    - b. FRICTION COEFFICIENT FOR SLIDING = 0.60 AND SOIL FRICTION ANGLE (Ø) = 32°.
    - c. LOADS
      - (1) UNIT WEIGHT OF SOIL ..... 125 PCF
      - (2) UNIT WEIGHT OF CONCRETE ..... 150 PCF

PEDESTRIAN BRIDGE "A" (45 FT SPAN)

Bearing Reactions	P (lb)	T (lb)	L_T (lb)	L_S (lb)
Dead (DC)	3500			
Dead (DW) (0 psf)	0			
Live (PL) (90 psf)	10200			
Vehicle (LL) (H5)	4700			
Wind (WS) (140 mph)	+/-2100	8000		
Overturning (WS_{VW}) (20 psf)	-3400			
Overturning (WS_{VL}) (20 psf)	-1200			
Stream (WA) (0 fps)	+/-0	0		
Snow (SL) (0 psf)	0			
Thermal (TU) (35% of DL)			1300	
Seismic (EQ)	TBD	TBD		TBD

PEDESTRIAN BRIDGES "B" AND "C" (30 FT SPAN)

Bearing Reactions	P (lb)	T (lb)	L_T (lb)	L_S (lb)
Dead (DC)	2300			
Dead (DW) (0 psf)	0			
Live (PL) (90 psf)	6800			
Vehicle (LL) (H5)	4600			
Wind (WS) (140 mph)	+/-1400	5300		
Overturning (WS_{VW}) (20 psf)	-2300			
Overturning (WS_{VL}) (20 psf)	-800			
Stream (WA) (0 fps)	+/-0	0		
Snow (SL) (0 psf)	0			
Thermal (TU) (35% of DL)			900	
Seismic (EQ)	TBD	TBD		TBD

PEDESTRIAN BRIDGE "E" (195 FT SPAN)

Bearing Reactions	P (lb)	T (lb)	L_T (lb)	L_S (lb)
Dead (DC)	32400			
Dead (DW) (0 psf)	0			
Live (PL) (90 psf)	43875			
Vehicle (LL) (H5)	5000			
Wind (WS) (140 mph)	+/- 25460	55900		
Overturning (WS_{VW}) (20 psf)	-14200			
Overturning (WS_{VL}) (20 psf)	-5310			
Stream (WA) (0 fps)	+/-0	0		
Snow (SL) (0 psf)	0			
Thermal (TU) (14% of DL)			4540	
Seismic (EQ)	TBD	TBD		TBD

PEDESTRIAN BRIDGE REACTIONS

Notes:

h_b is Backwall height, h_s is step height to TOD

P - Vertical Load each Bearing

T - Transverse Load each Abutment

L_T - Longitudinal Thermal Load Each Bearing (4 Per Bridge)

L_S - Longitudinal Seismic Load Each Fixed Bearing (2 Per Bridge)

WS_{VW} - Overturning on Windward Truss

WS_{VL} - Overturning on Leeward Truss

All Bearing Reactions are unfactored.

Seismic Bearing Reactions include an R of 1.0

ITEM NUMBER	TO BE CONSTRUCTED	PLAN QUANTITY	UNIT
18	VIBRATION MONITORING	1	LS
40	PERMANENT SHEETING, DPW WALL	7800	SF
41	FURNISHING EQUIPMENT FOR DRIVING PILES, DPW WALL	1	LS
43	FURNISHING EQUIPMENT FOR DRIVING PILES, KAYAK STORAGE PIER	1	LS
44	TEST PILE, FURNISHED, STEEL PILE, W 30 X 211	100	LF
45	TEST PILE, FURNISHED, TIMBER PILE, 12" DIAMETER	50	LF
46	TEST PILE, FURNISHED, STEEL H-PILE, HP 10 X 42	150	LF
47	TEST PILE, DRIVEN, STEEL PILE, W 30 X 211	100	LF
48	TEST PILE, DRIVEN, TIMBER PILE, 12" DIAMETER	50	LF
49	TEST PILE, DRIVEN, STEEL H-PILE, HP 10 X 42	150	LF
50	DYNAMIC PILE LOAD TEST	6	UNIT
51	STEEL PILE, FURNISHED, W 30 X 211, DPW WALL	3120	LF
52	STEEL PILE, DRIVEN, W 30 X 211, DPW WALL	3120	LF
54	TIMBER PILE, FURNISHED, 12" DIAMETER, KAYAK STORAGE PIER	1000	LF
56	TIMBER PILE, DRIVEN, 12" DIAMETER, KAYAK STORAGE PIER	1000	LF
57	CONSTRUCT REINFORCED CONCRETE BRIDGE FOUNDATION "A", INCLUDING COFFERDAMS, EXCAVATION, STONE BASE, REINFORCEMENT STEEL, CONCRETE FOOTINGS, ABUTMENTS, WINGWALLS, BACKFILL AND RAILINGS	1	LS
58	FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE "A"	1	LS
59	CONSTRUCT REINFORCED CONCRETE BRIDGE FOUNDATION "B", INCLUDING COFFERDAMS, EXCAVATION, STONE BASE, REINFORCEMENT STEEL, CONCRETE FOOTINGS, ABUTMENTS, WINGWALLS, BACKFILL AND RAILINGS	1	LS
60	FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE "B"	1	LS
61	CONSTRUCT REINFORCED CONCRETE BRIDGE FOUNDATION "C", INCLUDING COFFERDAMS, EXCAVATION, STONE BASE, REINFORCEMENT STEEL, CONCRETE FOOTINGS, ABUTMENTS, WINGWALLS, BACKFILL AND RAILINGS	1	LS
62	FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE "C"	1	LS
63	EXCAVATION, UNCLASSIFIED, BRIDGE "E"	1220	CY
64	I-9 SOIL AGGREGATE, BRIDGE "E"	1020	CY
65	COARSE AGGREGATE, SIZE NO. 57, BRIDGE "E"	80	CY
66	TEMPORARY COFFERDAM, BRIDGE "E"	1	LS
67	REINFORCEMENT STEEL, GALVANIZED, BRIDGE "E"	43000	LB
68	CONCRETE FOOTING, BRIDGE "E"	180	CY
69	CONCRETE WINGWALL, BRIDGE "E"	100	CY
70	CONCRETE ABUTMENT WALL, BRIDGE "E"	50	CY
71	FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE "E"	1	LS
72	EXCAVATION, UNCLASSIFIED, BRIDGE "F"	1930	CY
73	I-9 SOIL AGGREGATE, BRIDGE "F"	850	CY
74	COARSE AGGREGATE, SIZE NO. 57, BRIDGE "F"	100	CY
75	TEMPORARY COFFERDAM, BRIDGE "F"	1	LS
76	FURNISHING EQUIPMENT FOR DRIVING PILES, BRIDGE "F"	1	LS
77	STEEL H-PILE, FURNISHED, HP 10 X 42, BRIDGE "F"	3750	LF
78	STEEL H-PILE, DRIVEN, HP 10 X 42, BRIDGE "F"	3750	LF
79	REINFORCEMENT STEEL, GALVANIZED, BRIDGE "F"	140000	LB
80	CONCRETE FOOTING, BRIDGE "F"	340	CY
81	CONCRETE WINGWALL WITH STONE FORMLINERS, BRIDGE "F"	70	CY
82	CONCRETE ABUTMENT WALL WITH STONE FORMLINERS, BRIDGE "F"	60	CY
83	CONCRETE PIER WALL WITH STONE FORMLINERS, BRIDGE "F"	250	CY
84	FURNISH AND INSTALL STEEL TRUSS PEDESTRIAN BRIDGE "F"	1	LS
85	CONSTRUCT REINFORCED CONCRETE FOOTINGS, WALLS AND BEAMS FOR BOARDWALKS AT BOAT RAMPS, INCLUDING SUPPORT OF EXCAVATION, EXCAVATION, STONE BASE, REINFORCEMENT STEEL AND BACKFILL	33	CY
87	CONSTRUCT BOARDWALKS FOR BOAT RAMPS	400	SF
90	CONSTRUCT KAYAK STORAGE PIER	870	SF
289	STATIC PILE LOAD TEST	2	UNIT

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2	REVISED FOR RE-BID	04/02/2025	JS		
1	REVISED FOR RESUBMISSION	01/10/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

GENERAL STRUCTURAL DESIGN NOTES (4 OF 4)

CME ASSOCIATES
(732) 727 8000 CONSULTING AND MUNICIPAL ENGINEERS (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28159000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

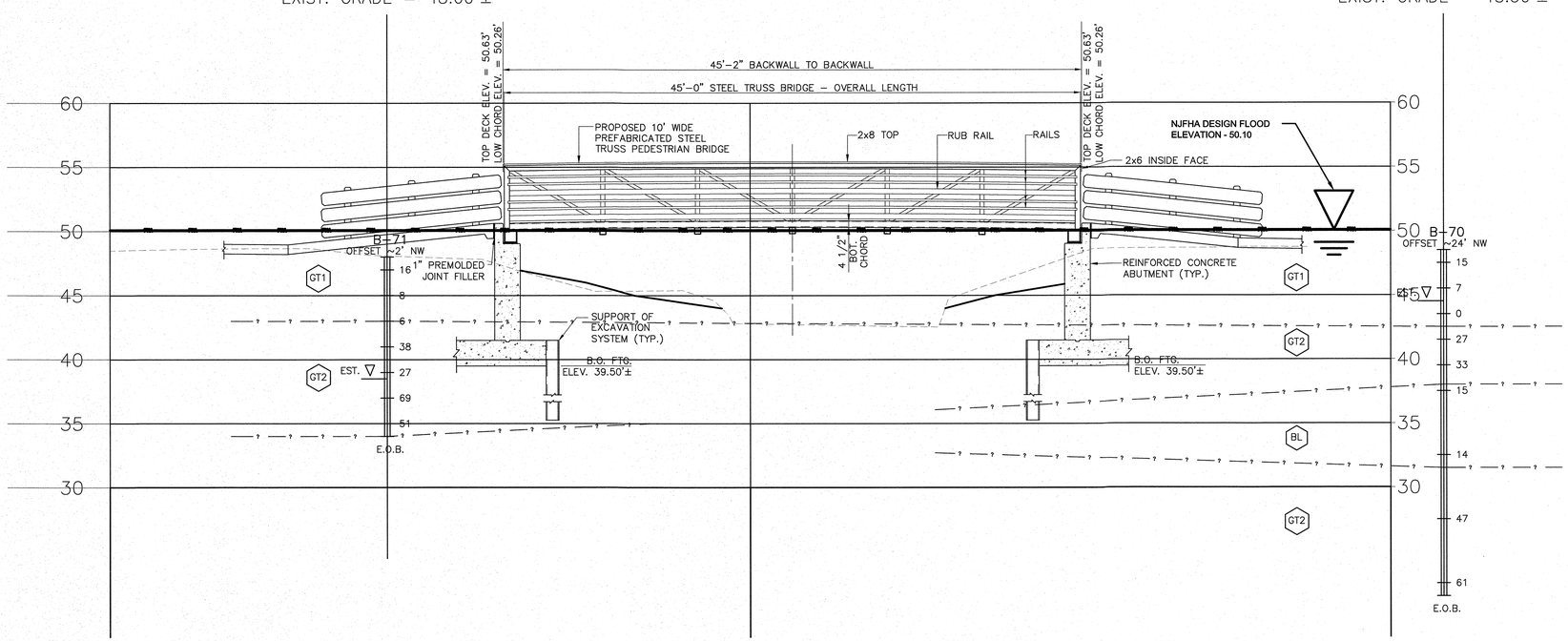
SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	S-4
DRAWN BY: RTJS	DESIGNED BY: RTJS	
CHECKED BY: NH	SHEET: 120 of 139	

REGISTER NO. 115.UN00213.P05



PEDESTRIAN BRIDGE "A" PLAN VIEW

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



PEDESTRIAN BRIDGE "A" PROFILE

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

GENERALIZED STRATA DESCRIPTIONS

GT1 — GLACIAL TILL
STRATUM COMPOSED OF SOFT TO MEDIUM STIFF CLAYEY SILT. THE PENETRATION RESISTANCE TEST RESULTS RANGED FROM 0 TO 16 BLOWS PER FOOT IN THE BORINGS.

GT2 — GLACIAL TILL
STRATUM COMPOSED OF STIFF TO VERY STIFF GRAVELLY SILT. THE PENETRATION RESISTANCE TEST RESULTS RANGED FROM 27 TO 69 BLOWS PER FOOT IN THE BORINGS.

BL — BULL'S LIVER (GLACIAL SEDIMENT)
STRATUM COMPOSED OF STIFF TO VERY STIFF CLAYEY SILT. THE PENETRATION RESISTANCE N VALUE IS APPROX. 14 BLOWS PER FOOT WITHIN THE LAYER.

LEGEND:

- B-2 — BORING NUMBER
- EXISTING GRADE AT BORING
- PROPOSED GRADE ON PROFILE
- EXISTING GRADE ON PROFILE
- STRATUM CHANGE
- GROUND WATER LEVEL AT DATE & TIME OF BORING
- 15 — RESULT OF STANDARD PENETRATION TEST IN BLOWS PER FOOT
- ROCK CORE SAMPLE
- END OF TEST BORING

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	APPROVED
1	REVISED FOR RE-BID	04/02/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

PEDESTRIAN BRIDGE "A" PLAN, PROFILE AND SUBSURFACE PROFILE

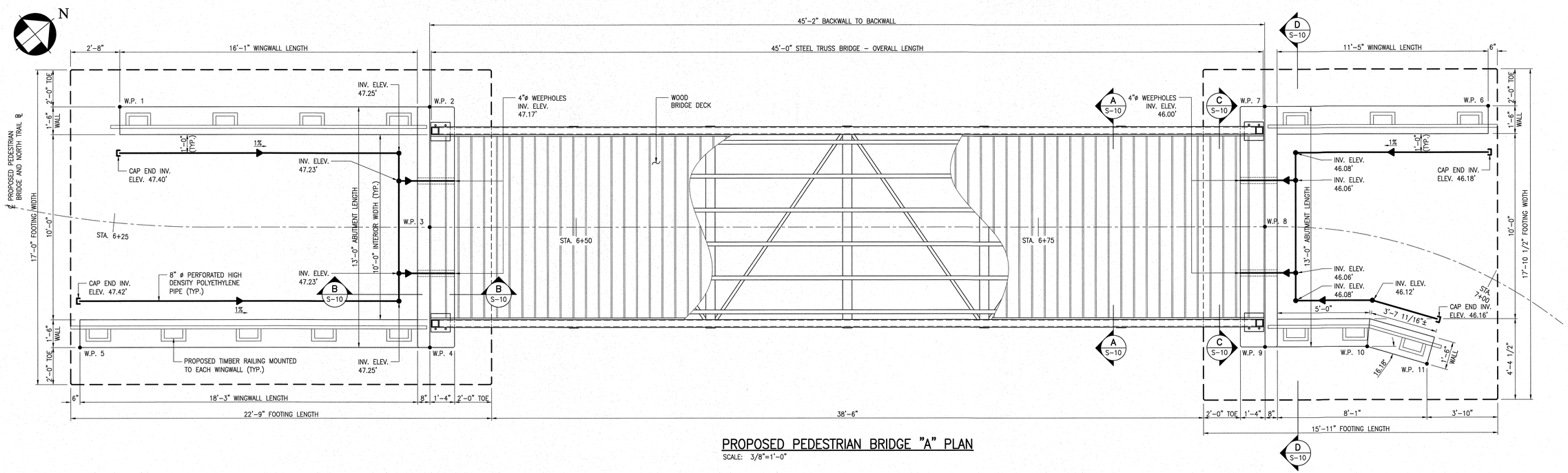
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY	DESIGNED BY
JS / AM	JS / RT
CHECKED BY	SHEET
NH	121 of 139

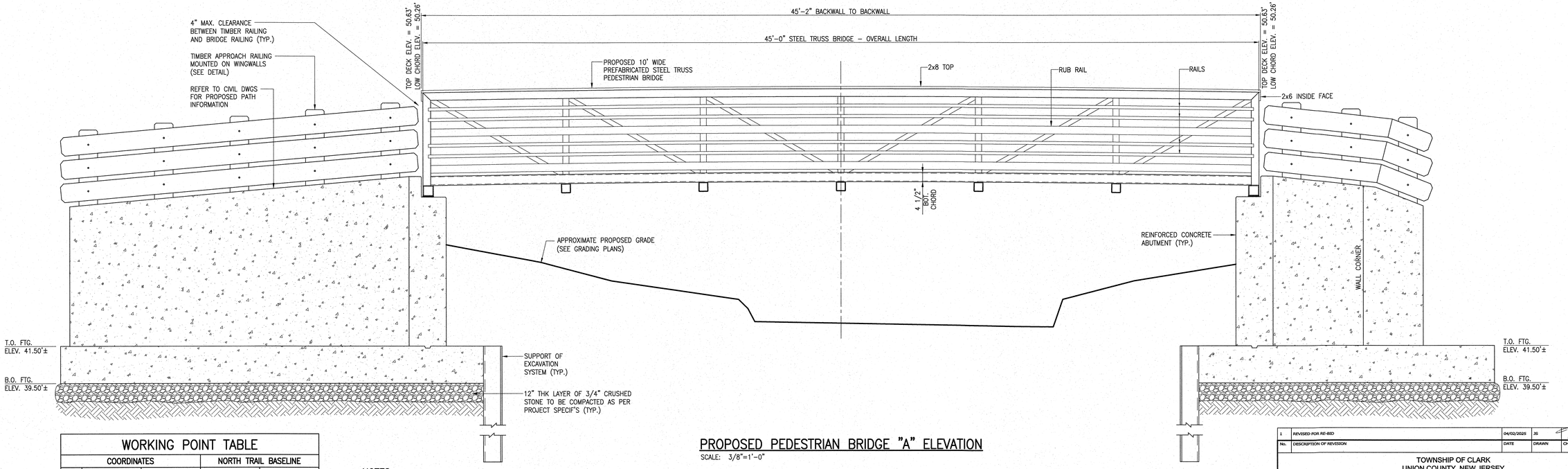
REGISTER NO.
FILE NO. 115.UN00213.P05

DRAWING NUMBER
S-5



PROPOSED PEDESTRIAN BRIDGE "A" PLAN

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



PROPOSED PEDESTRIAN BRIDGE "A" ELEVATION

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

WORKING POINT TABLE

COORDINATES			NORTH TRAIL BASELINE	
W.P.	NORTH	EAST	STATION	OFFSET
1	651,366.3256	542,424,.4037	6+24.66	6.25' L
2	651,379.4891	542,434.7616	6+42.09	6.50' L
3	651,375.4696	542,439.8698	6+42.09	0.00'
4	651,371.4502	542,444.9780	6+42.09	6.50' R
5	651,356.5839	542,433.2803	6+23.98	6.91' R
6	651,424.4807	542,470.1639	6+96.63	8.49' L
7	651,414.9846	542,462.6918	6+87.25	6.50' L
8	651,410.9651	542,467.8000	6+87.25	0.00'
9	651,406.9457	542,472.9082	6+87.25	6.50' R
10	651,411.2873	542,476.3245	6+94.32	5.89' R
11	651,413.2433	542,479.0539	6+98.69	5.69' R

NOTES:

1. THE PREFABRICATED PEDESTRIAN BRIDGE SHOWN ON THIS DRAWING SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER, CURRENTLY REGISTERED IN THE STATE OF NEW JERSEY, RETAINED BY THE CONTRACTOR AND EMPLOYED BY A QUALIFIED BRIDGE MANUFACTURER. ALL CALCULATIONS, SHOP DRAWINGS AND/OR CATALOG CUTS SHALL BE SUBMITTED TO THE OWNER'S ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND CONSTRUCTION. REFER TO SPECIFICATION SECTION 515 – PREFABRICATED PEDESTRIAN BRIDGES FOR MORE INFORMATION.
2. ALL REINFORCING STEEL BARS AND DOWELS SHALL BE ASTM A615 (GRADE 60).
3. ALL REINFORCING STEEL BARS AND DOWELS SHALL BE HOT–DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A 767. ELECTRO PLATED GALVANIZING IS NOT ACCEPTABLE AND WILL BE REJECTED.
4. ALLOWABLE SOIL BEARING CAPACITY = 4000 PSF.
5. FOR STRUCTURAL GENERAL NOTES, SEE DRAWING NOS. S–1, S–2 AND S–3.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVIEWED
1	REVISED FOR RE-BID	04/02/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

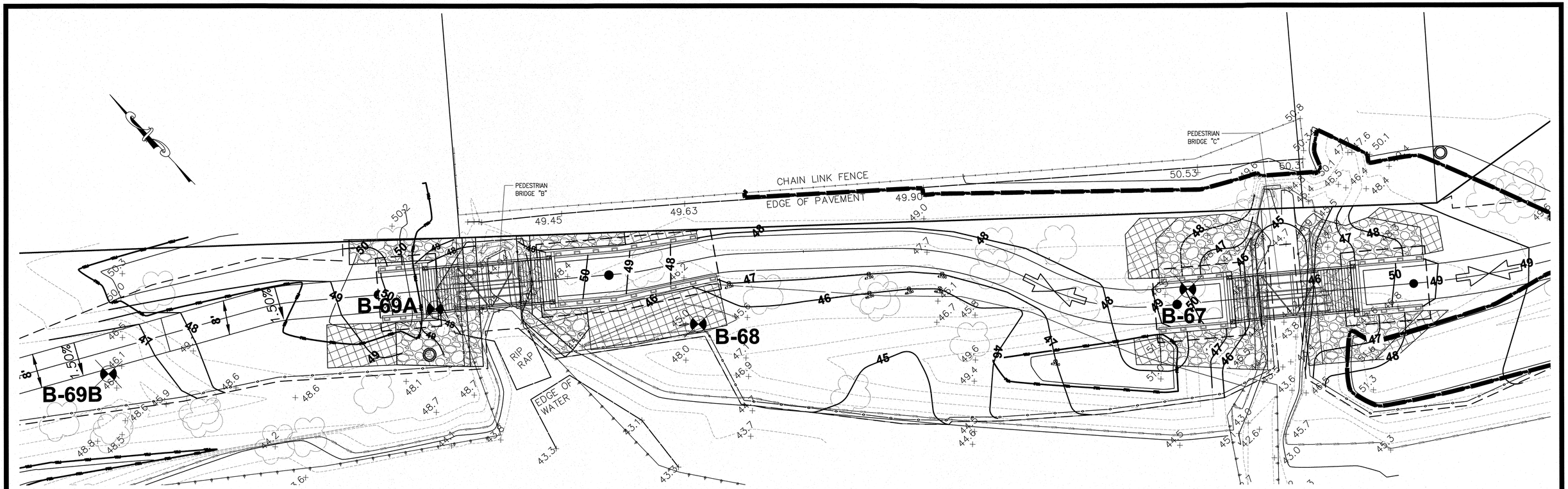
PEDESTRIAN BRIDGE "A" PLAN AND ELEVATION

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28059000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

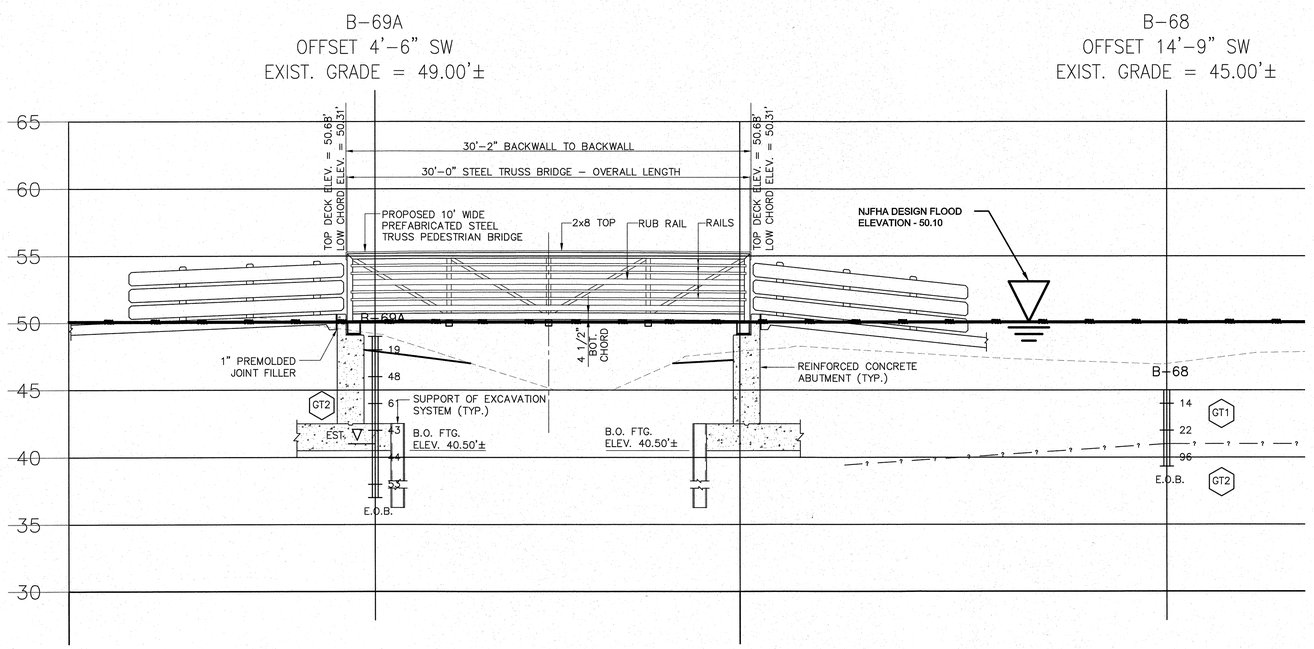
SCALE	As Shown
DATE	October 2024
DRAWN BY	JS / JN
DESIGNED BY	JS / RT / JN
CHECKED BY	NH
SHEET	122 of 139
DRAWING NUMBER	S-6

REGISTER NO.
FILE NO. 115.UN00213.P05



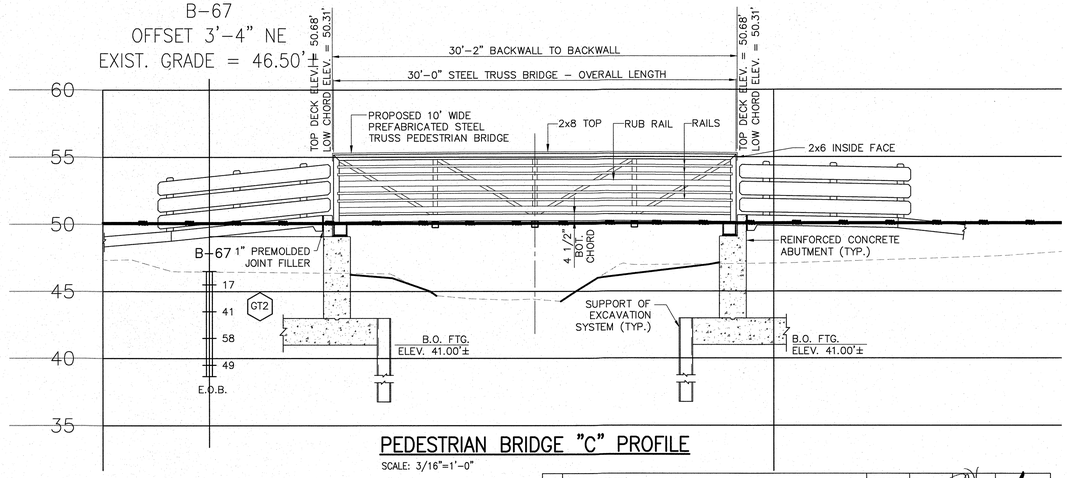
PEDESTRIAN BRIDGES "B" AND "C" PLAN VIEW

SCALE: 3/32"=1'-0"



PEDESTRIAN BRIDGE "B" PROFILE

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



PEDESTRIAN BRIDGE "C" PROFILE

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

GENERALIZED STRATA DESCRIPTIONS

GT1 GLACIAL TILL
STRATUM COMPOSED OF SOFT TO MEDIUM STIFF CLAYEY SILT. THE PENETRATION RESISTANCE TEST RESULTS RANGED FROM 14 TO 22 BLOWS PER FOOT IN THE BORINGS.

GT2 GLACIAL TILL
STRATUM COMPOSED OF STIFF TO VERY STIFF GRAVELLY SILT. THE PENETRATION RESISTANCE TEST RESULTS RANGED FROM 17 TO 96 BLOWS PER FOOT IN THE BORINGS.

LEGEND:

- B-2 BORING NUMBER
- EXISTING GRADE AT BORING
- PROPOSED GRADE ON PROFILE
- EXISTING GRADE ON PROFILE
- STRATUM CHANGE
- GROUND WATER LEVEL AT DATE & TIME OF BORING
- 15 RESULT OF STANDARD PENETRATION TEST IN BLOWS PER FOOT
- ROCK CORE SAMPLE
- END OF TEST BORING

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2	REVISED FOR RE-BID	04/02/2025	JS		
1	REVISED FOR RESUBMISSION	01/10/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

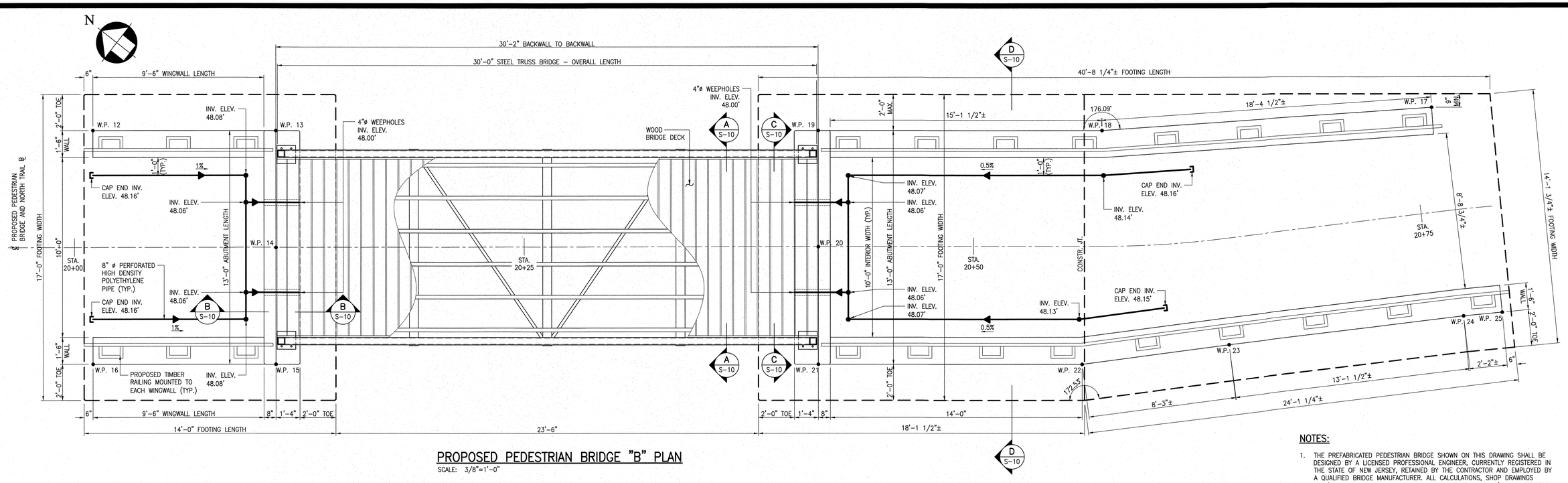
CLARK RESERVOIR IMPROVEMENTS

PEDESTRIAN BRIDGES "B" AND "C" PLANS, PROFILES AND SUBSURFACE PROFILES

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

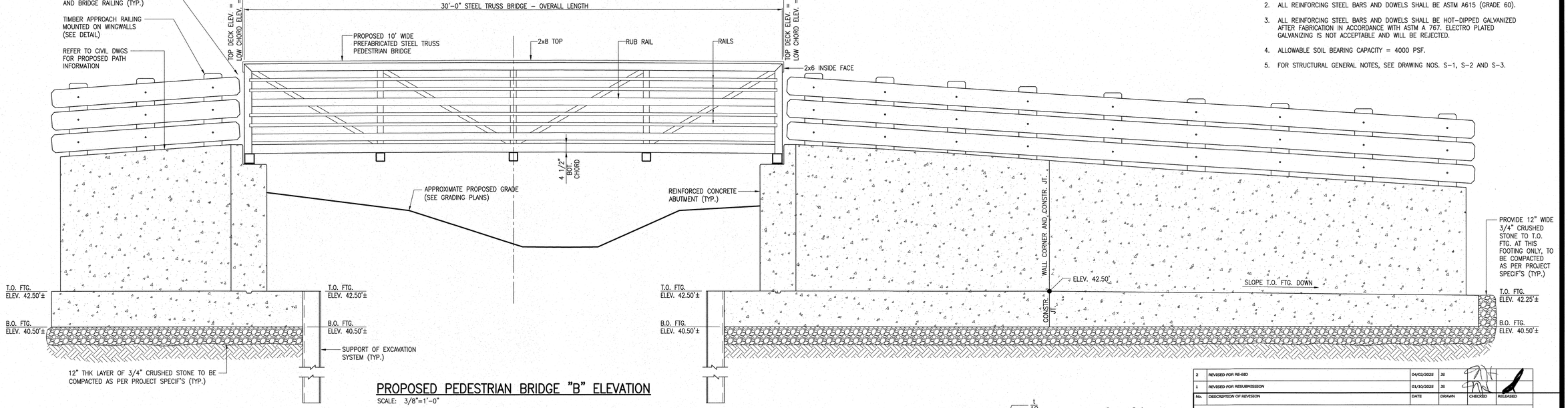
SCALE	As Shown
DATE	October 2024
DRAWN BY	JS / AM
DESIGNED BY	JS / RT
CHECKED BY	NH
SHEET	123 of 139
DRAWING NUMBER	S-7

REGISTER NO.
FILE NO. 115.UN00213.P05



PROPOSED PEDESTRIAN BRIDGE "B" PLAN

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



PROPOSED PEDESTRIAN BRIDGE "B" ELEVATION

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

NOTES:

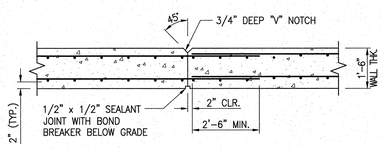
1. THE PREFABRICATED PEDESTRIAN BRIDGE SHOWN ON THIS DRAWING SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER, CURRENTLY REGISTERED IN THE STATE OF NEW JERSEY, RETAINED BY THE CONTRACTOR AND EMPLOYED BY A QUALIFIED BRIDGE MANUFACTURER. ALL CALCULATIONS, SHOP DRAWINGS AND/OR CATALOG CUTS SHALL BE SUBMITTED TO THE OWNER'S ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND CONSTRUCTION. REFER TO SPECIFICATION SECTION 515 – PREFABRICATED PEDESTRIAN BRIDGES FOR MORE INFORMATION.
2. ALL REINFORCING STEEL BARS AND DOWELS SHALL BE ASTM A615 (GRADE 60).
3. ALL REINFORCING STEEL BARS AND DOWELS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A 767. ELECTRO PLATED GALVANIZING IS NOT ACCEPTABLE AND WILL BE REJECTED.
4. ALLOWABLE SOIL BEARING CAPACITY = 4000 PSF.
5. FOR STRUCTURAL GENERAL NOTES, SEE DRAWING NOS. S-1, S-2 AND S-3.

WORKING POINT TABLE

COORDINATES			NORTH TRAIL BASELINE	
W.P.	NORTH	EAST	STATION	OFFSET
12	651,295.9607	543,635.4739	20+01.04	6.50' L
13	651,289.6414	543,643.4381	20+11.20	6.50' L
14	651,284.5496	543,639.3979	20+11.20	0.00'
15	651,279.4578	543,635.3577	20+11.20	6.50' R
16	651,285.7766	543,627.3932	20+01.04	6.50' R
17	651,250.6648	543,694.5788	20+76.31	5.90' L
18	651,261.0811	543,679.4325	20+57.15	6.50' L

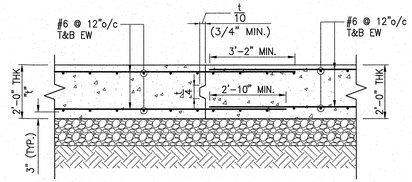
WORKING POINT TABLE

COORDINATES			NORTH TRAIL BASELINE	
W.P.	NORTH	EAST	STATION	OFFSET
19	651,270.8908	543,667.0694	20+41.37	6.50' L
20	651,265.7989	543,663.0292	20+41.37	0.00'
21	651,260.7071	543,658.9891	20+41.37	6.50' R
22	651,251.5908	543,670.4783	20+56.04	6.50' R
23	651,247.3478	543,677.5504	20+63.53	5.83' R
24	651,240.4789	543,688.7493	20+76.67	5.83' R
25	651,239.3064	543,690.5614	20+79.11	5.83' R



BRIDGE "B" WALL CONSTRUCTION JOINT DETAIL (PLAN)

SCALE: 3/8"=1'-0" 30'-0" o/c MAX.



BRIDGE "B" FOOTING CONSTRUCTION JOINT DETAIL

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

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2	REVISED FOR RE-BID	04/02/2025	JS		
1	REVISED FOR RESUBMISSION	01/10/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

PEDESTRIAN BRIDGE "B" PLAN AND ELEVATION

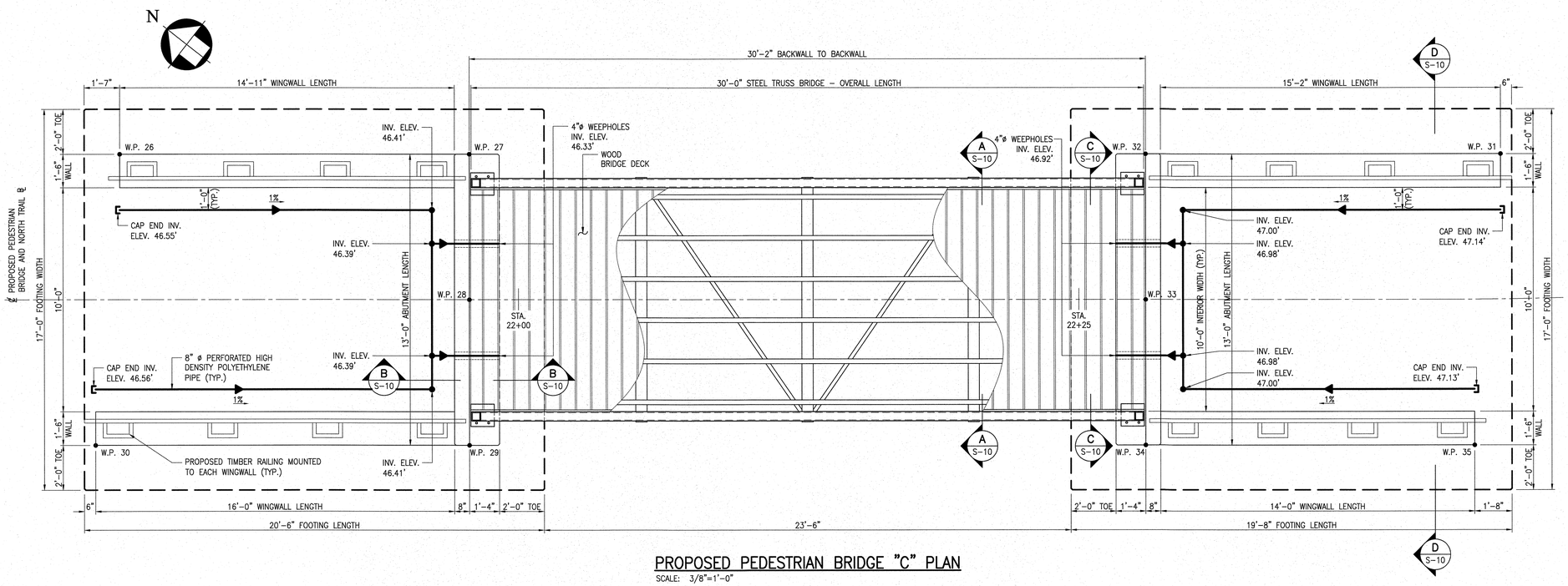
REGISTER NO.

FILE NO. 115.UN00213.P05

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

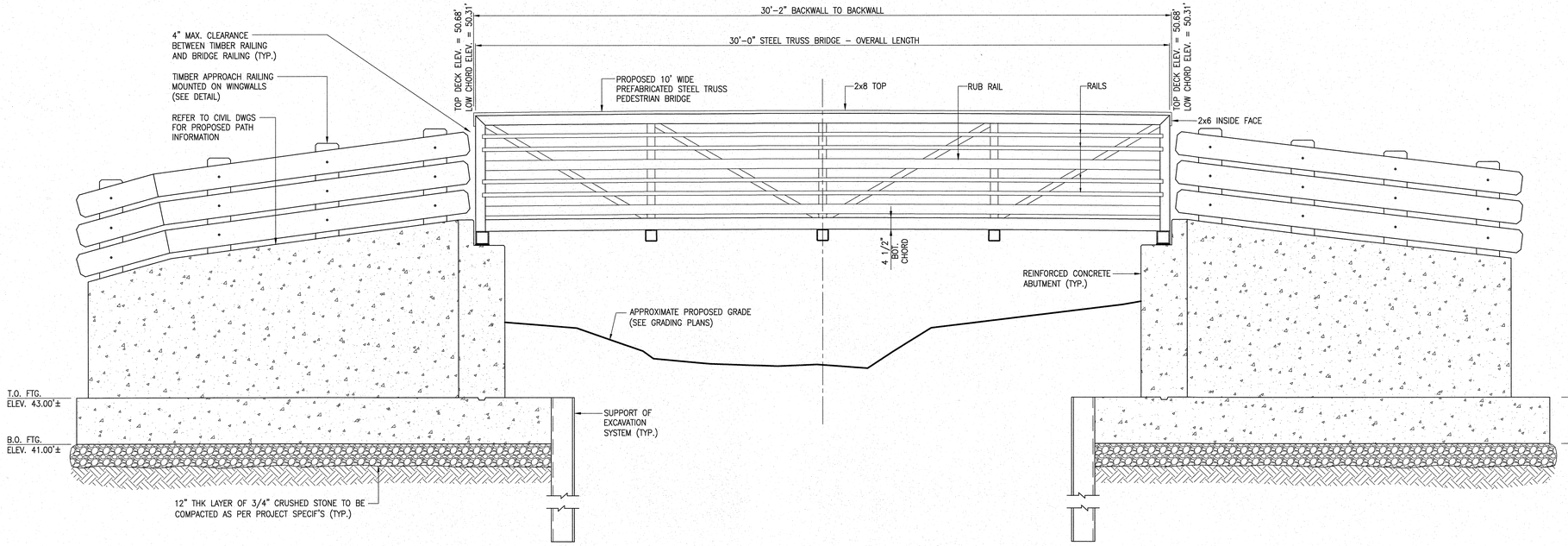
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	S-8
DRAWN BY: JS / JN	DESIGNED BY: JS / RT / JN	
CHECKED BY: NH	SHEET: 124 of 139	



PROPOSED PEDESTRIAN BRIDGE "C" PLAN

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



PROPOSED PEDESTRIAN BRIDGE "C" ELEVATION

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

WORKING POINT TABLE

COORDINATES			NORTH TRAIL BASELINE	
W.P.	NORTH	EAST	STATION	OFFSET
26	651,169.2981	543,765.5925	21+85.49	6.50' L
27	651,159.6120	543,777.7999	22+01.08	6.50' L
28	651,154.5201	543,773.7597	22+01.08	0.00'
29	651,149.4283	543,769.7195	22+01.08	6.50' R
30	651,159.7877	543,756.6634	21+84.41	6.50' R
31	651,131.0198	543,813.8344	22+47.16	6.48' L
32	651,140.8613	543,801.4312	22+31.24	6.50' L
33	651,135.7695	543,797.3910	22+31.24	0.00'
34	651,130.6776	543,793.3508	22+31.24	6.50' R
35	651,121.5613	543,804.8401	22+45.87	6.50' R

NOTES:

1. THE PREFABRICATED PEDESTRIAN BRIDGE SHOWN ON THIS DRAWING SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER, CURRENTLY REGISTERED IN THE STATE OF NEW JERSEY, RETAINED BY THE CONTRACTOR AND EMPLOYED BY A QUALIFIED BRIDGE MANUFACTURER. ALL CALCULATIONS, SHOP DRAWINGS AND/OR CATALOG CUTS SHALL BE SUBMITTED TO THE OWNER'S ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND CONSTRUCTION. REFER TO SPECIFICATION SECTION 515 – PREFABRICATED PEDESTRIAN BRIDGES FOR MORE INFORMATION.
2. ALL REINFORCING STEEL BARS AND DOWELS SHALL BE ASTM A615 (GRADE 60).
3. ALL REINFORCING STEEL BARS AND DOWELS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A 767. ELECTRO PLATED GALVANIZING IS NOT ACCEPTABLE AND WILL BE REJECTED.
4. ALLOWABLE SOIL BEARING CAPACITY = 4000 PSF.
5. FOR STRUCTURAL GENERAL NOTES, SEE DRAWING NOS. S-1, S-2 AND S-3.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2	REVISED FOR RE-BID	04/02/2025	JS		
1	REVISED FOR RESUBMISSION	01/10/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

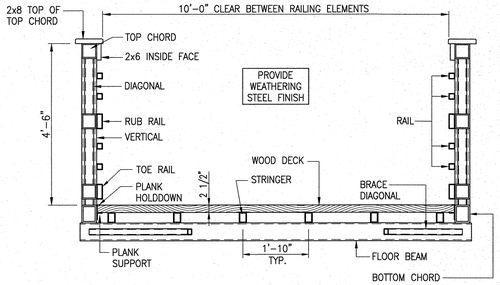
PEDESTRIAN BRIDGE "C" PLAN AND ELEVATION

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

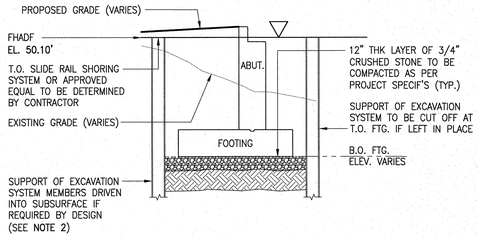
SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	S-9
DRAWN BY: JS / JN	DESIGNED BY: JS / RT / JN	
CHECKED BY: NH	SHEET: 125 of 139	

ASSESSTER NO.
FILE NO. 115.UN00213.P05



TYPICAL BRIDGE SECTION (BRIDGES "A" THROUGH "C")

SECTION A (S-6) SCALE: 1/2"=1'-0" , 8 & 9

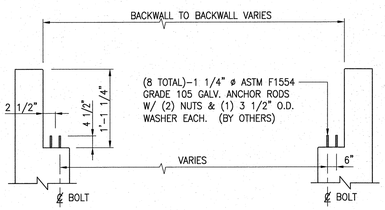


SCHEMATIC SUPPORT OF EXCAVATION SECTION

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

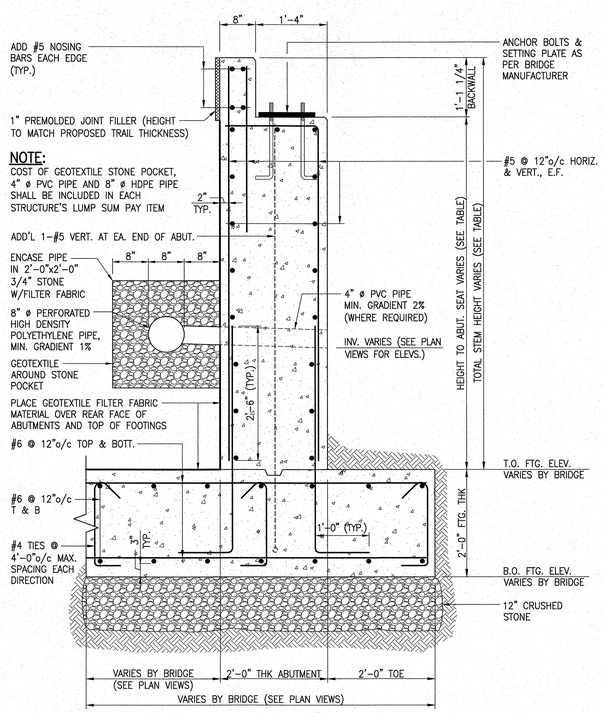
SUPPORT OF EXCAVATION NOTES:

1. THE SUPPORT OF EXCAVATION SYSTEM SHALL BE CONSTRUCTED TO SEPARATE THE STREAM FLOW FROM EXCAVATED AREAS DURING CONSTRUCTION ACTIVITIES. THE SUPPORT OF EXCAVATION SYSTEM SHALL CONSIST OF TEMPORARY STRUCTURAL MEMBERS (SEE THIS DRAWING FOR SOE LIMITS). THE SUPPORT OF EXCAVATION SYSTEM AND ALL DEWATERING REQUIRED TO FACILITATE THE CONSTRUCTION OF THE FOUNDATIONS SHALL BE COVERED UNDER THE TEMPORARY COFFERDAM ITEMS FOR BRIDGES "E" AND "F" AND UNDER THE LUMP SUM CONSTRUCT ITEMS FOR BRIDGES "A" THROUGH "C".
2. FOOTINGS SHALL NOT BE POURED DIRECTLY AGAINST THE SUPPORT OF EXCAVATION SYSTEM AND INSTEAD SHALL BE PLACED AGAINST STANDALONE FORMS OR A MINIMUM OF TWO LAYERS OF PLYWOOD TO ALLOW FOR ADEQUATE REMOVAL OF SHORING SYSTEM WITHOUT DAMAGING THE NEWLY POURED STRUCTURES.
3. SUPPORT OF EXCAVATION SYSTEM
   a. THE SUPPORT OF EXCAVATION SYSTEM ELEMENTS SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW JERSEY RETAINED BY THE CONTRACTOR, EXPERIENCED AND WELL QUALIFIED IN THE DESIGN OF EXCAVATION SUPPORT SYSTEMS. THE DESIGN SHALL ALSO CONSIDER MAINTENANCE OF EXCAVATION SUPPORT (WALERS, STRUTS, TIE RODS, ETC.) AND STREAM FLOW. THE DESIGN SHALL INDICATE THE SOLDIER PILE TIP ELEVATION, STEEL SHEETING TIP ELEVATION, OR OTHER SUPPORT OF EXCAVATION MEMBER TIP ELEVATIONS AS REQUIRED BY DESIGN. REFER TO THE BORING LOGS AND SUBSURFACE PROFILES FOR ALL SOIL INFORMATION. SIGNED AND SEALED WORKING DRAWINGS AND CALCULATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND CONSTRUCTION. THE COST OF THE DESIGN OF THE SUPPORT OF EXCAVATION SYSTEM AND THE PREPARATION OF ALL CALCULATIONS AND SHOP DRAWINGS THAT MUST BE SUBMITTED TO THE ENGINEER FOR REVIEW SHALL BE INCLUDED IN THE PAY ITEMS REQUIRING SAME.
   b. THE MAINTENANCE OF STREAM FLOW SYSTEM SHALL BE DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE FLOOD HAZARD AREA (FHA) PERMITS FILED FOR THIS PROJECT.
   c. PERFORM REQUIRED UTILITY MARKOUTS IN ACCORDANCE WITH THE SPECIFICATIONS. CONTACT SEWER UTILITIES TO LOCATE THE SANITARY SEWERS NOT COVERED IN THE ONE CALL SYSTEM MARKOUT PRIOR TO SETTING OR DRIVING TEMPORARY COFFERDAM. THE CONTRACTOR IS SOLELY RESPONSIBLE TO MONITOR GROUND VIBRATIONS ADJACENT TO THE PIPELINES.
   d. SUPPORT OF EXCAVATION SYSTEM LAYOUT SHALL CONFORM TO THE LAYOUT CONTROLS INDICATED ON THE STRUCTURAL DRAWINGS. PREPARE WORKING DRAWINGS AS SHOP DRAWINGS FOR LAYOUT CONFORMING TO THE DESIGN LAYOUT. REPORT CONFLICTS, IF ANY, TO THE ENGINEER FOR RESOLUTION.
   e. SET DRIVING TEMPLATES AND GUIDE BEAMS AS REQUIRED TO MAINTAIN THE STRICT TOLERANCES REQUIRED BY THE SHEET PILING LAYOUT DESIGN.
   f. INSTALL MEMBERS TO THE DEPTHS REQUIRED ON THE SCHEMATIC COFFERDAM DETAIL AND/OR AS REQUIRED BY DESIGN. REPORT ANY OBSTRUCTIONS ENCOUNTERED TO THE ENGINEER. EXCAVATE OR PROVIDE SPUDS TO PUSH ASIDE OBSTRUCTIONS AS REQUIRED.
   g. MAINTAIN SUPPORT OF EXCAVATION SYSTEM ALIGNMENT AND PLUMB WITHIN SPECIFIED MAXIMUM 3 INCH DEVIATION IN PLAN AND MAXIMUM 1% DEVIATION FROM PLUMB.
   h. CUTOFF SYSTEM AT REQUIRED ELEVATIONS, REPAIR ANY DAMAGE TO COATINGS AS REQUIRED PRIOR TO BACKFILL.
   i. INSTALL WALERS, ANCHORAGES AND CAPS AS REQUIRED BY THE CONTRACTOR'S ENGINEER'S DESIGN.



ANCHOR BOLT ELEVATION (BRIDGES "A" THROUGH "C")

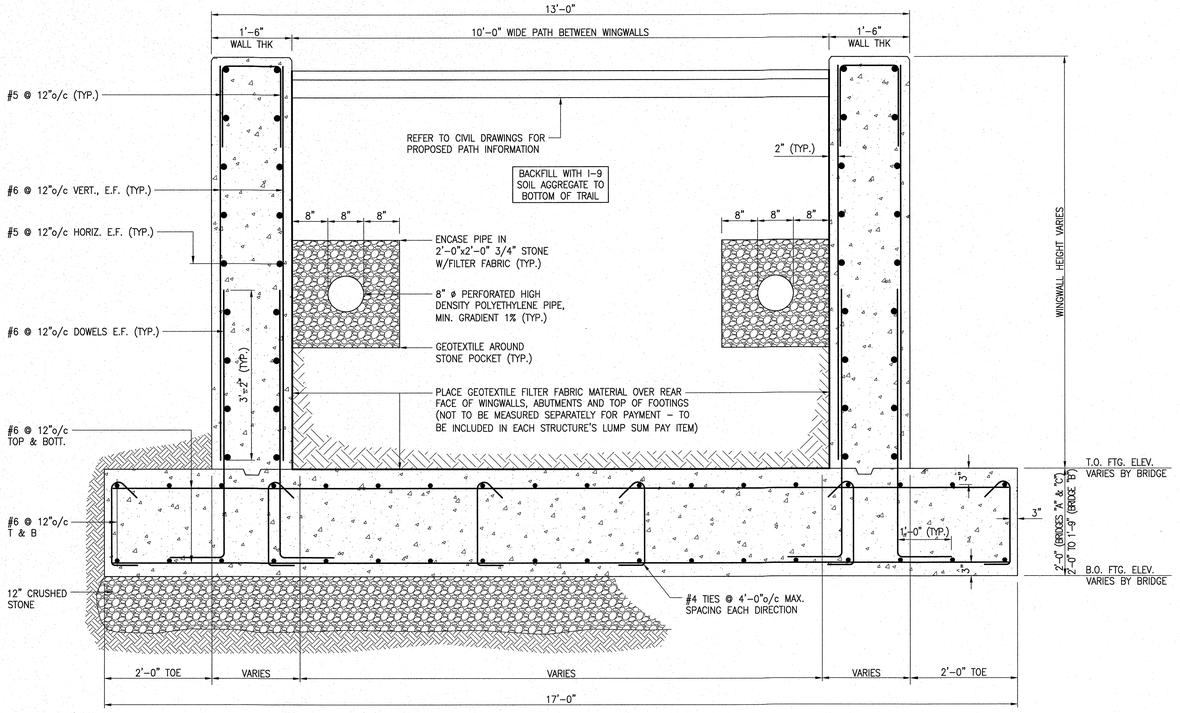
N.T.S.



NOTE:
COST OF GEOTEXTILE STONE POCKET, 4" ø PVC PIPE AND 8" ø HDPE PIPE SHALL BE INCLUDED IN EACH STRUCTURE'S LUMP SUM PAY ITEM

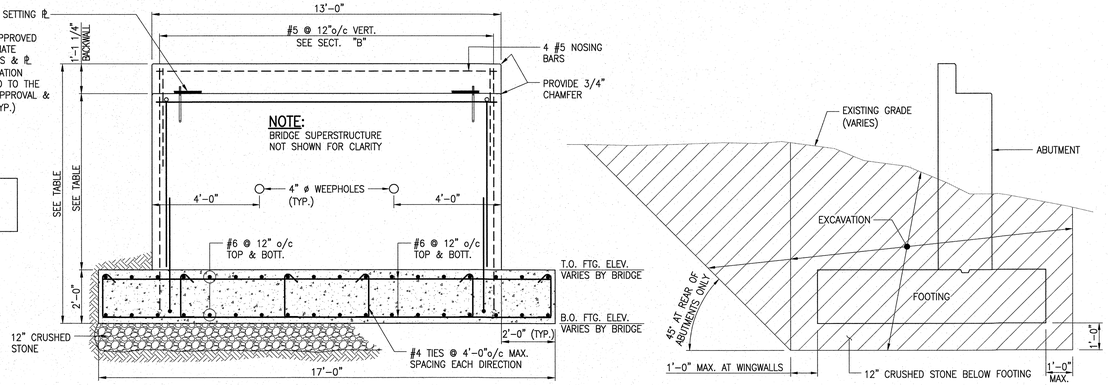
TYPICAL ABUTMENT SECTION (BRIDGES "A" THROUGH "C")

SECTION B (S-6) SCALE: 3/4"=1'-0" , 8 & 9



TYPICAL WINGWALL SECTION (BRIDGES "A" THROUGH "C")

SECTION D (S-6) SCALE: 3/4"=1'-0" 8 & 9

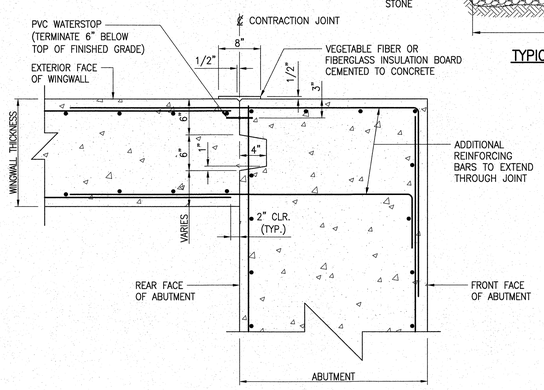


BRIDGE NO. AND LOCATION	HEIGHT TO ABUT. SEAT	TOTAL STEM HEIGHT
A (BOTH ABUTS.)	8'-0 1/4"	9'-1 1/2"
B (BOTH ABUTS.)	7'-0 7/8"	8'-2 1/8"
C (BOTH ABUTS.)	6'-6 7/8"	7'-8 1/8"

NOTE:
THERE IS NO PEDESTRIAN BRIDGE "D" AS PART OF THIS CONTRACT.

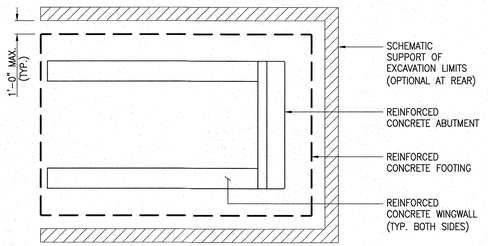
TYPICAL ABUTMENT SECTION (BRIDGES "A" THROUGH "C")

SECTION C (S-6) SCALE: 3/8"=1'-0" , 8 & 9



TYPICAL ABUTMENT AND WINGWALL JOINT

N.T.S.

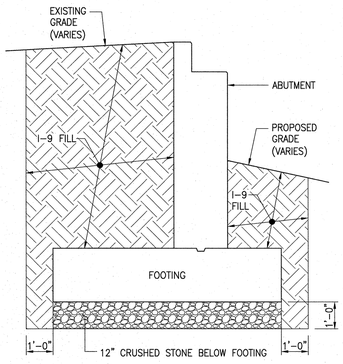


SCHEMATIC SUPPORT OF EXCAVATION LIMITS

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

PAY LIMITS OF EXCAVATION

N.T.S.



PAY LIMITS OF BACKFILL

N.T.S.

PAY LIMIT NOTES:

1. EXCAVATION AND BACKFILL LIMITS AT ABUTMENT SHOWN. WINGWALLS ARE SIMILAR. THESE DETAILS ALSO APPLY TO THE BOX CULVERT WINGWALLS.
2. EXCAVATION PAY LIMITS SHOWN INCLUDE THE 12" THICK CRUSHED STONE WORKING MAT.
3. ALL EXCAVATED MATERIAL SHALL BE DISPOSED OF PROPERLY AND NOT REUSED FOR BACKFILL. ANY EXCAVATION (INCLUDING EXCAVATION OUTSIDE OF THE PAY LIMITS) SHALL BE BACKFILLED WITH SOIL AGGREGATE CONFORMING TO STANDARD GRADIATION I-9 AS INDICATED ABOVE.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2	REVISED FOR RE-BID	04/02/2025	JS		
1	REVISED FOR RESUBMISSION	01/10/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

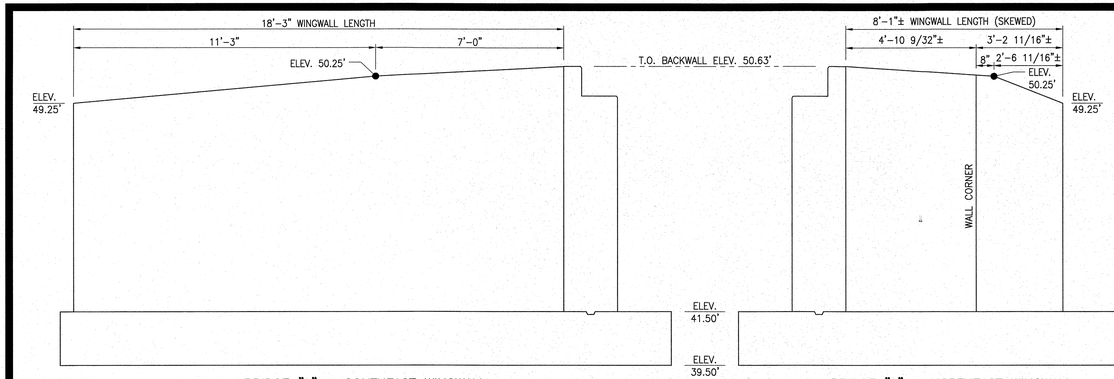
PEDESTRIAN BRIDGES "A" THROUGH "C" SECTIONS AND DETAILS (1 OF 2)

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTRATION NO.
FILE NO. 115.UN00213.P05

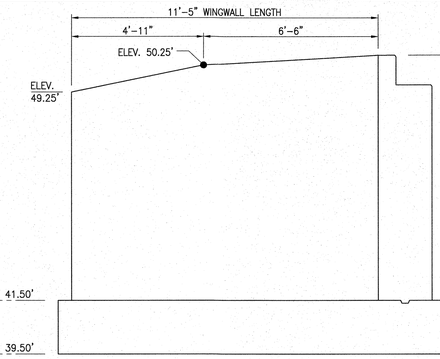
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	S-10
DRAWN BY: JS / JN	DESIGNED BY: JS / RT / JN	
CHECKED BY: NH	SHEET: 126 of 139	

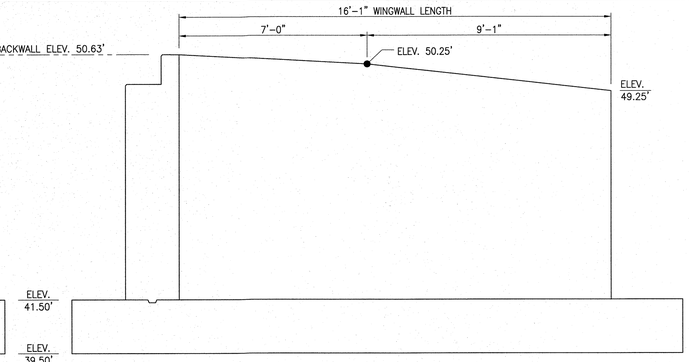


BRIDGE "A" – SOUTHEAST WINGWALL

BRIDGE "A" – NORTHEAST WINGWALL



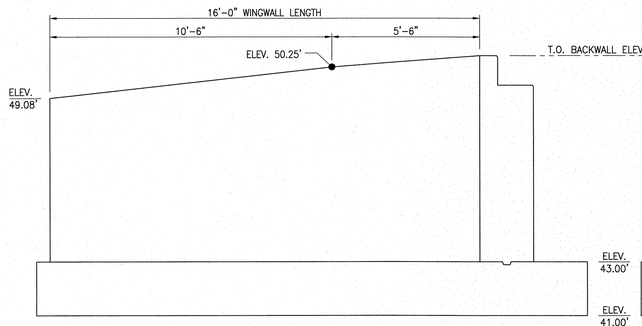
BRIDGE "A" – NORTHWEST WINGWALL



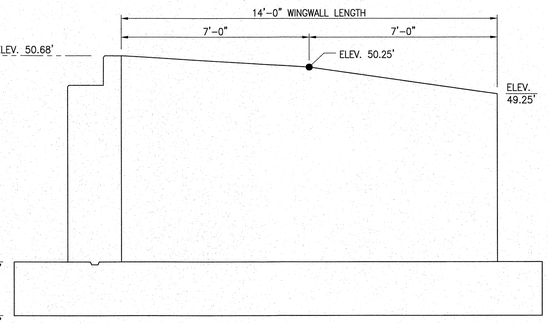
BRIDGE "A" – SOUTHWEST WINGWALL

PEDESTRIAN BRIDGE "A" WINGWALL ELEVATIONS

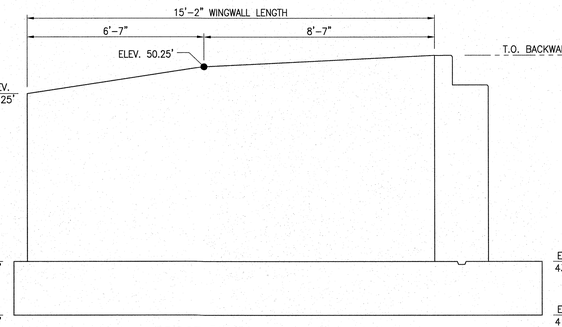
SCALE: 3/8"=1'-0"



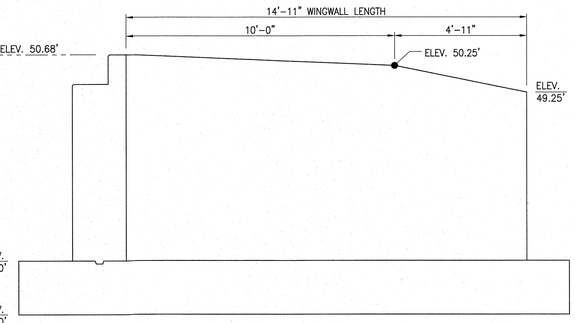
BRIDGE "C" – SOUTHWEST WINGWALL



BRIDGE "C" – SOUTHEAST WINGWALL



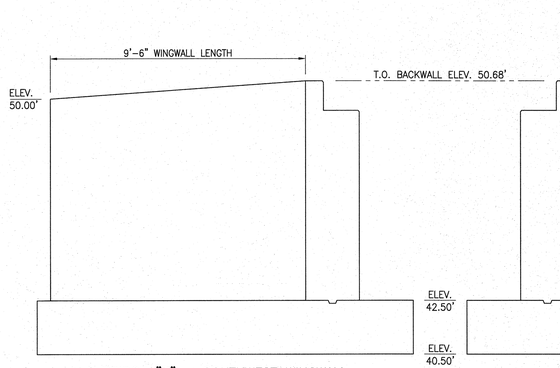
BRIDGE "C" – NORTHEAST WINGWALL



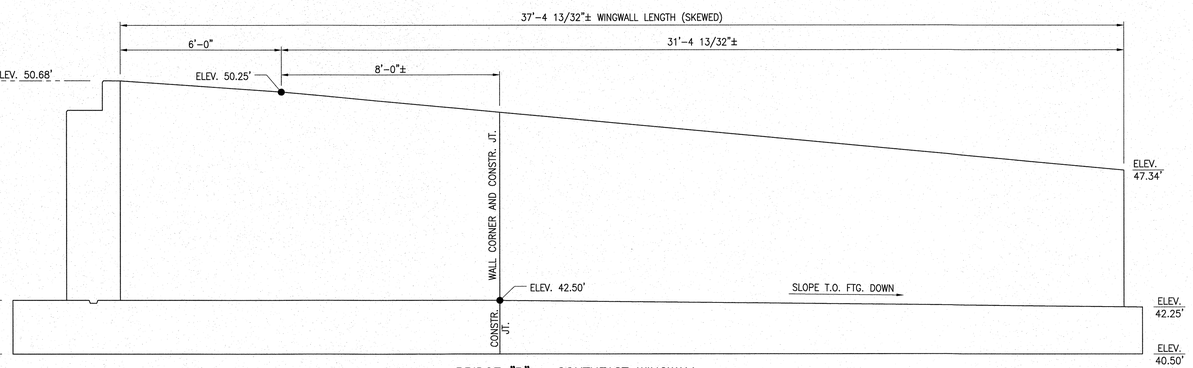
BRIDGE "C" – NORTHWEST WINGWALL

PEDESTRIAN BRIDGE "C" WINGWALL ELEVATIONS

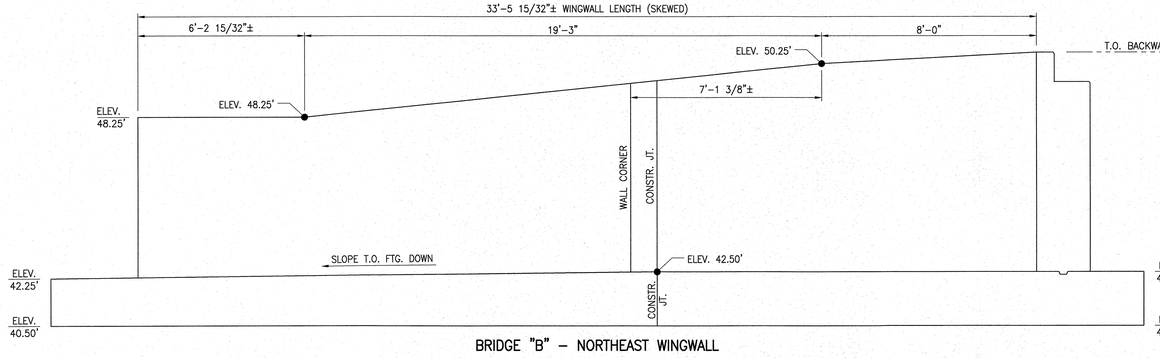
SCALE: 3/8"=1'-0"



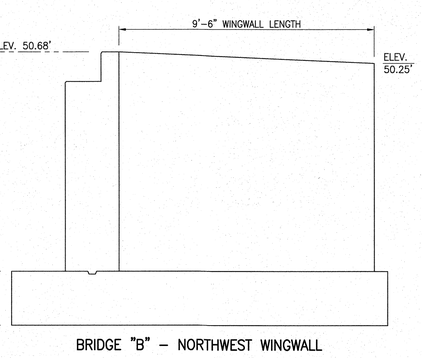
BRIDGE "B" – SOUTHWEST WINGWALL



BRIDGE "B" – SOUTHEAST WINGWALL



BRIDGE "B" – NORTHEAST WINGWALL



BRIDGE "B" – NORTHWEST WINGWALL

PEDESTRIAN BRIDGE "B" WINGWALL ELEVATIONS

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

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	APPROVED
2	REVISED FOR RE-BID	04/02/2025	JS		
1	REVISED FOR RESUBMISSION	01/10/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

PEDESTRIAN BRIDGES "A" THROUGH "C" SECTIONS AND DETAILS (2 OF 2)

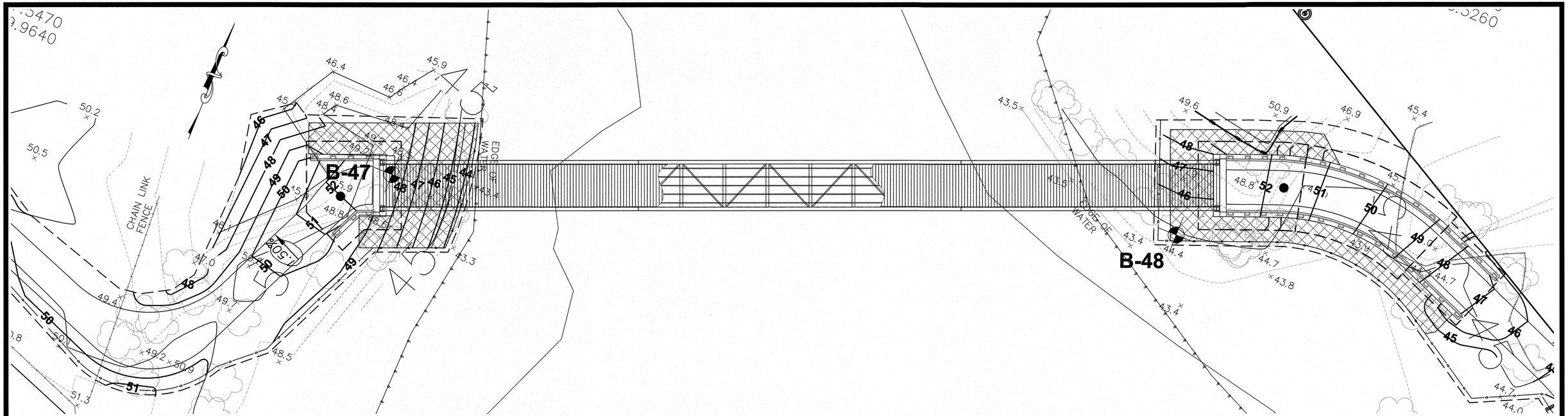
REGISTER NO.

FILE NO. 115.UN00213.P05

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

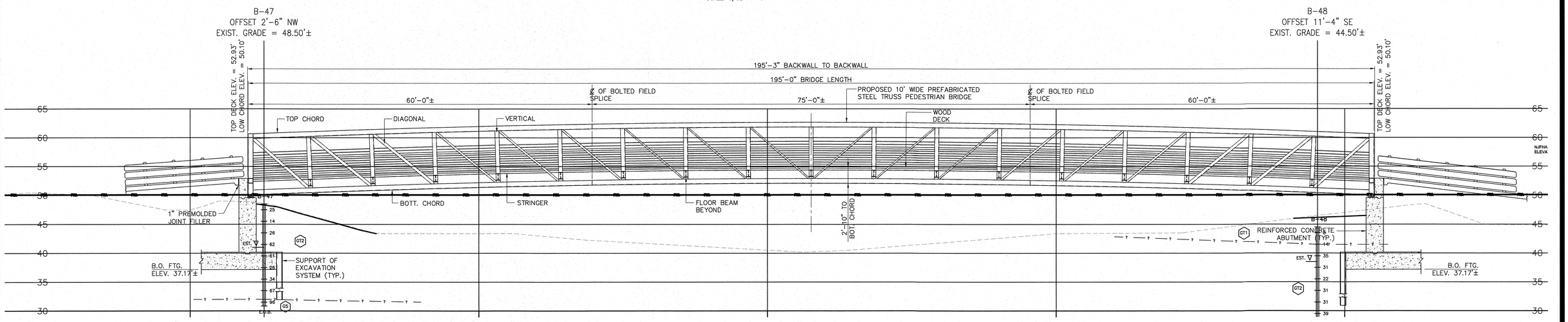
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	S-11
DRAWN BY: JS / JN	DESIGNED BY: JS / RT / JN	
CHECKED BY: NH	SHEET: 127 of 139	



PEDESTRIAN BRIDGE "E" PLAN VIEW

SCALE: 3/32"=1'-0"



PEDESTRIAN BRIDGE "E" PROFILE

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

GENERALIZED STRATA DESCRIPTIONS

GT1 — GLACIAL TILL
STRATUM COMPOSED OF SOFT TO MEDIUM STIFF CLAYEY SILT. THE PENETRATION RESISTANCE TEST RESULTS RANGED FROM 8 TO 14 BLOWS PER FOOT IN THE BORINGS.

GT2 — GLACIAL TILL
STRATUM COMPOSED OF STIFF TO VERY STIFF GRAVELLY SILT. THE PENETRATION RESISTANCE TEST RESULTS RANGED FROM 14 TO 67 BLOWS PER FOOT IN THE BORINGS.

GS — GLACIAL SEDIMENT
DENSE MEDIUM FINE SILTY SAND. THE PENETRATION RESISTANCE N VALUE IS APPROX. 96 BLOWS PER FOOT WITHIN THE LAYER.

LEGEND:

- B-2 — BORING NUMBER
- EXISTING GRADE AT BORING
- PROPOSED GRADE ON PROFILE
- EXISTING GRADE ON PROFILE
- STRATUM CHANGE
- ▽ GROUND WATER LEVEL AT DATE & TIME OF BORING
- 15 — RESULT OF STANDARD PENETRATION TEST IN BLOWS PER FOOT
- ROCK CORE SAMPLE
- END OF TEST BORING

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2	REVISED FOR RE-BID	04/02/2025	JS		
1	REVISED FOR RESUBMISSION	01/10/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

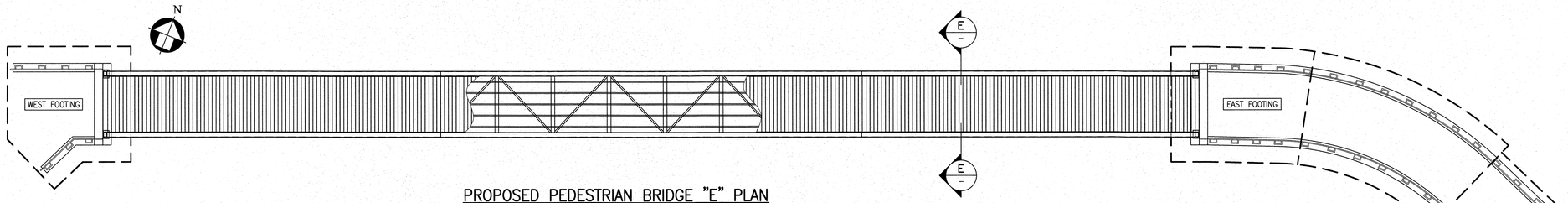
PEDESTRIAN BRIDGE "E" PLAN, PROFILE AND SUBSURFACE PROFILE

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

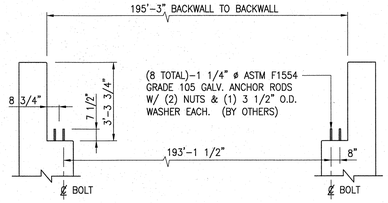
REGISTER NO. 115.UN00213.P05

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	S-12
DRAWN BY: JS / AM	DESIGNED BY: JS / RT	
CHECKED BY: NH	SHEET: 128 of 139	



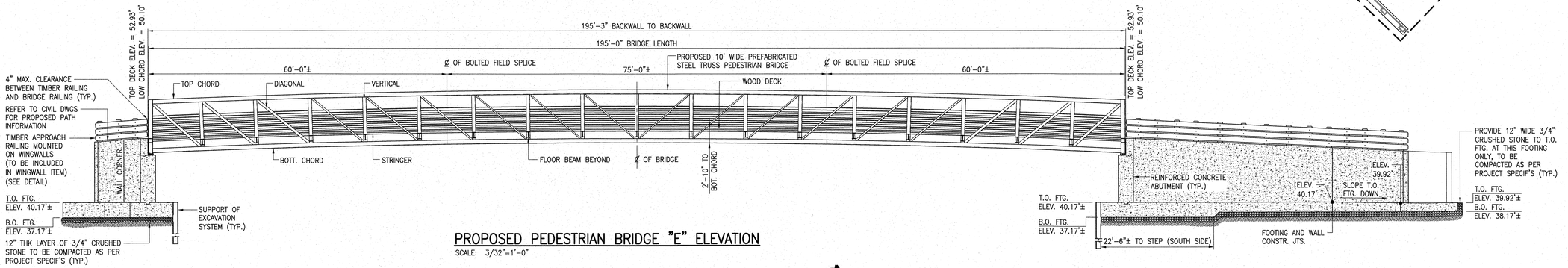
PROPOSED PEDESTRIAN BRIDGE "E" PLAN

SCALE: 3/32"=1'-0"



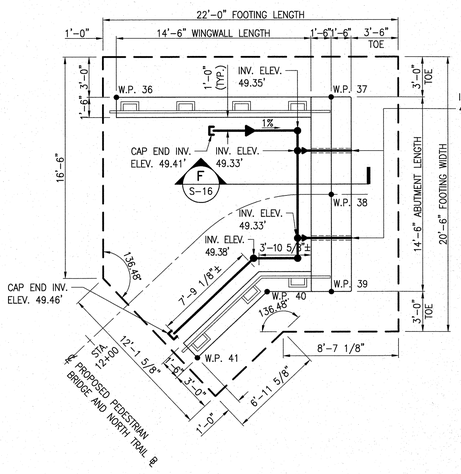
ANCHOR BOLT ELEVATION

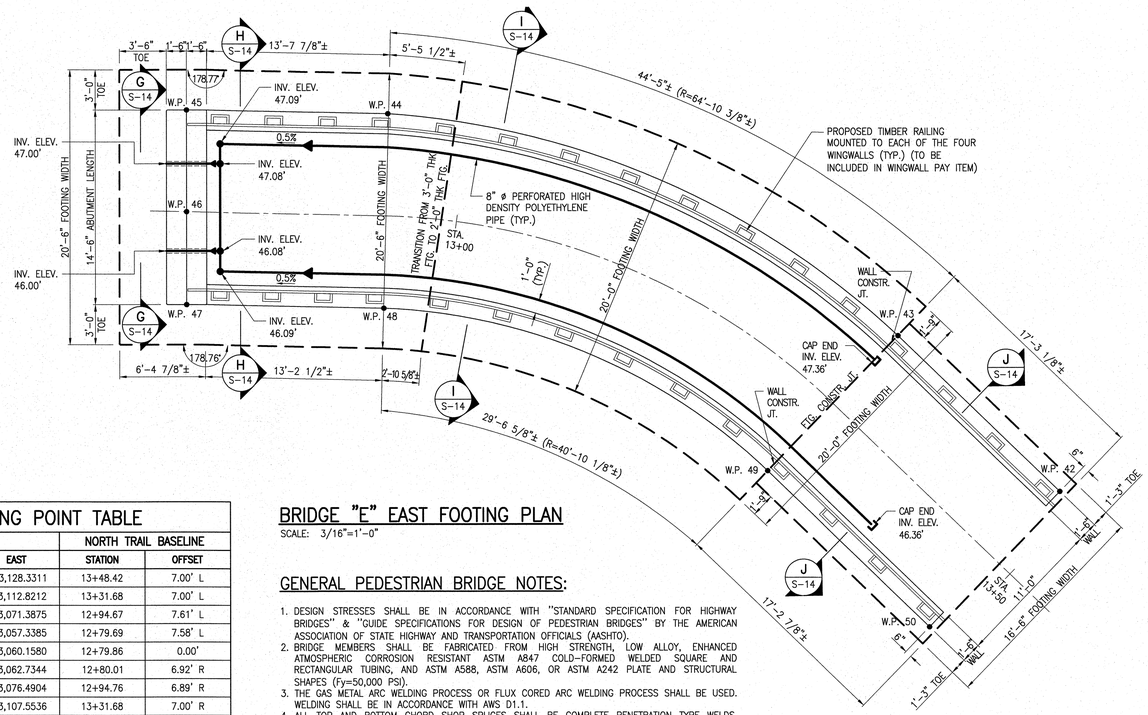
N.T.S.



PROPOSED PEDESTRIAN BRIDGE "E" ELEVATION

SCALE: 3/32"=1'-0"





BRIDGE "E" WEST FOOTING PLAN

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

WORKING POINT TABLE

COORDINATES			NORTH TRAIL BASELINE	
W.P.	NORTH	EAST	STATION	OFFSET
36	651,620.6811	542,861.2600	12+12.61	11.93' L
37	651,626.6351	542,876.1109	12+21.89	7.25' L
38	651,619.9058	542,878.8088	12+21.89	0.00'
39	651,613.1765	542,881.5067	12+21.89	7.25' R
40	651,611.3946	542,877.0623	12+12.96	6.40' R
41	651,604.8831	542,874.0766	12+04.91	6.46' R

WORKING POINT TABLE

COORDINATES			NORTH TRAIL BASELINE	
W.P.	NORTH	EAST	STATION	OFFSET
42	651,697.0926	543,128.3311	13+48.42	7.00' L
43	651,703.3914	543,112.8212	13+31.68	7.00' L
44	651,704.6111	543,071.3875	12+94.67	7.61' L
45	651,699.2926	543,057.3385	12+79.69	7.58' L
46	651,692.2601	543,060.1580	12+79.86	0.00'
47	651,685.8340	543,062.7344	12+80.01	6.92' R
48	651,691.0406	543,076.4904	12+94.76	6.89' R
49	651,690.4202	543,107.5536	13+31.68	7.00' R
50	651,684.1215	543,123.0634	13+48.42	7.00' R

NOTES:

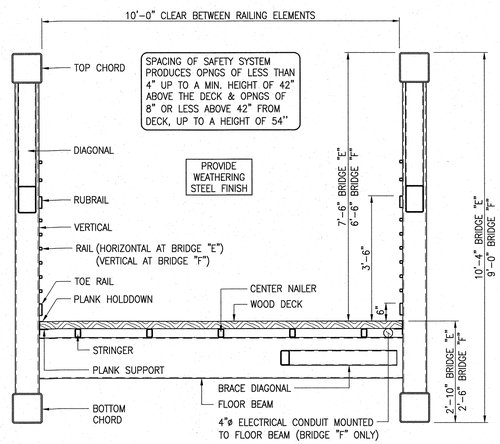
1. THE PREFABRICATED PEDESTRIAN BRIDGE SHOWN ON THIS DRAWING SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER, CURRENTLY REGISTERED IN THE STATE OF NEW JERSEY, RETAINED BY THE CONTRACTOR AND EMPLOYED BY A QUALIFIED BRIDGE MANUFACTURER. ALL CALCULATIONS, SHOP DRAWINGS AND/OR CATALOG CUTS SHALL BE SUBMITTED TO THE OWNER'S ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND CONSTRUCTION. REFER TO SPECIFICATION SECTION 515 – PREFABRICATED PEDESTRIAN BRIDGES FOR MORE INFORMATION.
2. ALL REINFORCING STEEL BARS AND DOWELS SHALL BE ASTM A615 (GRADE 60).
3. ALL REINFORCING STEEL BARS AND DOWELS SHALL BE HOT–DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A 767. ELECTRO PLATED GALVANIZING IS NOT ACCEPTABLE AND WILL BE REJECTED.
4. ALLOWABLE SOIL BEARING CAPACITY = 4000 PSF.
5. FOR STRUCTURAL GENERAL NOTES, SEE DRAWING NOS. S–1, S–2 AND S–3.

BRIDGE "E" EAST FOOTING PLAN

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

GENERAL PEDESTRIAN BRIDGE NOTES:

1. DESIGN STRESSES SHALL BE IN ACCORDANCE WITH "STANDARD SPECIFICATION FOR HIGHWAY BRIDGES" & "GUIDE SPECIFICATIONS FOR DESIGN OF PEDESTRIAN BRIDGES" BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO).
2. BRIDGE MEMBERS SHALL BE FABRICATED FROM HIGH STRENGTH, LOW ALLOY, ENHANCED ATMOSPHERIC CORROSION RESISTANT ASTM A847 COLD–FORMED WELDED SQUARE AND RECTANGULAR TUBING, AND ASTM A588, ASTM A606, OR ASTM A242 PLATE AND STRUCTURAL SHAPES (Fy=50,000 PSI).
3. THE GAS METAL ARC WELDING PROCESS OR FLUX CORED ARC WELDING PROCESS SHALL BE USED. WELDING SHALL BE IN ACCORDANCE WITH AWS D1.1.
4. ALL TOP AND BOTTOM CHORD SHOP SPLICES SHALL BE COMPLETE PENETRATION TYPE WELDS. WELD BETWEEN TOP CHORD AND END VERTICAL SHALL BE AS DETAILED.
5. UNLESS OTHERWISE NOTED, WELDED CONNECTIONS SHALL BE FILLET WELDS (OR HAVE THE EFFECTIVE THROAT OF A FILLET WELD) OF A SIZE EQUAL TO THE THICKNESS OF THE LIGHTEST GAGE MEMBER IN THE CONNECTION. WELDS SHALL BE APPLIED AS FOLLOWS:
   A. BOTH ENDS OF VERTICALS, DIAGONALS, AND FLOOR BEAMS SHALL BE WELDED ALL AROUND.
   B. BRACE DIAGONALS SHALL BE WELDED ALL AROUND.
   C. MISCELLANEOUS NON–STRUCTURAL MEMBERS SHALL BE STITCH WELDED TO THEIR SUPPORTING MEMBERS.
6. BRIDGE DESIGN SHALL BE BASED ON COMBINATIONS OF THE FOLLOWING LOADS WHICH WILL PRODUCE MAXIMUM CRITICAL MEMBER STRESSES:
   A. 90 PSF UNIFORM LIVE LOADING ON THE FULL DECK AREA OR ONE 10,000 LB VEHICLE LOAD. THE LOAD SHALL BE DISTRIBUTED AS A FOUR–WHEEL VEHICLE WITH 80% OF THE LOAD ON THE REAR WHEELS. THE WHEEL TRACK WIDTH OF THE VEHICLE SHALL BE 6'–0" AND THE WHEEL BASE SHALL BE 10'–0". THE VEHICLE SHALL BE POSITIONED SO AS TO PRODUCE THE MAXIMUM STRESSES IN EACH MEMBER, INCLUDING DECKING.
   B. 35 PSF WIND LOAD ON THE FULL HEIGHT OF THE BRIDGE, AS IF ENCLOSED.
   C. 20 PSF UPWARD FORCE APPLIED AT THE WINDWARD QUARTER POINT OF THE TRANVERSE BRIDGE WIDTH (AASHTO 3.15.3).
7. CLEANING: ALL EXPOSED SURFACES OF STEEL SHALL BE CLEANED IN ACCORDANCE WITH STEEL STRUCTURES PAINTING COUNCIL SURFACES PREPARATION SPECIFICATIONS NO. 7 BRUSH–OFF BLAST CLEANING. SSPC–SP7–LATEST EDITION.
8. MINIMUM MATERIAL THICKNESS OF 1/4" ON ALL STRUCTURAL MEMBERS.



BRIDGE SECTION (BRIDGES "E" AND "F")

SECTION E

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

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	APPROVED
2	REVISED FOR RE-BID	04/02/2025	JS		
1	REVISED FOR RESUBMISSION	01/10/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

PEDESTRIAN BRIDGE "E" PLAN AND ELEVATION

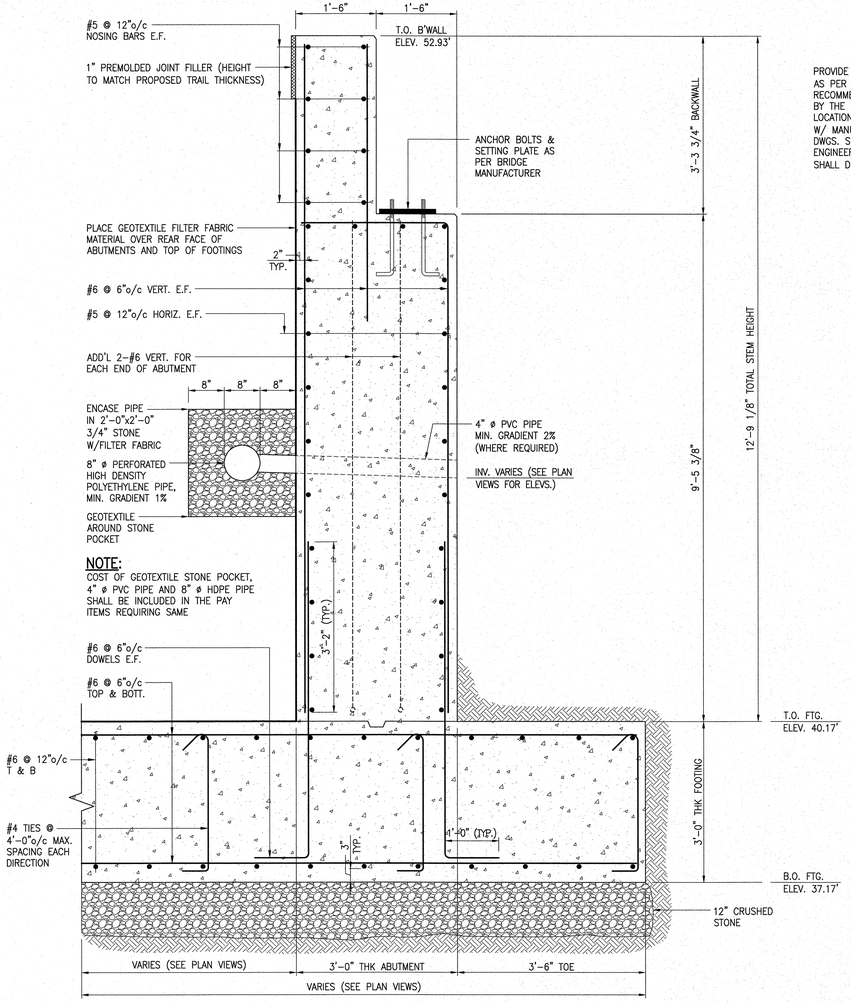
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO.

PM NO. 115.UN00213.P05

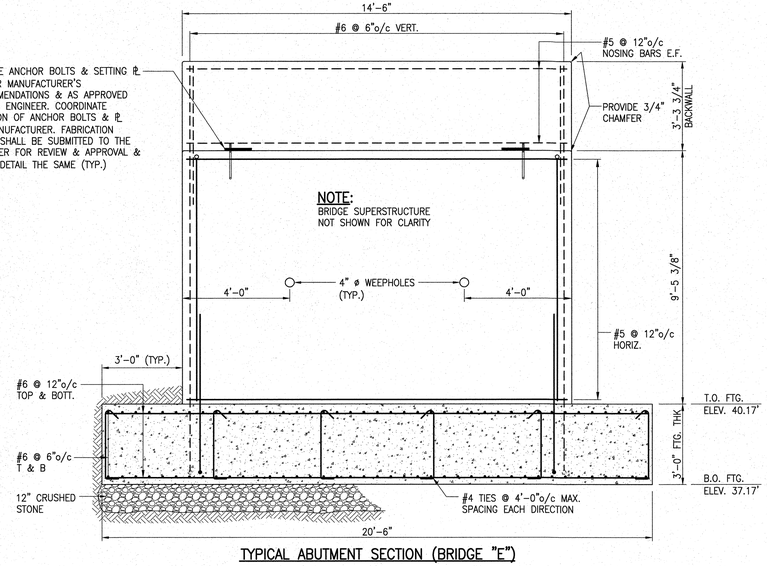
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	S-13
DRAWN BY: JS / JN	DESIGNED BY: JS / RT / JN	
CHECKED BY: NH	SHEET: 129 of 139	



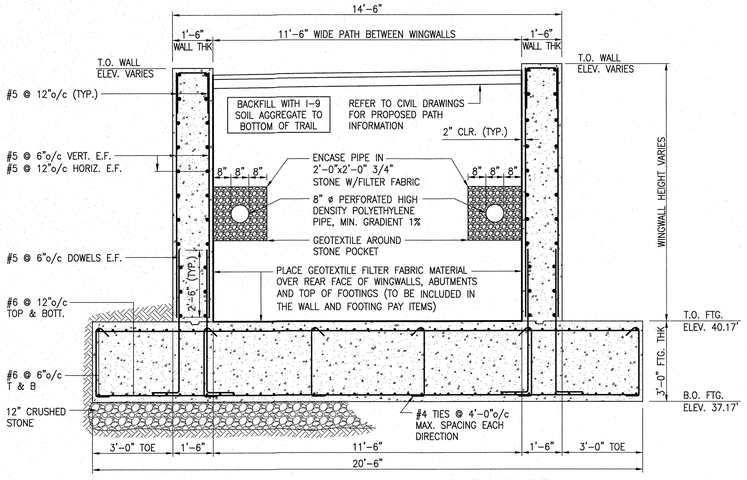
TYPICAL ABUTMENT SECTION (BRIDGE "E")

SECTION F
SCALE: 3/4"=1'-0" S-13



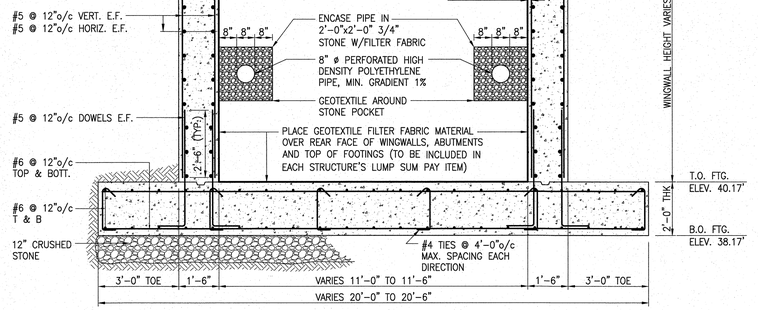
TYPICAL WINGWALL SECTION (BRIDGE "E")

SECTION G
SCALE: 3/8"=1'-0" S-13



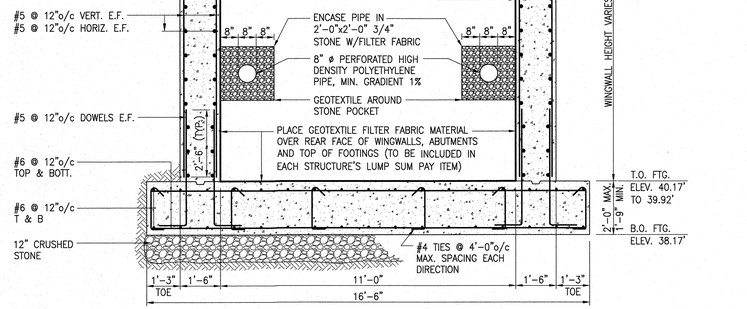
TYPICAL WINGWALL SECTION AT ABUTMENT (BRIDGE "E")

SECTION H
SCALE: 3/8"=1'-0" S-13



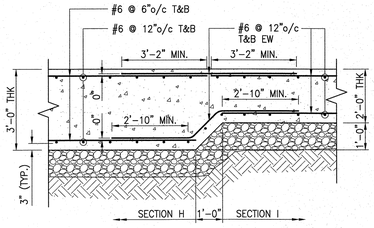
TYPICAL WINGWALL SECTION (BRIDGE "E")

SECTION I
SCALE: 3/8"=1'-0" S-13



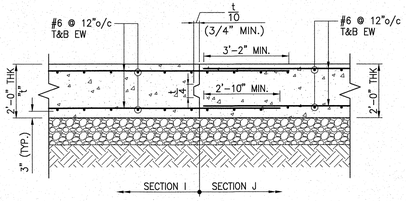
TYPICAL WINGWALL SECTION (BRIDGE "E")

SECTION J
SCALE: 3/8"=1'-0" S-13



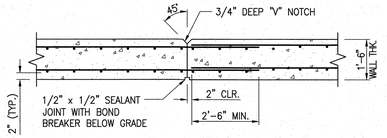
BRIDGE "E" EAST FOOTING STEP DETAIL

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



BRIDGE "E" EAST FOOTING CONSTRUCTION JOINT DETAIL

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



BRIDGE "E" WALL CONSTRUCTION JOINT DETAIL (PLAN)

SCALE: 3/8"=1'-0" 30'-0" o/c MAX.

NO.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2	REVISED FOR RE-BID	04/02/2025	JS		
1	REVISED FOR RESUBMISSION	01/10/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

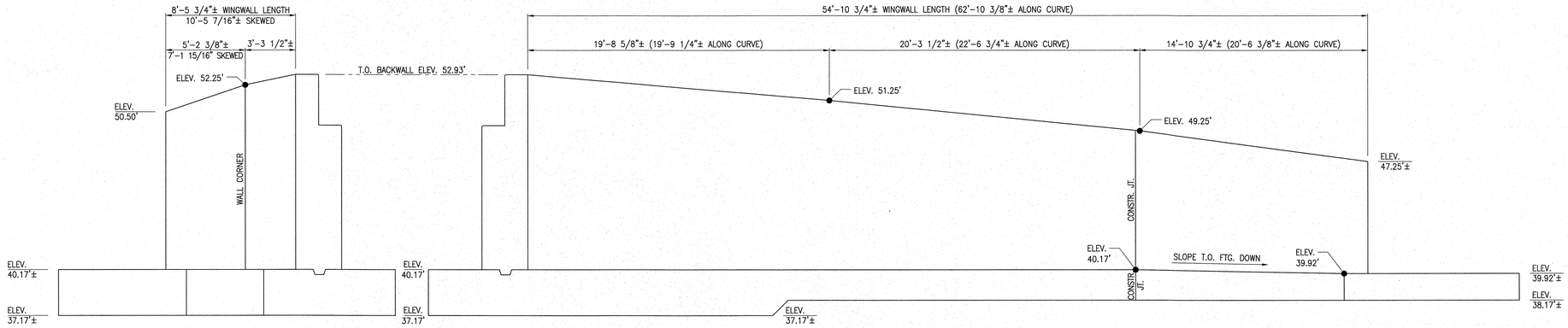
PEDESTRIAN BRIDGE "E" SECTIONS AND DETAILS (1 OF 2)

CVE ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO. 115.UN00213.P05
PM NO.

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	S-14
DRAWN BY JS / JN	DESIGNED BY JS / RT / JN	
CHECKED BY MM	SHEET 130 of 139	

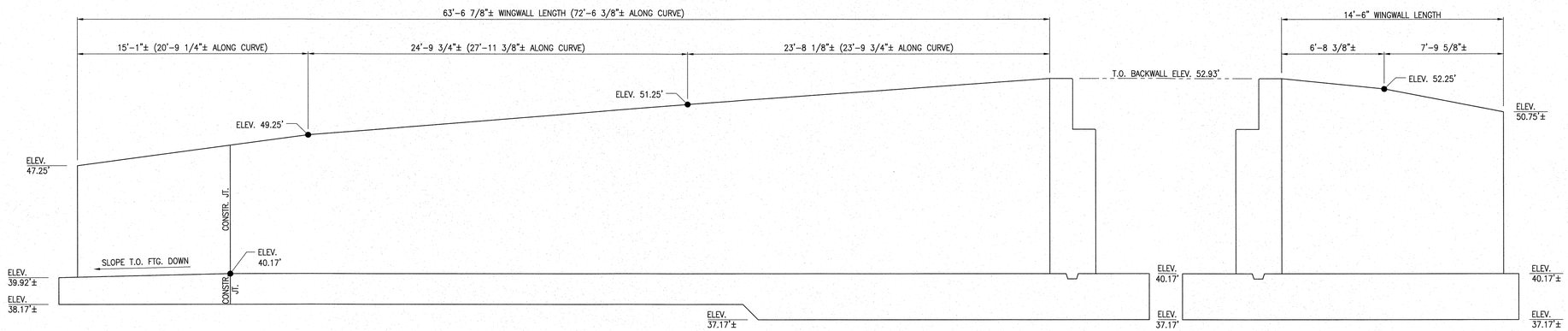


SOUTHWEST WINGWALL (SOUTH FACE)

SOUTHEAST WINGWALL (SOUTH FACE)

PEDESTRIAN BRIDGE "E" WINGWALL ELEVATIONS

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

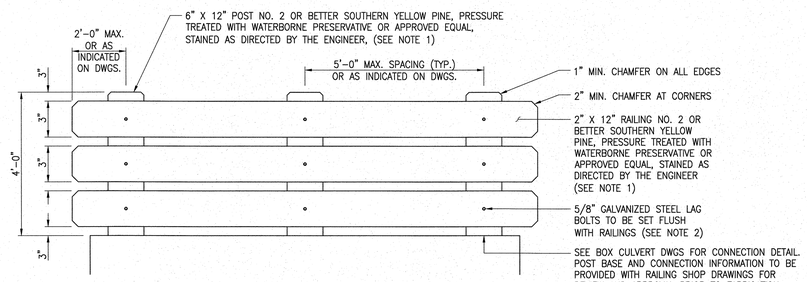


NORTHEAST WINGWALL (NORTH FACE)

NORTHWEST WINGWALL

PEDESTRIAN BRIDGE "E" WINGWALL ELEVATIONS

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



TIMBER BRIDGE APPROACH RAILING DETAIL

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

NOTES:

1. ALL TIMBER MEMBERS SHALL BE No. 2 OR BETTER SOUTHERN YELLOW PINE AND PRESSURE TREATED WITH WATERBORNE PRESERVATIVE OR APPROVED EQUAL TO A RETENTION AS NOTED IN THE SPECIFICATION. ALL TIMBER MEMBERS SHALL BE STAINED WITH "JACOBEAN 2750" WOOD FINISH AS MANUFACTURED BY MINWAX OR APPROVED EQUAL, OR AS DIRECTED BY THE ENGINEER. ALL TIMBER MEMBERS AND CONNECTION HARDWARE SHALL NOT BE MEASURED SEPARATELY FOR PAYMENT. THE COST FOR THESE MATERIALS AND ALL LABOR, EXCAVATION, INSTALLATION, PREP WORK, ETC. ASSOCIATED WITH THESE RAILINGS SHALL BE INCLUDED IN THE LUMP SUM ITEMS FOR BRIDGES "A" THROUGH "C" AND THE WINGWALL ITEMS FOR BRIDGES "E" AND "F".
2. ALL HARDWARE TO BE GALVANIZED STEEL.
3. THIS DETAIL SHALL APPLY TO ALL PROPOSED TIMBER RAILINGS TO BE MOUNTED TO THE WINGWALLS AT EACH PEDESTRIAN BRIDGE APPROACH. TIMBER RAILINGS SHALL NOT BE MEASURED SEPARATELY FOR PAYMENT. TIMBER RAILINGS FOR THE PEDESTRIAN BRIDGES AND BOX CULVERT, INCLUDING ALL CONNECTION HARDWARE AND FINISHING, SHALL BE INCLUDED IN EACH STRUCTURE'S LUMP SUM PAY ITEM OR EACH STRUCTURE'S CONCRETE WINGWALL PAY ITEM, WHICHEVER APPLIES.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	APPROVED
2	REVISED FOR RE-BID	04/02/2025	JS		
1	REVISED FOR RESUBMISSION	01/10/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

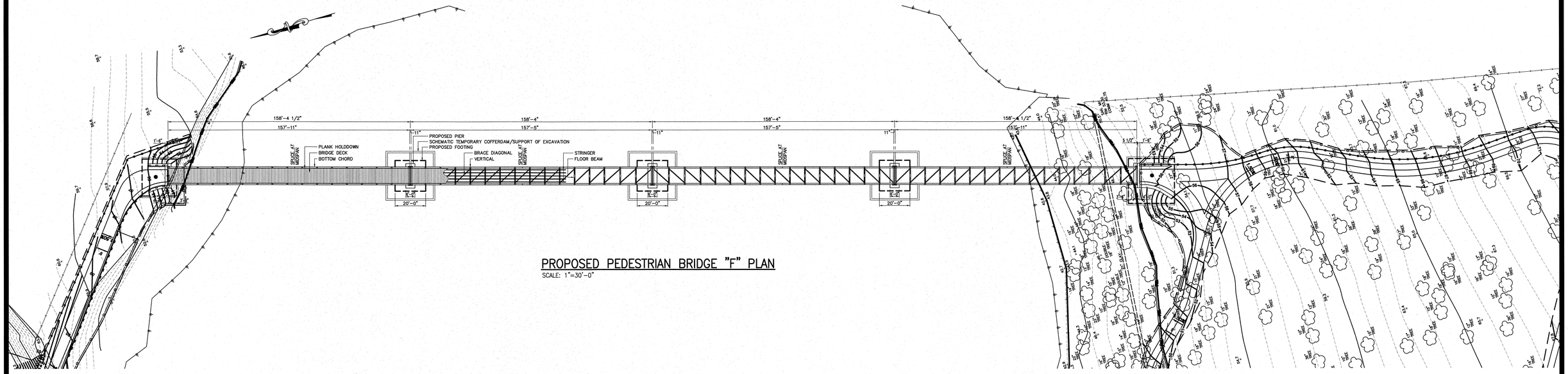
PEDESTRIAN BRIDGE "E" SECTIONS AND DETAILS (2 OF 2)

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28599000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

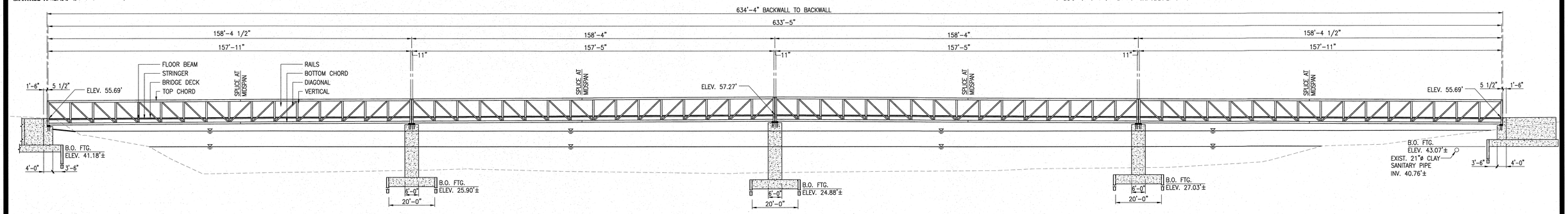
SCALE	As Shown
DATE	October 2024
DRAWN BY	JS / JN
DESIGNED BY	JS / RT / JN
CHECKED BY	NH
SHEET	131 of 139
DRAWING NUMBER	S-15

REGISTER NO.
FILE NO. 115.UN0213.P05



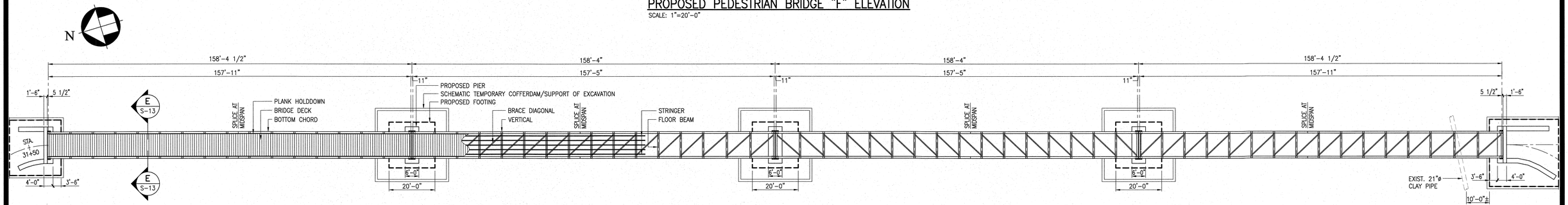
PROPOSED PEDESTRIAN BRIDGE "F" PLAN

SCALE: 1"=30'-0"



PROPOSED PEDESTRIAN BRIDGE "F" ELEVATION

SCALE: 1"=20'-0"



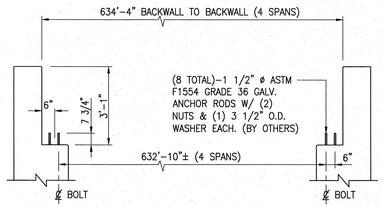
PROPOSED PEDESTRIAN BRIDGE "F" PLAN

SCALE: 1"=20'-0"

PEDESTRIAN BRIDGE "F" (158'-4" SPAN)

BRIDGE REACTIONS		+ DOWNWARD LOAD - UPWARD LOAD	
	P (LBS)	H (LBS)	L (LBS)
DEAD LOAD	22,000		
UNIFORM LIVE LOAD	36,000		
VEHICLE LOAD	5,000		
WIND UPLIFT 20 PSF WINDWARD	-13,600		
WIND UPLIFT 20 PSF LEEWARD	-4,534		
WIND	13,770	25,200	
THERMAL			3,210

"P" - VERTICAL LOAD EACH BASE PLATE (4 PER BRIDGE)
"H" - HORIZONTAL LOAD EACH FOOTING (2 PER BRIDGE)
"L" - LONGITUDINAL LOAD EACH BASE PLATE (4 PER BRIDGE)



ANCHOR BOLT ELEVATION

N.T.S.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2	REVISED FOR RE-BID	04/02/2025	JS		
1	REVISED FOR RESUBMISSION	01/10/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

PEDESTRIAN BRIDGE "F" PLAN, ELEVATION AND DETAILS

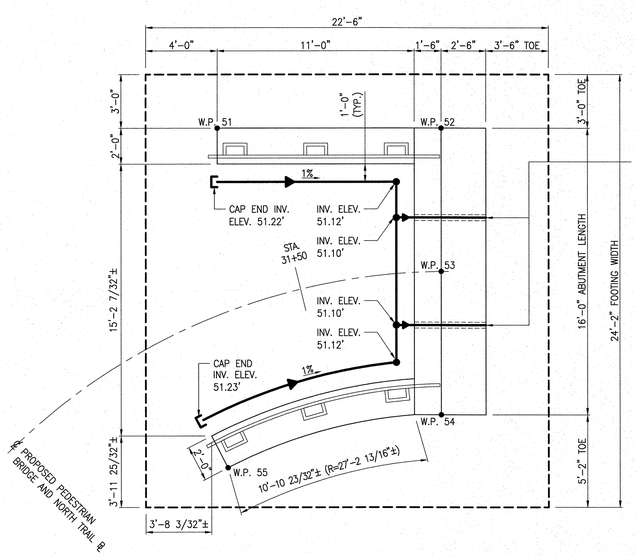
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468
DATE 11/24

SCALE	DATE
As Shown	October 2024
DRAWN BY	DESIGNED BY
JS / JN	JS / JN
CHECKED BY	SHEET
NH	132 of 139

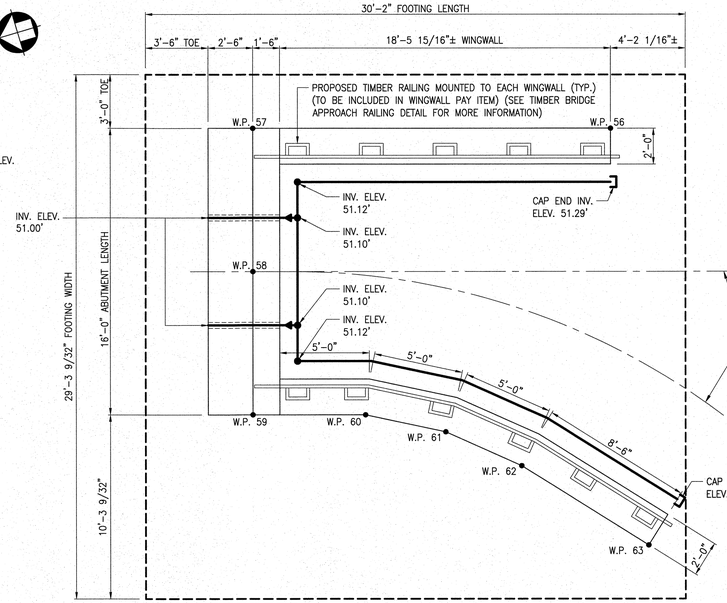
DRAWING NUMBER
S-16

PROJECT NO.
115.UN00213.P05



SCHEMATIC BRIDGE "F" NORTH ABUTMENT PLAN

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

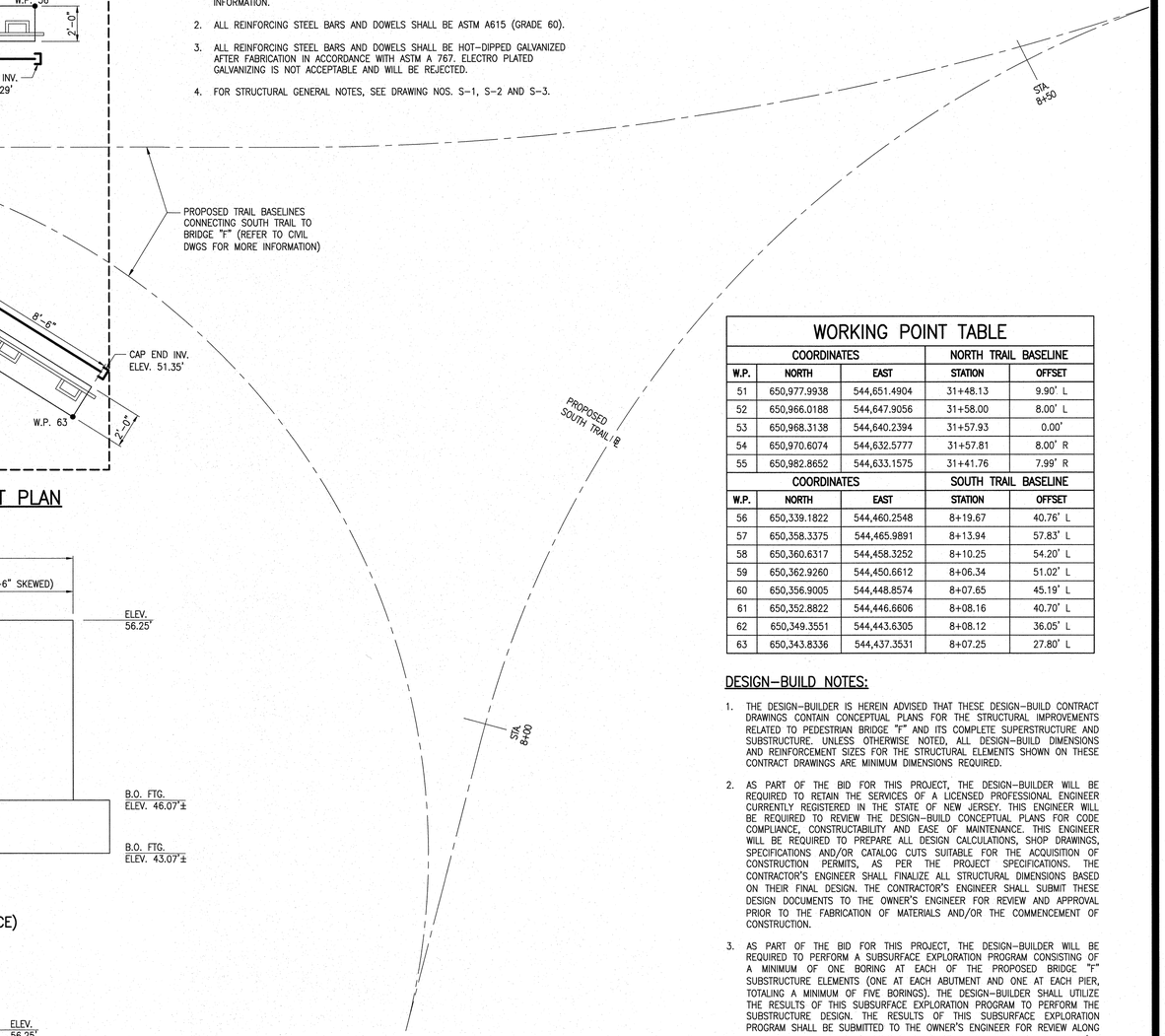


SCHEMATIC BRIDGE "F" SOUTH ABUTMENT PLAN

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

NOTES:

1. THE PREFABRICATED PEDESTRIAN BRIDGE SHOWN ON THESE DRAWINGS SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER, CURRENTLY REGISTERED IN THE STATE OF NEW JERSEY, RETAINED BY THE CONTRACTOR AND EMPLOYED BY A QUALIFIED BRIDGE MANUFACTURER. ALL CALCULATIONS, SHOP DRAWINGS AND/OR CATALOG CUTS SHALL BE SUBMITTED TO THE OWNER'S ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND CONSTRUCTION. REFER TO SPECIFICATION SECTION 515 – PREFABRICATED PEDESTRIAN BRIDGES FOR MORE INFORMATION.
2. ALL REINFORCING STEEL BARS AND DOWELS SHALL BE ASTM A615 (GRADE 60).
3. ALL REINFORCING STEEL BARS AND DOWELS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A 767. ELECTRO PLATED GALVANIZING IS NOT ACCEPTABLE AND WILL BE REJECTED.
4. FOR STRUCTURAL GENERAL NOTES, SEE DRAWING NOS. S-1, S-2 AND S-3.



WORKING POINT TABLE

COORDINATES			NORTH TRAIL BASELINE	
W.P.	NORTH	EAST	STATION	OFFSET
51	650,977.9938	544,651.4904	31+48.13	9.90' L
52	650,966.0188	544,647.9056	31+58.00	8.00' L
53	650,968.3138	544,640.2394	31+57.93	0.00'
54	650,970.6074	544,632.5777	31+57.81	8.00' R
55	650,982.8652	544,633.1575	31+41.76	7.99' R
COORDINATES			SOUTH TRAIL BASELINE	
W.P.	NORTH	EAST	STATION	OFFSET
56	650,339.1822	544,460.2548	8+19.67	40.76' L
57	650,358.3375	544,465.9891	8+13.94	57.83' L
58	650,360.6317	544,458.3252	8+10.25	54.20' L
59	650,362.9260	544,450.6612	8+06.34	51.02' L
60	650,356.9005	544,448.8574	8+07.65	45.19' L
61	650,352.8822	544,446.6606	8+08.16	40.70' L
62	650,349.3551	544,443.6305	8+08.12	36.05' L
63	650,343.8336	544,437.3531	8+07.25	27.80' L

DESIGN-BUILD NOTES:

1. THE DESIGN-BUILDER IS HEREIN ADVISED THAT THESE DESIGN-BUILD CONTRACT DRAWINGS CONTAIN CONCEPTUAL PLANS FOR THE STRUCTURAL IMPROVEMENTS RELATED TO PEDESTRIAN BRIDGE "F" AND ITS COMPLETE SUPERSTRUCTURE AND SUBSTRUCTURE. UNLESS OTHERWISE NOTED, ALL DESIGN-BUILD DIMENSIONS AND REINFORCEMENT SIZES FOR THE STRUCTURAL ELEMENTS SHOWN ON THESE CONTRACT DRAWINGS ARE MINIMUM DIMENSIONS REQUIRED.
2. AS PART OF THE BID FOR THIS PROJECT, THE DESIGN-BUILDER WILL BE REQUIRED TO RETAIN THE SERVICES OF A LICENSED PROFESSIONAL ENGINEER CURRENTLY REGISTERED IN THE STATE OF NEW JERSEY. THIS ENGINEER WILL BE REQUIRED TO REVIEW THE DESIGN-BUILD CONCEPTUAL PLANS FOR CODE COMPLIANCE, CONSTRUCTABILITY AND EASE OF MAINTENANCE. THIS ENGINEER WILL BE REQUIRED TO PREPARE ALL DESIGN CALCULATIONS, SHOP DRAWINGS, SPECIFICATIONS AND/OR CATALOG CUTS SUITABLE FOR THE ACQUISITION OF CONSTRUCTION PERMITS, AS PER THE PROJECT SPECIFICATIONS. THE CONTRACTOR'S ENGINEER SHALL FINALIZE ALL STRUCTURAL DIMENSIONS BASED ON THEIR FINAL DESIGN. THE CONTRACTOR'S ENGINEER SHALL SUBMIT THESE DESIGN DOCUMENTS TO THE OWNER'S ENGINEER FOR REVIEW AND APPROVAL PRIOR TO THE FABRICATION OF MATERIALS AND/OR THE COMMENCEMENT OF CONSTRUCTION.
3. AS PART OF THE BID FOR THIS PROJECT, THE DESIGN-BUILDER WILL BE REQUIRED TO PERFORM A SUBSURFACE EXPLORATION PROGRAM CONSISTING OF A MINIMUM OF ONE BORING AT EACH OF THE PROPOSED BRIDGE "F" SUBSTRUCTURE ELEMENTS (ONE AT EACH ABUTMENT AND ONE AT EACH PIER, TOTALING A MINIMUM OF FIVE BORINGS). THE DESIGN-BUILDER SHALL UTILIZE THE RESULTS OF THIS SUBSURFACE EXPLORATION PROGRAM TO PERFORM THE SUBSTRUCTURE DESIGN. THE RESULTS OF THIS SUBSURFACE EXPLORATION PROGRAM SHALL BE SUBMITTED TO THE OWNER'S ENGINEER FOR REVIEW ALONG WITH THE REQUIRED CALCULATIONS, SHOP DRAWINGS, SPECIFICATIONS AND/OR CATALOG CUTS.
4. THE COSTS ASSOCIATED WITH RETAINING THIS ENGINEER AND THE PERFORMANCE OF THE SUBSURFACE EXPLORATION PROGRAM, INCLUDING THE COSTS TO PROVIDE THE REQUIRED DESIGN CALCULATIONS, SHOP DRAWINGS, SPECIFICATIONS AND/OR CATALOG CUTS, SHALL BE INCLUDED IN THE PRICES BID FOR THE DESIGN-BUILD ITEMS REQUIRING SAID SERVICES.

NORTHWEST WINGWALL (WEST FACE)

SOUTHWEST WINGWALL (WEST FACE)

SOUTHEAST WINGWALL

NORTHEAST WINGWALL (EAST FACE)

PEDESTRIAN BRIDGE "F" WINGWALL ELEVATIONS

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

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	DESIGNED
2	REVISED FOR RE-BID	04/02/2025	JS		
1	REVISED FOR RESUBMISSION	01/10/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

PEDESTRIAN BRIDGE "F" SECTIONS, DETAILS AND DESIGN-BUILD NOTES (1 OF 2)

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY: JS / JN	DESIGNED BY: JS / JN
CHECKED BY: NH	SHEET: 133 of 139

REGISTER NO. FILE NO. 115.UN00213.P05

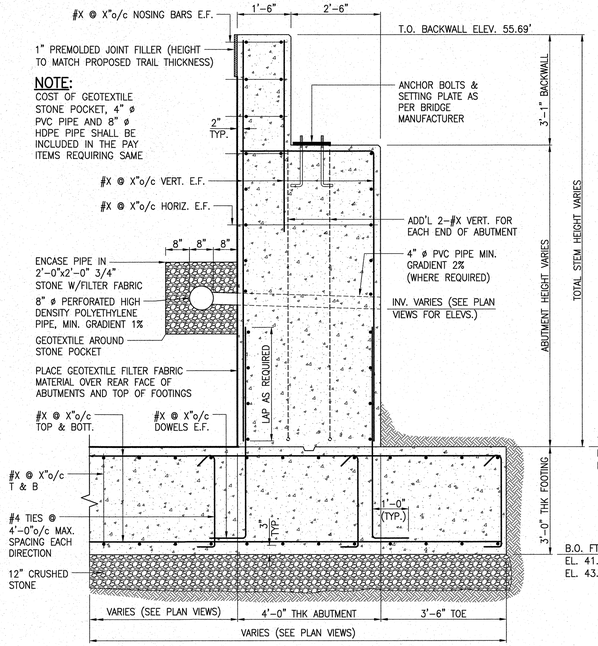
DRAWING NUMBER **S-17**

NOTES:

1. THE PREFABRICATED PEDESTRIAN BRIDGE SHOWN ON THESE DRAWINGS SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER, CURRENTLY REGISTERED IN THE STATE OF NEW JERSEY, RETAINED BY THE CONTRACTOR AND EMPLOYED BY A QUALIFIED BRIDGE MANUFACTURER. ALL CALCULATIONS, SHOP DRAWINGS AND/OR CATALOG CUTS SHALL BE SUBMITTED TO THE OWNER'S ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND CONSTRUCTION. REFER TO SPECIFICATION SECTION 515 – PREFABRICATED PEDESTRIAN BRIDGES FOR MORE INFORMATION.
2. ALL REINFORCING STEEL BARS AND DOWELS SHALL BE ASTM A615 (GRADE 60).
3. ALL REINFORCING STEEL BARS AND DOWELS SHALL BE HOT–DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A 767. ELECTRO PLATED GALVANIZING IS NOT ACCEPTABLE AND WILL BE REJECTED.
4. FOR STRUCTURAL GENERAL NOTES, SEE DRAWING NOS. S–1, S–2 AND S–3.
5. BACKFILL AT THE BRIDGE "F" ABUTMENTS AND WINGWALLS SHALL BE I–9 SOIL AGGREGATE TO THE LIMITS INDICATED ON THE DETAILS ON DWG. NO. S–10.
6. BACKFILL AT THE BRIDGE "F" PIERS SHALL BE NATIVE STREAMBED MATERIAL OR APPROVED EQUAL SATISFYING NJDEP REQUIREMENTS. BACKFILL AT THE PIERS WILL NOT BE MEASURED SEPARATELY FOR PAYMENT AND WILL BE INCLUDED IN THE COST OF THE ITEMS REQUIRING SAME.
7. STONE FORMLINERS TO BE PROVIDED ON EXTERIOR VERTICAL FACES AT ALL BRIDGE "F" ABUTMENTS, WINGWALLS AND PIERS. THE STONE FORMLINERS SHALL CLOSELY MATCH A STONEMONT SPLIT LEDGE PATTERN OR APPROVED EQUAL. REFER TO THE PROJECT SPECIFICATIONS FOR MORE INFORMATION. CONTRACTOR TO SUBMIT SAMPLES OF STONE FORMLINERS AND PROPOSED STAIN COLOR DURING THE SHOP SUBMITTAL PROCESS. ALL MATERIAL SELECTIONS ARE SUBJECT TO THE REVIEW AND APPROVAL OF THE COUNTY AND THE ENGINEER PRIOR TO INSTALLATION. THE STONE FORMLINERS AND STAINING SHALL NOT BE MEASURED SEPARATELY FOR PAYMENT AND SHALL BE INCLUDED IN THE PAY ITEMS REQUIRING SAME.
8. A MINIMUM OF ONE PILE DRIVING TEST SHALL BE PERFORMED AT EACH BRIDGE "F" PIER, FOR A MINIMUM OF THREE H–PILE TESTS. TEST PILES SHALL BE DRIVEN AT PRODUCTION PILE LOCATIONS PRIOR TO COMMENCING PRODUCTION PILE DRIVING. EXACT LOCATIONS WILL BE AGREED UPON PRIOR TO DRIVING OF TEST PILES.
9. MINIMUM ALLOWABLE CAPACITY OF THE BRIDGE "F" PILES IS 25 TONS, WHILE THE MINIMUM ULTIMATE CAPACITY IS 62.5 TONS.
10. BRIDGE "F" PIER PILE BASE BID LENGTH IS 50 FT FOR ESTIMATING PURPOSES.
11. PILES MAY NEED TO BE AUGERED, IF AND WHERE REQUIRED, TO ACHIEVE THE MINIMUM PENETRATION DUE TO THE HIGH BLOW COUNTS OBSERVED IN OTHER TEST BORINGS ON THE SITE AND THE POTENTIAL FOR THE PRESENCE OF COBBLES AND BOULDERS. PRE–AUGERING WILL NOT BE MEASURED SEPARATELY FOR PAYMENT AND WILL BE INCLUDED IN THE COST OF THE VARIOUS PILE ITEMS.

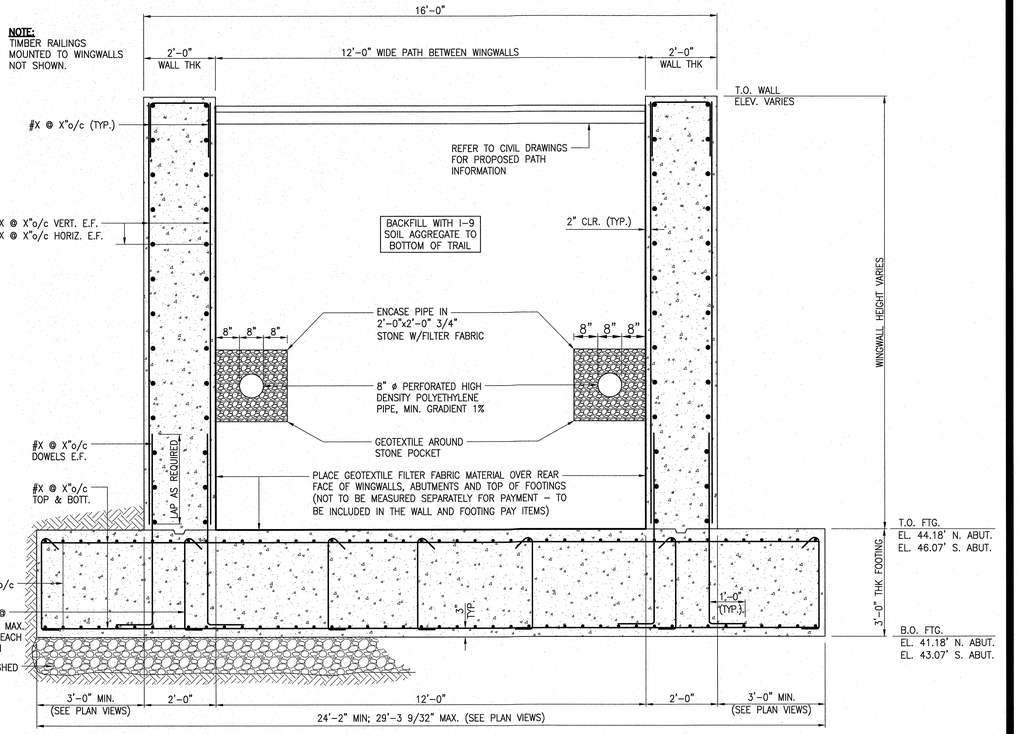
DESIGN–BUILD NOTES:

1. THE DESIGN–BUILDER IS HEREIN ADVISED THAT THESE DESIGN–BUILD CONTRACT DRAWINGS CONTAIN CONCEPTUAL PLANS FOR THE STRUCTURAL IMPROVEMENTS RELATED TO PEDESTRIAN BRIDGE "F" AND ITS COMPLETE SUPERSTRUCTURE AND SUBSTRUCTURE. UNLESS OTHERWISE NOTED, ALL DESIGN–BUILD DIMENSIONS AND REINFORCEMENT SIZES FOR THE STRUCTURAL ELEMENTS SHOWN ON THESE CONTRACT DRAWINGS ARE MINIMUM DIMENSIONS REQUIRED.
2. AS PART OF THE BID FOR THIS PROJECT, THE DESIGN–BUILDER WILL BE REQUIRED TO RETAIN THE SERVICES OF A LICENSED PROFESSIONAL ENGINEER CURRENTLY REGISTERED IN THE STATE OF NEW JERSEY. THIS ENGINEER WILL BE REQUIRED TO REVIEW THE DESIGN–BUILD CONCEPTUAL PLANS FOR CODE COMPLIANCE, CONSTRUCTABILITY AND EASE OF MAINTENANCE. THIS ENGINEER WILL BE REQUIRED TO PREPARE ALL DESIGN CALCULATIONS, SHOP DRAWINGS, SPECIFICATIONS AND/OR CATALOG CUTS SUITABLE FOR THE ACQUISITION OF CONSTRUCTION PERMITS, AS PER THE PROJECT SPECIFICATIONS. THE CONTRACTOR'S ENGINEER SHALL FINALIZE ALL STRUCTURAL DIMENSIONS BASED ON THEIR FINAL DESIGN. THE CONTRACTOR'S ENGINEER SHALL SUBMIT THESE DESIGN DOCUMENTS TO THE OWNER'S ENGINEER FOR REVIEW AND APPROVAL PRIOR TO THE FABRICATION OF MATERIALS AND/OR THE COMMENCEMENT OF CONSTRUCTION.
3. AS PART OF THE BID FOR THIS PROJECT, THE DESIGN–BUILDER WILL BE REQUIRED TO PERFORM A SUBSURFACE EXPLORATION PROGRAM CONSISTING OF A MINIMUM OF ONE BORING AT EACH OF THE PROPOSED BRIDGE "F" SUBSTRUCTURE ELEMENTS (ONE AT EACH ABUTMENT AND ONE AT EACH PIER, TOTALING A MINIMUM OF FIVE BORINGS). THE DESIGN–BUILDER SHALL UTILIZE THE RESULTS OF THIS SUBSURFACE EXPLORATION PROGRAM TO PERFORM THE SUBSTRUCTURE DESIGN. THE RESULTS OF THIS SUBSURFACE EXPLORATION PROGRAM SHALL BE SUBMITTED TO THE OWNER'S ENGINEER FOR REVIEW ALONG WITH THE REQUIRED CALCULATIONS, SHOP DRAWINGS, SPECIFICATIONS AND/OR CATALOG CUTS.
4. THE COSTS ASSOCIATED WITH RETAINING THIS ENGINEER AND THE PERFORMANCE OF THE SUBSURFACE EXPLORATION PROGRAM, INCLUDING THE COSTS TO PROVIDE THE REQUIRED DESIGN CALCULATIONS, SHOP DRAWINGS, SPECIFICATIONS AND/OR CATALOG CUTS, SHALL BE INCLUDED IN THE PRICES BID FOR THE DESIGN–BUILD ITEMS REQUIRING SAID SERVICES.



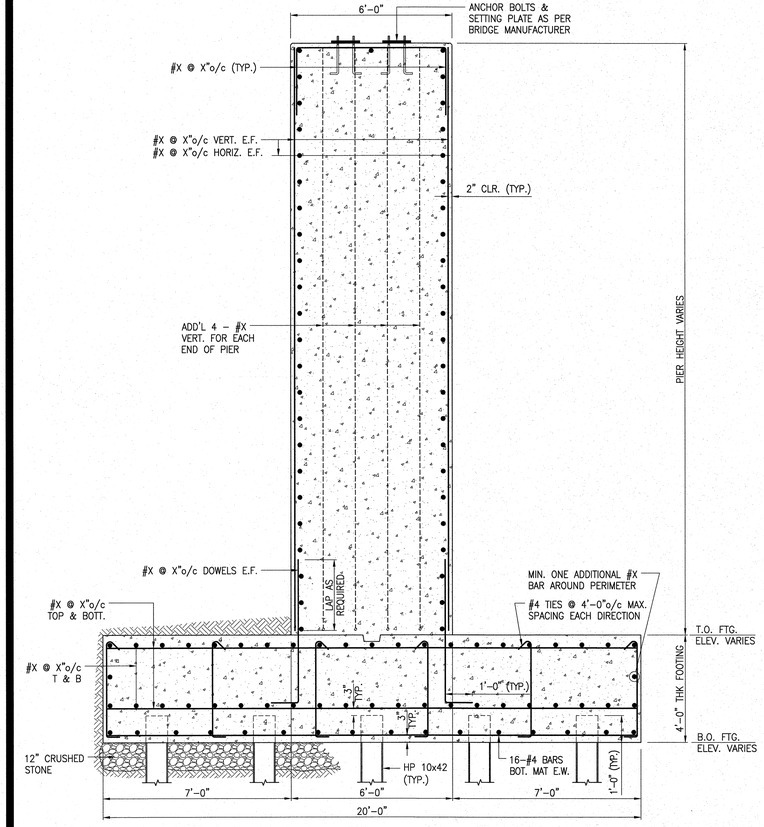
TYPICAL DESIGN–BUILD ABUTMENT SECTION (BRIDGE "F")

SCALE: N.T.S.



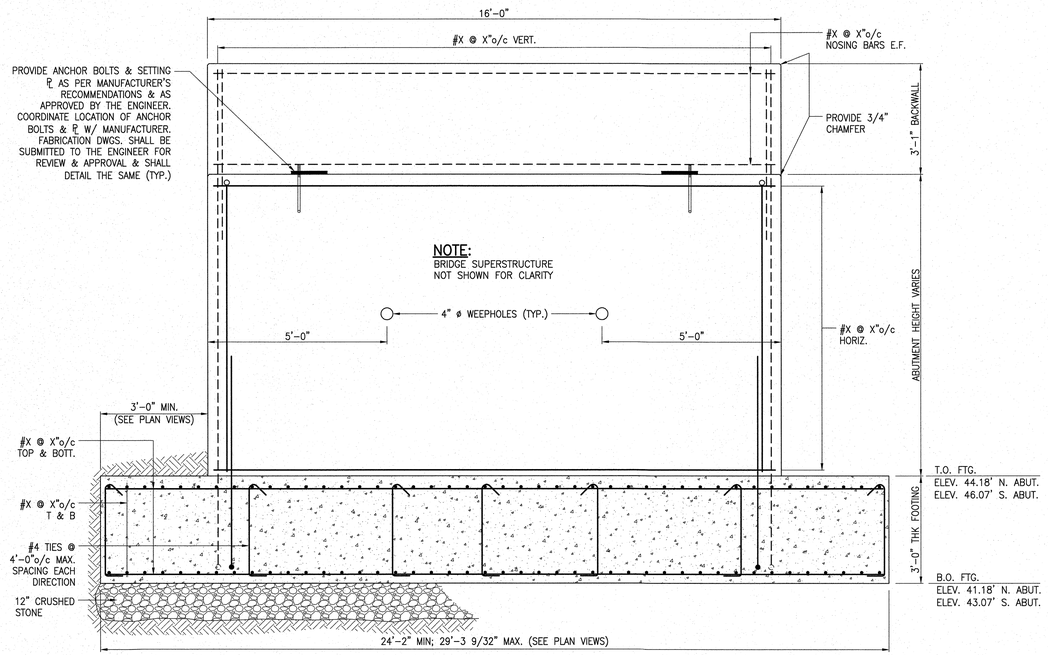
TYPICAL DESIGN–BUILD WINGWALL SECTION AT ABUTMENT (BRIDGE "F")

SCALE: 1/2"=1'–0"



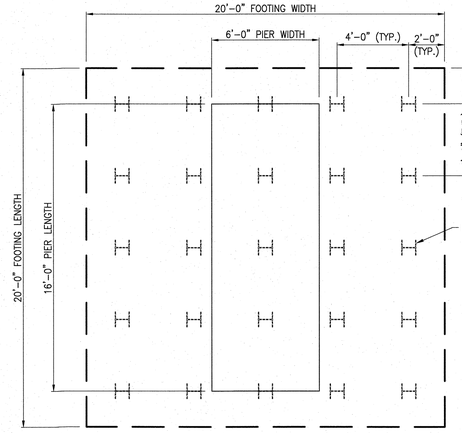
TYPICAL DESIGN–BUILD PIER SECTION (BRIDGE "F")

SCALE: 3/8"=1'–0"



TYPICAL DESIGN–BUILD ABUTMENT SECTION (BRIDGE "F")

SCALE: N.T.S.



SCHEMATIC BRIDGE "F" PIER PLAN

SCALE: 1/4"=1'–0"

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVIEWED
2	REVISED FOR RE-BID	04/02/2025	JS		
1	REVISED FOR RESUBMISSION	01/10/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

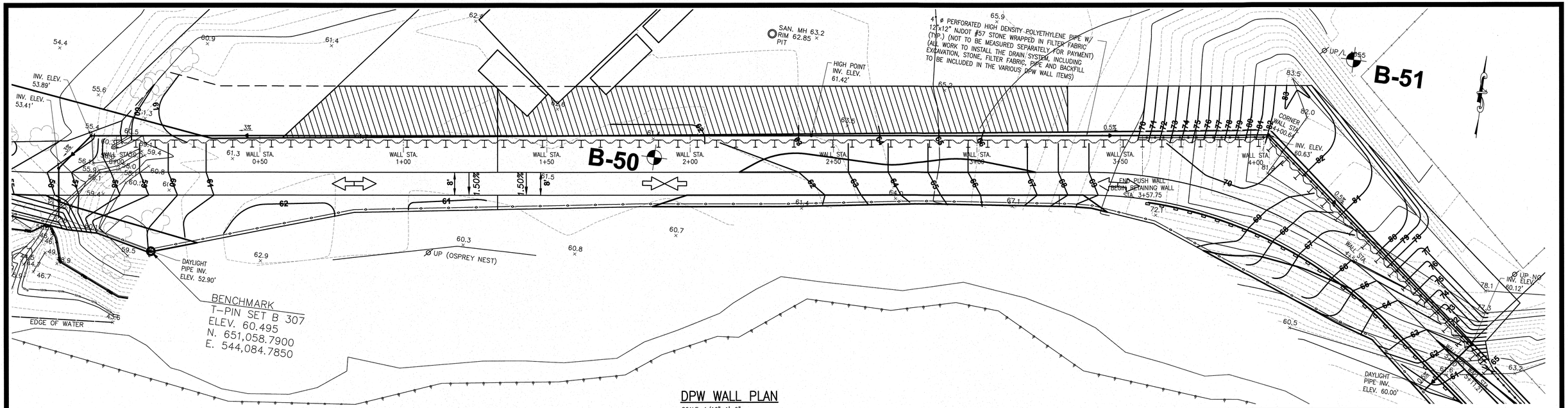
PEDESTRIAN BRIDGE "F" SECTIONS, DETAILS AND DESIGN-BUILD NOTES (2 OF 2)

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28379000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO. FILE NO. 115.UN00213.P05

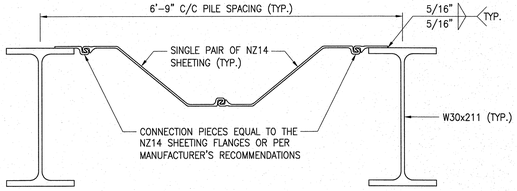
MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468
DATE 11.24

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	S-18
DRAWN BY JS / JN	DESIGNED BY JS / JN	
CHECKED BY NH	SHEET 134 of 139	



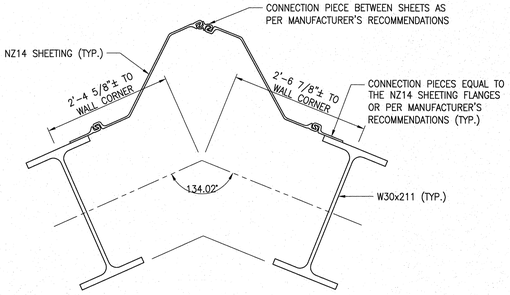
DPW WALL PLAN

SCALE: 1/16"=1'-0"



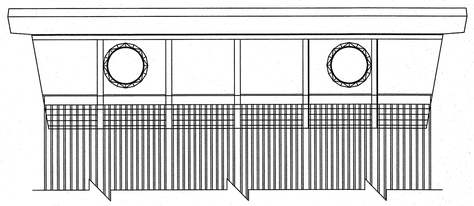
TYPICAL COMBINATION WALL DETAIL

SCALE: 3/4"=1'-0"



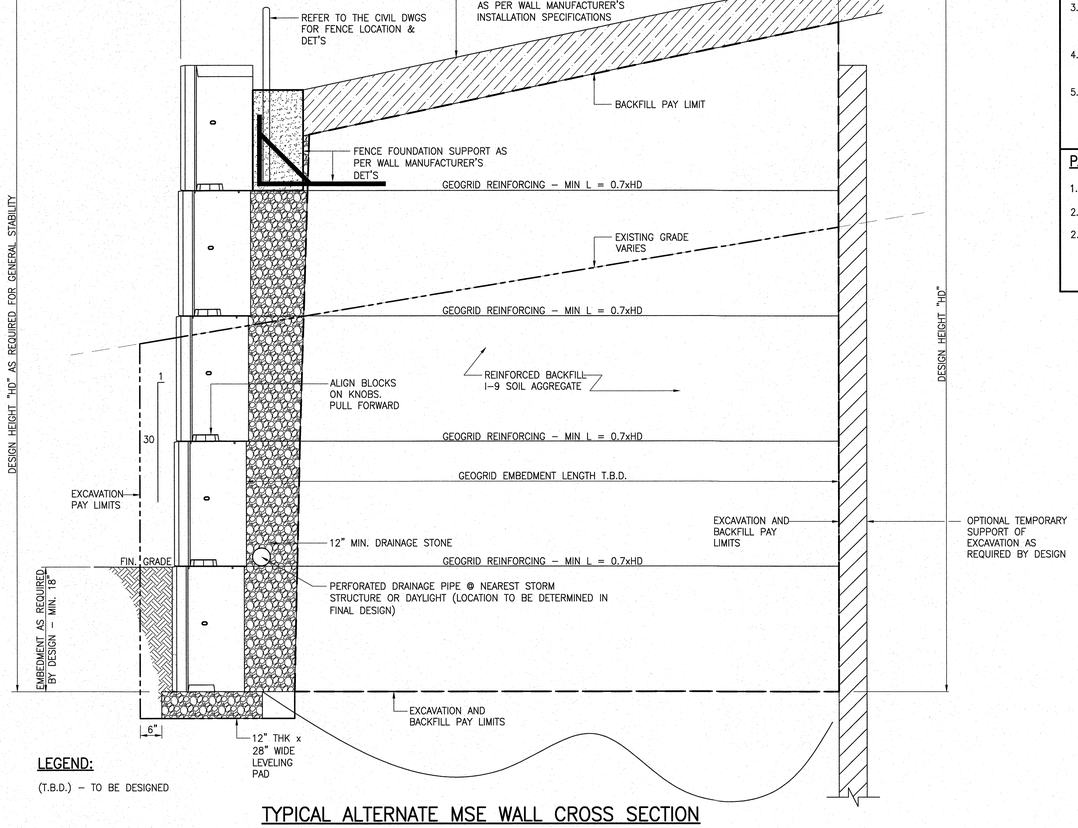
SUGGESTED COMBINATION WALL CORNER DETAIL

SCALE: 3/4"=1'-0"



ALTERNATE MSE WALL GEOGRID AND WEDGE CONNECTOR DETAIL

N.T.S.



LEGEND:

(T.B.D.) – TO BE DESIGNED

TYPICAL ALTERNATE MSE WALL CROSS SECTION

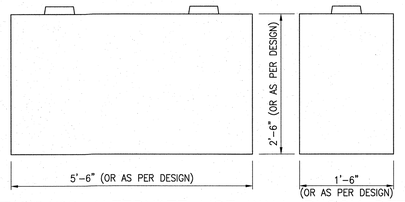
N.T.S.

ALTERNATE MSE RETAINING WALL DESIGN AND CONSTRUCTION NOTES:

1. THE ALTERNATE MSE RETAINING WALL SHOWN ON THIS DRAWING IS THE MEGAWALL MSE WALL SYSTEM OR APPROVED EQUAL AND SHALL BE UTILIZED AT THE RETAINING WALL PORTION OF THE WALL (FROM STA. 3+57.75 TO THE END OF THE WALL) ONLY IF DIRECTED BY THE ENGINEER. THE BLOCK DETAILS SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. CONTRACTOR TO COORDINATE WITH WALL MANUFACTURER ON EXACT BLOCK DIMENSIONS AND BLOCK PLACEMENT IN ACCORDANCE WITH THE BLOCK MANUFACTURER'S DESIGN AND WALL SPECIFICATIONS.
2. THE CONTRACTOR IS HEREIN ADVISED THAT THE MSE BLOCK RETAINING WALL DESIGN AND ITS FOUNDATION ELEMENTS WILL BE REQUIRED FOR THIS PROJECT IF THE ALTERNATE MSE RETAINING WALL DESIGN IS SELECTED. THESE DETAILS PROVIDE FOR MINIMUM DIMENSIONS AND MINIMUM REQUIREMENTS FOR THE STRUCTURES AND STRUCTURAL ELEMENTS TO BE DESIGNED AND BUILT. AS A PART OF THE BID FOR THIS PROJECT, THE CONTRACTOR WILL BE REQUIRED TO RETAIN THE SERVICES OF A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW JERSEY TO DESIGN ALL OF THESE STRUCTURAL ELEMENTS FOR THE RETAINING WALL SPECIFIED.
3. THE CONTRACTOR'S ENGINEER WILL BE REQUIRED TO SUBMIT A DESIGN FOLLOWING STRUCTURAL DESIGN LOADS, CODE COMPLIANCE (LATEST EDITIONS OF IBC, NJ EDITION AND ASCE 7) AND CONSTRUCTABILITY; AND TO PERFORM A GEOTECHNICAL INTERPRETATION OF THE SOIL BORING LOGS TO DEVELOP SOIL DESIGN PROPERTIES FOR THE DESIGN OF THE STRUCTURES AND STRUCTURAL ELEMENTS.
4. THE CONTRACTOR'S ENGINEER WILL BE REQUIRED TO SUBMIT DETAILED DESIGN CALCULATIONS, SHOP DRAWINGS AND/OR CATALOG CUTS TO THE OWNER'S ENGINEER FOR REVIEW AND APPROVAL FOR THE SPECIFIED RETAINING WALL PRIOR TO THE WALL'S FABRICATION. THE CONTRACTOR'S ENGINEER'S LAYOUT SHALL BE BASED ON THE DETAILS SHOWN ON THESE DRAWINGS.
5. UPON APPROVAL BY THE OWNER'S ENGINEER, THE CONTRACTOR'S LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW JERSEY SHALL PROVIDE SIX (6) SETS OF SIGNED AND SEALED DETAILED DOCUMENTS TO THE OWNER'S ENGINEER FOR USE BY THE CONTRACTOR DURING CONSTRUCTION. THE COSTS ASSOCIATED WITH RETAINING A LICENSED PROFESSIONAL ENGINEER, INCLUDING PROVIDING THE REQUIRED DOCUMENTS, SHALL BE INCLUDED IN THE PRICE BID FOR THE NEW RETAINING WALL STRUCTURE AND ITS FOUNDATION, INCLUDING ALL APPURTENANCES, AS DESCRIBED HEREIN.

PAY LIMIT NOTES:

1. THE PROPRIETARY ALTERNATE MSE RETAINING WALL WILL BE MEASURED BY THE SQUARE FOOT UNDER THE PAY ITEM "MSE RETAINING WALL".
2. THE AREA MEASURED WILL BE THE PRODUCT OF THE EXPOSED AND BURIED WALL FACE AND THE TOTAL LENGTH OF WALL SHOWN.
2. GEOGRID REINFORCEMENT, BASE LEVELING PAD, UNIT FILL, BACKFILL, EXCAVATION, FOUNDATION, SOIL PREPARATION, BLOCK WALL UNITS, CAPS, FILTER FABRIC, TOE DRAINS, HEEL DRAINS, ANY DEWATERING REQUIRED TO FACILITATE THE CONSTRUCTION OF THE RETAINING WALL, AND ANY OTHER WORK REQUIRED TO SATISFACTORILY COMPLETE SAME SHALL NOT BE MEASURED SEPARATELY FOR PAYMENT AND WILL BE INCLUDED IN THE SQUARE FOOT "MSE RETAINING WALL" ITEM.



STANDARD ALTERNATE MSE WALL BLOCK DETAIL

N.T.S.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2	REVISED FOR RE-BID	04/02/2025	JS		
1	REVISED FOR RESUBMISSION	01/10/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DPW WALL PLAN AND DETAILS

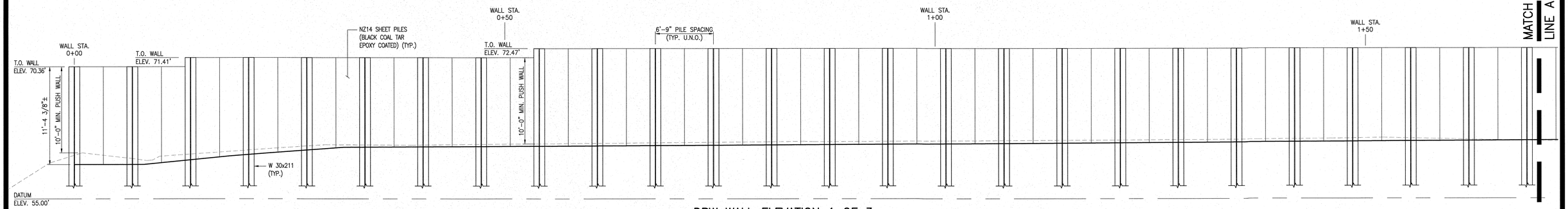
CVE ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	As Shown
DATE	October 2024
DRAWN BY	JS/RT
DESIGNED BY	GT/JS
CHECKED BY	NH
SHEET	135 of 139

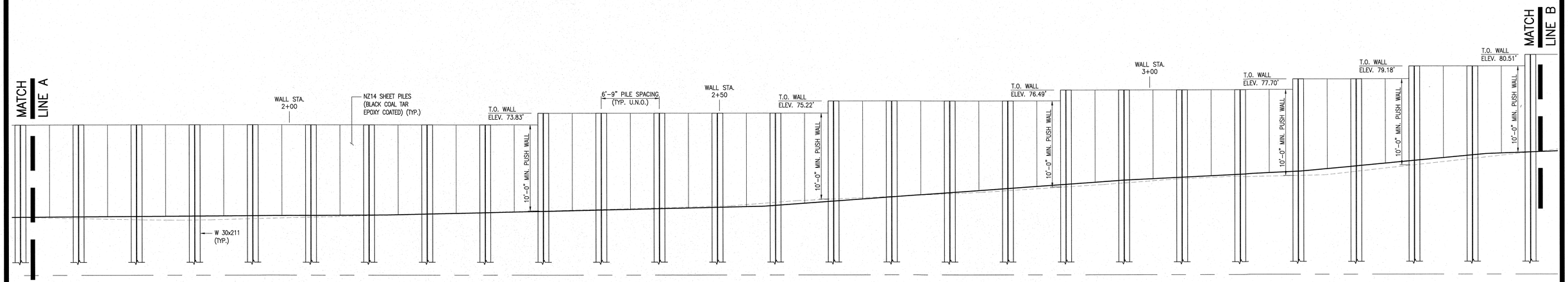
REGISTER NO. 115.UN00213.P05

DRAWING NUMBER **S-19**



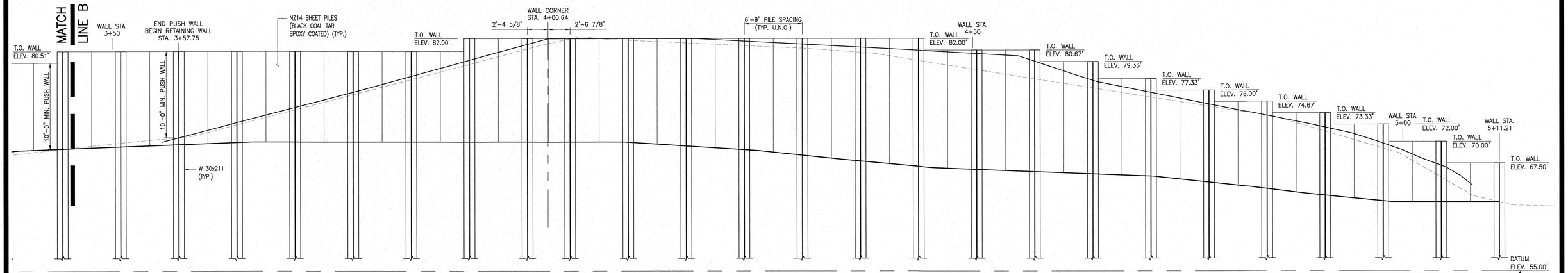
DPW WALL ELEVATION 1 OF 3

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



DPW WALL ELEVATION 2 OF 3

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



DPW WALL ELEVATION 3 OF 3

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

DPW COMBINATION WALL NOTES:

1. THE REQUIREMENT FOR THE SHEET PILES IS TO PROVIDE A NEARLY CONTINUOUS BARRIER OF INTERLOCKED STEEL SHEET PILING TO MITIGATE FLOOD INDUCED UNDERSEEPAGE OF THE FLOOD WALLS AND TO ACT AS THE STRUCTURAL ELEMENT FOR THE LINEAR "I" TYPE FLOOD BARRIERS IN ADDITION TO SEEPAGE MITIGATION
2. PREPARE SUBMIT AND REVIEW SUBMITTALS AS REQUIRED BY THE SPECIFICATIONS AND PARTIALLY LISTED ON DRAWING S-1.
3. PERFORM ALL WORK IN ACCORDANCE WITH MUNICIPAL, COUNTY, STATE AND FEDERAL SAFETY REGULATIONS HAVING JURISDICTION.
4. STORE MATERIALS IN AREAS ON SITE SO AS NOT TO INTERFERE WITH DPW YARD ACTIVITIES.
5. COORDINATE BULKHEAD INSTALLATION WITH EXCAVATION OPERATIONS, IF REQUIRED.
6. PREPARE STABLE PLATFORMS FOR OPERATION OF CRANES, AND SHEET PILE INSTALLATION.
7. STAGE AND POSITION EQUIPMENT SO AS TO PREVENT LOSS OF SUPPORT AT THE TOP OF SLOPE. STOCKPILE MATERIALS AWAY FROM TOP OF SLOPE.
8. COORDINATE VIBRATION AND SETTLEMENT MONITORING PROGRAMS WITH SHEET PILE INSTALLATION AND ADHERE TO WARNING AND ACTION MONITORING LEVELS REQUIRING INTERRUPTION OF WORK AND MODIFICATION OF INSTALLATION OPERATIONS.
9. SEE SPECIFICATIONS AND THIS DRAWING FOR SECTION REQUIREMENTS COMBINATION BEARING PILE AND SHEET PILE SECTIONS.
10. SHEET PILES SHALL BE FABRICATED FROM STEEL CONFORMING TO ASTM A572 WITH MINIMUM YIELD STRESS OF 50,000 PSI.
11. SEE BEARING PILE NOTES AND SPECIFICATIONS FOR COMBINATION WALL BEARING PILE REQUIREMENTS.
12. WELDING FOR BULKHEAD WORK, IF REQUIRED, SHALL CONFORM TO AWS D1.1. ELECTRODES SHALL CONFORM TO AWS E70XX WITH MINIMUM YIELD STRESS OF 70000 PSI.
13. PERFORM LAYOUT OF SYSTEM IN ACCORDANCE WITH APPROVED LAYOUT PLAN.
14. PROVIDE SUITABLE TEMPLATES TO MAINTAIN THE ALIGNMENT OF THE SHEET PILES DURING DRIVING. MAXIMUM DEVIATION FROM PLAN LOCATION SHALL BE 2 INCHES AT THE CUTOFF ELEVATION. MAXIMUM DEVIATION FROM PLUMB SHALL BE 1 PERCENT.
15. INSTALL SHEETING USING DRIVING EQUIPMENT CONFORMING TO SUBMITTALS. USE VIBRATORY OR IMPACT HAMMERS SPECIFICALLY DESIGNED FOR INSTALLATION OF SHEET PILES IN THE DENSE STRATA REPORTED IN THE BORINGS. PROVIDE CRANES AND LIFTING EQUIPMENT AT CAPACITIES CERTIFIED FOR LIFTING BOTH THE HAMMERS, LEADS AND SHEET PILES.
16. DRIVE PILES CONTINUOUSLY WITHOUT INTERRUPTION TO THE REQUIRED DEPTH. REMOVE SHALLOW OBSTRUCTIONS ABOVE A DEPTH OF 5 FEET BY EXCAVATION WITHIN THE PRESCRIBED LIMITS OF DISTURBANCE. REPORT DEEP OBSTRUCTIONS OR REFUSAL TO THE OWNER/ENGINEER FOR EVALUATION.
17. INSTALL COMBINATION WALL CUTOFFS IN ACCORDANCE WITH SEQUENCE REQUIRED TO MAINTAIN INTERLOCKS BETWEEN SHEET PILING AND BEARING PILES.
18. CUT SHEETING TO THE ELEVATION SHOWN ON THE PLANS USING METHOD INDICATED ON THE APPROVED WORKING DRAWING SUBMITTAL.
19. IF REQUIRED, EXCAVATE AS REQUIRED TO INSTALL CONCRETE ENCASEMENTS AND FOR UTILITY CROSSINGS.
20. IF REQUIRED, PROVIDE CUTOUTS FOR UTILITY CROSSINGS AND PREPARE FOR CONSTRUCTION OF BULKHEAD SEALS AT THE UTILITY CROSSINGS.
21. W-SECTION BASE BID LENGTH IS 40 FT. THE TOP OF WALL STEPS UP AND DOWN THROUGHOUT THE LENGTH OF THE WALL, SO TIP ELEVATIONS WILL VARY ACCORDINGLY.
22. W-SECTIONS SHALL BE COATED WITH A 16 MIL APPLICATION OF COAL TAR EPOXY EXTENDING FROM AN ELEVATION OF 3 FEET MINIMUM BELOW THE FINISHED GROUND SURFACE TO THE TOP OF THE EXPOSED STEEL.
23. SHEET PILING SHALL BE COATED WITH A 16 MIL APPLICATION OF COAL TAR EPOXY.
24. COAL TAR EPOXY SHALL CONFORM TO SSPC-PAINT NO. 16 AND BE BLACK IN COLOR.
25. THE SHEET PILE CONNECTOR PIECES ARE QUANTIFIED AND INCLUDED IN THE SQUARE FOOT "PERMANENT SHEETING, DPW WALL" PAY ITEM.
26. THE SHEET PILES HAVE BEEN QUANTIFIED AS HAVING A BASE BID LENGTH OF 15 FT. THE TOP OF WALL STEPS UP AND DOWN THROUGHOUT THE LENGTH OF THE WALL, SO TIP ELEVATIONS WILL VARY ACCORDINGLY.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
2	REVISED FOR RE-BID	04/02/2025	JS		
1	REVISED FOR RESUBMISSION	01/10/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

DPW WALL ELEVATIONS

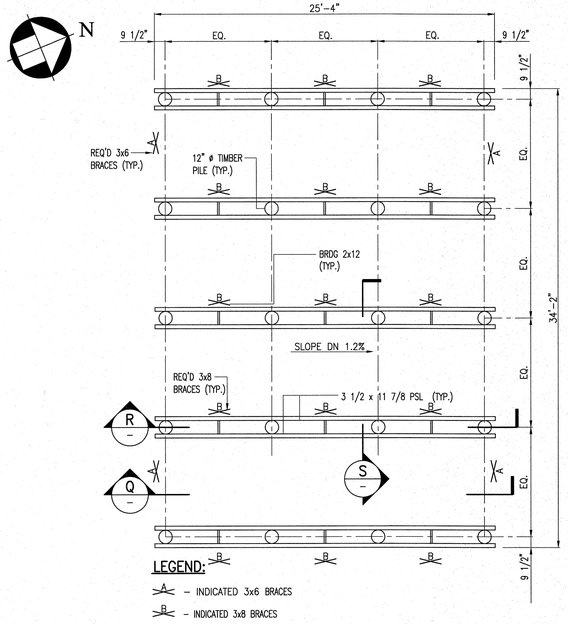
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28339000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 (732) 727 8000
1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194 (732) 462 7400

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468
DATE 10.1.24

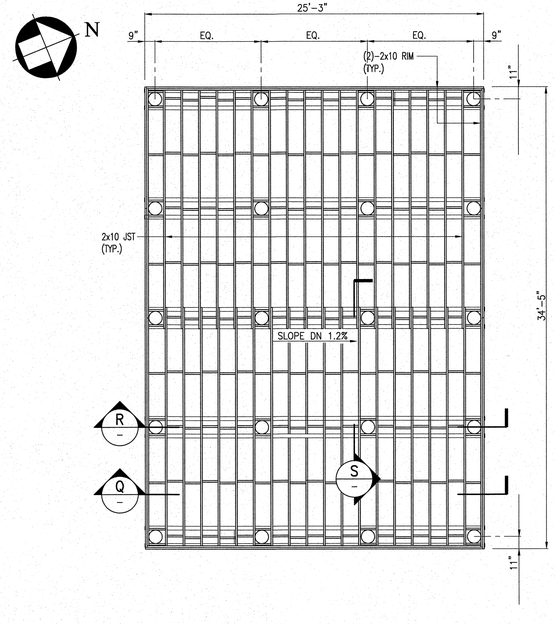
SCALE	DATE
As Shown	October 2024
DRAWN BY	DESIGNED BY
JSRT	GTJ/JS
CHECKED BY	SHEET
NH	136 of 139

DRAWING NUMBER **S-20**

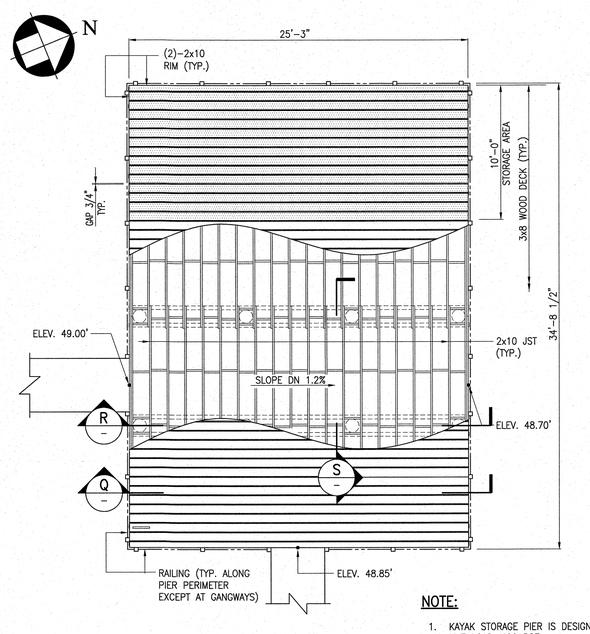
REGISTER NO. 115.UN00213.P05
JOB NO.



PILE LAYOUT AND SPLIT PILE CAP LAYOUT PLAN
SCALE: 3/16"=1'-0"



JOISTS FRAMING PLAN
SCALE: 3/16"=1'-0"



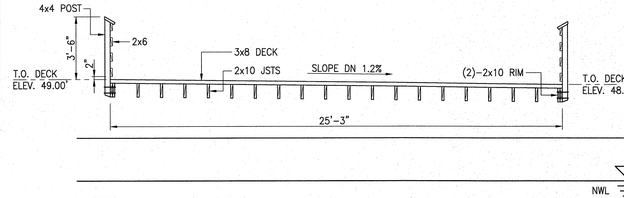
DECK LAYOUT PLAN
SCALE: 3/16"=1'-0"

NOTE:
1. KAYAK STORAGE PIER IS DESIGNED FOR FOLLOWING LOADS:
   LIVE LOAD: 100 PSF
   GROUND SNOW LOAD: 25PSF
   WIND LOADS:
   RISK CATAGORY: III
   BASIC WIND SPEED: 124MPH
   SEISMIC LOADING:
   RISK CATEGORY: III
   SITE CLASS: D
   S_{DS}: 0.29
   S_{D1}: 0.093
   SEISMIC DESIGN CATEGORY: B
2. HYDROSTATIC LOADS ARE BASED ON THE FOLLOWING WATER LEVELS:

a. NORMAL DURATION – EL. 43.3 FT.
b. THE 10 YEAR STORM EVENT – EL. 45.7 FT.

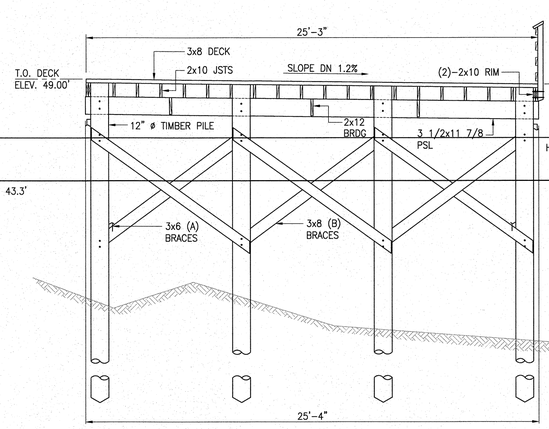
3. THE LOWEST DECK ELEVATION EL. 48.7 IS BASED ON THE 10 YEAR STORM EVENT EL. 45.7 PLUS A FREE BOARD OF 3 FT. SEE CIVIL DRAWINGS FOR REFERENCE.
4. THIS KAYAK STORAGE PIER IS NOT CONSIDERED AS A COASTAL STRUCTURE AND IS THEREFORE ONLY DESIGNED FOR STILL WATER LEVELS. NO WAVE ACTION IS CONSIDERED FOR DESIGN.
5. ALL FASTENERS AND CONNECTORS REQUIRED FOR CONNECTIONS SHALL BE STAINLESS STEEL GRADE 316 AND 316L RESPECTIVELY, U.O.N.
6. INSTALL ONE HURRICANE TIE ON EACH JOIST AT EACH PILE CAP.
7. ALL TIMBER PILES SHALL BE ROUND 12" ø TAPERED PILES WITH A MINIMUM TIP DIAMETER OF 10" AND MINIMUM ALLOWABLE CAPACITY OF 20 TONS.
8. UNLESS OTHERWISE NOTED, MINIMUM EMBEDMENT OF PILES BELOW GROUND SHALL BE 25 FT.
9. PILES MAY NEED TO BE PRE-AUGURED, IF AND WHERE REQUIRED, TO ACHIEVE THE MINIMUM PENETRATION DUE TO THE HIGH BLOW COUNTS OBSERVED IN TEST BORINGS AND THE POTENTIAL FOR THE PRESENCE OF COBBLES AND BOULDERS IN THE VICINITY OF THE KAYAK STORAGE PIER. DIAMETER OF PRE-AUGER SHALL BE 8 IN, U.O.N. PRE-AUGURING WILL NOT BE MEASURED SEPARATELY FOR PAYMENT AND WILL BE INCLUDED IN THE COST OF THE DRIVEN TIMBER PILE PAY ITEMS.
10. PILE DRIVING IN THE LAKE AREA NEEDS TO BE COORDINATED WITH THE PROPOSED DREDGING ACTIVITY IN THE CENTRAL LAKE. THE CONTRACTOR SHOULD PLAN TO DRIVE THE PILES AFTER THE DREDGING PROCESS IS COMPLETED AND BEFORE THE WATER LEVEL HAS BEEN RESTORED.
11. BEARING PILES SHALL BE CUT OFF HORIZONTAL AND BE LEVELED AT THE REQUIRED ELEVATION. NO VERTICAL NOTCHING IS ALLOWED. CUTOFF ENDS OF THE PILES SHALL BE COATED WITH PRESERVATIVE AND COVERED WITH A PLASTIC CAP.
12. DECKING WHERE SPECIFIED IS PRESSURE TREATED 3"X8" "DENSE STANDARD" SOUTHERN PINE WOOD DECKING OR BETTER WITH THE FOLLOWING MINIMUM ALLOWABLE DESIGN PROPERTIES:

   F_b = 1600 PSI (SINGLE), F_b = 1800 PSI (REPETITIVE), $F_{c\ per}$ = 440 PSI, E = 1,600,000 PSI & E_{min} = 580,000 PSI

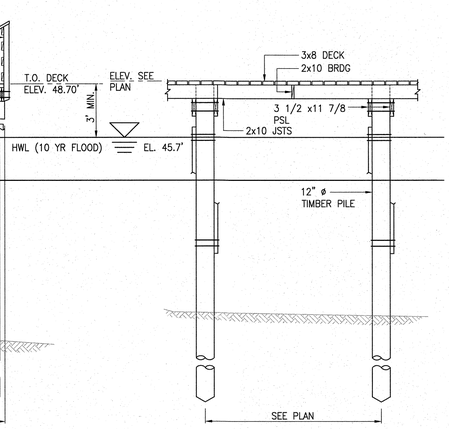


NOTE:
1. PILES, SPLIT PILE CAPS AND BRACING BELOW NOT SHOWN FOR CLARITY.

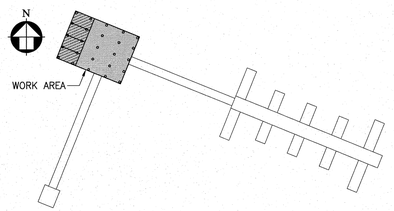
SECTION Q
SCALE: 1/4"=1'-0"



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



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



KEY PLAN
N.T.S.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	REVIEWED
1	REVISED FOR RE-BID	04/02/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

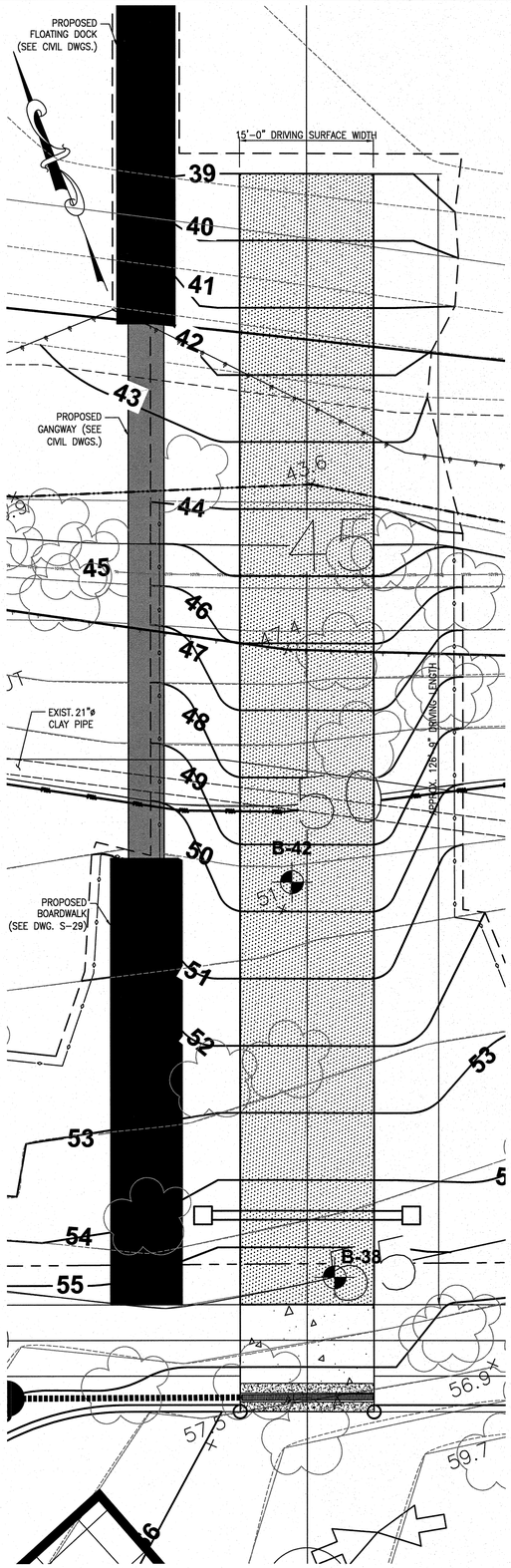
KAYAK STORAGE PIER - PILE CAPS, JOISTS AND DECK FRAMING PLAN

CVE ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
(732) 727 8000 (732) 462 7400
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

REGISTER NO.
FILE NO. 115.UN00213.P05

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE	DRAWING NUMBER
As Shown	October 2024	S-21
DRAWN BY: JN/GT	DESIGNED BY: JN/GT	
CHECKED BY: NH	SHEET: 137 of 139	

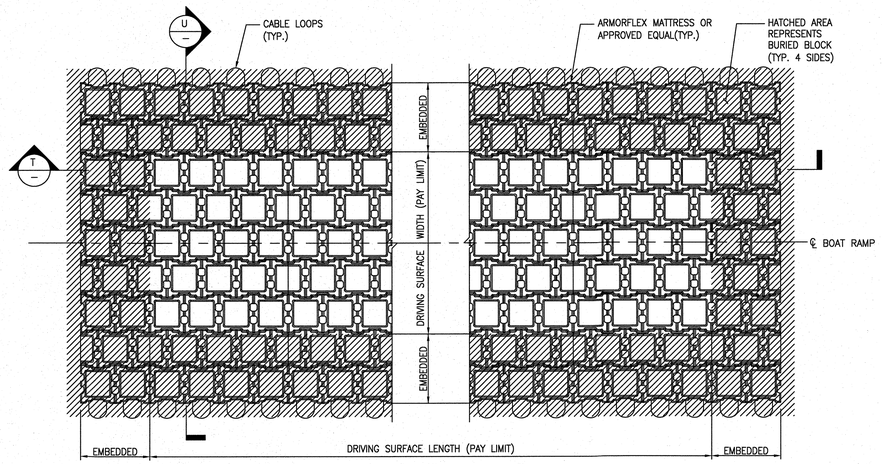


CENTRAL LAKE BOAT RAMP PLAN

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

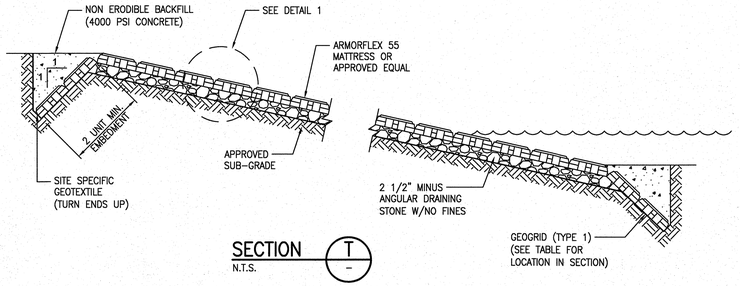
GENERAL CONSTRUCTION NOTES:

1. INFORMATION AS TO THE LOCATION OF EXISTING UTILITIES HAS BEEN COLLECTED FROM VARIOUS SOURCES. THE RESULTS OF SUCH INVESTIGATIONS AS SHOWN ON THE CONTRACT DRAWINGS ARE NOT GUARANTEED AS TO THE ACCURACY. THE CONTRACTOR IS PARTICULARLY DIRECTED TO THE FACT THAT UNDERGROUND OBJECTS OR MATERIALS LOCATION, ELEVATION, OR TYPE IS NOT WARRANTED TO BE APPROXIMATELY CORRECT NOR CAN THEY BE ASSUMED TO BE THE ONLY SUBSURFACE OBJECTS OR MATERIAL WHICH MAY BE ENCOUNTERED IN THE WORK. THE CONTRACTOR SHALL MAKE ALL NECESSARY INVESTIGATIONS TO SATISFY THEMSELF AS TO THE EXISTING CONDITIONS PRIOR TO THE BIDDING OF THE WORK.
2. THE CONTRACTOR IS RESPONSIBLE FOR AND SHALL VERIFY ALL DIMENSIONS AND DETAILS BEFORE PROCEEDING WITH THE WORK; ANY DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER. SHOP DRAWINGS SHALL BE SUBMITTED TO THE OWNER'S ENGINEER PRIOR TO CONSTRUCTION FOR APPROVAL.
3. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT ANY UTILITIES AND ALL OTHER EXISTING SITE CONDITIONS. ANY AREA, EITHER WITHIN OR OUTSIDE OF THE PROJECT LIMITS, DISTURBED AND/OR DAMAGED DURING CONSTRUCTION WILL BE RESTORED TO THE OWNER'S SATISFACTION AT THE EXPENSE OF THE CONTRACTOR, UNLESS OTHERWISE SPECIFIED BY THE OWNER'S ENGINEER.
4. WHEN DISTURBING, REMOVING, AND/OR DISPOSING OF ASBESTOS CEMENT PIPE, THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REQUIREMENTS INCLUDING BUT NOT LIMITED TO: CURRENT USEPA REGULATIONS (NESHAP, 40 CFR 61 SUBPART M); OSHA REGULATIONS (29 CFR 192658); THE CURRENT NEW JERSEY ASBESTOS HAZARD ABATEMENT SUBCODE (N.J.A.C. 5:23-8); THE CURRENT NJDEPE REGULATIONS (N.J.A.C. 7:26-1) ET. SEQ.); AND NOTIFICATION REGULATIONS (N.J.A.C. 5:23-8.6, 4 CFR 61 SUBPART M, AND N.J.A.C. 7:26-2:12).
5. THE CONTRACTOR SHALL MAINTAIN THE FLOW OF ALL STREAMS, DRAINAGE DITCHES, STORM SEWERS, AND SANITARY SEWERS AT ALL TIMES BY A MEANS ACCEPTABLE TO THE ENGINEER AND ALL THE RESPONSIBLE AGENCIES.
6. THE CONTRACTOR SHALL MAINTAIN ALL UTILITY SERVICE FLOWS AND PRESSURES UNLESS WRITTEN APPROVAL BY THE RESPONSIBLE UTILITY PERMITS THEM TO DO OTHERWISE.
7. THE CONTRACTOR SHALL TAKE EVERY PRECAUTION NECESSARY TO PRECLUDE DAMAGE TO EXISTING STRUCTURES, FACILITIES, AND UTILITIES DUE TO LOSS OF LATERAL SUPPORT AND/OR CONSTRUCTION LOADINGS. SPECIFIC DETAILS NECESSARY TO ACCOMPLISH SAME SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO COMMENCING CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.
8. THE CONTRACTOR IS ADVISED THAT THEY SHALL EXERCISE CARE WHEN WORKING NEAR EXISTING WATER, ELECTRIC AND/OR OTHER UTILITIES IN THE PROJECT AREA.
9. EXCAVATIONS OR TRENCHING WITHIN CLOSE PROXIMITY TO UNDERGROUND FACILITIES OR UTILITY POLES WILL REQUIRE PROTECTION TO PREVENT DAMAGE OR INTERRUPTION OF SERVICE TO UNDERGROUND OR OVERHEAD FACILITIES. THE COST TO PROVIDE THIS PROTECTION SHALL BE BORNE BY THE CONTRACTOR.



BOAT RAMP PLAN

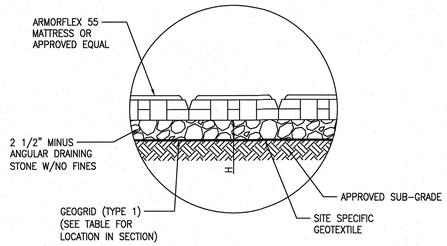
N.T.S.



SECTION T

N.T.S.

NOTE:
SEE PROFILE ON CIVIL DWGS. FOR SLOPES

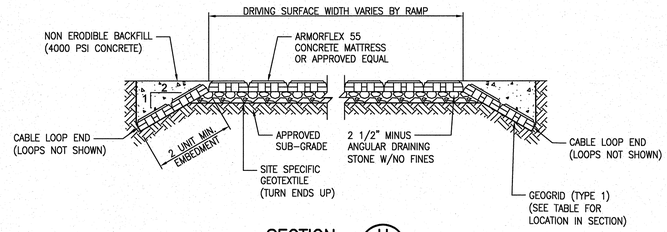


DETAIL 1

N.T.S.

CBR%	1	2	3	4	5
UNREINFORCED STONE THICKNESS, H (IN.)	61	31	20	15	11
REINFORCED STONE THICKNESS, H (IN.)	36*	16	8	8	8
NOTE: SECTION DEVELOPED ASSUMING 1000 PASSES OF HET MILITARY LOADING					

* 2 LAYERS OF TYPE 1 GEOGRID, AT SUBGRADE AND MIDDLE OF DRAINAGE BOX



SECTION U

N.T.S.

No.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	APPROVED
2	REVISED FOR RE-BID	04/02/2025	JS		
1	REVISED FOR RESUBMISSION	01/10/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CENTRAL LAKE PARK BOAT RAMP PLAN, DETAILS AND NOTES

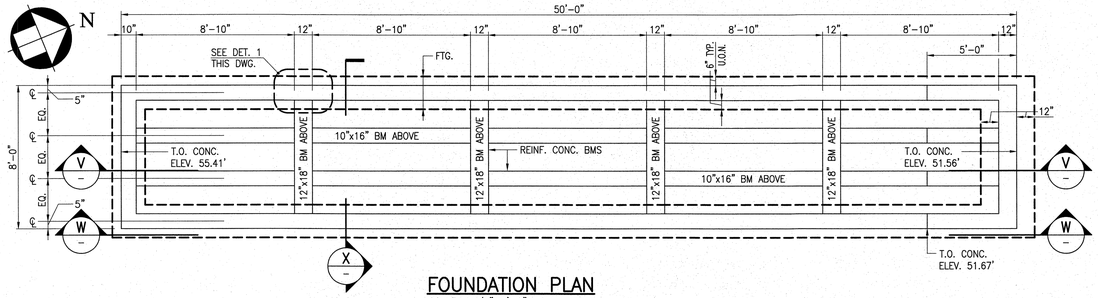
CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER
LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY: CH / JS	DESIGNED BY: CH / JS
CHECKED BY: NH	SHEET: 138 of 139

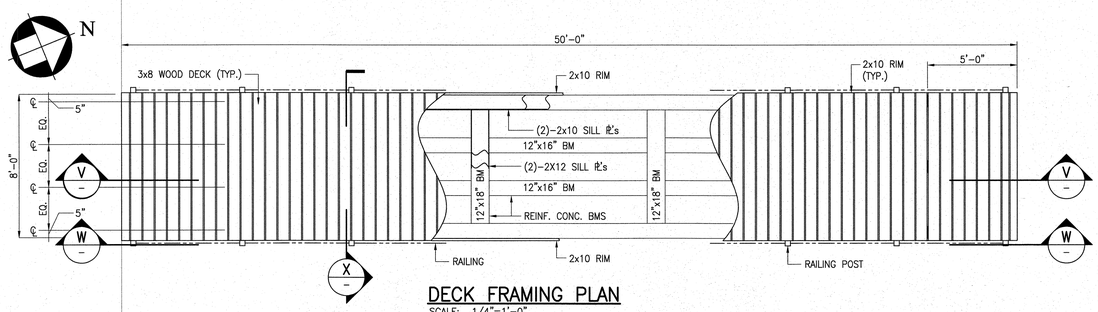
DRAWING NUMBER: S-22

REGISTER NO.
FILE NO. 115.UN00213.P05



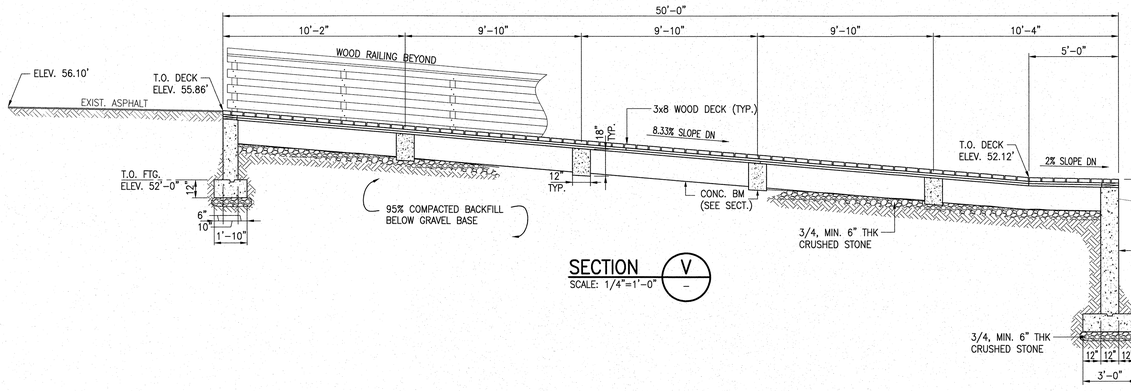
FOUNDATION PLAN

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



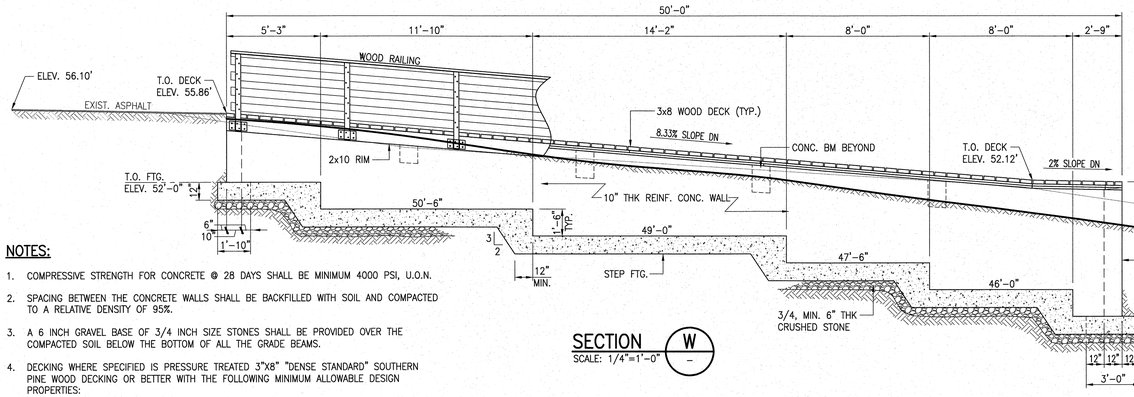
DECK FRAMING PLAN

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



SECTION V

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



SECTION W

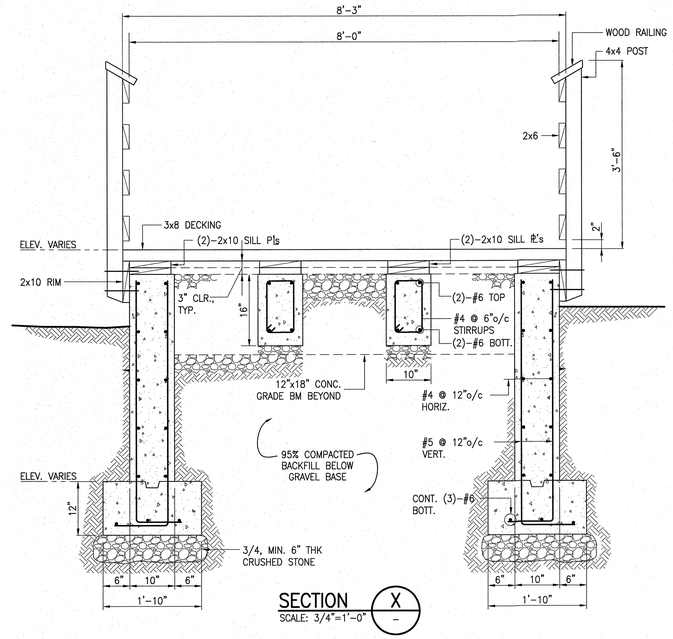
SCALE: 1/4"=1'-0"

NOTE:
PROPOSED GANGWAY FROM BOARDWALK TO FLOATING DOCK NOT SHOWN. CONNECTION OF GANGWAY TO BOARDWALK SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS AND SHALL BE SUBMITTED TO THE OWNER'S ENGINEER FOR REVIEW AND COORDINATION PRIOR TO FABRICATION AND/OR CONSTRUCTION.

NOTES:

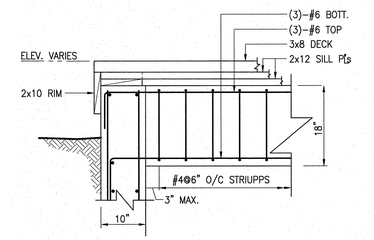
1. COMPRESSIVE STRENGTH FOR CONCRETE @ 28 DAYS SHALL BE MINIMUM 4000 PSI, U.O.N.
2. SPACING BETWEEN THE CONCRETE WALLS SHALL BE BACKFILLED WITH SOIL AND COMPACTED TO A RELATIVE DENSITY OF 95%.
3. A 6 INCH GRAVEL BASE OF 3/4 INCH SIZE STONES SHALL BE PROVIDED OVER THE COMPACTED SOIL BELOW THE BOTTOM OF ALL THE GRADE BEAMS.
4. DECKING WHERE SPECIFIED IS PRESSURE TREATED 3"X8" "DENSE STANDARD" SOUTHERN PINE WOOD DECKING OR BETTER WITH THE FOLLOWING MINIMUM ALLOWABLE DESIGN PROPERTIES:

   F_b = 1600 PSI (SINGLE), F_b = 1800 PSI (REPETITIVE), $F_{c\ per}$ = 440 PSI, E = 1,600,000 PSI & E_{min} = 580,000 PSI
5. PROVIDE A 3"± GAP BETWEEN WOOD DECKING AND GRAVEL BASE, TYP.



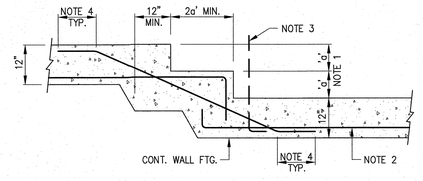
SECTION X

SCALE: 3/4"=1'-0"



DETAIL 1

SCALE: 3/4"=1'-0"

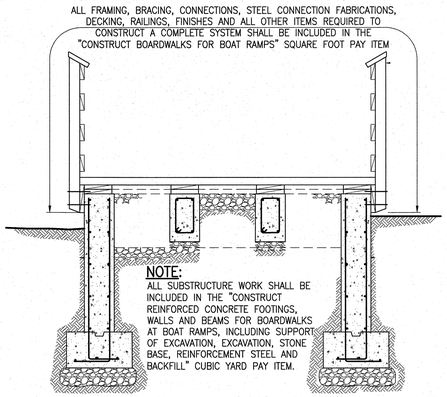


NOTES:

1. DIMENSION 'o' TO BE KEPT IN BLOCK COURSING NOT TO EXCEED 1'-4" AT MAS. OR 1'-6" AT CONC. WALLS.
2. FOOTING REINF. IN ALL BLOCK FNDN WALLS SHALL BE 3-#6 CONT.
3. DOWELS AT CONC. OR MAS. WALLS AS REQ'D, SEE TYP. DET. ◯ &/OR SECTIONS.
4. DIMENSION = LAP TYPE 'B' MIN.

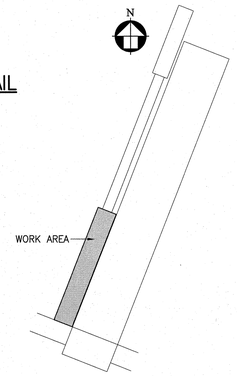
TYPICAL STEPPED FOOTING DETAIL

N.T.S.



PAY ITEM LIMITS

SCALE: 1/2"=1'



KEY PLAN

N.T.S.

NO.	DESCRIPTION OF REVISION	DATE	DRAWN	CHECKED	RELEASED
1	REVISED FOR RE-BID	04/02/2025	JS		

TOWNSHIP OF CLARK
UNION COUNTY, NEW JERSEY

CLARK RESERVOIR IMPROVEMENTS

CENTRAL LAKE PARK BOAT RAMP BOARDWALK- FOUNDATION LAYOUT AND DECK FRAMING

CME ASSOCIATES
CONSULTING AND MUNICIPAL ENGINEERS
(732) 727 8000 (732) 462 7400
NJ CERTIFICATE OF AUTHORIZATION NO. 24GA28359000
3141 BORDENTOWN AVENUE, PARLIN, NEW JERSEY 08859-1162 1460 ROUTE 9 SOUTH, HOWELL, NEW JERSEY 07731-1194

MICHAEL J. McCLELLAND P.E.
NEW JERSEY PROFESSIONAL ENGINEER LIC. 32468

SCALE	DATE
As Shown	October 2024
DRAWN BY: JN/GT	DESIGNED BY: JN/GT
CHECKED BY: NH	SHEET: 139 of 139

REGISTER NO. PAC MN 115.UN00213.P05

DRAWING NUMBER **S-23**