

SPECIFICATIONS

Final Remedial Design

**DESIGN ENGINEERING SERVICES – EPA REGION 2
CONTRACT #68HE0318D0009**

RARITAN BAY SLAG SUPERFUND SITE – SEAWALL SECTOR REMEDIAL DESIGN

Work Assignment Number Task Number 68HE0222F0017

Prepared For:



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
290 BROADWAY
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**Date of Issue:
September 2023**

**RARITAN BAY SLAG SUPERFUND SITE
SEAWALL SECTOR - FINAL REMEDIAL DESIGN
BIDDING SCHEDULE**

Item	Description	Unit	Estimated Quantity	Unit Cost	Total
<u>SECTION A - GENERAL REQUIREMENTS</u>					
0001	General Conditions	LS	NA	NA	NA
0002	Safety, Health, and Emergency Response	LS	NA	NA	NA
0003	Temporary Facilities	Month	15		
0004	Site Security	Month	17		
0005	Surveying	LS	NA	NA	NA
<u>SECTION B – SITE PREPARATION</u>					
0006	Site Preparation	LS	NA	NA	NA
0007	Clearing and Grubbing	AC	2		
0008	Soil Erosion and Sediment Control	LS	NA	NA	NA
0009	Soil/Sediment Stockpile and Loadout Area	LS	NA		
0010	Decontamination Stations	LS	NA	NA	NA
0011	Temporary Access Road	SY	9,000		
0012	Secondary Access Road	SY	10,800		
<u>SECTION C – DEWATERING AND WATER TREATMENT SYSTEM</u>					
0013A	Sheet Pile Wall Purchase	SF	184,800		
0013B	Sheet Pile Wall Installation	SF	184,800		
0014A	Dewatering - Required Items	LS	NA	NA	NA
0014B	Dewatering - Optional Items	LS	NA	NA	NA
0015A	Water Treatment System Installation and Startup Testing - Required Items	LS	NA	NA	NA
0015B	Water Treatment System Installation and Startup Testing - Optional Items	LS	NA	NA	NA
0016	Water Treatment System O&M	HR	312		
<u>SECTION D – REMOVAL AND DECONTAMINATION OF RIPRAP</u>					
0017	Post-Sandy Riprap Removal	CY	4,300		
0018	Riprap Decontamination	CY	4,300		
0019	Startup Pilot Testing	LS	NA	NA	NA
<u>SECTION E – LARGE SLAG, DEBRIS AND WEATHERED RIPRAP REMOVAL</u>					
0020	Large Slag, Weathered Riprap and Debris Removal	CY	5,300		
0021	Transportation and Disposal of RCRA Waste - Hazardous Slag	Tons	15,050		
0022	Transportation and Off-Site Disposal of Subtitle D Material - Miscellaneous Debris	Tons	800		
<u>SECTION F – EXCAVATION, WASTE HANDLING, AND DISPOSAL</u>					
0023	Primary Excavation	BCY	41,900		
0024	Secondary Excavation	BCY	4,190		
0025	Post-Excavation and Waste Characterization Sampling	EACH	3,924	NA	NA
0026	Transportation and Disposal of Subtitle D Material - Soil/Sediment	Tons	66,100		
0027	Transportation and Disposal of RCRA Waste - Soil/Sediment	Tons	20,690		
<u>SECTION G – BACKFILL, COMPACTION AND GRADING</u>					
0028	Backfill, Compaction and Grading	Tons	53,680		
0029	Backfill and Compaction (On-Site Reuse)	ECY	10,530		
0030	Topsoil	ECY	9,030		
<u>SECTION H – REVETMENT CONSTRUCTION</u>					
0031	Revetment Subgrade Preparation	SY	21,580		

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0032	Revetment Construction	SY	21,580		
0033	Stormwater Pipe Outfalls	LS	NA	NA	NA

SECTION I – SITE RESTORATION

0034	Margaret's Creek Access Road	SY	1,000		
0035	Seeding	SF	338,000		
0036	Transition and Wetland Area Restoration	LS	NA	NA	NA
0037	Wetland Monitoring and Maintenance	Years	5		

Specifications

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Title

Water Treatment System

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.1 SITE LOCATION

- A. The Raritan Bay Slag Superfund Site is approximately 1.5 miles in length and is located in a recreation area on the shore of Raritan Bay, in the eastern part of Old Bridge Township within the Laurence Harbor section in Middlesex County, New Jersey. A small portion of the western end of the site, the western jetty at the Cheesequake Creek Inlet, is in the Borough of Sayreville. The Raritan Bay Slag Superfund Site is bordered to the north by Raritan Bay and to the east, west, and south by residential properties.

1.2 SITE DESCRIPTION

- A. The Raritan Bay Slag Superfund Site has been divided into eleven areas. These areas have been grouped into three sectors based on the type of environment and proximity to source areas. These sectors include:
1. Seawall Sector (Areas 1, 2, 3, 4, 5, and 6)
 2. Jetty Sector (Areas 7, 8, and 11)
 3. Margaret's Creek Sector (Area 9)
- B. Area 10 was used for the collection of background samples during the Remedial Investigation, and it is not included within the areas subject to remediation.
- C. The Seawall Sector consists of the following areas:
1. Area 1: Laurence Harbor Seawall – The seawall along Old Bridge Waterfront Park west of Margaret's Creek to the beach area at the foot of Laurence Parkway.
 2. Area 2: Laurence Harbor Beach – The beach area at the foot of Laurence Parkway between the western end of the seawall and the First Jetty.
 3. Area 3: Laurence Harbor Playground – The Park playground adjacent to the western end of the seawall. No remedial target areas were identified in Area 3; therefore, no remedial action is required in this area.
 4. Area 4: Old Bridge Waterfront Park – The Park area along the seawall (not including the playground) from the fence to the roadway.
 5. Area 5: Laurence Harbor Beach – The beach area between the first and third jetty.
 6. Area 6: Laurence Harbor Beach – The beach area between the third jetty and Cheesequake Creek Inlet eastern jetty. No remedial target areas were identified in Area 6; therefore, no remedial action is required in this area.
- D. In addition to the Seawall Sector, the Contract Documents includes an upland portion, bordering Old Bridge Waterfront Park, of Area 9, the Margaret's Creek Sector.
- E. The remediation of the Raritan Bay Slag Superfund Site is being conducted in phases, with the Contract Documents addressing the Seawall Sector (Areas 1, 2, 4, and 5) and an upland portion of Margaret's Creek Sector (Area 9) that had not been remediated previously, herein collectively referred to as "the site."
- F. Waves in Raritan Bay flow predominantly from the east and northeast (from the Atlantic Ocean), and contaminants from the Seawall and Margaret's Creek sectors tend to migrate westward. Currents near the Jetty sector are complex due to strong tidal currents within Cheesequake Creek. This complicated environment dictates a specific sequencing of cleanup activities to prevent recontamination of remediated areas. The

sequence for site remediation to prevent recontamination is as follows: the Margaret's Creek sector; the Seawall sector; and then the Jetty sector. The remedial action for the wetland areas of the Margaret's Creek Sector was already completed in September 2018, but a small upland area more easily accessed and remediated with the Seawall Sector will be addressed in Paragraph 1.2.D. of this Specification.

- G. An extent of the seawall located in Area 1 along Old Bridge Waterfront Park has been expanded/alterd after the Superstorm Sandy as part of the response action. The terms, "Footprint of Seawall" and "Extent of Riprap" refer to the following definitions in the Contract Documents:
1. Footprint of Seawall – The extent of pre-Sandy seawall was estimated based on the 2010 topographic map converted from aerial photographs. It is assumed that the extent of large pieces of slag pieces (approximately greater than 8 to 10 inches), debris and battery casings are limited to this area within the footprint of seawall. The footprint of seawall also consists of mixed-in weathered riprap, which is visually distinct as brown to dark gray rock comingled with the slag pieces.
 2. Extent of Riprap – The extent of riprap was estimated based on the 2018 topographic survey conducted during the 2018 Pre-Design Investigation. The extent of the riprap includes the Footprint of Seawall plus the area where large riprap (also referred to as post-Sandy riprap) was placed after the Superstorm Sandy. The post-Sandy riprap are visually distinct as gray to medium gray large riprap, generally greater than 18 to 24 inches.

1.3 BACKGROUND AND SITE HISTORY

- A. The initial activities that led to the Raritan Bay Slag Superfund Site's National Priorities List (NPL) listing began in the late 1960s and early 1970s, when slag—mostly in the form of blast furnace pot bottoms from a secondary lead smelter—was used in the construction of a seawall in an area that had sustained significant beach erosion and damage due to a series of storms in the preceding years. Slag was used as fill/stabilizing material. Demolition debris in the form of concrete and a variety of bricks, including fire bricks, was also placed within the Footprint of Seawall. In addition, a portion of the seawall contains large riprap believed to have been placed over the slag.
- B. In 2007, elevated levels of lead, antimony, arsenic, chromium, and copper were identified by the New Jersey Department of Environmental Protection (NJDEP) in soil along the seawall, as well as at the edge of the beach near the western end of the seawall. On April 24, 2008, EPA received a request from NJDEP to evaluate the Laurence Harbor seawall for a removal action under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). On November 3, 2008, NJDEP forwarded an amended request to include the Western Jetty along the Cheesequake Creek Inlet. Several investigations and RA activities were conducted by EPA, NJDEP, and the Old Bridge Municipal Utilities Authority (OBMUA) between 2007 and 2015. Details of these investigations conducted from 2007 to 2010 are provided in Section 2.1 of the Record of Decision (ROD) dated May 2013.
- C. A Remedial Investigation (RI) was conducted by CDM Smith between September 2010 and June 2011. Activities focused on collecting sufficient data to supplement the existing data as identified in the Final (Revised) Data Gap Evaluation Technical Memorandum. Based on the RI results, Feasibility Study (FS) was completed in September 2012. The ROD for the Raritan Bay Slag Superfund Site was signed by EPA in May 2013 and called for removal of the source material, institutional controls, and long-term monitoring.

- D. In October 2013, as a result of Hurricane Sandy, EPA's Removal Program completed removal of storm-deposited debris from the park, assessed and remediated contaminated park surface soils, repaired damaged portions of the seawall, and established fencing and signage along the park.

1.4 SUMMARY OF AVAILABLE DATA

- A. The primary sources of site-related metals contamination are slag and battery casings. The seawall is up to 80 percent slag. Battery casings were found in the upper two inches of depositional zones in Areas 2 and 5. Buried slag was observed in test excavations on the upland side of the seawall in Area 1 and the eastern end of Area 4. In general, slag depths ranged from 1 to 5 feet below ground surface.
- B. Lead is the primary contaminant of concern for soil and sediment at the Raritan Bay Slag Superfund Site.
- C. The lead soil and sediment results, groundwater and surface water results, and results of leachability testing conducted on soil, slag and battery casing material during previous investigations are included in the Design Analysis Report. The maximum soil lead concentration detected at the site was 61,000 milligrams per kilogram (mg/kg). Concentrations of lead in both composite and core slag samples were identified at levels ranging from 38,000 mg/kg to 91,000 mg/kg.
- D. In Area 1, along the seawall, lead concentrations (up to 61,000 mg/kg) that exceeded the remediation cleanup level occur along the mean high tide line. Most of the contamination in this area is in the shallow soils and sediment.
- E. In Area 2, in the soils and near-shore sediments, lead concentrations (up to 23,800 mg/kg) exceeded the remediation cleanup level. Soils at depths up to 9 feet in this area exceeded remediation cleanup level.
- F. In Area 5, near the First Jetty, lead concentrations (up to 1,090 mg/kg) in soil and sediment exceeded the remediation cleanup level.
- G. Only lead was detected at concentrations greater than the hazardous waste toxicity TCLP criteria of 5 milligrams per liter (mg/l). Lead TCLP values ranged from 15.1 to 1050 mg/l, with the maximum concentration detected at 1-2 feet bgs within the Footprint of Seawall.
- H. In surface water, lead was commonly detected above the site-specific screening criterion in surface water samples collected from the intertidal zone, between the eastern end of Area 1 and the western end of Area 6. The highest concentrations of dissolved lead [up to 1,780 micrograms per liter (µg/l)] exceeded the site-specific screening criterion of 5 µg/l, which was detected in Area 2. Both dissolved and total lead concentrations generally exceeded the site-specific screening criterion in samples adjacent to the seawall. Arsenic was detected above its site-specific screening criterion less frequently than lead. The highest concentrations of dissolved arsenic (up to 36.2 µg/l) exceeded the site-specific screening criterion of 0.061 µg/l.

1.5 PROJECT OBJECTIVES

- A. The Contract Documents (Specifications and drawings) were prepared using performance and prescriptive designs to implement the remedy for the site. The Contractor shall provide all labor, materials, equipment, and incidentals necessary to complete the remedial action (RA) required by the Raritan Bay Slag Superfund Site ROD dated May 2013.

- B. The ROD outlined the Remedial Action Objectives (RAOs), which address the human health risks and environmental concerns at the site. The RAOs are organized into these categories: slag, battery casings, and associated wastes, which comprise the highly toxic source material principal threat waste (PTW); soil; sediment; and surface water. In general, PTW are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or present a significant risk to human health, or the environment should exposure occur. PTW (i.e., source materials) at the site include 1) Slag and battery casings/associated wastes, including particles of slag and battery casings/associated wastes identified in the soil and sediment media; 2) Highly impacted soil in the Seawall Sector in portions of Areas 1 and 2, and in the upland portion of the Margaret's Creek Sector; and 3) Highly impacted sediment located in Areas 1 and 2 in the Seawall Sector. The RAOs are listed below:
1. The RAOs for the slag and battery casings and associated wastes are to:
 - a. Reduce exposure resulting from incidental ingestion of slag and battery casings and associated wastes to levels that are protective of human health.
 - b. Reduce exposure resulting from the ingestion of slag and battery casings and associated wastes to levels that are protective of ecological receptors.
 - c. Reduce migration of contamination from the slag and battery casings and associated wastes to surface water, soil and sediments to levels that are protective of human health and ecological receptors.
 2. The RAOs for contaminated soil and highly impacted soil (containing PTW) are to:
 - a. Reduce exposure resulting from incidental ingestion of contaminated soil to levels protective of human health.
 - b. Reduce exposure resulting from the ingestion of contaminated soil and ingestion of contaminants via food chain to levels protective of ecological receptors.
 - c. Reduce migration of contamination from the soil to surface water and sediments to levels that are protective of human health and ecological receptors in Area 9.
 3. The RAOs for contaminated sediment and highly impacted sediment (containing PTW) are to:
 - a. Reduce exposure resulting from the ingestion of contaminated sediments and ingestion of contaminants via food chain to levels protective of ecological receptors.
 - b. Reduce the migration of contamination from the sediments to surface water and soil to levels that are protective of human health and ecological receptors.
 4. The RAO for surface water is to:
 - a. Reduce metals concentrations to levels that are protective of ecological receptors by remediating source materials.
- C. The selected remedy addresses the potential risks to human health and the environment associated with the site.
1. The selected remedy as per the ROD dated May 2013 includes the following components:
 - a. Remediation of Slag, Battery Casings and Associated Wastes: PTW such as slag, battery casings and associated wastes will be excavated based on visual observation and disposed of at appropriate off-site facilities. Slag materials that are not readily visible will be remediated as soil/sediment. Demolition debris in the form of concrete and various bricks will also be removed and disposed of at appropriate off-site facilities.

- b. Surface Water: By removing PTW, surface water contamination will be reduced to acceptable levels over time. Monitoring will be implemented to ensure the effectiveness of the remedy by achieving the remedial goals presented in the Table 5-2 of the ROD.
 - c. Soil and Sediments: Contaminated soils and sediment above the lead remediation cleanup level of 400 mg/kg will be excavated and/or dredged and disposed of at appropriate off-site facilities.
- 2. Through the execution of the selected remedy, the 2013 ROD states that RAOs for the site will be met and no institutional controls will be required.
- D. Cleanup Levels for Chemicals of Concern
 - 1. The selected remedy will remove the concentrations of lead above the cleanup levels in soil and sediment specified by the Table 5-2 of the ROD. Non-cancer hazards identified in the risk assessment will be reduced below the remedy cleanup levels.
 - 2. The selected remedy will reduce the concentrations of contaminants of concern (COCs) for surface water identified in the risk assessment over time to levels at or below the performance standards listed in the Table 5-2 of the ROD.

1.6 MAJOR DESIGN CONSIDERATIONS

- A. To implement the selected remedy for the site, the Contractor shall complete all work covered by the Contract Documents (Specifications and Drawings) including those listed as the major design considerations.
- B. The major design considerations include:
 - 1. Off-site stabilization (Stabilization Plan; Waste Management and Disposal Plan)
 - 2. Excavation dewatering system using sheet pile wall, collection trench, and/or well point dewatering system (Dewatering and Drainage Plan)
 - 3. Temporary water treatment (Dewatering and Drainage Plan)
 - 4. Temporary excavation slope stability systems (Excavation and Handling Plan)
- C. The Contract Documents (Specifications and Design Drawings) are prepared to include concise design requirements, performance metrics and responsibilities of the Contractor for the design components listed in Paragraph 1.6.B. The minimum design requirements for these four components have been developed based on industry standards and technical and present worth cost considerations that are specific to conditions at the site.
- D. Recommendations for these design components have been presented in the Contract Documents; however, it is the responsibility of the Contractor to submit detailed designs for these components, propose means and methods, obtain approvals, and implement these components of the remediation. The purpose of this format is to encourage the Contractor to add value to the system based on previous experience.

1.7 WORK INCLUDED IN DESIGN PACKAGE

- A. The Contractor shall complete all work covered by the Contract Documents.
- B. Remediation will consist of the excavation and removal of source materials (i.e., pieces of slag comingled with crushed battery casing materials and associated wastes that act as sources of contamination), and contaminated soil/sediment from the areas located in the Seawall Sector as well as an isolated upland area in Area 9. Source materials, contaminated soil/sediment, riprap/armored stone, and miscellaneous debris will be removed in stages, starting from the eastern end of the riprap extent in Areas 4, and proceeding westward along the seawall. The removal process will continue in Area 1

and 4 along the seawall, then move to beach Area 2, and finally conclude in Area 5 between the First and Second Jetty. Excavations in the vicinity of the seawall has been divided into eight “Seawall” segments to facilitate discussion of the removal and handling of the mentioned site materials. These segments, labeled A through H, are each approximately 300 feet in length, and are depicted in the Design Drawings.

- C. The general sequence of work is to:
1. Prepare all project plans and applicable permits and approvals required for the remedial construction activities.
 2. Conduct pre-construction conferences.
 3. Prepare the site as follows:
 - a. Perform utility mark outs and clearances and coordinate with appropriate utility authorities.
 - b. Mobilize equipment and personal necessary to complete the remedial action.
 - c. Conduct pre-construction topographic and bathymetric surveys. Conduct tree and shrub inventory and wetland delineation.
 - d. Perform pre-construction photographic and video documentation.
 - e. Perform site clearing within the limits identified.
 - f. Remove and reuse or recycle of existing chain link fence.
 - g. Install site security fencing and signs
 - h. Remove and store park facilities including but not limited to the playground, gazebo, and light poles and benches within the work area.
 - i. Implement soil and sediment control measures, including silt fences and turbidity barriers.
 - j. Initiate perimeter air monitoring/sampling in accordance with the perimeter air monitoring plan.
 - k. Construct staging area.
 - l. Construct primary and emergency contingency access roads.
 - m. Construct temporary Margaret’s Creek crossing/culvert and bypass.
 - n. Establish temporary facilities.
 - o. Construct decontamination facilities.
 - p. Decommission monitoring wells
 4. Initiate excavation and backfilling in the upland portion of Areas 4 and 9.
 5. Install sheet pile wall prior to initiating excavation in Areas 1, 2, and 5, and the rest of Area 4.
 6. Install dewatering system to establish in-dry conditions for contaminated material removal/excavation.
 7. Mobilize and establish temporary water treatment system.
 8. Construct riprap and armor stone decontamination facilities and stage frac tanks.
 9. Handling of riprap and source materials - Removal of source materials and riprap to be conducted in stages starting from the eastern end of the extent of riprap (in Areas 4 and 9), proceeding to the west as follows:
 - a. Remove and decontaminate post-sandy riprap and stage the clean riprap in the Support Zone for possible reuse in the proposed revetment during site restoration.
 - b. Next remove large slag pieces, weathered riprap, and debris from the footprint of seawall.
 - c. Segregate large slag pieces and debris visually and stage within the Exclusion Zone for an off-site treatment and disposal. Stage large, weathered riprap separately within the Exclusion Zone for decontamination.

- d. Lastly, scrape the top six inches of soil/sediment commingled with small pieces of slag/riprap material beneath (the large slag piece and debris) and at the toe of the footprint of seawall and temporarily place in a separate stockpile within the Exclusion Zone.
 - e. Segregate any smaller pieces of slag /riprap that are buried within or commingled with the soil/sediment media requiring off-site treatment and disposal.
 - f. Conduct waste characterization sampling and slag/debris/source materials load out activities concurrently with the removal activity.
10. Soil/sediment excavation:
- a. Implement dewatering measures, as necessary. Collect, store, and treat contact water from excavation areas and from decontamination and discharge to surface water.
 - b. Perform soil/sediment excavations starting from the eastern end of excavations (in Area 4), proceeding to the west. Excavate each seawall segment beginning from the seaward edge of excavations moving toward the landward edge.
 - c. Stockpile contaminated soil/sediment within the Exclusion Zone.
 - d. Excavate contaminated soil/sediment at minimum to the excavation depths as shown on the Design Drawings.
 - e. Perform removal of contamination around the First Jetty.
 - f. Inspect the excavation bottom and side slope for visual contamination, slag, and battery casings and remove as required.
11. Perform post-excavation confirmatory sampling to confirm that the site remediation cleanup levels are achieved.
12. Conduct waste disposal sampling and soil/sediment load out activities concurrently with the excavation activity.
13. Perform secondary excavation of contaminated material based on the results of post-excavation confirmatory sample analysis and/or field observations.
14. Backfill, compaction, and grading.
15. Perform transportation and disposal of source materials including slag and battery casings and associated waste, debris, and contaminated soil/sediment.
16. Conduct off-site stabilization of source materials and hazardous soil.
17. Restore the site, including the construction of new revetment and tidal wetland areas and restoration of active work area, transition and freshwater wetland areas, and the park. Refer to Sheet 0D9-03 for sequencing of wetland restoration areas.
18. Remove sheet pile wall.
19. Conduct planting in tidal wetland areas.
20. Conduct final inspection.
21. Demobilize.
22. Conduct post-construction topographic and bathymetric surveys.
23. Perform post-construction photographic and video documentation.
- D. The work includes, but is not limited to the following:
- 1. Obtaining the necessary permits and approvals from applicable federal, state, and local regulatory agencies to execute the project unless otherwise noted within the Contract Documents. The Contractor shall be responsible for all fines related to permits/authorizations issued regarding the work completed and waste transportation by the Contractor. EPA will be responsible for submitting the Soil Erosion and Sediment Control Plan for certification by the Freehold Soil Conservation District, the NJDEP Division of Land Resource Protection permit

equivalency, and the New Jersey Pollutant Discharge Elimination System Discharge to Surface Water (NJPDES DSW) permit equivalent.

2. Providing all submittals to the EPA's Representative identified in the Specifications and summarized in the submittal register or otherwise identified in the text in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
3. Attending meetings/conferences as specified in SECTION 01101 – COMMUNITY INVOLVEMENT, SECTION 01201 – PRE-CONSTRUCTION AND PRE-WORK CONFERENCES, and in SECTION 01202 – PROJECT MEETINGS.
4. Providing all utilities, materials, equipment, labor, and facilities required to perform the work in accordance with the Design Drawings and Specifications.
5. Mobilization, including all labor, materials, and equipment required to perform the following activities, including but not limited to:
 - a. Compliance with health and safety requirements as specified in SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.
 - b. Compliance with community health and safety requirements as specified in SECTION 01352 – COMMUNITY HEALTH AND SAFETY PLAN.
 - c. Constructing of the staging area, as shown on the Design Drawings, or as directed by the EPA's Representative.
 - d. Installing project and safety signs, as specified in SECTION 01580 – SIGNS.
 - e. Installing security fencing, as specified in SECTION 02100 – SITE PREPARATION and the Design Drawings.
 - f. Providing temporary utilities (electric, telephone and internet), parking, construction staging area, signage, and security in accordance with SECTION 01500 – TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS.
 - g. Performing a pre-construction survey of the site in accordance with SECTION 01550 – SURVEYING.
 - h. Marking out all underground utilities, and field verifying the location and depth for all underground utilities within excavation areas and coordinating with the utility authorities.
 - i. Providing and maintaining traffic control in accordance with SECTION 01585 – TRAFFIC CONTROL.
 - j. Providing and maintaining site security in accordance with SECTION 01540 – SECURITY.
 - k. Constructing the temporary water treatment plant area, decontamination areas and personnel hygiene facilities as specified in SECTION 02100 – SITE PREPARATION, SECTION 01500 – TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS and the Design Drawings.
 - l. Establishing the trailer compound, including utility connections, personnel hygiene facilities, and other temporary facilities, as specified in SECTION 01500 – TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS.
 - m. Establishing primary and emergency access roads in accordance with SECTION 02100 – SITE PREPARATION and the Design Drawings.
 - n. Decommissioning monitoring well as specified in SECTION 02957 – DECOMMISSION GROUNDWATER MONITORING WELL.
 - o. Installation of erosion and sediment measures and stormwater management controls, as specified in SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT.
 - p. Installation of silt fence and turbidity barriers, as specified in SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT.

- q. Construction of temporary decontamination area, as specified in SECTION 02100 – SITE PREPARATION and SECTION 01510 – DECONTAMINATION PLAN.
- r. Construction of temporary water treatment plant and discharge connection to surface water discharge, as specified in SECTION 13300 – WATER TREATMENT SYSTEM and SECTION 02140 – DEWATERING AND DRAINAGE.
- s. Construction of areas for decontaminating seawall riprap as specified in SECTION 02100 – SITE PREPARATION and SECTION 01510 – DECONTAMINATION PLAN.
- t. Site clearing as specified in SECTION 02230 – CLEARING AND GRUBBING.
- u. Designing and installing sheet pile wall prior to initiating excavation in the intertidal areas of Area 1, 2, & 5 in accordance with SECTION 03150 – METAL SHEET PILE and SECTION 02140 – DEWATERING AND DRAINAGE.
- v. Designing, installing, and operating a temporary water treatment system in accordance with SECTION 02140 – DEWATERING AND DRAINAGE and SECTION 13300 – WATER TREATMENT SYSTEM for treating (if required) the contact water generated during excavation and decontamination activities. The treated water shall be discharged to surface water in accordance with New Jersey Pollution Discharge Elimination System (NJPDES) Surface Water Discharge (SWD) permit equivalency.
- w. Performing perimeter air monitoring in accordance with SECTION 01362 – PERIMETER AIR MONITORING.
- x. Implementing soil erosion and sediment controls as specified in SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT.
- y. Removing source materials including slag and battery casings, and associated waste and debris in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS.
- z. Excavating contaminated soil/sediment in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS.
- aa. Performing waste handling and disposal of excavated material in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL. The Contractor is responsible for identifying an approved facility to conduct off-site treatment/stabilization of source materials, followed by off-site disposal. The off-site treatment/stabilization will involve transporting source materials and will require additional precautionary measures by the Contractor for the load out and transportation of hazardous waste.
- bb. Performing decontamination of riprap in accordance with SECTION 01510 – DECONTAMINATION PLAN.
- cc. Performing post-excavation confirmatory sampling to meet NJDEP verification requirements for closure samples in accordance with the Contract Documents.
- dd. Performing secondary excavation of contaminated material as directed by EPA's Representative based on the results of post-excavation confirmation sample analysis and/or field observations in accordance with the Contract Documents. No secondary excavation shall be performed without an approval from EPA's Representative.
- ee. Collecting and analyzing waste characterization, post-excavation, and backfill material samples in accordance with SECTION 01450 - CHEMICAL DATA

QUALITY CONTROL and the Contractor's approved Uniform Federal Policy – Quality Assurance Project Plan (UFP-QAPP).

- ff. Performing waste handling and disposal of excavated material in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.
 - gg. Supplying clean earth material, backfilling, and site grading in accordance with SECTION 02201 – BACKFILL, COMPACTION AND GRADING and as specified in the Contract Documents.
 - hh. Reconstructing the seawall in accordance with SECTION 03530– REVETMENT CONSTRUCTION.
 - ii. Completing site restoration in accordance with SECTION 02900 – SITE RESTORATION, SECTION 02921 – UPLAND SEEDING, and SECTION 02955 – TRANSITION AND WETLAND AREA RESTORATION.
 - jj. Removal of the sheet pile wall in accordance with SECTION 03150 – METAL SHEET PILE and SECTION 02140 – DEWATERING AND DRAINAGE.
 - kk. Conducting a final site survey and preparing As-Built Drawing(s) documenting site restoration conditions upon completion of remediation in accordance with SECTION 01550 – SURVEYING.
- 6. Demobilizing and securing the site.
 - 7. Completing closeout and project documentation in accordance with SECTION 01780 – PROJECT CLOSEOUT.
 - 8. The surface water monitoring listed as part of the selected remedy in Paragraph 1.5.C.b will be conducted by the EPA, not by the Contractor performing the RA. The post-RA surface water monitoring activities shall not be included as part of the work performed by the Contractor.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

END OF SECTION

SECTION 01101

COMMUNITY INVOLVEMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes the minimum requirements for preparing and participating for community involvement activities including public meetings/site visits/local briefings/public information sessions and preparing project fact sheets.
- B. The Contractor shall prepare for and attend all activities identified in this Specification.

1.2 REFERENCES

- A. Not used.

1.3 SUBMITTALS

- A. Not used.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. EPA will include the state, where appropriate, to participate in public meetings/site visits/local briefings/public information sessions.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 COMMUNITY INVOLVEMENT

- A. The Contractor shall plan to attend periodic meetings/site visits/local briefings and provide adequate effort and time to prepare for such meetings. Formal public meetings will be held at the outset of the project.
- B. There will also be at least one public meeting held to outline proposed plan for remedial action for the site soon after the Contractor is engaged. The Contractor will be expected to attend this meeting.
- C. A second public meeting will be held prior to the start of construction. The project scope and construction activities will be explained, and the Contractor's project manager will be introduced to the public. The Contractor will be expected to attend this meeting.
- D. During the course of the project, one (1) or more additional public meetings may be held and require attendance by the Contractor.
- E. Listed below is the Community Involvement Overview for project requirements:
 - 1. Community Involvement Overview
 - a. Primary community relations responsibilities assigned by contract will be performed by the Contractor under supervision and direction of the EPA, who will implement an on-going Community Involvement Plan (January 2011) throughout the duration of the project. Upon notification to proceed, the Contractor will be called upon to assist in the presentation of the remediation

scope of work to municipal, county, state and federal officials, the news media, other governmental agencies, and the general public.

2. Community Involvement Deliverables
 - a. The Contractor should be prepared to present and discuss technical activities involving the construction project to a lay audience at the request of the EPA upon notification to proceed. This may include, at a minimum, assisting the EPA's Representative with the following:
 - 1) Fact Sheets: These are usually two (2) to three (3) pages long and provide information about the activities and objectives related to the project. These fact sheets may describe construction goals, emergency management procedures, health and safety procedures, test and laboratory findings, scheduling, etc. The Contractor will prepare a draft with the assistance of the EPA's Representative. EPA will use this information to develop a final fact sheet to be distributed publicly.
 - 2) Site Visits and/or Local Briefings: These will be scheduled by the EPA as needed to present information about remedial action implementation to local officials and the public. Primary responsibility will reside with the EPA.
 - 3) Public Information Sessions and/or Public Meetings: Formal public meetings may be required, however, informal public information sessions using an open-house style are more common. Primary responsibility to conduct such meeting or sessions will reside with the EPA.
 - 4) Information Requests: In general, all information requests from the public, elected officials and the media concerning the project should be referred to the EPA's Representative, in turn, refer them to the EPA Community Relations Coordinator. If the EPA's Representative is not available, these requests should be referred directly to the USEPA Community Involvement Contacts at (Toll Free): 877-251-4575 or Region 2: 800-346-5009. The Contractor shall follow this protocol if approached for information by residents, officials, or news media either at the site or elsewhere during remedial action activities.

END OF SECTION

SECTION 01201
PRE-CONSTRUCTION AND PRE-WORK CONFERENCES

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes requirements for Pre-Construction, and Pre-work Conferences at the start of construction.

1.2 REFERENCES

- A. Not used.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
1. Project Submittal Schedule; Pre-construction Submittals; EA
 - a. The Contractor shall prepare and submit the Project Submittal Schedule in accordance SECTION 01320 – PROJECT SCHEDULES. A Project Submittal Schedule shall be submitted showing full coordination with the project schedule. All products and tests under each submittal number shall be prioritized and linked to the progress schedule.
 2. Conference Meeting Minutes; Pre-construction Submittals; EA
 - a. The Contractor shall record the minutes of the conferences, including significant proceedings and decisions arising from the four conferences, and within seven calendar days after each conference, furnish an electronic copy of the minutes to the EPA's Representative. After the EPA's Representative's review and approve, the Contractor shall distribute copies to each participant in the meeting and to parties affected by decisions made at the meeting.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. EPA will include the state, where appropriate, to participate in Pre-Construction and Pre-Work Conferences.
- B. Within 30 calendar days after issuance of the Notice to Proceed (NTP), the Contractor shall meet with the EPA's Representative for a Pre-Construction Conference.
- C. Within 60 calendar days after the Pre-Construction Conference, first Pre-Work Conferences shall be held approximately 60 days prior to the mobilization for construction activities.
- D. Within 30 calendar days after the first Pre-Work Conference, second Pre-Work Conferences shall be held approximately 28 days prior to the mobilization for construction activities.
- E. After the Pre-Work Conferences, before the start of construction, a Pre-Construction Quality Control Conference shall be held between the Contractor and EPA's Representative.

- F. The Contractor shall meet with the EPA's Representative for a Pre-Construction Safety Conference before the start of construction.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION GENERAL

- A. The Contractor shall schedule and administer the Pre-Construction Conference, Pre-Work Conferences, Pre-Construction Quality Control Conference and Pre-Construction Safety Conference, as specified in Paragraphs 3.3 through 3.6 of this section.

3.2 GENERAL CONFERENCE MEETING REQUIREMENTS

- A. The Contractor shall administer the following general requirements for the conference meetings:
 - 1. Prepare agenda for conferences.
 - 2. Make physical arrangements for conferences.
 - 3. Preside at conferences
- B. Record the minutes including a detailed description of proceedings and Decisions

3.3 PRE-CONSTRUCTION CONFERENCE

- A. Within 30 calendar days after issuance of the Notice to Proceed (NTP), the Contractor shall meet with the EPA's Representative for a Pre-Construction Conference to discuss contract clauses and project schedules.
- B. The EPA's Representative will prepare an agenda for the conference.
- C. The Contractor shall attend a Pre-Construction Conference scheduled by the EPA's Representative. Work shall not commence prior to the conference. Unless specified otherwise, the Contractor shall submit an electronic copy of the following for review at least 15 calendar days prior to the Pre-Construction Conference:
 - 1. Project Submittal Schedule in accordance with Paragraph 1.3.1.
 - 2. Project Organizational Chart and Project Manager Name and Experience in accordance with SECTION 01310 – JOB SITE ADMINISTRATION.
 - 3. Initial Project Schedule, in accordance with SECTION 01320 – PROJECT SCHEDULES.
 - 4. Submittal Register, in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
- D. The Contractor shall address project orientation, personnel contact, safety issues, permits, deficiencies, and the location of the Contractor's office.
- E. Prior to Notice to Proceed, the Contractor is required to attend a Post Award Conference with the EPA and EPA's Representative, at a location, date, and time selected by the EPA. The purpose of this Post-Award Conference is to develop a mutual understanding of the Contract prior to initiation of work. The meeting will specifically address permit status, safety and emergency response procedures, schedules for the site preparation and any questions.
- F. The Job Superintendent, the office project manager, quality control personnel, and safety personnel of the Contractor, as well as any major subcontractor(s), will be required to attend the conference.

3.4 PRE-WORK CONFERENCE

- A. The first Pre-Work Conference shall be held between the Contractor and EPA's Representative. The purpose of these conferences is to review submittals, safety, payrolls and labor relations, environmental protection, project schedules and payment, and procurement of materials. Questions concerning the administrative requirements, or any other aspect of the project may also be addressed.
- B. Attendance by the Contractor's superintendent, quality control personnel, safety personnel, and any major subcontractor's superintendents shall be required.
- C. Unless specified otherwise, the Contractor shall submit an electronic copy and three hard copies of the following for review at least 28 calendar days prior to the first Pre-Work Conference:
 - 1. Site Safety and Health Plan, Accident Prevention Plan, and Dust and Odor Control Plan in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.
 - 2. Severe Storm Plan, in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.
 - 3. Community Health and Safety Plan, in accordance with SECTION 01352 – COMMUNITY HEALTH AND SAFETY PLAN.
 - 4. Environmental Protection Plan, in accordance with SECTION 01355 – ENVIRONMENTAL PROTECTION.
 - 5. Perimeter Air Monitoring Plan, in accordance with SECTION 01362 – PERIMETER AIR MONITORING.
 - 6. Uniform Federal Policy Quality Assurance Project Plan, in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.
 - 7. Contractor Quality Control (CQC) Plan, in accordance with SECTION 01451 – CONTRACTOR QUALITY CONTROL PLAN.
 - 8. Decontamination Plan, in accordance with SECTION 01510 - DECONTAMINATION PLAN
 - 9. Security Plan, in accordance with SECTION 01540 – SECURITY.
 - 10. Traffic Control Plan, in accordance with SECTION 01585 – TRAFFIC CONTROL.
 - 11. Site Preparation Plan in accordance with SECTION 02100 – SITE PREPARATION.
 - 12. Herbicide Application Plan in accordance with SECTION 2100 – SITE PREPARATION.
 - 13. Excavation and Handling Plan in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.
 - 14. Waste Management and Transportation Plan in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.
 - 15. Stabilization Plan in in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.
 - 16. Dewatering and Drainage Plan in accordance with SECTION 02140 – DEWATERING AND DRAINAGE.
 - 17. Metal Sheet Piling Installation Work Plan, in accordance with SECTION 03150 – METAL SHEET PILE.
 - 18. Water Treatment Plan, in accordance with SECTION 13300 – WATER TREATMENT SYSTEM.
- D. Any plans submitted to the EPA's Representative in advance of the first Pre-Work Conference will be briefly reviewed by the EPA's Representative and will also be

subjected to discussion during the first Pre-Work Conference. EPA will review in consultation with the state, where appropriate.

- E. The Contractor's schedule, particularly for the initial startup period, will be discussed. Questions concerning the administrative requirements outlined during the Pre-Construction Conference or any other aspect of the project may also be addressed.
- F. Within 30 calendar days after the first Pre-Work Conference, the second Pre-Work Conference shall be held prior to mobilization for construction activities.

3.5 PRE-CONSTRUCTION QUALITY CONTROL CONFERENCE

- A. After the first Pre-Work Conference, before start of construction, a Pre-Construction Quality Control Conference will be held between the Contractor and EPA's Representative. The purpose of this conference is to discuss the quality control procedures to be used for all on-site and off-site work and defining the interrelationship of the Contractor's Management and the Contracting officer representative's Quality Assurance.
- B. At least 14 calendar days prior to the Pre-Construction Quality Control Conference, the Contractor shall submit an electronic copy and three (3) hardcopies of the Contractor Quality Control Plan, in accordance with SECTION 01451 – CONTRACTOR QUALITY CONTROL.

3.6 PRE-CONSTRUCTION SAFETY CONFERENCE

- A. The Contractor shall meet with the EPA's Representative for a Pre-Construction Safety Conference before the start of construction. The purpose of this conference is to discuss how work will be safely implemented including, but not limited to, work procedures, safety considerations associated with those work procedures, heavy equipment to be used, training required to operate equipment, and other safety requirements, such as training to be conducted and safety equipment to be used.

END OF SECTION

SECTION 01202

PROJECT MEETINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes the minimum requirements for conducting Project Meetings during execution of the construction work.

1.2 REFERENCES

- A. Not used.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES:
1. Monthly Progress Report; Product Data; EA
 - a. The Contractor shall submit a Monthly Progress Report at the first project meeting of each month. The Monthly Progress Report shall address as a minimum:
 - 1) Progress Schedule
 - 2) Potential Factor of Delay
 - 3) Deficiencies
 - 4) Material Delivery Schedule
 - 5) Submittals
 - 6) Health and Safety Issues
 - 7) Field Change Orders, and
 - 8) Any additional data pertinent to the progress of the work and record keeping for the project.
 2. Project Meeting Minutes; Product Data; EA
 - a. The Contractor shall be responsible for recording the minutes of Project Meetings including any significant proceedings and decisions arising from the meetings. The Contractor shall reproduce and submit to the EPA's Representative within two calendar days after each meeting an electronic copy of the minutes of the meeting. After the EPA's Representative's review and approve, the Contractor shall distribute copies to each participant in the meeting and to parties affected by decisions made at the meeting.
 3. Project Cost Summary Report; Product Data; EA
 - a. On a monthly basis, the Contractor shall submit to the EPA's Representative the Project Cost Summary Report for review and approval.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. The Contractor shall schedule and administer Project Meetings to discuss project progress weekly and such additional meetings as required, when requested by either the EPA's Representative or the Contractor during any stage of this project when it is deemed necessary to raise any significant questions, establish new guidelines, introduce a new aspect to the project, or address any other items affecting the progress of work.

- B. EPA will include the state, where appropriate, to participate in Project Meetings.
- C. The following persons shall attend the Project Meetings:
 - 1. EPA Project Manager
 - 2. EPA's Representative
 - 3. Contractor's Site Superintendent
 - 4. Contractor's Project Manager
 - 5. Contractor's Key Quality Control Staff
 - 6. Contractor's Safety and Health Manager and/or Officer and Emergency Response Coordinator Specialist
 - 7. Subcontractors as appropriate to the agenda
 - 8. Suppliers as appropriate to the agenda, and
 - 9. Others as requested by the EPA's Representative or as appropriate to the agenda.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor shall schedule and administer Project Meetings weekly and additional meetings as required, and if requested by the EPA's Representative.
- B. Meetings and conferences shall take place at the project site or some other location convenient to both the EPA's Representative and the Contractor.
- C. The Contractor shall attend these meetings with all necessary personnel as determined by the EPA's Representative for the duration of this contract.
- D. A suggested meeting agenda is provided in Paragraph 3.3.E.

3.2 GENERAL MEETING REQUIREMENTS

- A. The Contractor shall administer the following general requirements for the Project Meetings:
 - 1. Prepare agenda for meetings
 - 2. Make physical arrangements for meetings
 - 3. Preside over meetings
 - 4. Record the minutes, including a detailed description of proceedings and decisions, and
 - 5. Reproduce and distribute an electronic copy of minutes in accordance with Paragraph 1.3.A.2.

3.3 PROJECT MEETING

- A. The Contractor shall conduct and administer Project Meetings.
- B. The progress of the work, scheduling problems, submittals, field orders, change orders, and other pertinent matters shall be discussed during the Project Meetings.
- C. A Monthly Progress Report shall be submitted with the progress schedule, and shall address potential factors of delay, deficiencies, material delivery schedules, submittals, and safety issues.
- D. A Project Submittal Schedule shall be submitted showing full coordination with the project schedule. All products and tests under each submittal number shall be prioritized and linked to the progress schedule.

- E. The following is a suggested agenda for Project Meetings; the Contractor shall modify this agenda in accordance with ongoing work.
1. Review and approval of minutes of previous meeting
 2. Review of Health and Safety
 3. Maintenance of quality and safety standards
 4. Review of work progress
 5. Permit activities
 6. Field observations, problems, and conflicts
 7. Problems which impede the schedule and proposed corrective actions
 8. Review of off-site materials and equipment delivery schedules
 9. Corrective measures and procedures to regain projected schedule
 10. Revisions to project schedule
 11. Review of planned progress during succeeding work period
 12. Coordination of schedules
 13. Review of submittal schedules (expedite as required)
 14. Milestone dates
 15. Review of transmittals submitted to the EPA's Representative, submittals returned from the EPA's Representative, transmittals pending re-submittal, and Requests for Information (RFIs)
 16. Review of quality control, including all completed inspections
 17. Discussion of pending changes and substitutions
 18. Review of proposed changes for effect on construction schedule and on completion date, and effect on other contracts of the project
 19. Community relations issues
 20. Discussion of other business, as appropriate, and
 21. Assignment of action items.

3.4 OTHER MEETINGS

- A. The Contractor shall attend special meetings which may be required or called for by Federal, State or Local authorities, utility companies, or any other firm, person or organization related to the project. Attendance by the Contractor shall include the Contractor's Superintendent and Office Manager, and major Subcontractors (if required by EPA's Representative).
- B. The EPA's Representative does not wish to meet solely with a subcontractor and requests for such meetings will be discouraged. If a meeting is deemed necessary, every effort will be made to have the Contractor attend. If, for some reason, circumstances do not allow such, the meeting may be held, minutes of the meeting will be sent to Contractor, and decisions on any major questions will be reserved until Contractor has been consulted. Subcontractors may accompany the Contractor to meetings provided Contractor notifies the EPA's Representative in advance.

END OF SECTION

SECTION 01270
MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This section covers the methods and procedures which will be used to measure the Contractor's work and to provide payment to the Contractor for work performance. It is the responsibility of the bidder to make a thorough investigation of the drawings, Specifications, and the site to determine the scope of work included in each bid item. Payments will be made to the Contractor based on the quantities of work as measured in accordance with the specified methods of measurement and the prices stipulated as shown on the Bidding Schedule. This method of payment will constitute complete compensation for all work shown on the Design Drawings and provided in the Contract Specifications or other Contract Documents, and for all costs of accepting the general risks, liabilities and shall include, but not be limited to, compensation for overhead, profit, materials, and services, and performing all work required to accomplish and complete the work specified under each item and all other work required.

1.2 REFERENCES

- A. Not used.

1.3 SUBMITTALS

- A. Not used.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Lump Sum Items
1. The quantities of work performed under lump sum items will not be measured except for the purpose of determining reasonable interim payments.
 2. Interim payments will be made in accordance with the estimated value of work done as determined by the EPA's Representative or as specified in this section. After the award of the contract, the Contractor shall submit a detailed breakdown of all lump sum items that will be used for partial payments.
- B. Unit Price Items
1. Payments will be made for unit price items in accordance with the measurement methods set forth in this section or, where specified payment limits are unclear, as determined reasonable by the EPA's Representative, at the unit prices entered in the Bidding Schedule.
 2. Interim measurements and/or payments may be adjusted to account for partially completed work.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

SECTION A - GENERAL REQUIREMENTS (BID ITEMS 0001 THROUGH 0005)

3.1 GENERAL CONDITIONS (BID ITEM 0001)

- A. Measurement for this lump sum item shall include all items described under this bid item, and no separate quantity measurement shall be made.
- B. Payment for general conditions will be made at the lump sum price bid, for which price and payment shall be full compensation for the expense of said conditions. General Conditions shall include all of the items required under these Contract Documents but not covered under other bid items, including but not limited to: the Contractor's cost for insurance, bonds, fees, permits, and other similar expenses directly related to and required by these Contract Documents; the preparation and submittal of all required plans; project-dedicated supervisory staff and equipment; compliance with specified regulatory requirements; acquiring all applicable permits and permit-equivalents; pre-construction and construction period planning, meetings/conferences, community involvement, scheduling, submittals, reporting, administration; contractor quality control; environmental protection and spill control; project photographs and videotaping; mobilization and demobilization of heavy equipment; the preparation and submittal of the Remedial Action Report, and other requirements and related miscellaneous items.

3.2 SAFETY, HEALTH, AND EMERGENCY RESPONSE (BID ITEM 0002)

- A. Measurement for this lump sum item shall include all items described under this bid item, and no separate quantity measurement shall be made.
- B. Payment for safety, health, and emergency response will be made at the lump sum price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for providing safety, health, and emergency response equipment, facilities, personnel, and services detailed in SECTION 01351 – SAFETY, HEALTH AND EMERGENCY RESPONSE, SECTION 01362 – PERIMETER AIR MONITORING, SECTION 01352 – COMMUNITY HEALTH AND SAFETY PLAN, and the Contract Documents. This item shall include, but not be limited to, costs to implement the community and occupational safety monitoring program, safety personnel, safety monitoring equipment, perimeter air monitoring, emergency response materials and supplies, environmental protection and spill control kits, and personnel protection equipment.

3.3 TEMPORARY FACILITIES (BID ITEM 0003)

- A. Measurement for this unit price item will be made to the nearest month of operation and maintenance performed for temporary facilities, in accordance with the Specifications.
- B. Payment for Temporary Facilities will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to furnish, maintain, and operate the trailer compound for the Contractor and the EPA's Representative and furnish, install, operate, maintain, remove, and dispose of the equipment washdown and decontamination facilities throughout the duration of the project. Costs shall include, but not be limited to, furnishing project trailers, mobilization and demobilization of trailers/facilities, utility connections and services (power, telephone, internet), portable toilets, computers and peripherals, office supplies and equipment, cleaning services for the trailers, project signs, work lights, and other

temporary facilities in accordance with SECTION 01500 – TEMPORARY CONSTRUCTION FACILITIES AND UTILITIES and as otherwise required by the Contract Documents.

3.4 SITE SECURITY (BID ITEM 0004)

- A. Measurement for this unit price item will be made to the nearest month in accordance with the Specifications.
- B. Payment for security will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to provide security in accordance with SECTION 01540 – SECURITY or as otherwise required by the Contract Documents.

3.5 SURVEYING (BID ITEM 0005)

- A. Measurement for this lump sum item shall include all items described under this bid item, and no separate quantity measurement shall be made.
- B. Payment for surveying will be made at the lump sum price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to perform surveying for baseline conditions, excavated areas, and final grade, and preparation of as-built drawings, as well as pre-construction tree inventory, wetland delineation and documentation of percent vegetative cover in tidal and freshwater wetland areas, and any other requirements found in SECTION 01550 – SURVEYING or as otherwise required by the Contract Documents.

SECTION B – SITE PREPARATION (BID ITEMS 0006 THROUGH 0012)

3.6 SITE PREPARATION (BID ITEM 0006)

- A. Measurement for this lump sum item shall include all items described under this bid item and no separate quantity measurement shall be made.
- B. Payment for site preparation will be made at the lump sum bid price, for which price and payment will be full compensation for all labor, equipment, materials, and incidentals required to prepare the site in accordance with SECTION 02100 – SITE PREPARATION.

3.7 CLEARING AND GRUBBING (BID ITEM 0007)

- A. Measurement for this unit price item will be made to the nearest acre of clearing completed in accordance with the Specifications.
- B. Payment for clearing and grubbing will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for clearing and grubbing of all trees, shrubs, roots, and other objectionable vegetative material within the limits of excavation and the clearing limits as defined on the Design Drawings, and in accordance with SECTION 02230 – CLEARING AND GRUBBING. This item shall also include transportation and disposal of all cleared trees, shrubs, and other vegetative material. The transportation and disposal of all roots at an approved Subtitle D landfill, including cleared *Phragmites* mixed with contaminated soil for transport is included under Bid Item 0026.

3.8 SOIL EROSION AND SEDIMENT CONTROL (BID ITEM 0008)

- A. Measurement for this lump sum item shall include all items described under this bid item, and no separate quantity measurement shall be made.

- B. Payment for soil erosion and sediment control will be made at the lump sum price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to furnish, install, and maintain silt fencing, hay bales, and other soil erosion and sediment controls for the duration of the project. Soil erosion and sediment control measures shall be in accordance with the requirements of the Freehold Soil Conservation District, SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT and the Design Drawings. Price and payment for the removal of control measures at the completion of the work shall also be included as part of this bid item.

3.9 SOIL/SEDIMENT STOCKPILE AND LOADOUT AREA (BID ITEM 0009)

- A. Measurement for this lump sum item shall include all items described under this bid item, and no separate quantity measurement shall be made.
- B. Payment for the soil/sediment stockpile and loadout area will be made at the lump sum price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to maintain, and remove the stockpile and loadout area for source materials and excavated material as shown on the Design Drawings, and in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL or as otherwise required by the Contract Documents. Disposal of stockpile area construction material is included under Bid Item 0022. Loading of waste from the stockpile area into vehicles for off-site transportation and disposal is included under Bid Items 0021 and/or 0027.

3.10 DECONTAMINATION STATIONS (BID ITEM 0010)

- A. Measurement for this lump sum item shall include all items described under this bid item, and no separate quantity measurement shall be made.
- B. Payment for the decontamination stations will be made at the lump sum price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to construct, maintain, and remove the decontamination stations for shown on the Design Drawings, and in accordance with SECTION 01510 – DECONTAMINATION PLAN or as otherwise required by the Contract Documents. Disposal of decontamination stations construction material is included under Bid Item 0020. Loading of waste from the decontamination stations into vehicles for off-site transportation and disposal is included under Bid Items 0021 and/or 0027.

3.11 TEMPORARY ACCESS ROAD (BID ITEM 0011)

- A. Measurement for this unit price item will be made to the nearest square yards of crushed stone used to construct temporary access road in accordance with the Specifications.
- B. Payment for the temporary access road will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for supplementation of the existing secondary access road as defined on the Design Drawings and as required for construction access, and in accordance with SECTION 02100 – SITE PREPARATION.

3.12 SECONDARY ACCESS ROAD (BID ITEM 0012)

- A. Measurement for this unit price item will be made to the nearest square yards of crushed stone used to supplement the existing secondary access road through the Margaret's Creek Area in accordance with the Specifications.

- B. Payment for the secondary access road will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for supplementation of the existing secondary access road as defined on the Design Drawings and as required for construction access, and in accordance with SECTION 02100 – SITE PREPARATION.

SECTION C – DEWATERING AND WATER TREATMENT SYSTEM (BID ITEMS 0013 THROUGH 0016)

3.13 SHEET PILE WALL (BID ITEM 0013)

A. ITEM (BID ITEM 0013A)

1. Measurement for this unit price item will be made to the nearest square feet of required sheet piles purchased and delivered and shall include other items described under this bid item, and no separate quantity measurement shall be made. The limits used for payment will be the measured quantity by multiplying the length of the wall the work plan show by the length of sheeting required by the design. No measurement will be made of end extensions or returns necessary for the safety of the retained facility.
2. Payment for purchase and delivery of sheet piles will be made at the unit price per square feet, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to purchase and deliver in accordance with SECTION 03150 – METAL SHEET PILE and as otherwise required by the Contract Documents. Design submittal for metal sheet pile wall is included under Bid Item 0001.

B. ITEM (BID ITEM 0013B)

1. Measurement for this unit price item will be made to the nearest square feet of temporary sheet pile wall installed, accepted, removed, and shall include other items described under this bid item, and no separate quantity measurement shall be made. The limits used for payment will be the actual horizontal limit of temporary sheet pile wall installed and accepted, and the vertical limit as measured from the bottom of the exposed face of the sheeting to the top of the retained earth behind the sheeting. No measurement will be made of end extensions or returns necessary for the safety of the retained facility.
2. Payment for installation of sheet pile wall will be made at the unit price per square feet, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to install, maintain, and remove in accordance with SECTION 03150 – METAL SHEET PILE and SECTION 02140 – DEWATERING AND DRAINAGE and as otherwise required by the Contract Documents. This item shall also include the removal of sheet pile wall and transporting to Jetty Sector area when no longer necessary for dewatering. Design submittal for metal sheet pile wall is included under Bid Item 0001.

3.14 DEWATERING (BID ITEM 0014)

A. REQUIRED ITEM (BID ITEM 0014A)

1. Measurement for this lump sum item shall include all items described under this bid item and no separate quantity measurement shall be made.
2. Payment for dewatering will be made at the lump sum bid price, for which price and payment will be full compensation for all labor, equipment, materials, and incidentals required to design, install, operate, and maintain the dewatering system designed in accordance with SECTION 02140 – DEWATERING AND

DRAINAGE to dewater the excavation area during source materials removal, excavation, backfill, and revetment construction operations. This item shall also include transfer of non-contact water from the dewatering operations to the surface water and contact water to the on-site temporary water treatment system, and then discharge to the dewatering trench sump system. Design submittal for dewatering system is included under Bid Item 0001.

B. OPTIONAL ITEM (BID ITEM 0015B)

1. Measurement for this lump sum item shall include all items described under this bid item and no separate quantity measurement shall be made.
2. Payment for optional dewatering using deep well points will be made at the lump sum bid price, for which price and payment will be full compensation for all labor, equipment, materials, and incidentals required to design, install, operate and maintain the dewatering system designed in accordance with SECTION 02140 – DEWATERING AND DRAINAGE to dewater the deeper excavation area during excavation and backfill, operations. This item shall also include transfer of non-contact water from the dewatering operations to the dewatering trench sump system and contact water to the on-site temporary water treatment system, and then discharge to the dewatering trench sump system. Design submittal for dewatering system is included under Bid Item 0001.

**3.15 WATER TREATMENT SYSTEM INSTALLATION AND STARTUP TESTING
(BID ITEM 0015)**

A. REQUIRED ITEM (BID ITEM 0015A)

1. Measurement for this lump sum item shall include all items described under this bid item, and no separate quantity measurement shall be made.
2. Payment for temporary water treatment system including multiple storage tanks to collect and store decontamination and contact water and installation and startup testing will be made at the lump sum price bid, for which price and payment will be full compensation for mobilization, demobilization, installation, and startup testing of the temporary water treatment system in accordance with SECTION 13300 – WATER TREATMENT SYSTEM and as otherwise required by the Contract Documents. This bid item includes all required sampling for startup testing, construction of temporary water treatment system containment area, installation of effluent discharge pipe, valves, fittings, cleanouts, and appurtenances between the treatment system and the discharge to the dewatering collection trench system or placement and maintenance of a riprap at outfall to prevent excessive scouring at the discharge point if discharge is to surface water. Design submittal for temporary water treatment system is included under Bid Item 0001.

B. OPTIONAL ITEM (BID ITEM 0015B)

1. Measurement for this lump sum item shall include all items described under this bid item, and no separate quantity measurement shall be made.
2. Payment for temporary water treatment system installation of optional items will be made at the lump sum price bid, for which price and payment will be full compensation for mobilization, demobilization, installation of the optional components of the temporary water treatment system in accordance with SECTION 13300 – WATER TREATMENT SYSTEM and as otherwise required by the Contract Documents in order to meet discharge permit criteria. These optional items will be executed at the direction of the EPA's Representative.

3.16 WATER TREATMENT SYSTEM O&M (BID ITEM 0016)

- A. Measurement for this unit price item will be made to the nearest hour of full-scale operation of the temporary water treatment system completed, in accordance with the Specifications.
- B. Payment for the temporary water treatment system O&M will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to furnish, maintain, and operate the full-scale temporary water treatment system during dewatering operations in accordance with SECTION 13300 – WATER TREATMENT SYSTEM and as otherwise required by the Contract Documents. It shall include, without limitation, the cost of equipment rentals, filter bag and carbon replacement (if used), compliance sampling, utility costs, maintenance of treatment system, and conveyance of water to the point of charge.

SECTION D – REMOVAL AND DECONTAMINATION OF RIPRAP (BID ITEMS 0017 TO 0019)

3.17 POST-SANDY RIPRAP REMOVAL (BID ITEM 0017)

- A. Measurement for this unit price item will be made in square feet of area with post-sandy riprap measured in place before and after removal, by a land surveyor, or approved alternative. The area of removal shall be measured by means of surveys before and after removal.
- B. Payment for removal, segregation, and stockpile of all large post-sandy riprap from the designated seawall areas will be made in square feet of removed price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for removal of riprap and temporary placement in stockpile and as required by the Contract Documents and detailed in the SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. Payment will include on-site handling and delivery of all large riprap/armored stone to the decontamination stations. Disposal of riprap not suitable to reuse on-site shall be paid on a per ton basis in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.

3.18 RIPRAP DECONTAMINATION (BID ITEM 0018)

- A. Measurement for this unit price item will be made in per 100 large riprap/armored stones before and after decontamination, counted each day, or approved alternative. The total number of riprap/armored stones shall be counted that was decontaminated and stockpiled in a support zone.
- B. Payment for performing decontamination and stockpile of all large riprap stone to the designated clean areas will be made in per 100 large riprap stones decontaminated price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for decontamination of riprap and temporary placement in clean stockpile and otherwise as required by the Contract Documents and detailed in the SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL and as per Decontamination Plan. Payment will include on-site handling and decontamination of all large riprap. Disposal of riprap/armored not suitable to reuse on-site shall be paid on a per ton basis in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.

3.19 STARTUP PILOT TESTING (BID ITEM 0019)

- A. Measurement for this lump sum item shall include all items described under this bid item, and no separate quantity measurement shall be made.
- B. Payment for the startup pilot testing will be made at the lump sum price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for providing the collection, field screening testing method such as utilizing handheld x-ray fluorescence (XRF) and reporting of the result of the task to verify the effectiveness of the decontamination method selected for cleaning the riprap. This task includes reviewing and revising the selected decontamination method if required and revising the Contract Documents in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.

SECTION E –LARGE SLAG, DEBRIS AND WEATHERED RIPRAP REMOVAL (BID ITEMS0020 THROUGH 0022)

3.20 LARGE SLAG, WEATHERED RIPRAP AND DEBRIS REMOVAL (BID ITEM 0020)

- A. Measurement for this unit price item will be made in square feet of area with large slag and debris comingled with weathered riprap measured in place before and after removal, by a land surveyor, or approved alternative. The area of removal shall be measured by means of surveys before and after removal.
- B. Payment for removal, segregation, and stockpile of all large slag, miscellaneous debris, and weathered riprap from the designated seawall areas will be made in square feet of removed price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for removal of large slag, miscellaneous debris, and weathered riprap, segregating each material and temporary placement in stockpile as required by the Contract Documents and detailed in the SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. Payment will include on-site handling of large slag, miscellaneous debris, and weathered riprap to the designated stockpile area. Disposal of slag and debris shall be paid on a per ton basis in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL. Decontamination of weathered riprap shall be paid on per 100 stones and included in Bid Item 0018. Disposal of riprap not suitable to reuse on-site shall be paid on a per ton basis in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.

3.21 TRANSPORTATION AND DISPOSAL OF RCRA WASTE – SLAG (BID ITEM 0021)

- A. Measurement for this unit price item will be the actual number of tons of RCRA waste transported, treated, and disposed of off-site.
- B. Payment for the Transportation and Disposal of RCRA Waste including the slag will be made at the unit price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for the loadout, off-site transportation, off-site treatment, and disposal of RCRA Waste in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTMAINATED MATERIAL and any other requirements in the Contract Documents. Waste Characterization sampling required by disposal facility is included under Bid Item 0025.

3.22 TRANSPORTATION AND OFF-SITE DISPOSAL OF SUBTITLE D MATERIAL – MISCELLANEOUS DEBRIS (BID ITEM 0022)

- A. Measurement for this unit price item will be made to the nearest ton of Subtitle D material including the miscellaneous debris and riprap/armored stone unsuitable for reuse disposed of off-site.
- B. Payment for transportation and disposal of Subtitle D material including debris and riprap/armored stone will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for loadout, transportation, and disposal of Subtitle D material in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL and any other requirements in the Contract Documents. Waste characterization sampling required by the approved disposal facility(ies) is included under Bid Item 0025.

SECTION F – EXCAVATION, WASTE HANDLING, AND DISPOSAL (BID ITEMS 0023 THROUGH 0025)

3.23 PRIMARY EXCAVATION (BID ITEM 0023)

- A. Measurement for this unit price item will be made in bank cubic yards measured in place after excavation, by a land surveyor, or approved alternative and confirmed by the EPA's Representative. The volume of excavation shall be measured by means of surveys before and after excavation.
- B. Payment for primary excavation will be made at the unit price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for excavation of contaminated material from within the primary excavation limits, as shown on the Design Drawings and detailed in the SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. Payment will also include on-site handling, delivery of contaminated material to designated stockpile area, segregation of small slag from soil/sediment to meet the disposal facility requirements, and management of stockpiles. Excavation dewatering, post-excavation confirmatory sampling, transportation, disposal, and surveying costs are included under other bid items.

3.24 SECONDARY EXCAVATION (BID ITEM 0024)

- A. Measurement for this unit price item will be made in bank cubic yards measured in place after excavation, by a land surveyor, or approved alternative and confirmed by the EPA's Representative. The volume of excavation shall be measured by means of surveys before and after excavation.
- B. Payment for secondary excavation will be made at the unit price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for secondary excavation based on post-excavation confirmatory sampling results and as approved by the EPA's Representative in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. Payment will also include on-site handling and delivery of contaminated material to the designated stockpile area and management of stockpiles. Excavation dewatering, stockpile area management, post-excavation confirmatory sampling, transportation, disposal, and surveying costs are not included under this bid item.

3.25 POST-EXCAVATION AND WASTE CHARACTERIZATION SAMPLING (BID ITEM 0025)

- A. Measurement for this unit price item shall include all items described under this bid item and no separate quantity measurement shall be made.
- B. Payment for Post-Excavation and Waste Characterization Sampling will be made at the per sample unit price, for which price and payment will be full compensation for all labor, equipment, materials, and incidentals required to perform post-excavation and waste characterization/disposal sampling in accordance with Design Drawings, SECTION 01450 – CHEMICAL DATA QUALITY CONTROL, SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. Post-excavation sampling will be required to determine whether secondary excavation is required or to document the concentrations of contaminant of concern at the excavation limits.

3.26 TRANSPORTATION AND DISPOSAL OF SUBTITLE D MATERIAL – SOIL/SEDIMENT (BID ITEM 0026)

- A. Measurement for this unit price item will be made to the nearest ton of Subtitle D material – soil/sediment disposed of off-site.
- B. Payment for transportation and disposal of Subtitle D material – soil/sediment will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for loadout, transportation, and disposal of Subtitle D material in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL and any other requirements in the Contract Documents. Waste characterization sampling required by disposal facility is included under Bid Item 0025.

3.27 TRANSPORTATION AND DISPOSAL OF RCRA WASTE – SOIL/SEDIMENT (BID ITEM 0027)

- A. Measurement for this unit price item will be the actual number of tons of RCRA waste – soil/sediment transported, treated, and disposed of off-site.
- B. Payment for the Transportation and Disposal of RCRA Waste – soil/sediment will be made at the unit price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for the loadout, off-site transportation, treatment, and disposal of RCRA Waste in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL and any other requirements in the Contract Documents. Waste characterization sampling required by disposal facility is included under Bid Item 0019.

SECTION G – BACKFILL, COMPACT AND GRADING (BID ITEMS 0028 THROUGH 0030)

3.28 BACKFILL, COMPACTION AND GRADING (BID ITEM 0028)

- A. Measurement for this unit price item will be made to the nearest tons of compacted backfill material (common backfill, beach sand fill and wetland backfill) installed, measured in-place by a land surveyor or approved and confirmed by the EPA's Representative.
- B. Payment for backfill and compaction will be made at the unit price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for the delivery, placement, compaction, testing and grading of

common and structural fill material, in accordance with SECTION 02201 – BACKFILL, COMPACTION AND GRADING, SECTION 01450 – CHEMICAL DATA QUALITY CONTROL, and the Contract Documents.

3.29 BACKFILL AND COMPACTION (ON-SITE REUSE) (BID ITEM 0029)

- A. Measurement for this unit price item will be made to the nearest embankment cubic yard of backfill material (over-excavated of clean material and stockpiled) installed, measured in-place by a land surveyor or approved alternative.
- B. Payment for backfill and compaction will be made at the unit price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for the placement, compaction, and grading of backfill material in accordance with SECTION 02201 – BACKFILL, COMPACTION AND GRADING and the Contract Documents. NJDEP sampling and analysis for clean fill is included in bid item 0028.

3.30 TOPSOIL (BID ITEM 0030)

- A. Measurement for this unit price item will be made to the nearest embankment cubic yard of topsoil installed, measured in-place by a land surveyor, or approved alternative and confirmed by the EPA's Representative.
- B. Payment for topsoil will be made at the unit price bid, for which price and payment will be full compensation for all labor, equipment, material, testing, and incidentals required for the delivery of topsoil, in accordance with SECTION 02201 – BACKFILL, COMPACTION AND GRADING, SECTION 01450 – CHEMICAL DATA QUALITY CONTROL, and the Contract Documents.

SECTION H – REVETMENT CONSTRUCTION (BID ITEMS 0031 THROUGH 0033)

3.31 REVETMENT SUBGRADE PREPARATION (BID ITEM 0031)

- A. Measurement for this unit price item will be made to the nearest square yard of revetment subgrade preparation, measured in-place by a land surveyor or approved alternative and confirmed by the EPA's Representative.
- B. Payment for backfill and compaction will be made at the unit price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for the delivery, placement, compaction, testing and grading of the revetment subgrade, in accordance with SECTION 02201 – BACKFILL, COMPACTION AND GRADING, SECTION 03530 – REVETMENT CONSTRUCTION, and the Contract Documents.

3.32 REVETMENT CONSTRUCTION (BID ITEM 0032)

- A. Measurement for this unit price item will be made to the nearest square yard of revetment installed, measured in-place by a land surveyor, or approved alternative and confirmed by the EPA's Representative.
- B. Payment for revetment construction will be made at the unit price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to construct revetment, in accordance with SECTION 03530 – REVETMENT CONSTRUCTION and the Contract Documents.

3.33 STORMWATER PIPE OUTFALLS (BID ITEM 0033)

- A. Measurement for this lump sum item shall include all items described under this bid item and no separate quantity measurement shall be made.
- B. Payment for revetment construction will be made at the lump sum price bid, for which price and payment will be full compensation for all labor, equipment, material, and incidentals to construct stormwater pipe outfalls, in accordance with SECTION 03530 – REVETMENT CONSTRUCTION and the Contract Documents.

SECTION I – SITE RESTORATION (BID ITEMS 0034 THROUGH 0037)

3.34 MARGARET’S CREEK ACCESS ROAD (BID ITEM 0034)

- A. Measurement for this unit price item will be made to the nearest square yards of restored access roads in accordance with the Specifications.
- B. Payment for restoration of the Old Bridge Municipal Utilities Authority (OBMUA) fire access road will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required to restore the access road as shown on the Design Drawings, and in accordance with SECTION 02100 – SITE PREPARATION or as otherwise required by the Contract Documents. This item also shall include, but not be limited to, costs for providing temporary emergency access during construction. Structural fill required for road restoration is included within Bid Item 0028.

3.35 SEEDING (BID ITEM 0035)

- A. Measurement for this unit price item will be made to the nearest square foot of upland area and wetland transition zone seeded in accordance with the Specifications.
- B. Payment for seeding will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for upland area and wetland transition zone seeding as shown in the Design Drawings, and in accordance with SECTION 02921 - UPLAND SEEDING, SECTION 02955 – TRANSITION AND WETLAND AREA RESTORATION or as otherwise required by the Contract Documents.

3.36 TRANSITION AND WETLAND AREA RESTORATION (BID ITEM 0036)

- A. Measurement for this lump sum item will include all items described under this bid item, and no separate quantity measurement shall be made.
- B. Payment for wetland restoration will be made at the lump sum price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for the testing, delivery, placement and final grading of loam organic-rich topsoil over the wetland areas, restoration of the emergent and forested wetlands in accordance with SECTION 02921 - UPLAND SEEDING, SECTION 02955 – TRANSITION AND WETLAND AREA RESTORATION and as shown on the Design Drawings, including the planting of trees, shrubs, and ground cover in the wetlands, material warranties, and installation of waterfowl and deer fencing.

3.37 WETLAND MONITORING AND MAINTENANCE (BID ITEM 0037)

- A. Measurement for this unit price item will be the actual number of years that monitoring, and maintenance is performed in accordance with the Specifications.

- B. Payment for wetland monitoring and maintenance will be made at the unit price, for which price and payment will be full compensation for all labor, equipment, material, and incidentals required for wetland monitoring and maintenance, including adaptive management activities, in accordance with SECTION 02955 – TRANSITION AND WETLAND AREA RESTORATION or as otherwise required by the Contract Documents. This item shall also include preparation of the Wetland Inspection Plan, Maintenance Plan, and preparation of the annual report and submittal to the New Jersey Department of Environmental Protection (NJDEP).

END OF SECTION

SECTION 01310
JOB SITE ADMINISTRATION

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall provide all services required to assure site safety, site security, site communication, project management, record keeping and individual additional task performance. These services shall include the provision of qualified personnel to be accepted by the EPA's Representative and the equipment necessary to complete the performance of such tasks.

1.2 REFERENCES

- A. Not used.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
 - 1. Project Organizational Chart; Pre-Construction Submittals; EA
 - a. The Contractor shall submit an organizational chart including all personnel to be used on the project prior to Pre-Construction Conference.
 - 2. Project Manager Name and Experience; Pre-Construction Submittals; EA
 - a. The Contractor shall submit the name and experience of the Project Manager for the project within 14 calendar days from the Notice to Proceed.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Not used.

1.5 QUALITY ASSURANCE

- A. The Contractor shall be responsible for the overall management of quality control and shall have the overall responsibility for quality control as defined in SECTION 01451 – CONTRACTOR QUALITY CONTROL.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 SITE SAFETY

- A. The Contractor shall be responsible for the safe operation of the work at the site and shall employ a Safety and Health Manager (SHM) and a Site Safety and Health Officer (SSHO). These individuals shall be responsible for the administration of site health and safety and shall have the responsibilities as defined in SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.

3.2 PROJECT MANAGEMENT AND RECORDKEEPING

- A. The Contractor shall provide an overall project management team including Project Manager and administrative personnel qualified and capable of providing management for the project including construction supervision, expediting labor relations, staffing and recordkeeping. The Contractor shall submit a detailed Project Organizational Chart, which shows the key individuals directly involved in the project.
- B. The Project Manager shall take overall responsibility for conducting the work and for ensuring that the work is conducted in accordance with the requirements of the Contract Documents. The Project Manager shall be responsible for communication and information exchange with the EPA's Representative and shall officially represent the Contractor in all project-related activities. The Project Manager, at a minimum, shall have authority to sign payments and change orders.
- C. The Contractor shall make available in a timely manner records of all site activity, quantities of materials delivered to the site, quantities of materials utilized, quantities of materials excavated, quantities of water discharged to or to surface water, the waste quantities produced, laboratory results, waste transportation activity information and all other information required to support requests for payment.
- D. A minimum of 14 calendar days before mobilization, the Project Manager and the EPA's Representative shall meet with Old Bridge Township and Middlesex County engineers in the presence of the EPA. EPA will include the state, where appropriate, for the meeting with the town and county. The parties will discuss the planned construction approach and phasing of work.
 - 1. Items to be discussed shall include, but are not limited to:
 - a. Planned construction methods to be used
 - b. The type and size of equipment and operating procedures including heavy equipment operations, mechanical equipment operations, etc.
 - c. The effect of construction on overhead and buried utilities
 - d. Community protection requirements
 - e. Planned work hours and access to the site
 - f. Emergency contact procedures
 - 2. The Contractor shall record the minutes of the meeting and include all significant proceedings and decisions.

3.3 WORKING HOURS

- A. Working hours shall be scheduled by the Contractor to occur between 7:00 am and 4:00 pm, with the possibility of extending the maximum working time until 6:00 pm, Monday through Friday. Work shall not be permitted before 7:00 am or after 6:00 pm Monday through Friday, or on weekends, or on holidays unless approved by the EPA's Representative.
- B. The Contractor may be permitted to conduct construction activities six days per week, Monday through Saturday, with the approval of the EPA's Representative.
- C. Written notification of any changes to the normal work schedule, including work before 7:00 am, after 6:00 pm Monday through Friday, on weekends, or on holidays, shall be submitted to the EPA's Representative for approval at least one (1) week in advance of proposed changes.

END OF SECTION

SECTION 01320

PROJECT SCHEDULES

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all labor, materials, equipment, and incidentals required to prepare and update critical path method project schedules and prepare the monthly progress reports for review at the Pre-Construction Conference and subsequent progress meetings.

1.2 REFERENCES

- A. Not used.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following items to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
 - 1. Initial Project Schedule; Pre-Construction Submittals; EA
 - a. Submit initial project schedule for approval at least 15 calendar days prior to the Pre-Construction Conference. Project schedule to start with the Notice to Proceed date and end at project completion and demobilization.
 - 2. Revised Project Schedule
 - a. Submit revised project schedule, if necessary, for approval within five (5) days after date of the Pre-Construction Conference and during each regular monthly progress meeting.
 - b. The EPA's Representative will review schedules and return a reviewed copy within seven (7) days after receipt.
 - c. If required, the Contractor shall resubmit a revised schedule within seven (7) days after return of reviewed copy

1.4 ADMINISTRATIVE REQUIREMENTS

- A. The Contractor shall designate an authorized representative who shall be responsible for the preparation of all required project schedule reports.
- B. The Contractor shall prepare and update the project schedule using a computer software system that produces legible, easily updated critical path schedules. The Contractor shall submit the software to the EPA's Representative for approval prior to use.
- C. The Contractor shall prepare the critical path schedules in the form of a bar chart with the following details.
 - 1. Identify the project at the top of the project schedule.
 - 2. Provide a separate horizontal bar for each work activity or operation.
 - 3. Provide bold vertical lines, at one-week intervals, with consecutive numbering of each week on the horizontal time scale.
 - 4. Identify the first workday of each work item on the horizontal time scale.
 - 5. The chronological order of the start of each major operation or segment of work will determine the vertical location of its bar on the chart.

6. The sheet size shall be as approved by the EPA's Representative.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 GENERAL

- A. Project Schedule as described below shall be prepared. The scheduling of design and construction shall be the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Designers, subcontractors, and suppliers working on the project shall also contribute to developing and maintaining an accurate Project Schedule. The approved Project Schedule shall be used to measure the progress of the work, and to aid in evaluating time extensions, and to provide the basis of all progress payments.
 1. Approved Project Schedule
 - a. The Contractor shall use the approved Project Schedule to measure the progress of the work and to aid in evaluating time extensions. The schedule shall be cost loaded and activity coded. The schedule will provide the basis for all progress payments. If the Contractor fails to submit any schedule within the time prescribed, the EPA's Representative may withhold approval of progress payments until the Contractor submits the required schedule.
 2. Schedule Status Report
 - a. Provide a Schedule Status Report on at least a monthly basis. If, in the opinion of the EPA's Representative, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress including those that may be required by the EPA's Representative, without additional cost to the Government. In this circumstance, the EPA's Representative may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction planned, and to submit for approval any supplementary schedule or schedules as the EPA's Representative deems necessary to demonstrate how the approved rate of progress will be regained.
 3. Default Terms
 - a. Failure of the Contractor to comply with the requirements of the EPA's Representative shall be grounds for a determination by the EPA's Representative that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the EPA's Representative may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of the contract.

3.2 PROJECT SCHEDULE

- A. The computer software system utilized by the Contractor to produce the Project Schedule shall be capable of providing all requirements of this Specification. Failure of the Contractor to meet the requirements of this Specification shall result in the disapproval of the schedule. Manual methods used to produce any required information shall require approval by the EPA's Representative.
 1. Use of the Critical Path Method
 - a. The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The Contractor shall provide the Project Schedule in the Precedence Diagram Method (PDM).

2. Level of Detail Required
 - a. The Project Schedule shall include an appropriate level of detail. Failure to develop or update the Project Schedule or provide data to the EPA's Representative at the appropriate level of detail, as specified by the EPA's Representative, shall result in the disapproval of the schedule. The EPA's Representative will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule:
 - 1) Activity Durations
 - a) Contractor submissions shall follow the direction of the EPA's Representative regarding reasonable activity durations. Reasonable durations are those that allow the progress of activities to be accurately determined between payment periods.
 - 2) Design and Permit Activities
 - a) Design and permitting activities, including necessary conferences and follow-up actions and design package submission dates, shall be integrated into the schedule.
 - 3) Procurement Activities
 - a) Tasks related to the procurement of long lead materials or equipment shall be included as separate activities in the project schedule. Long lead materials and equipment are those materials that have a procurement cycle of over 90 days. Examples of procurement process activities include, but are not limited to submittals, approvals, procurement, fabrication, and delivery.
 - 4) Critical Activities
 - a) The following activities shall be listed as separate line activities on the Contractor's project schedule:
 - (1) Submittal and approval of all required plans
 - (2) Pre-excavation sampling
 - (3) Mobilization for construction activities
 - (4) Permitting
 - (5) Clearing and grubbing
 - (6) Soil erosion and sediment control
 - (7) Air monitoring
 - (8) Sediment containment area and soil stockpile/loadout area construction
 - (9) Temporary water treatment system containment area construction
 - (10) Temporary water treatment system installation
 - (11) Temporary water treatment system start-up and testing
 - (12) Sediment dewatering
 - (13) Excavation and backfilling
 - (14) Transportation and disposal of contaminated material
 - (15) Wetlands and site restoration
 - (16) Pre-final inspection
 - (17) Correction of punch list from pre-final inspection
 - (18) Final inspection
 - (19) Project close-out and demobilization
 - 5) Government Activities
 - a) Government and other agency activities that could impact progress shall be shown. These activities include, but are not limited to approvals, inspections, utility tie-in, and Notice to Proceed (NTP) for phasing requirements.

- 6) Responsibility
 - a) All activities shall be identified in the project schedule by the party responsible to perform the work. Responsibility includes, but is not limited to, the subcontracting firm, Contractor work force, or government agency performing a given task. Activities shall not belong to more than one responsible party. The responsible party for each activity shall be identified by the Responsibility Code.
- 7) Work Areas
 - a) All activities shall be identified in the project schedule by the work area in which the activity occurs. Activities shall not be allowed to cover more than one work area. The work area of each activity shall be identified by the Work Area Code.
- 8) Modification or Claim Number
 - a) Any activity that is added or changed by contract modification or used to justify claimed time shall be identified by a modification or claim code that changed the activity. Activities shall not belong to more than one modification or claim item. The modification or claim number of each activity shall be identified by the Modification or Claim Number. Whenever possible, changes shall be added to the schedule by adding new activities. Existing activities shall not normally be changed to reflect modifications.
- 9) Bid Item
 - a) All activities shall be identified in the Project Schedule by the Bid Item to which the activity belongs. An activity shall not contain work in more than one Bid Item. The Bid Item for each appropriate activity shall be identified by the Bid Item Code.
- 10) Phase of Work
 - a) All activities shall be identified in the Project Schedule by the phase of work in which each activity occurs. Activities shall not contain work in more than one phase of work.
- 11) Category of Work
 - a) All Activities shall be identified in the project schedule according to the category of work which best describes the activity. Category of work refers, but is not limited, to the procurement chain of activities including such items as submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing.
- 12) Feature of Work
 - a) All activities shall be identified in the project schedule according to the feature of work to which the activity belongs. Feature of work refers, but is not limited to, a work breakdown structure for the project.
- 3. Scheduled Project Completion
 - a. The schedule interval shall extend from the contract start date to the contract completion date. The contract completion activity (End Project) shall finish based on the required contract duration in the accepted contract proposal, as adjusted for any approved contract time extensions. The first scheduled work period shall be the day after NTP is acknowledged by the Contractor.

3.3 PROGRESS REVISIONS

- A. The Contractor shall indicate progress of each activity to date of submission.

- B. The Contractor shall show changes occurring since previous submission of schedule with the following details:
 - 1. Show major changes in scope or quantities (if any).
 - 2. Show activities modified since previous submission.
 - 3. Show revised projections of progress and completion.
 - 4. Show other identifiable changes.
- C. The Contractor shall provide a very brief narrative report as needed to define:
 - 1. Problem areas, anticipated delays, and the impact on schedule.
 - 2. Recommended corrective action and its effect.
 - 3. The effect of changes, if any, on schedules of subcontractors.

3.4 REQUESTS FOR TIME EXTENSIONS

- A. In the event the Contractor requests an extension of the contract completion date, or any interim milestone date, the Contractor shall furnish the following for a determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract: justification, project schedule data, and supporting evidence as the EPA's Representative may deem necessary. Submission of proof of delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is required for any approvals.
 - 1. Justification of Delay
 - a. The Project Schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The EPA's Representative's determination as to the number of allowable days of contract extension shall be based upon the project schedule updates in effect for the time period in question, and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in the extension of the schedule, shall not be a cause for a time extension to the contract completion date.
 - 2. Submission Requirements
 - a. The Contractor shall submit a justification for each request for a change in the contract completion date based upon the most recent schedule update. Such a request shall include, as a minimum:
 - 1) A list of affected activities, with their associated project schedule activity number
 - 2) A brief explanation of the causes of the change
 - 3) An analysis of the overall impact of the changes proposed

3.5 DIRECTED CHANGES

- A. If the NTP is issued for changes prior to settlement of price and/or time, the Contractor shall submit proposed schedule revisions to the EPA's Representative within 14 calendar days of the NTP being issued. The proposed revisions to the schedule will be approved by the EPA's Representative prior to inclusion of those changes within the Project Schedule. If the Contractor fails to submit the proposed revisions, the EPA's Representative may furnish the Contractor with suggested revisions to the Project Schedule. The Contractor shall include these revisions in the Project Schedule until revisions are submitted, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the EPA's Representative, the Contractor shall advise the EPA's Representative within 14 calendar days of receipt of the revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the EPA's Representative's revisions until a mutual agreement in the

revisions is reached. If the Contractor fails to submit alternative revisions within 14 calendar days of receipt of the EPA's Representative's proposed revisions, the Contractor will be deemed to have concurred with the EPA's Representative's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

END OF SECTION

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. The submittals described herein are those required, and further described in other sections of the Specifications, for acceptance by the EPA's Representative. Other requirements pertaining to submittals may be included in the Special Clauses.

1.2 REFERENCES

- A. Not used.

1.3 SUBMITTAL REQUIREMENTS

- A. Submittal Identification
 - 1. The submittals described herein are those required, and further described in other sections of the specifications, for acceptance by the EPA's Representative. Other requirements pertaining to submittals may be included in the Special Clauses.
- B. Submittal Requirements
 - 1. Submittals Requiring Approval (EA)
 - a. Approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the EPA's Representative.
 - 2. Information Only Submittals (FIO)
 - a. All submittals not requiring approval will be for information only.
- C. Approved Submittals
 - 1. Approval of submittals by the EPA's Representative shall not be construed as a complete check but will indicate only that the general method of construction, materials, detailing, and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor's Quality Control (CQC) requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work. After submittals have been approved by the EPA's Representative, no resubmits for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.
- D. Disapproved Submittals
 - 1. The Contractor shall make all corrections required by the EPA's Representative and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the Contract, a notice in accordance with the Contract Clause "Changes" shall be given promptly to the EPA's Representative.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Withholding of Payment
 - 1. Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor shall prepare submittals as required by the Specifications. The EPA's Representative may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same used in the Design Drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with Contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including, but not limited to, catalog cuts, diagrams, operating charts, or curves; test reports; test cylinders; samples; Operation and Maintenance (O&M) manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of, in accordance with manufacturers Safety Data Sheets (SDS) and in compliance with existing laws and regulations.

3.2 SUBMITTAL REGISTER

- A. At the end of this section is a Submittal Register listing items of equipment and materials for which submittals are required by the Specifications; this list may not be all inclusive and additional submittals may be required.

3.3 SCHEDULING

- A. Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 21 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delays, damages, or time extensions will be allowed for time lost in late submittals.
- B. The EPA's Representative will review the Submittal Register for approval action.
- C. The approved register will become a part of the contract and Contractor shall be subject to the requirements thereof. The Contractor shall revise and/or update the register monthly to take into account all changes in the contract. Each such revised addition and/or revision to the register shall be submitted to the EPA's Representative for approval. This register and the progress schedules shall be coordinated.

3.4 TRANSMITTAL FORM

- A. The sample Transmittal Form attached to this section shall be used for submitting both submittals requiring approval and information only submittals in accordance with instructions on the reverse side of the form. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Particular care will be exercised to ensure proper listing of the Specification paragraph and/or sheet number of the Design Drawings pertinent to the data submitted for each item.

3.5 SUBMITTAL PROCEDURE

A. Submittals shall be made as follows:

1. Procedures
 - a. The Contractor shall submit five copies, each with separate transmittal, and/or an electronic copy to the EPA's Representative in accordance with the Submittal Register. The mailing address for these submittals shall be obtained at the Pre-Construction Conference. Items not to be submitted with five copies, as specified in the Submittal Register, such as samples and test cylinders, shall be submitted accompanied by five copies of the submittal register.
2. Deviations
 - a. For submittals that include proposed deviations requested by the Contractor, the column "variation" of the submittal register shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The EPA's Representative reserves the right to rescind approval of submittals containing unnoted deviations.
3. The Contractor shall submit items listed on the Design Drawings and listed or specified in the other sections of these Specifications. The EPA's Representative may request submittals in addition to those listed when deemed necessary to adequately describe the work covered in the respective sections. Each submittal shall be completed and in sufficient detail for ready determination of compliance with the contract requirements.

3.6 CONTROL OF SUBMITTALS

- #### **A. The Contractor shall carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved Submittal Register.**

3.7 REVIEW OF SUBMITTALS

- #### **A. The EPA's Representative will review the submittals to determine general compliance with the Contract Documents. Submittals will be reviewed as follows:**
1. "A – Approved" if no objections are observed or comments made
 2. "B – Approved, except as Noted. Resubmission not Required" if minor objections, comments, or additions are made but resubmittal is not considered necessary.
 3. "C – Approved, except as Noted. Resubmission Required" if the objections, comments, or additions are extensive. The Contractor would be required to resubmit the items after correction.
 4. "D – Will be Returned by Separate Correspondence"
 5. "E – Disapproved" if the submittal under consideration is not acceptable or when the data submitted are not sufficiently complete to establish compliance with the Design Drawings and Specifications.
 6. "F – Receipt Acknowledged" all submittal listed "For Information Only" will require this code.

3.8 APPROVED SUBMITTALS

- #### **A. Upon completion of review of submittals requiring approval, the submittals will be identified as having received approval by being so stamped and dated. Three copies of the submittal will be retained by the EPA's Representative and one copy of the submittal will be returned to the Contractor.**

3.9 INFORMATION ONLY SUBMITTALS

- A. Normally submittals for information only will not be returned. Approval of the EPA's Representative is not required on information only submittals. The EPA's Representative reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and Specifications and will not prevent the EPA's Representative from requiring removal and replacement of nonconforming material incorporated in the work.

3.10 RESUBMISSION REQUIREMENTS

- A. Make any corrections or changes in the submittals required by the EPA's Representative and resubmit until approved.
- B. Revise initial drawings or data and resubmit as specified for the initial submittal.
- C. Indicate any changes which have been made other than those requested by the EPA's Representative.
- D. For samples, submit new samples as required for initial submittal.

3.11 PROFESSIONAL ENGINEER (P.E.) CERTIFICATION FORM

- A. If specifically required in other Sections of these Specifications, the Contractor shall submit a New Jersey P.E. Certification for each item required, in the form attached to this Section, completely filled in and stamped.

3.12 SUBMITTAL DESCRIPTIONS

- A. Pre-Construction Submittals
 - 1. Pre-construction submittals are required prior to commencing construction activities and as noted for each individual pre-construction submittal included in the Specifications.
- B. Shop Drawings
 - 1. Drawings, diagrams, and schedules specifically prepared to illustrate some portion of the work. Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.
 - 2. Shop drawings include, but are not necessarily limited to, fabrication and installation drawings, schedule information and coordination drawings, as applicable to the work.
 - 3. All calculations or analyses used to develop designs shall be submitted with the detailed shop drawings.
- C. Product Data
 - 1. Product data, as specified in individual sections include, but are not necessarily limited to, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation or use instructions, manufacturer's printed statements of compliance and applicability, catalog cuts, product photographs, production or quality control inspection and test reports and certificates.
- D. Samples
 - 1. Samples specified in individual sections include, but are not necessarily limited to, physical examples of the items to be used in the work.

- E. Design Data
 - 1. Calculations, mix designs, analyses or other data pertaining to a part of the work.
- F. Test Reports
 - 1. Reports signed by an authorized official of a testing laboratory that a material, product, or system identical to the material, product, or system to be provided has been tested in accordance with specified requirements. Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to the job site. Report which includes findings of a test made at the job site or on a sample taken from the job site, on a portion of work during or after installation. Test Reports may include, but not limited to, investigation reports, daily checklists, final acceptance tests, and operational reports.
- G. Certificates
 - 1. Statements signed by responsible officials of the manufacturer of a product, system or material attesting that the product, system, or material meets the specification requirements. Must be dated after award of project contract and clearly name the project. Document required of the Contractor, or of a supplier, installer or subcontractor through the Contractor, the purpose of which is to further the quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.
- H. Manufacturer's Instructions
 - 1. Preprinted material describing installation of a product, system, or material, including special notices and Safety Data Sheets (SDS) concerning impedances, hazards, and safety precautions.
- I. Manufacturer's Field Reports
 - 1. Documentation of the testing and verification actions taken by the manufacturer's representative to confirm compliance with the manufacturer's standards or instructions. The documentation must be signed by an authorized official of a testing laboratory or agency, must state the test results, and indicate whether the material, product, or system has passed or failed the test.
- J. Operation and Maintenance Data
 - 1. Data that are furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel. These data are needed by operating and maintenance personnel for the safe and efficient operation, maintenance, and repair of the item.
- K. Closeout Submittals
 - 1. Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

3.13 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor shall review shop drawings, product data and samples prior to submission to determine and verify the following:
 - 1. Field measurements
 - 2. Field construction criteria
- B. The review and approval of shop drawings or samples by the EPA's Representative shall not relieve the Contractor from its responsibility with regard to the fulfillment of the

terms of the contract. All risks of error and omission are assumed by the Contractor, and the EPA's Representative will have no responsibility.

- C. No portion of the work requiring a shop drawing, working drawings, sample, or catalog data shall be started nor shall any materials be fabricated, installed, or used on the site prior to the approval of the EPA's Representative. Fabrication performed, materials purchased, or on-site construction accomplished which does not conform to approved shop drawings and data shall be at the Contractor's risk. The EPA's Representative will not be liable for any expense for delay due to corrections or remedies required to accomplish conformity.
- D. Project Work, materials, fabrication, and installation shall conform to approved shop drawings, working drawings, applicable samples, and catalog data.

END OF SECTION

P. E. CERTIFICATION FORM

The undersigned hereby certifies that he/she is a Professional Engineer registered in the State of

_____ New Jersey _____ and that he/she has been employed by

_____ to design _____

(Name of Contractor)

(Insert P.E. Responsibilities)

in accordance with Specification Section _____ for the

_____.

(Name of Project)

The undersigned further certifies that he/she has performed the design of the

_____, that said

(Name of Project)

design is in conformance with all applicable local, state, and federal codes, rules, and regulations, and that his/her signature and P.E. stamp have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the EPA's Representative within seven days following written request by the EPA's Representative.

P. E. Name

Signature

Address

Contractor's Name

Signature

Title

Address

RMS SUBMITTAL REGISTER INPUT FORM													CONTRACT NUMBER			
TITLE AND LOCATION																
RARITAN BAY SLAG SUPERFUND SITE, SEAWALL SECTOR, OLD BRIDGE TOWNSHIP, MIDDLESEX COUNTY, NEW JERSEY																
SECTION	PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL											CLASSIFICATION		
			PRE-CONSTRUCTION SUBMITTALS	SHOP DRAWINGS	PRODUCT DATA	SAMPLES	DESIGN DATA	TEST REPORTS	CERTIFICATES	MFRS INSTRUCTIONS	MFRS FIELD REPORT	OPERATION & MAINTENANCE DATA	CLOSEOUT SUBMITTALS	FOR INFORMATION ONLY	EPA REPRESENTATIVE APPROVAL	
01201	1.3A.1	PROJECT SUBMITTAL SCHEDULE	X													X
01201	1.3A.2	CONFERENCE MEETING MINUTES	X													X
01202	1.3A.1	MONTHLY PROGRESS REPORT			X											X
01202	1.3A.2	PROJECT MEETING MINUTES			X											X
01202	1.3A.3	PROJECT COST SUMMARY REPORT			X											X
01310	1.3A.1	PROJECT ORGANIZATIONAL CHART	X													X
01310	1.3A.2	PROJECT MANAGER NAME AND EXPERIENCE	X													X
01320	1.3A.1	INITIAL PROJECT SCHEDULE	X													X
01320	1.3A.2	REVISED PROJECT SCHEDULE	X													X
01330	3.2	SUBMITTAL REGISTER	X													X
01351	1.3A.1	SITE SAFETY AND HEALTH PLAN (SSHP)	X													X
01351	1.3A.2	SEVERE STORM PLAN	X													X
01351	1.3A.3	WORK ZONE AND DECONTAMINATION FACILITY DRAWINGS		X												X
01351	1.3A.4	WEEKLY SAFETY AND ACCIDENT REPORTS			X										X	
01351	1.3A.5	EXPOSURE AND AIR MONITORING DATA			X										X	
01351	1.3A.6	PERSONNEL HEALTH AND SAFETY CERTIFICATES						X							X	
01351	1.3A.7	SAFETY AND HEALTH MANAGER STATEMENTS						X							X	
01351	1.3A.8	CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGEMENT						X							X	
01351	1.3A.9	PROJECT SAFETY AND HEALTH PHASE-OUT REPORT											X	X		
01352	1.3A.1	COMMUNITY HEALTH AND SAFETY PLAN	X													X
01355	1.3A.1	ENVIRONMENTAL PROTECTION PLAN	X													X
01355	1.3A.2	NON-HAZARDOUS SOLID WASTE DIVERSION REPORT			X										X	
01362	1.3A.1	PERIMETER AIR MONITORING PLAN (PAMP)	X													X
01362	1.3A.2	PROGRESS REPORTS						X							X	
01380	1.3A.1	PRE-CONSTRUCTION, PROGRESS, AND POST-CONSTRUCTION PHOTOGRAPHS			X										X	
01381	1.3A.1	PRE-CONSTRUCTION, PROGRESS, AND POST-CONSTRUCTION VIDEO			X										X	
01450	1.3A.1	UNIFORM FEDERAL POLICY QUALITY ASSURANCE PROJECT PLAN (UFP-QAPP)	X													X
01450	1.3A.2	TRIP REPORT						X							X	
01450	1.3A.3	TOPSOIL AND BACKFILL MATERIAL TESTING RESULTS						X								X
01450	1.3A.4	ANALYTICAL DATA						X							X	

RMS SUBMITTAL REGISTER INPUT FORM													CONTRACT NUMBER		
TITLE AND LOCATION															
RARITAN BAY SLAG SUPERFUND SITE, SEAWALL SECTOR, OLD BRIDGE TOWNSHIP, MIDDLESEX COUNTY, NEW JERSEY															
SECTION	PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL											CLASSIFICATION	
			PRE-CONSTRUCTION SUBMITTALS	SHOP DRAWINGS	PRODUCT DATA	SAMPLES	DESIGN DATA	TEST REPORTS	CERTIFICATES	MFRS INSTRUCTIONS	MFRS FIELD REPORT	OPERATION & MAINTENANCE DATA	CLOSEOUT SUBMITTALS	FOR INFORMATION ONLY	EPA REPRESENTATIVE APPROVAL
01450	1.3A.5	FIELD SCREENING DATA						X						X	
01450	1.3A.6	NON-CONFORMANCE REPORTS						X						X	
01450	1.3A.7	CHEMICAL DATA FINAL REPORT (CDFR)						X							X
01451	1.3A.1	CQC PLAN	X												X
01451	1.3A.2	CQC ORGANIZATIONAL CHANGES			X										X
01451	1.3A.3	CQC REPORTS			X									X	
01500	1.3A.1	TEMPORARY SITE FACILITY LAYOUT PLAN		X											X
01510	1.3A.1	DECONTAMINATION PLAN	X												X
01540	1.3A.1	SECURITY PLAN	X												X
01550	1.3A.1	PRE-CONSTRUCTION SURVEY												X	
01550	1.3A.2	SURVEYOR QUALIFICATIONS	X											X	
01550	1.3A.3	SURVEY ACCURACY DOCUMENTATION			X									X	
01550	1.3A.4	SURVEYOR FIELD NOTES			X									X	
01550	1.3A.5	AS-BUILT DRAWINGS											X	X	
01550	1.3A.6	POST-CONSTRUCTION SURVEY											X	X	
01550	1.3A.7	PROJECT RECORD DOCUMENTS											X	X	
01585	1.3A.1	TRAFFIC CONTROL PLAN	X												X
01670	1.3A.1	RENEWABLE ENERGY PROGRAM			X										X
01670	1.3A.2	FUEL			X										X
01670	1.3A.3	PAPER PRODUCT LITERATURE			X										X
01670	1.3A.4	GREEN REMEDIATION DOCUMENTATION							X					X	
01780	1.3A.1	REMEDIAL ACTION REPORT											X		X
01780	1.3A.2	REMEDIAL CLOSEOUT PACKAGE											X	X	
02100	1.3A.1	SITE PREPARATION PLAN	X												X
02100	1.3A.10	PERMITS							X					X	
02100	1.3A.2	HERBICIDE APPLICATION PLAN	X												X
02100	1.3A.3	CRUSHED STONE AGGREGATE CERTIFICATE OF COMPLIANCE							X						X
02100	1.3A.4	NO. 2 STONE CERTIFICATE OF COMPLIANCE							X						X
02100	1.3A.5	DENSE GRADED AGGREGATE CERTIFICATE OF COMPLIANCE							X						X
02100	1.3A.6	NON-WOVEN GEOTEXTILE FILTER FABRIC CERTIFICATE OF COMPLIANCE							X						X
02100	1.3A.7	GEOMEMBRANE LINER CERTIFICATES OF COMPLIANCE							X						X
02100	1.3A.8	PIPE BEDDING GRAVEL CERTIFICATE OF COMPLIANCE							X						X
02100	1.3A.9	SITE PREPARATION RIPRAP							X						
02111	1.3A.1	EXCAVATION AND HANDLING PLAN	X												X

RMS SUBMITTAL REGISTER INPUT FORM													CONTRACT NUMBER			
TITLE AND LOCATION																
RARITAN BAY SLAG SUPERFUND SITE, SEAWALL SECTOR, OLD BRIDGE TOWNSHIP, MIDDLESEX COUNTY, NEW JERSEY																
SECTION	PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL											CLASSIFICATION		
			PRE-CONSTRUCTION SUBMITTALS	SHOP DRAWINGS	PRODUCT DATA	SAMPLES	DESIGN DATA	TEST REPORTS	CERTIFICATES	MFRS INSTRUCTIONS	MFRS FIELD REPORT	OPERATION & MAINTENANCE DATA	CLOSEOUT SUBMITTALS	FOR INFORMATION ONLY	EPA REPRESENTATIVE APPROVAL	
02111	1.3.A.10	QUANTITY OF WATER/PRODUCT REMOVED DURING DEWATERING												X		X
02111	1.3.A.11	SAMPLING LOCATIONS												X		X
02111	1.3.A.12	SCALED DRAWINGS												X		X
02111	1.3.A.13	PROGRESS PHOTOGRAPHS												X	X	
02111	1.3.A.14	OTHER SUBMITTAL REQUIREMENTS												X		X
02111	1.3.A.2	POST-EXCAVATION CONFIRMATORY SAMPLING RESULTS							X						X	
02111	1.3.A.3	SURVEYS		X												X
02111	1.3.A.4	WORK PLAN			X											X
02111	1.3.A.5	CLOSURE REPORT			X											X
02111	1.3.A.6	SAMPLING LIQUID							X							X
02111	1.3.A.7	EXCAVATION FIELD LOGS												X		X
02111	1.3.A.8	FIELD SCREEN READINGS												X		X
02111	1.3.A.9	QUANTITY OF MATERIALS REMOVED FROM EACH AREA OF CONTAMINATION												X		X
02120	1.3.A.1	WASTE MANAGEMENT AND TRANSPORTATION PLAN	X													X
02120	1.3.A.1.a.6	STABILIZATION PLAN	X													X
02120	1.3.A.10	EPA OFF-SITE POLICY							X							X
02120	1.3.A.11	TRANSPORT CERTIFICATION							X						X	
02120	1.3.A.12	CERTIFICATES OF DISPOSAL							X							X
02120	1.3.A.13	SHIPPING DOCUMENTS							X							X
02120	1.3.A.2	NOTICES OF NON-COMPLIANCE AND NOTICES OF VIOLATION			X											X
02120	1.3.A.3	CONTAMINATED MATERIAL STOCKPILE REPORTS			X											X
02120	1.3.A.4	ANNUAL AND BIENNIAL REPORTS							X							X
02120	1.3.A.5	SPILL RESPONSE							X							X
02120	1.3.A.6	MANIFEST EXCEPTION REPORTS							X							X
02120	1.3.A.7	CERTIFICATION							X							X
02120	1.3.A.8	TRANSPORTATION AND DISPOSAL COORDINATOR							X							X
02120	1.3.A.9	TRAINING							X							X
02140	1.3.A.1	DEWATERING AND DRAINAGE PLAN	X													X
02140	1.3.A.2	ANALYTICAL RESULTS							X						X	
02201	1.3.A.1	SAMPLES OF PROPOSED FILL AND TOPSOIL				X										X
02201	1.3.A.2	LABORATORY AND FIELD TEST RESULTS							X							X

RMS SUBMITTAL REGISTER INPUT FORM											CONTRACT NUMBER				
TITLE AND LOCATION															
RARITAN BAY SLAG SUPERFUND SITE, SEAWALL SECTOR, OLD BRIDGE TOWNSHIP, MIDDLESEX COUNTY, NEW JERSEY															
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02201	1.3.A.3	BACKFILL MATERIALS SOURCES AND CERTIFICATION							X						X
02201	1.3.A.4	LABORATORY CERTIFICATION CREDENTIALS							X						X
02370	1.3.A.1	SAMPLES				X									X
02900	1.3.A.1	SITE RESTORATION PLAN	X												X
02900	1.3.A.2	MATERIAL SAMPLES				X									X
02900	1.3.A.3	INSPECTION REPORTS									X				X
02921	1.3.A.1	SEEDING SCHEDULE			X									X	
02921	1.3.A.2	SEED CERTIFICATION							X						X
02921	1.3.A.3	MAINTENANCE RECORD										X		X	
02955	1.3.A.1	UPLAND (PARK) AREA TREE RESTORATION PLAN	X												X
02955	1.3.A.10	RESTORATION MONITORING REPORTS									X				X
02955	1.3.A.2	TRANSITION AND WETLAND AREA RESTORATION PLAN	X												X
02955	1.3.A.3	MATERIAL SAMPLES				X									X
02955	1.3.A.4	WETLAND BACKFILL AND TOPSOIL TESTING													
02955	1.3.A.5	STATE NURSERY INSPECTION CERTIFICATES AND SAMPLES							X						X
02955	1.3.A.6	PLANT STOCK CERTIFICATIONS							X					X	
02955	1.3.A.7	WETLAND RESTORATION SPECIALIST							X						X
02955	1.3.A.8	MAINTENANCE INSTRUCTIONS									X				X
02955	1.3.A.9	RESTORATION INSPECTION REPORTS									X				X
02957	1.3.A.1	DECOMMISSIONING PROCEDURES	X												X
02957	1.3.A.2	PRODUCT DATA			X									X	
03150	1.3.A.2	METAL SHEET PILING	X												X
03150	1.3.A.3	DRIVING			X									X	
03150	1.3.A.4	PILE DRIVING EQUIPMENT			X									X	
03150	1.3.A.5	PULLING AND REDRIVING			X									X	
03150	1.3.A.6	INSTALLER QUALIFICATIONS			X									X	
03150	1.3.A.7	INTERLOCKED JOINT STRENGTH IN TENSION TEST PROCEDURES			X									X	
03150	1.3.A.8	MATERIALS TEST; INTERLOCKED JOINT STRENGTH IN TENSION TEST						X						X	
03150	1.3.A.9	PILE DRIVING RECORD										X		X	
03150	1.3.A.1	METAL SHEET PILING INSTALLATION WORK PLAN	X												X
03212	1.3.A.1	ASPHALT CEMENT BINDER					X								X
03212	1.3.A.2	JOB-MIX DESIGNS					X								X
03212	1.3.A.3	BITUMINOUS MIX TESTS						X							X

RMS SUBMITTAL REGISTER INPUT FORM											CONTRACT NUMBER				
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SECTION	PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL											CLASSIFICATION	
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03212	1.3.A.4	COMMERCIAL LABORATORY CERTIFICATION							X						X
03530	1.3.A.1	MATERIAL SOURCES AND GRADATION REPORTS FOR ARMORED STONE AND BEDDING STONE						X							X
03530	1.3.A.10	STONE QUALITY AND TEST REPORT SCHEDULE AND STONE DELIVERY SCHEDULE			X										X
03530	1.3.A.11	STONE QUALITY TEST REPORTS						X							X
03530	1.3.A.12	STONE GRADATION TEST REPORTS						X							X
03530	1.3.A.13	STONE GRADATION TEST METHODOLOGY DESCRIPTIONS			X										X
03530	1.3.A.14	DAILY ACTIVITIES REPORTS						X						X	
03530	1.3.A.15	NAME AND AFFILIATION OF REGISTERED PROFESSIONAL LAND SURVEYOR			X									X	
03530	1.3.A.16	SURVEYING PLAN		X											X
03530	1.3.A.17	SURVEY NOTIFICATION			X									X	
03530	1.3.A.18	SURVEY SUBMITTAL LOG			X										X
03530	1.3.A.19	INITIAL SURVEY DRAWINGS		X											X
03530	1.3.A.2	MANUFACTURER'S MATERIAL CERTIFICATIONS AND CATALOG CUTS FOR FILTER FABRIC							X						X
03530	1.3.A.20	INTERIM SURVEY DRAWINGS		X											X
03530	1.3.A.21	FINAL SURVEY DRAWINGS		X											X
03530	1.3.A.22	ACCEPTANCE AERIAL PHOTOGRAPHS			X										X
03530	1.3.A.3	MANUFACTURER'S MATERIAL CERTIFICATIONS AND CATALOG CUTS FOR CONCRETE PIPE							X						X
03530	1.3.A.4	SHOP DRAWINGS FOR CONCRETE PIPE OUTFALL EXTENSIONS		X											X
03530	1.3.A.5	CONCRETE MIX DESIGN					X								X
03530	1.3.A.6	CERTIFICATION REPORTS, SAMPLES, GRADATION CURVES AND ASTM D1557 COMPACTION TEST RESULTS FOR ALL IMPORTED COMMON FILL AND TOPSOIL							X						X
03530	1.3.A.7	SAMPLES, GRADATION CURVES AND ASTM D1557 COMPACTION TEST RESULTS FOR ON-SITE SATISFACTORY MATERIAL						X							X
03530	1.3.A.8	NAME, LOCATION, AND HISTORICAL QUALITY REPORTS FROM PROPOSED STONE SOURCE(S)			X									X	
03530	1.3.A.9	QUALIFICATIONS/CERTIFICATIONS FOR SAMPLING/TESTING AGENCY							X						X
13300	1.3.A.1	WATER TREATMENT PLAN	X												X
13300	1.3.A.2	TREATMENT PLANT OPERATOR							X						X

SECTION 01351
SAFETY, HEALTH, AND EMERGENCY RESPONSE

PART 1 - GENERAL

1.1 SUMMARY

- A. This section provides requirements for implementing practices and procedures for working safely and in compliance with the regulations and guidelines listed below, while performing remedial activities at the site. This section primarily addresses safety, health, and emergency response for potential chemical and physical hazards associated contingency with work performed in both “contaminated” and “clean” areas, that includes but not limited to sheet pile wall installation, dewatering measures implementation, decontamination, excavation and removal of source materials and lead-contaminated and soil/sediment; dewatering and treatment of lead-contaminated construction water; off-site transportation and disposal; revetment construction; and site restoration.
- B. This section describes the responsibilities of the Contractor for safety, health, and emergency response. The work performed under these Specifications shall be actively managed so as to:
 - 1. Prevent injuries to employees or other persons
 - 2. Maintain employee exposures to health hazards well below the occupational limits established by Occupational Safety and Health Administration (OSHA) or American Conference of Governmental Industrial Hygienists (ACGIH)
 - 3. Keep the exposure of area residents to air contaminants well below the levels established for general public exposure by OSHA, the United States Environmental Protection Agency (EPA), or the New Jersey Department of Environmental Protection (NJDEP).
 - 4. Prevent increasing contaminant levels in soil, water, and sediment near the site.
- C. Any disregard for the provisions of these safety and health requirements shall be deemed just and sufficient cause for termination of the contract without compromise or prejudice to the rights of the Contractor.
- D. The Contractor is responsible to protect its work and the Government will not be liable for costs associated with storm damage or loss of work due to inadequate protection by the Contractor.

1.2 REFERENCES

- A. References
 - 1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of the standards below, the revision in effect at the time of contract award shall apply. If conflicts exist between these standards, regulations, or requirements, the most stringent of the documents shall apply.
 - a. American Conference of Governmental Industrial Hygienists (ACGIH)
 - 1) ACGIH Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices
 - 2) ACGIH Guide to Occupational Exposure Values
 - b. American National Standards Institute (ANSI)

- 1) ANSI Z87.1 Occupational and Educational Personal Eye and Face Protection Devices ANSI Z88.2 Practices for Respiratory Protection
- 2) ANSI Z89.1 Industrial Head Protection
- 3) ANSI Z358.1 Emergency Eyewash and Shower Equipment ANSI Z590.3 Prevention through Design
- c. American Petroleum Institute (API)
 - 1) API RP 2003 Protection Against Ignition Arising Out of Static, Lightning, and Stray Currents
- d. American Society for Testing and Materials (ASTM)
 - 1) ASTM F2412 Standard Test Methods for Foot Protection
 - 2) ASTM F2413 Standard Specification for Performance Requirements for Foot Protection
- e. Code of Federal Regulations (CFR)
 - 1) 10 CFR 19 Notices, Instructions and Reports to Workers: Inspection and Investigations 29 CFR 1904 Recording and Reporting Occupational Injuries and Illnesses
 - 2) 29 CFR 1910 Occupational Safety and Health Standards
 - 3) 29 CFR 1926 Safety and Health Regulations for Construction
 - 4) CFR 302 Designation, Reportable Quantities, and Notification
 - 5) CFR Part 50-204 Safety and Health Standards for Federal Supply Contracts 49 CFR 171 General Information, Regulations, and Definitions
 - 6) 49 CFR 172 Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans
- f. Federal Acquisition Regulation
 - 1) 52.236.13 Accident Prevention
- g. National Institute for Occupational Safety and Health (NIOSH)
 - 1) NIOSH Pub Occupational Safety and Health Guidance Manual for Hazardous Waste Site No. 85-115 Activities
 - 2) NIOSH Manual of Analytical Methods, 5th. Edition, Volumes 1 and 2
 - 3) NIOSH Pocket Guide to Chemical Hazards, Pub No. 2010-168
- h. Occupational Safety and Health Administration (OSHA)
 - 1) OSHA Industrial Hygiene Field Technical Manual
 - 2) TED 01-00-015 OSHA Technical Manual
- i. U.S. Environmental Protection Agency (EPA)
 - 1) EPA Standard Operating Safety Guides
 - 2) EPA Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)
 - 3) EPA Air Quality Guidelines – National Ambient Air Quality Standards (NAAQS) Order 1440.2 Health and Safety Requirements for Employees Engaged in Field Activities
- j. New Jersey Administrative Code (N.J.A.C.)
 - 1) N.J.A.C. 16:25A Soil Erosion and Sediment Control Standards
 - 2) N.J.A.C. 7:26E Technical Requirements for Site Remediation
 - 3) N.J.A.C. 7:29 Noise Control
 - 4) N.J.A.C. 7:13 Flood Hazard Area Control Act Rules
 - 5) N.J.A.C. 7:26G Hazardous Waste
 - 6) N.J.A.C. 7:26 Solid Waste
- k. U.S. Army Corps of Engineers Publications (USACE)
 - 1) EM 385-1-1 Safety and Health Requirements; Critical Lift Plan

B. Definitions

1. Source Materials

- a. In general, principal threat waste (PTW) are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health, or the environment should exposure occur. Principal threat wastes at the site include:
 - 1) Slag and battery casings/associated wastes, including particles of slag and battery casings/associated wastes identified in the soil and sediment media.
 - 2) Highly impacted soil in the Seawall Sector in portions of Areas 1 and 2, and in the upland portion of the Margaret's Creek Sector.
 - 3) Highly impacted sediment located in Areas 1 and 2 in the Seawall Sector.

2. Debris

- a. Demolition debris in the form of concrete and a variety of bricks, including fire bricks that is considered debris and is to be segregated based on visual observation.

3. Riprap

- a. The on-site riprap, consisting of newer rock material along the Old Bridge Waterfront Park (referred to as post-Sandy riprap), is located within the Extent of Riprap but outside the Footprint of Seawall. The post-Sandy riprap can be visually identified as gray to dark gray large rocks, with a size approximately ranging from 18 to 36 inches in diameter, and it is not mixed with any other waste or stone.
- b. On-site weathered riprap, consisting of older rock material, is found within the Footprint of Seawall. The weathered riprap can be visually identified as brown to dark gray rocks with sizes approximately 12 to 24 inches in diameter and is mixed with debris, slag, and lead pots.
- c. Both types of ripraps will be segregated, decontaminated, and reused on-site.

4. Armored Stone

- a. The existing jetty armoring capstone placed above ground around the First Jetty located in Area 5.

5. Severe Storm

- a. In general, a severe or large storm event is Category 1 or higher hurricane, tropical storm, or a nor'easter, resulting in more than 1.0 inches of rainfall in 1-hour period and 3.0 inches of rainfall in 24-hour period.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with a "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall provide each of the following documents to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES. The Contractor shall maintain a copy of all documents described in this section on-site at all times during construction.

1. Site Safety and Health Plan; Pre-Construction Submittals; EA

- a. The Contractor shall submit the SSHP in accordance with Paragraphs 1.7 and 1.9 to the EPA's Representative at least 28 calendar days prior to the first Pre-Work conference. The SSHP must be approved by the EPA's Representative prior to commencement of any field activities. The Contractor shall allow 30 calendar days for the approval process.

2. Severe Storm Plan; Pre-Construction Submittals; EA

- a. The Contractor shall submit the Severe Storm Plan in accordance with Paragraph 1.8 to the EPA's Representative at least 28 calendar days prior to the

- first Pre-Work conference. The Severe Storm Plan must be approved by the EPA's Representative prior to commencement of site mobilization. The Contractor shall allow 30 calendar days for the review process.
3. Work Zone and Decontamination Facility Drawings; Shop Drawings; EA
 - a. The Contractor shall submit the drawings showing the Exclusion Zone, Contamination Reduction Zone and Support Zone boundaries and decontamination facility areas for the EPA's Representative's approval prior to commencement of field activities.
 4. Weekly Safety and Accident Reports; Product Data; FIO
 - a. The Contractor shall submit the following documents to the EPA's Representative during the course of the project site work:
 - 1) Weekly Safety Report (within one week)
 - 2) Accident Notification (with 24 hours) and Report (within 6 days) The accident report shall address the following items:
 - a) Name, organization, telephone number, and location of the Contractor
 - b) Name and title of the person(s) reporting.
 - c) Date and time of the accident/incident.
 - d) Location of the accident/incident, i.e., site location, facility name.
 - e) Brief summary of the accident/incident giving pertinent details including type of operation ongoing at the time of the accident/incident including type of construction equipment used, PPE used, etc.
 - f) Cause of the accident/incident, if known.
 - g) Names of personnel injured.
 - h) Casualties (fatalities, disabling injuries).
 - i) Details of any existing chemical hazard or contamination.
 - j) Estimated property damage, if applicable.
 - k) Nature of damage, effect on contract schedule.
 - l) Action taken by Contractor to ensure safety and security.
 - m) Other damage or injuries sustained publicly or privately.
 5. Exposure and Air Monitoring Data; Product Data; FIO
 - a. The Contractor shall submit the Air Monitoring Data required by this section.
 6. Personnel Health and Safety Certificates; Certificates; FIO
 - a. The Contractor shall submit the following information to the EPA's Representative for approval at or prior to the Pre-Work Conference:
 - 1) Initial medical certifications and annual exam certificates for all field personnel
 - 2) Training certificates for all field personnel who have completed the safety and health course required by OSHA 29 CFR 1910.120
 - 3) Respirator fit-test certificates for all field personnel
 - 4) Construction Safety
 7. Safety and Health Manager Statements; Certificates; FIO
 - a. The Contractor shall submit the following information to the EPA's Representative prior to mobilizing on-site:
 - 1) An affidavit signed by the SHM indicating the Contractor's commitment to follow the SSHP
 - 2) A statement indicating that personnel who will enter the work zone understand that they are working on a hazardous waste site/operations and are trained and qualified in compliance with 29 CFR 1910.120(e)

8. Certificate of Worker/Visitor Acknowledgement; Certificates; FIO
 - a. The Contractor shall submit a Certificate of Worker/Visitor Acknowledgement for each worker or visitor on-site in accordance with the requirements of this section.
9. Project Safety and Health Phase-Out Report; Closeout Submittals; FIO
 - a. The Project Safety and Health Summary Report shall be signed by the project SHM and submitted to the EPA's Representative within 30 days of completing project site work. The report shall conform to the requirements of Paragraph 1.21.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Construction Safety Conference
 1. Contractor representatives who have a responsibility or significant role in accident prevention on the project shall be required to attend a Pre-Construction Safety Conference where information including, but not limited to, work procedures, safety considerations associated with those work procedures, heavy equipment to be used, training and experience to operate equipment, and safety interventions such as training, and safety equipment will be provided.

1.5 REGULATORY REQUIREMENT

- A. Work performed under this Contract shall comply with all applicable Federal, State, and local safety and occupational health laws and regulations. This includes, but is not limited to:

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION STANDARDS

29 CFR 1910	Section 38	"Emergency Action Plans"
	Section 95	"Occupational Noise Exposure"
	Section 120	"Hazardous Waste Operations and Emergency Response"
	Subpart I	"Personal Protection Equipment"
	Section 146	"Permit Required Confined Spaces"
	Section 147	"The Control of Hazardous Energy (Lockout/Tagout)"
29 CFR 1926	Subpart Z	"Toxic and Hazardous Substances"
	Section 21	"Safety Training and Education"
	Section 59	"Hazard Communication"
	Section 62	"Lead"
	Section 65	"Hazardous Waste Operations and Emergency Response"
	Subpart F	"Fire Protection and Prevention"
	Subpart M	"Fall Protection"
10 CFR 19	Subpart P	"Excavations"
	Section 11	"Notices, Instructions, and Reports to Workers: Inspections and Investigations"

- B. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting work. Where the requirements of this Specification, applicable laws, criteria, ordinances, regulations and referenced documents vary, the most stringent requirements shall apply.

1.6 SAFETY AND HEALTH PROGRAM

- A. OSHA Standards 29 CFR 1910, Section 120 (b) and 29 CFR 1926, Section 65 (b) require employers to develop and implement a written Safety and Health Program for employees involved in hazardous waste operations. The site-specific program requirements of the OSHA Standards shall be integrated into one site-specific document, the SSHP. The SSHP shall interface with the employer's overall Safety and Health Program. Any portions of the overall Safety and Health Program that are referenced in the SSHP shall be included as appendices to the SSHP.

1.7 SITE SAFETY AND HEALTH PLAN

- A. The Contractor shall develop and implement a Site Safety and Health Plan that shall address all occupational safety and health hazards (traditional construction as well as contaminant-related hazards) associated with the removal action conducted at the site. The SSHP is a dynamic document, subject to change as project operations/execution change. The SSHP will require modification to address changing and previously unidentified health and safety conditions. It is the Contractor's responsibility to ensure that the SSHP is updated accordingly. The Contractor shall submit amendments to the SSHP to the EPA's Representative as the SSHP is updated. The Contractor shall resubmit the SSHP to the EPA's Representative annually for review. The SSHP must contain all updates.
- B. The SSHP shall address in detail the significant aspects as listed below:
- a. Site description and history
 - b. Site map with hospital route
 - c. Types of concentrations of site contamination
 - d. Hazards of concern
 - e. Waste characteristics
 - f. Hazardous material summary
 - g. Monitoring equipment
 - h. Scope of construction work
 - i. Work zones (Exclusion Zone, contamination reduction zone, support zone)
 - j. Heat/cold stress monitoring
 - k. Exposure monitoring and sampling program
 - l. Accident prevention
 - m. Activity hazard analysis for each major phase of work, including potential drowning hazards
 - n. Organizational structure indicating personnel responsibilities
 - o. Hearing conservation program
 - p. Critical lift plan, if applicable
 - q. Spill and discharge control procedures
 - r. Material handling and disposal
 - s. Engineering safeguards
 - t. Dust and odor control plan
 - u. Personal protective equipment (PPE) requirements and maintenance procedures
 - v. Standard operating procedures and work guidelines
 - w. Site control measures
 - x. Personal hygiene
 - y. Equipment and personnel decontamination procedures
 - z. Emergency response and contingency procedures including sufficient entrance and egress areas for worker safety, where applicable
 - aa. Emergency contacts

- bb. Logs, reports, and recordkeeping
 - cc. Medical surveillance requirements indicated in Paragraph 1.14
 - dd. Training requirements
- C. The SSHP shall include a site description and contamination characterization section that addresses the following elements:
- 1. Description of site location, topography, size, and past uses of the site.
 - 2. A list of contaminants that may present occupational safety and health hazards. This list shall be created by evaluating the analytical results in this section and by researching sources of information from past site investigation activities. Chemical names, concentration ranges, affected media, locations on-site and estimated quantities/volumes to be impacted by site work shall be included if known. The contamination characterization shall be reviewed and revised if new chemicals are identified as work progresses.
- D. In addition to describing how exposure levels will be maintained below maximum permissible concentrations (OSHA, ACGIH, etc.) the SSHP shall also address the health and safety hazards associated with each site task and operation to be performed during the remedial action. The following outlines anticipated tasks/operations:
- a. Mobilization
 - b. Topographic and bathymetric surveying
 - c. Clearing and grubbing
 - d. Site preparation
 - e. Access road and temporary facilities installation
 - f. Traffic control measures installation
 - g. Soil erosion and sediment control measures installation
 - h. Sheet pile wall installation
 - i. Dewatering measures installation
 - j. Temporary water treatment and discharge system installation and operation
 - k. Removal of riprap and source materials and stockpiling
 - l. Decontamination of riprap and armored stone
 - m. Excavation of source materials and soil/sediment and stockpiling
 - n. Post-excavation confirmatory sampling and analysis
 - o. Surveying
 - p. Waste characterization sampling and analysis
 - q. Off-site treatment and disposal
 - r. Backfilling and grading
 - s. Wetland area construction
 - t. Revetment construction
 - u. Site restoration
 - v. Sheet pile wall removal
 - w. Wetland area planting
 - x. Decontamination of personnel, tools, and equipment
 - y. Demobilization
- E. Preparation and Implementation
- 1. A SSHP shall be prepared covering on-site work to be performed by the Contractor and all subcontractors. The SHM shall be responsible for the development, implementation, and oversight of the SSHP. The SSHP shall establish, in detail, the protocols necessary for the anticipation, recognition, evaluation, and control of hazards associated with each task performed.

F. Acceptance and Modifications

1. Prior to submittal, the SSHP shall be signed and dated by the SHM, and the Site Superintendent. The EPA's Representative will review the SSHP and return it to the Contractor with comments. Deficiencies in the SSHP will be discussed at the Pre-Construction Safety Conference. The Contractor shall make all necessary amendments required by the EPA's Representative and resubmit it for approval. This procedure shall continue until the EPA's Representative gives final written approval. At that time, the Contractor shall indicate its commitment to following the SSHP by an affidavit, signed by the company SHM. The Contractor shall not mobilize on-site prior to receiving written approval of the SSHP.
2. On-site work shall not begin until the plan has been approved and accepted by the EPA's Representative. A copy of the written SSHP shall be maintained on-site and shall be made available in accordance with 29 CFR 1910, Section 120 (b) (1) (v) and 29 CFR 1926, Section 65 (b) (1) (v).1.8.4. As work proceeds, the SSHP shall be adapted to new situations and new health and safety conditions. It is the responsibility of the Contractor to ensure that the SSHP is updated accordingly. Changes and modifications to the accepted SSHP shall be made with the knowledge and concurrence of the SHM, the Site Superintendent, and the EPA's Representative. The requested modification may not be implemented until authorized in writing by the EPA's Representative. Should any unforeseen hazard become evident during the performance of the work, the Site Safety and Health Officer (SSHO) shall bring such hazard to the attention of the SHM, the Site Superintendent, and the EPA's Representative, both verbally and in writing, for resolution as soon as possible. In the interim, necessary action shall be taken to re-establish and maintain safe working conditions in order to safeguard on-site personnel, visitors, the public, and the environment. Disregard for the provisions of this Specification or the accepted SSHP shall be cause for stopping of work until the matter has been rectified.

G. Availability

1. The Contractor shall make available the SSHP in accordance with 29 CFR 1910.120, (b)(1)(v) and 29 CFR 1926.65, (b)(1)(v).

1.8 SEVERE STORM PLAN

- A. Severe Storm Plan shall be submitted in conjunction with the SSHP and include stormwater control during hurricane, tropical storm, or nor'easter conditions. The Severe Storm Plan shall focus on preserving any exposed work areas or stockpiles that are vulnerable to re-contamination or spreading to un-contaminated areas. The plan shall also include mitigating exposure to impacted material for workers and the public in the event storm surge or wave action impacts the site during the remedial action. At minimum the Severe Storm Plan shall include but not limited to:
1. Evaluation of the site to identify potential risks and vulnerabilities related to storm events. This includes assessing factors such as site topography, drainage systems, proximity to water bodies, and soil conditions.
 2. Effective stormwater management practices to prevent or minimize erosion, sedimentation, and flooding on the site. This involves installing appropriate drainage systems, erosion control measures, and sediment barriers.
 3. Establishment of a clear communication protocol for emergency situations, including storms. Ensure that all workers are aware of the communication channels, emergency contact information, and procedures to follow in case of severe weather events.

4. Development of safety procedures and provide adequate training to workers on how to respond to storms. This includes instructions on seeking shelter, evacuation routes, use of personal protective equipment (PPE), and procedures for equipment shutdown and securing the site.
5. Identification of safe locations for storing construction equipment, materials, and hazardous substances outside of the Flood Hazard Area limits during storms and securing or relocating items that may pose a risk during high winds or flooding.
6. Assessment of the need for emergency power and backup systems to ensure the continued operation of critical equipment and essential services during storm-related power outages.
7. Development of evacuation and sheltering plans specific to the construction site. Identification of safe areas or nearby facilities where workers can seek shelter in the event of severe storms. Ensure that evacuation routes are clearly marked and easily accessible.
8. Establishment of procedures for assessing and addressing any damage or hazards that may occur as a result of storm events. Procedures for conducting inspections, repair or replacement of damaged infrastructure, and restoration of normal site operations as quickly as possible.

1.9 ACCIDENT PREVENTION PLAN

- A. An Accident Prevention Plan shall be part of the SSHP. The Contractor and its subcontractor(s) shall follow the approved Accident Prevention Plan throughout construction. The Accident Prevention Plan shall include a phased safety plan for each of the major tasks performed under these Specifications. The phased safety plans shall address the safety and health procedures, protective equipment, personnel, and training requirements that are special to each task. These major tasks are described in Paragraph 1.7.D. In the Accident Prevention Plan, particular attention shall be paid to excavations, medical and first aid sanitation, PPE, fire prevention, electrical safety, public safety, and chemical, physical, and biological occupational exposure prevention. The Accident Prevention Plan shall address, at a minimum, the following items:

1. Safety Meetings
2. Fire Prevention and Protection
3. Site Housekeeping
4. Mechanical Equipment Inspection
5. Sanitation
6. Daily Safety Inspections
7. Accident Reporting
8. Safety Equipment
9. Medical Support
10. Personal Protective Equipment
11. Accident Prevention Signs and Signals
12. Mandatory Site-specific Training
13. Emergency Response Training
14. Attendance

1.10 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

- A. The Raritan Bay Slag Superfund Site is approximately 1.5 miles in length and located in a recreation area on the shore of Raritan Bay, in the eastern part of Old Bridge Township within the Laurence Harbor section in Middlesex County, New Jersey. A small portion of the western end of the site, the western jetty at the Cheesequake Creek

Inlet, is in the Borough of Sayreville. The Raritan Bay Slag Superfund Site is bordered to the north by Raritan Bay and to the east, west, and south by residential properties.

- B. The Raritan Bay Slag Superfund Site has been divided into eleven areas. These areas have been grouped into three sectors based on the type of environment and proximity to source areas. These sectors include:
 - 1. Seawall Sector (Areas 1, 2, 3, 4, 5, and 6)
 - 2. Jetty Sector (Areas 7, 8, and 11)
 - 3. Margaret's Creek Sector (Area 9)
- C. Area 10 was used for the collection of background samples during the Remedial Investigation, and it is not included within the areas subject to remediation.
- D. The Seawall Sector consists of the following areas:
 - 1. Area 1: Laurence Harbor Seawall – The seawall along Old Bridge Waterfront Park west of Margaret's Creek to the beach area at the foot of Laurence Parkway.
 - 2. Area 2: Laurence Harbor Beach – The beach area at the foot of Laurence Parkway between the western end of the seawall and the First Jetty.
 - 3. Area 3: Laurence Harbor Playground – The Park playground adjacent to the western end of the seawall. No remedial target areas were identified in Area 3; therefore, no remedial action is required in this area.
 - 4. Area 4: Old Bridge Waterfront Park – The Park area along the seawall (not including the playground) from the fence to the roadway.
 - 5. Area 5: Laurence Harbor Beach – The beach area between the first and third jetty.
 - 6. Area 6: Laurence Harbor Beach – The beach area between the third jetty and Cheesequake Creek Inlet eastern jetty. No remedial target areas were identified in Area 6; therefore, no remedial action is required in this area.
- E. In addition to the Seawall Sector, the Contract Documents includes an upland portion, bordering Old Bridge Waterfront Park, of Area 9, the Margaret's Creek Sector.
- F. The remediation of the Raritan Bay Slag Superfund Site is being conducted in phases, with the Contract Documents addressing the Seawall Sector (Areas 1, 2, 4, and 5) and an upland portion of Margaret's Creek Sector (Area 9) that had not been remediated previously, herein collectively referred to as "the site."
- G. An extent of the seawall located in Area 1 along Old Bridge Waterfront Park has been expanded/alterd after the Superstorm Sandy as part of the response action. The terms, "Footprint of Seawall" and "Extent of Riprap" refers to the following definitions in the Contract Documents:
 - 1. Footprint of Seawall – The extent of pre-Sandy seawall was estimated based on the 2010 topographic map converted from the aerial photographs. It is assumed that the extent of large pieces of slag pieces (approximately greater than 8 to 10 inches), debris and battery casings are limited to this area within the footprint of seawall. The footprint of seawall also consists of weathered riprap mixed clearly identified visually as brown to dark gray rock material comingled with the slag pieces.
 - 2. Extent of Riprap – The extent of riprap was estimated based on the 2018 topographic survey conducted during the 2018 Pre-Design Investigation. The extent of the riprap includes the Footprint of Seawall plus the area where large riprap was placed after the Superstorm Sandy, which are clearly identified visually as gray to medium gray large riprap in size approximately greater than 18 to 24 inches.
- H. The primary sources of site-related metals contamination are slag and battery casings. The seawall is up to 80 percent slag. Battery casings were found in the upper two inches

of depositional zones in Areas 2 and 5. Buried slag was observed in test excavations on the upland side of the seawall in Area 1 and the eastern end of Area 4. In general, slag depths ranged from 1 to 5 feet below ground surface.

1. Lead is the primary contaminant of concern for soil and sediment at the Raritan Bay Slag Superfund Site.
 2. The lead soil and sediment results, groundwater and surface water results, and results of leachability testing conducted on soil, slag and battery casing material during previous investigations are included in the Design Analysis Report. The maximum soil lead concentration detected at the site was 61,000 milligrams per kilogram (mg/kg). Concentrations of lead in both composite and core slag samples were identified at levels ranging from 38,000 mg/kg to 91,000 mg/kg.
 3. In Area 1, along the seawall, lead concentrations (up to 61,000 mg/kg) that exceeded the remediation cleanup level occur along the mean high tide line. Most of the contamination in this area is in the shallow soils and sediment.
 4. In Area 2, in the soils and near-shore sediments, lead concentrations (up to 23,800 mg/kg) exceeded the remediation cleanup level. Soils at depths up to 9 feet in this area exceeded remediation cleanup level.
 5. In Area 5, near the First Jetty, lead concentrations (up to 1,090 mg/kg) in soil and sediment exceeded the remediation cleanup level.
 6. Only lead was detected at concentrations greater than the hazardous waste toxicity TCLP criteria of 5 milligrams per liter (mg/l). Lead TCLP values ranged from 15.1 to 1050 mg/l, with the maximum concentration detected at 1-2 feet bgs within the Footprint of Seawall.
 7. In surface water, lead was commonly detected above the site-specific screening criterion in surface water samples collected from the intertidal zone, between the eastern end of Area 1 and the western end of Area 6. The highest concentrations of dissolved lead [up to 1,780 micrograms per liter (µg/l)] exceeded the site-specific screening criterion of 5 µg/l which was detected in Area 2. Both dissolved and total lead concentrations generally exceeded the site-specific screening criterion in samples adjacent to the seawall. Arsenic was detected above its site-specific screening criterion less frequently than lead. The highest concentrations of dissolved arsenic (up to 36.2 µg/l) exceeded the site-specific screening criterion of 0.061 µg/l.
- I. Additional project site conditions are detailed in SECTION 01010 – SUMMARY OF WORK.

1.11 ACTIVITY HAZARD ANALYSIS

- A. Prior to beginning each major phase of work, an Activity Hazard Analysis shall be prepared by the Contractor performing that work and submitted for review and acceptance. A major phase of work is defined as an operation involving a type of work presenting hazards not experienced in previous operations or where a new subcontractor or work crew is to perform. The analysis shall define the activities to be performed and identify the sequence of work, the specific hazards anticipated, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level. Work shall not proceed on that phase until the activity hazard analysis has been accepted and a preparatory meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activities, including the government on-site representatives. The activity hazard analyses shall be continuously reviewed and, when appropriate, modified to address changing site conditions or operations, with the concurrence of the SHM, the Site Superintendent, and the EPA's Representative. Activity Hazard Analyses shall be attached to and become a part of the SSHP. The

Activity Hazard Analyses shall comply with 29 CFR 1910, Subpart I, “Personal Protective Equipment” and shall, as described in ANSI Z590.3, Prevention through Design, provide the information necessary for determining safety and health procedures, equipment, and training to protect on-site personnel, the environment, and the public. The following elements, at a minimum, shall be addressed.

- B. The Contractor shall provide all equipment, materials, and personnel necessary to protect on-site personnel and members of the public from injury or exposure to physical, chemical, or biological hazards. The Contractor shall operate a program of protective equipment maintenance in accordance with the manufacturer’s Specifications. All equipment shall be NIOSH-approved, if applicable. The EPA’s Representative will reject the use of equipment if, in the EPA’s Representative’s opinion, it provides less protection than that specified in the SSHP.
- C. Site Tasks and Operations (Work Plan)
 - 1. Based on the type of remediation required, anticipated major site tasks and operations to be performed, as described in Paragraph 1.7.D, and the initial levels of protection required appear in Table 01351-1.

Table 01351-1 Task/Specific Levels of Protection

Task	Level Of Protection In Exclusion Zone
Mobilization	D
Topographic, Bathymetric and Excavation Surveying	D Modified
Site Preparation/Clearing and Grubbing	Initial: D Modified Contingency: D
Decontamination Area Construction	Initial: D Modified Contingency: D
Installation of Sheet Pile Wall ¹	D Modified
Installation of Temporary Water Treatment System	D Modified
Operation and Maintenance of Temporary Water Treatment System	D Modified
Dewatering ¹	D Modified
Removal of Source Materials ^{1,2}	Initial: D Modified Contingency: C
Decontamination of Riprap and Armor Stone	Initial: D Modified Contingency: D
Excavation ^{1,2}	Initial: D Modified Contingency: C
Soil/Sediment Disposal ²	Initial: D Modified Contingency: C
Chemical Sampling ²	Initial: D Modified Contingency: C
Backfilling, Grading and Site Restoration	D Modified

Decontamination of Personnel, Tools, and Equipment	D Modified
Demobilization	D Modified

¹Any activities that take place on or near the water require the worker to wear a United States Coast Guard (USCG) approved Personal Floatation Device.

²Any workers performing intrusive activities or activities likely to lead to airborne lead shall be required to wear respirators until lead exposure monitoring results indicate that respiratory protection can be modified.

D. Hazards

1. The following potential hazards may be encountered during site work. This is not a complete list; therefore, the list shall be expanded and/or revised as necessary during preparation of the SSHP.
 - a. Physical Hazards - Hazards including heavy equipment operation, contaminant handling, process equipment operations, slips, trips, and falls, etc.
 - b. Chemical Hazards – Hazards involving chemical, physical, and toxicological properties of contaminants sources and pathways of employee exposures, anticipated on-site and off-site exposure levels, and regulatory (including federal, state, and local) or recommended protective exposure standards.
 - c. Physical Agents - Hazards associated with noise and heat/cold stress.
 - d. Biological Hazards - Hazards associated with poisonous plants, insects, and animals shall also be evaluated in the SSHP.
 - e. Action Levels - Action levels shall be established for the active work areas in accordance with current EPA air quality guidelines (NAAQS). Minimum acceptable action levels for active work areas appear in Table 01351-2.

Table 01351-2 Minimum Acceptable Action Levels

Contaminant	Level	Action To Be Taken*
<u>ACTIVE WORK AREA</u>		
Dust in air (total, above background)	Not to exceed 0.5 mg/m ³	Evaluate dust suppression, work practices, and take action to control dust
Airborne lead	Not to exceed 30 µg/m ³ averaged over an 8-hour period	Evacuate area
Noise (Active Work Area)	90 dBA	Implement engineering or administrative control
Combustible gas in air	>10% LEL	Evacuate area
Oxygen in air	<19.5%	Evacuate area
	>22%	Evacuate area
<u>SITE PERIMETER</u>		
Refer to SECTION 01362 – PERIMETER AIR MONITORING for perimeter air monitoring and sampling requirements, action level and required actions.		

Notes:

* Changes in these initial action levels may be required in the course of this project but will only occur with the written approval of the EPA's Representative.

Abbreviations:

mg/m³ – milligrams per cubic meter

µg/m³ – micrograms per cubic meter

dBA – decibels (A-weighted)

LEL – lower explosive limit

1.12 STAFF ORGANIZATION, QUALIFICATION AND RESPONSIBILITIES

- A. An organizational structure shall be developed that sets forth lines of authority, responsibilities, and communication procedures concerning site safety, health, and emergency response. The SSHP shall include a description of this organizational structure as well as qualifications and responsibilities of each of the following individuals. The structure shall include the means for coordinating and controlling work activities of subcontractors and suppliers. The Contractor shall obtain the EPA's Representative's acceptance before replacing any member of the Safety and Health Staff.
- B. The safety and health organization shall be separately identified from the project's operations organizations in order to maintain the appropriate degree of independence from day-to-day activities. The project manager shall be responsible for safety and health on the project including providing the proper and adequate personnel, materials, and resources to implement the safety and health program.
 - 1. Site Superintendent
 - a. A Site Superintendent, who has responsibility to implement the SSHP and the authority to direct work performed under this contract and verify compliance shall be designated.
 - 2. Safety and Health Manager (SHM)
 - a. Qualifications
 - 1) The services of a Certified Industrial Hygienist (CIH) certified by the American Board of Industrial Hygiene shall be used. The name, qualifications (education summary and documentation), and work experience summary shall be included in the SSHP. The SHM shall have the following additional qualifications:
 - a) A minimum of three years' experience in developing and implementing safety and health programs at hazardous waste sites
 - b) Documented experience in supervising professional and technician-level personnel
 - c) Documented experience in developing worker exposure assessment programs and air monitoring programs and techniques
 - d) Documented experience in the development of PPE programs and conducting PPE hazard evaluations for the types of activities and hazards likely to be encountered on this project.
 - e) Working knowledge of state and federal occupational safety and health regulations
 - f) Documented experience in working near and around water.
 - b. Responsibilities
 - 1) The SHM shall:
 - a) Be responsible for the development, implementation, oversight, and enforcement of the SSHP
 - b) Sign and date the SSHP prior to submittal
 - c) Conduct initial site-specific training

- d) Be present on-site during the first three days of remedial activities and at the startup of each new major phase of work
 - e) Visit the site as needed and at least once per month during construction activities, to audit the effectiveness of the SSHP. Any safety and health deficiencies shall be noted in writing with action items identified and assigned so as to resolve deficiencies.
 - f) Be available at all times for emergencies
 - g) Provide consultation as needed to ensure the SSHP is fully implemented
 - h) Coordinate any modifications to the SSHP with the Site Superintendent, the SSHO, and the EPA's Representative
 - i) Provide continued support for upgrading/downgrading the level of personal protection
 - j) Be responsible for evaluating air monitoring data and recommending changes to engineering controls, work practices, and PPE
 - k) Review accident reports and results of daily inspections
 - l) Serve as a member of the Contractor's quality control staff
3. Site Safety and Health Officer (SSHO)
- a. Qualifications
 - 1) An individual and one alternate shall be designated the SSHO. The name, qualifications (education and training summary and documentation), and work experience of the SSHO and alternate shall be included in the SSHP. The SSHO shall have the following qualifications:
 - a) A minimum of two years' experience in implementing safety and health programs at hazardous waste sites where Level C PPE was required
 - b) Documented experience in construction techniques and construction safety procedures
 - c) Working knowledge of federal and state occupational safety and health regulations
 - d) Specific training in personal and respiratory protective equipment program implementation, confined space program oversight, and in the proper use of air monitoring instruments, and air sampling methods
 - e) Certified as having completed training in First Aid and CPR by a recognized organization such as the American Red Cross
 - b. Responsibilities
 - 1) The SSHO shall:
 - a) Assist and represent the SHM in on-site training and the day-to-day on-site implementation and enforcement of the accepted SSHP. The SSHO shall report directly to the SHM.
 - b) Have authority to ensure site compliance with specified safety and health requirements, Federal, State and OSHA regulations and all aspects of the SSHP including, but not limited to activity hazard analyses, air monitoring, use of PPE, decontamination, site control, standard operating procedures used to minimize hazards, safe use of engineering controls, the Emergency Response Plan (ERP), spill containment program, and preparation of records by performing a daily safety and health inspection and documenting results on the Daily Safety Inspection Log in accordance with 29 CFR 1904.

- c) Have authority to stop work if unacceptable health or safety conditions exist and take necessary action to re-establish and maintain safe working conditions.
 - d) Consult with and coordinate any modifications to the SSHP with, the SHM, the Site Superintendent, and the EPA's Representative.
 - e) Serve as a member of the Contractor's quality control staff on matters relating to safety and health.
 - f) Conduct accident investigations and prepare accident reports.
 - g) Review results of daily quality control inspections and document safety and health findings into the Daily Safety Inspection Log and track noted safety and health deficiencies to ensure that they are corrected.
 - h) Conduct emergency response training which shall include the following: procedures, spill plans, firefighting plans, posting of emergency numbers, and medical support.
 - i) In coordination with site management and the SHM, recommend corrective actions for identified deficiencies and oversee the corrective actions.
- 4. Occupational Physician or Licensed Health Care Provider (LHCP)
 - a. Qualifications
 - 1) The services of a licensed physician or LHCP, who is certified in occupational medicine by the American Board of Preventative Medicine, or who, by necessary training and experience is Board- eligible, shall be used. The physician or LHCP shall be familiar with the site hazards and the scope of this project. The medical consultant's name, qualifications, and knowledge of the site's conditions and proposed activities shall be included in the SSHP.
 - b. Responsibilities
 - 1) The physician or LHCP shall be responsible for the determination of medical surveillance protocols and for review of examination/test results performed in compliance with 29 CFR 1910, Section 120 (f) and 29 CFR 1926, Section 65 (f) and Paragraph 1.14.
- 5. Persons Certified in First Aid and CPR
 - a. At least two persons who are currently certified in first aid, CPR, and use of an automated external defibrillator by the American Red Cross or other approved agency shall be on-site at all times during site operations. He/she shall be trained in universal precautions and the use of PPE as described in the Blood borne Pathogens Standard of 29 CFR 1910, Section 1030. The person may perform other duties but shall be immediately available to render first aid when needed.
- 6. Safety and Health Technicians
 - a. For each work crew in the Exclusion Zone (EZ), one person, designated as a Safety and Health technician, shall perform activities such as air monitoring, decontamination, and safety oversight on behalf of the SSHO. They shall have appropriate training equivalent to the SSHO in each specific area for which they have responsibility and shall report to the SSHO.

1.13 TRAINING

- A. All on-site Contractor personnel involved in intrusive work, or work that could expose them to site related contamination shall receive training in accordance with the Contractor's written safety and health training program and 29 CFR 1910, Section 120, 29 CFR 1926, Section 65, and 29 CFR 1926, Section 21. The SSHP shall include a

section describing training requirements. Personnel not involved with intrusive work, such as decontamination area construction shall not require the above training.

1. General Hazardous Waste Operations Training
 - a. Personnel entering the Exclusion Zone or Contamination Reduction Zone (CRZ) shall have successfully completed 40 hours of hazardous waste instruction off the site, three days actual field experience under the direct supervision of a trained, experienced supervisor, and eight hours refresher training annually. On-site supervisors shall have completed the above training and eight hours of additional, management and supervisor training as specified in 29 CFR 1910.120/29 CFR 1926.65 (e) (4). Copies of current training certification statements shall be submitted prior to initial entry onto the work site. The Contractor shall maintain, at the work site, documentation that shows that each on-site employee or subcontractor has completed the safety and health training course appropriate for their job function and responsibility. The training certificates shall be current within 12 months of the start of work and remain up to date during work performance.
2. Site-specific Training
 - a. The Contractor's SHM shall approve a site-specific training session for the Contractor and government personnel scheduled to work on-site. This training may be given by the SSHO. This site-specific training shall consist of an initial safety and health briefing on the following information:
 - 1) Names of personnel and alternate responsible for site safety and health
 - 2) Hazards present on the site
 - 3) Hazard communications training
 - 4) Safe use of engineering controls and equipment on-site
 - 5) Work practice by which the employee can minimize risks from hazards
 - 6) Selection, use, care, and maintenance of PPE
 - 7) Site control procedures, including log-in and log-out
 - 8) Site decontamination procedures
 - 9) Standard operating safety procedures
 - 10) Site emergency response contingency plan
3. Initial Session (Pre-entry Briefing)
 - a. Prior to commencement of on-site field activities, all site employees, including those assigned only to the Support Zone (SZ), shall attend a site-specific safety and health training session to ensure that all personnel are familiar with requirements and responsibilities for maintaining a safe and healthy work environment. Procedures and contents of the accepted SSHP shall be thoroughly discussed. The EPA's Representative shall be notified at least five calendar days prior to the initial site-specific training session so government personnel involved in the project may attend.
4. Periodic Sessions
 - a. Periodic on-site training shall be conducted by the SSHO for personnel assigned to work at the site during the following week. The training shall address safety and health procedures, work practices, any changes in the SSHP, activity hazard analyses, work tasks, schedules, results of previous week's air monitoring, review of safety discrepancies and accidents.
 - a. All on-site personnel (Contractor, subcontractor(s), and government representatives) shall participate in the specified, periodic safety meetings. All affected personnel shall attend the special training. Training attendance and participation shall be documented in a training log. The SHM may delegate the day-to-day implementation of this follow-up training policy to the SSHO.

- b. Training logs shall document personnel in attendance, topics covered and length of training for each type of training.

1.14 MEDICAL SURVEILLANCE

A. The SHM, in conjunction with the Occupational Physician or LHCP, shall detail, in the Contractor's Safety and Health Program and the SSHP, the medical surveillance program that includes scheduling of examinations, certification of fitness for duty, compliance with OSHA requirements, and information provided to the physician or LHCP. The Contractor shall use the service of a licensed physician board-certified or board-eligible in occupational medicine to provide a medical surveillance program as required by OSHA regulations. This would be without cost to the employee, without loss of pay and at a reasonable time and place. Selection of medical tests is the responsibility of the physician or LHCP, who shall certify that such medical surveillance meets the requirements of OSHA Standard 29 CFR 1910.120, and 29 CFR 1926, Section 65. The contents of the exam shall include wearing the PPE specified for the site. The protocol below is an example of requirements common in this industry. Final determination of tests should be made by the physician who performs the physical examination. The content of the medical examination shall be submitted to the EPA's Representative and shall be relevant to the site conditions.

1. Frequency of Examinations

- a. Employees shall have been provided with medical examinations as specified, within the last 12 months and shall receive exams annually thereafter (if contract duration exceeds one year); on termination of employment; reassignment in accordance with 29 CFR 1910, Section 120 (f)(3)(i)(C), and 29 CFR 1926, Section 65 (f)(3)(i)(C); if the employee develops signs or symptoms of illness related to workplace exposures; if the physician or LHCP determines examinations need to be conducted more often than once a year; and when an employee develops a lost time injury or illness during the period of this contract. The supervisor shall be provided with a written statement signed by the physician or LHCP prior to allowing the employee to return to the work site after injury or illness resulting in a lost workday, as defined in 29 CFR 1904.
- b. Medical examinations must be repeated under the following conditions:
 - 1) At the discretion of the Contractor's Occupational Physician or LHCP, the EPA's Representative, the SHM, or the SSO
 - 2) At the request of an employee with demonstrated symptoms of exposure to toxic or hazardous materials
 - 3) Within 30 days of the completion of on-site work activities if the person is to leave the job site for periods greater than six months
- c. Before work begins a copy of the physician's written opinion of fitness for work for each employee and ability to wear required respiratory protection shall be obtained and furnished to the SHM and the employee.

2. Content of Examinations

- a. The physical examination/consultation shall verify the following information about the medical surveillance program participants:
 - 1) Baseline health conditions and exposure history.
 - 2) Allergies, sensitivity, and susceptibility to hazardous substances exposure.
 - 3) Ability to wear PPE inclusive of NIOSH-certified respirators under extreme temperature conditions.
 - 4) Fitness to perform assigned duties.

3. Information Provided to the Occupational Physician
 - b. The Contractor shall provide the Occupational Physician with the following information for each medical surveillance program participant:
 - 1) Information on the employee's anticipated or measured exposure.
 - 2) A description of any PPE used or to be used.
 - 3) A description of the employee's duties as they relate to the employee's exposures (including physical demands on the employee and heat/cold stress).
 - 4) A copy of 29 CFR 1910, Section 120, or 29 CFR 1926, Section 65.
 - 5) Information from previous examinations not readily available to the examining physician.
 - 6) A copy of Section 5 of NIOSH Pub No. 85-115.
 - 7) Information required by 29 CFR 1910, Section 134.
4. Physician's Written Opinion
 - a. Before work begins, a copy of the physician's written opinion for each employee shall be obtained and furnished to the SHM and the employee. The opinion shall address the employee's ability to perform hazardous remediation work and shall contain the following:
 - 1) The physician's verification of the employee's fitness to perform duties as well as recommended limitations upon the employee's assigned work and/or PPE usage.
 - 2) The physician's opinion about increased risk to the employee's health resulting from work.
 - 3) A statement that the employee has been advised about the results of the examination.
5. Employee Certificates
 - a. Employee certificates shall be provided for each worker performing cleanup operations with potential for contaminant-related occupational exposure. Employee certificates shall be signed by the SHM and the Occupational Physician indicating that the workers meet the contract requirements for training and medical surveillance.
6. Medical Records
 - a. Documentation of medical exams shall be provided as part of the Certificate of Worker or Visitor Acknowledgment. Medical records shall be maintained in accordance with 29 CFR 1910, Section 120, and 29 CFR 1926, Section 65. The Contractor shall maintain all medical surveillance records for thirty years post-employment and make these records available to the EPA's Representative or other agencies, as required.

1.15 EXPOSURE MONITORING AND AIR SAMPLING PROGRAM

A. General

1. The SSHP shall include the exposure monitoring/air sampling procedures for occupational exposures. The air monitoring, at minimum, shall include procedures to detect combustible gases, oxygen levels, airborne lead, and dust. The exposure monitoring plan shall be designed to identify and quantify safety and health hazards and airborne levels of hazardous substances in order to ensure proper selection of engineering controls, work practices and PPE for affected site personnel. The plan shall provide enough information to allow the SSHO to recognize conditions that require changes in work practices or level of protection.
2. Initial exposure monitoring shall be conducted to determine if any workers may be exposed to lead at or above the action level. The exposure assessment shall be

performed in accordance with 29 CFR 1926.62(d). During the exposure assessment, the Contractor shall meet requirements of 29 CFR 1926.62(d)(2)(v). Any modifications to respiratory protection shall be made based on the exposure assessment in accordance with 29 CFR 1926.62.

3. During excavation, unloading, and handling of excavated materials, the Contractor shall monitor air contaminant levels at least four times per shift on a daily basis (or at the discretion of the SSHO). The types of measurements to be collected shall be listed in the APP/SSHP with examples of the instruments to be used. After the initial phase of monitoring, if the SHM determines that a reduced level of monitoring is appropriate, the SHM shall decrease the monitoring requirements in consultation with the EPA's Representative. The Contractor shall perform real-time air monitoring for an adequate period prior to commencement of work to establish baseline conditions for lead and respirable particulates.
4. Equipment used for air monitoring in accordance with this section shall be calibrated before and after each use and maintained as per specified methods, manufacturer's recommendations, and good industrial hygiene practices. The Contractor shall document, in the site log or site files, the regular calibration of each instrument used. Only individuals trained to operate this equipment shall do so.
5. The following publications define terms and establish contaminant evaluation and monitoring procedures discussed in this Specification. These publications are incorporated into this Specification by reference:
 - a. Threshold Limit Values and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists (ACGIH) (current edition)
 - b. Manual of Analytical Methods, 4th. Edition, Volumes 1 and 2, National Institute for Occupational Safety and Health (NIOSH)
 - c. OSHA Technical Manual, U. S. Department of Labor, Occupational Safety and Health Administration (OSHA)
 - d. Air Contaminants - Permissible Exposure Levels, 29 CFR 1910.1000

1.16 METEOROLOGICAL MONITORING

- A. The Contractor shall furnish and maintain a portable meteorological station for the continuous observation and recording of wind speed, wind direction, ambient air temperature, atmospheric pressure, atmospheric humidity, solar insulation, and atmospheric precipitation. The equipment and its placement shall be in conformance with EPA Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD). The station shall also include a continuous readout temperature gauge and a rainfall gauge.
- B. The meteorological station shall be positioned by the SSHO to provide representative data on the overall atmospheric diffusion conditions at the site. Visual wind direction indicators shall be established in a central location at each active work area. The meteorological station shall be installed in an area relatively free of trees and houses, at the office trailer or in the Support Zone of the site. The station shall be capable of recording all measured parameters every 5 minutes. The station shall be able to produce a 24-hour average figure for each parameter so that the weather influences on the air samples can be characterized. The station shall also transmit real-time data back to a central location so that the real-time particulate monitoring can be correlated to wind direction.
- C. Meteorological data collected by the station shall be effectively logged on each day of intrusive site work, so that the weather influences on the air samples can be characterized. The Contractor shall maintain records, written or electronic, of the

meteorological monitoring results for the duration of the project. Meteorological monitoring results shall be documented in the Daily Safety Log by the SSHO.

- D. The calibration, audit, data reduction, and document control of meteorological equipment and meteorological data shall be specified by the Contractor. For the purposes of this document, it is assumed that hourly averages of all meteorological parameters during the entire air monitoring program shall be collected, tabulated, and verified. Meteorological data shall be submitted with air monitoring data.
- E. The wind speed sensor to be used shall be a Met One 034E or equivalent and the wind direction sensor to be used is a Met One 034E or equivalent. A windsock or weather vane can also be used to provide a visual indication of wind directions..

1.17 REAL-TIME AIR MONITORING

- A. The Contractor shall furnish and maintain real-time air monitoring equipment and all necessary calibration/audit equipment and supplies to detect and monitor dust, combustible gas, and oxygen levels. All equipment shall be intrinsically safe. Perimeter air monitoring shall be performed in accordance with SECTION 01362 – PERIMETER AIR MONITORING.
- B. The Contractor shall perform real-time air monitoring adjacent to each open excavation, staging and loading areas, and any contaminated liquids handling areas in the Exclusion Zones. This monitoring shall be performed in the breathing zone of the highest-risk employee in the Exclusion Zone.
- C. The Contractor shall provide real-time monitoring for dust using a total airborne dust monitor (MIE-Ram-1 or equivalent), and with data logging capabilities, within 10 feet (downwind) of appropriate areas adjacent to soil excavation, staging and loading operations.
- D. On-site monitoring frequency total/respirable dust shall be every 30 minutes or less during on-site waste handling activities and at intervals consistent with the Contractor's SSHP during all other activities to limit personal exposure.
- E. See Table 01351-2 for minimum acceptable action levels under the Contractor's SSHP and responses to their exceedance. The Contractor is responsible for analyzing specific project circumstances and requirements and developing appropriate action levels and responses. Action levels must be approved by the EPA's Representative.
- F. When working in confined spaces or excavations deeper than four feet, the Contractor shall utilize a combination of combustible gas indicator (CGI) and oxygen monitor to monitor combustible gas and oxygen levels. Should the combustible gas meter and oxygen monitor indicate levels outside the action levels shown on Table 01351-2, personnel should be evacuated from the space immediately.
- G. A data sheet shall be developed and implemented by the SHM upon which the following real-time monitoring data will be recorded:
 - 1. Date and time of monitoring.
 - 2. Air monitoring location.
 - 3. Instrument, model number, serial number.
 - 4. Calibration/background levels.
 - 5. Results of monitoring.
 - 6. Safety and Health Specialist/Industrial Hygienist Technician signature.
 - 7. Interpretation of the data and any further recommendations by the SHM or the SSHO in consultation with the SHM.

- H. The person conducting the monitoring must sign and date the data sheets as they are filled in. The SSHO, as appropriate, shall review then sign and date the data sheets weekly. These results shall be given verbally to the EPA's Representative following each site scan for which concentrations exceed the action levels. This shall be documented in writing by the end of each workday with three copies provided to the EPA's Representative.
- I. The person obtaining the sample or conducting the monitoring must sign and date the data sheets as they are filled in. The SSHO, as appropriate, shall sign and date the data sheets weekly after their review. All measured air concentrations of particulates and exposure durations shall be recorded. Records of these exposures shall be placed in the employee's permanent medical files.
- J. Monitoring and exposure results shall be given verbally to the EPA's Representative following each site scan that indicates concentrations in excess of the action levels, and documented in writing by the end of each workday with three copies provided

1.18 HEAT AND COLD STRESS MONITORING

- A. The SHM shall develop a heat stress and cold stress-monitoring program for on-site activities. Details of the monitoring program, including schedules for work and rest, and physiological monitoring requirements, shall be described in the SSHP. Personnel shall be trained to recognize the symptoms of heat and cold stress. The SSHO and an alternate person shall be designated, in writing, to be responsible for the heat and cold stress-monitoring program. Heat and cold stress monitoring program shall be in accordance with NIOSH/ACGIH recommended procedures.

1.19 CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGMENT

- A. A copy of a Contractor-generated certificate of worker/visitor acknowledgment shall be completed and submitted for each visitor allowed to enter CRZ or EZ, and for each employee, following the example certificate at the end of this section.

1.20 INSPECTIONS

- A. The SSHO shall perform daily inspections of the job site and the work in progress to ensure compliance with the Safety and Health Program, the SSHP and other occupational health and safety requirements of the contract and to determine the effectiveness of the SSHP. Procedures for correcting deficiencies (including actions, timetable, and responsibilities) shall be described in the SSHP. Follow-up inspections to ensure correction of deficiencies shall be conducted and documented. Daily Safety Inspection Logs shall be used to document the inspections, noting safety and health deficiencies, deficiencies in the effectiveness of the SSHP, and corrective actions taken. The SSHO's Daily Safety Inspection Logs shall be attached to and submitted with the Daily Quality Control reports. Each entry shall include the date, work area checked, employees present in work area, PPE and work equipment being used in each area, special safety and health issues and notes, and signature of preparer. In the event of an accident, the EPA's Representative shall be notified. Within six working days of any reportable accident, an Accident Report shall be completed and submitted to the EPA's Representative. An Accident Report form shall be included in the SSHP.

1.21 SAFETY AND HEALTH PHASE-OUT REPORT

- A. A Safety and Health Phase-Out Report shall be submitted in conjunction with the project closeout report, prior to final acceptance of the work. The following minimum information shall be included:

1. Summary of the overall performance of safety and health (accidents or incidents including near misses, unusual events, lessons learned, etc.)
2. Final decontamination documentation including procedures and techniques used to decontaminate equipment, vehicles, and on-site facilities
3. Summary of exposure monitoring and air sampling accomplished during the project
4. Signatures of SHM and SSHO
5. Copies of hazardous waste manifest forms indicating proper disposal of hazardous wastes was accomplished
6. Initial and final physical/medical certifications
7. Daily Safety Inspection Reports
8. Weekly Safety Reports
9. Training Logs
10. Accident Reports

PART 2 - PRODUCTS

2.1 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

- A. The Contractor shall maintain, as a minimum, the following items on-site and available for immediate use:
 1. First aid equipment and supplies approved by the consulting physician.
 2. Emergency eyewashes and showers that comply with ANSI/ISEA Z358.1.
 3. Provide fire extinguishers of sufficient size and type at site facilities and in all vehicles and at any other site locations where flammable or combustible materials present a fire risk.
 4. United States Coast Guard (USCG) approved Personal Flotation Devices and rescue equipment for workers as well as spare floatation devices for visitors.

2.2 PERSONAL PROTECTIVE EQUIPMENT

- A. The Contractor's PPE Program shall comply with 29 CFR Part 1910.132, 29 CFR Part 1910.120, and 29 CFR Part 1910.136. On-site personnel exposed to contaminants shall be provided with appropriate personnel protective equipment. Components of levels of protection (C, D, and modifications) must be relevant to site-specific conditions, including heat and cold stress potential and safety hazards. Only respirators approved by NIOSH shall be used. Protective equipment and clothing shall be kept clean and well maintained. The PPE section of the SSHP shall include site-specific procedures to determine PPE program effectiveness and for on-site fit-testing of respirators, cleaning, maintenance, inspection, and storage of PPE.
- B. Operations under this contract may require work exposure to potentially hazardous materials. The Contractor shall, therefore, provide and ensure the wearing of all necessary PPE for all personnel on-site. All personnel entering the Work Zones shall don, at a minimum, level D PPE. The SHM shall establish and evaluate, as the work progresses, the levels of protection for each work activity. The SHM shall also establish action levels for upgrade or downgrade in levels of PPE. Protocols and the communication network for changing the level of protection shall be described in the SSHP. The PPE evaluation protocol shall address air monitoring results, potential for exposure, changes in site conditions, work phases, job tasks, weather, temperature extremes, individual medical considerations, etc.
- C. Based on available information, the initial minimum protection for each major task and operation appears in Table 01351-1. Available site information shall be reviewed, and

the list of tasks and operations and these levels of protection shall be expanded and/or revised during preparation of the SSHP.

- D. The following items constitute minimum protective clothing and equipment ensembles to be utilized during this project:
1. Level D: Work clothing, as dictated by the weather
 - a. Safety (steel toe/shank) shoes or boots
 - b. Safety glasses, goggles, or face shield
 - c. Disposable, hooded, one-piece, full-body coveralls constructed of spun-bonded olefin or polypropylene fabrics (e.g., Tyvek or equivalent)
 - d. Hard hat
 - e. Items from the Level D modified list, as required for tasks.
 2. Modified Level D:
 - a. Hard hat
 - b. Safety glasses, goggles, or face shield
 - c. Nitrile, neoprene, or natural rubber gloves (when handling contaminated soils or water)
 - d. Gloves with cotton liners
 - e. Hearing protection (where required)
 - f. Disposable boot covers of (minimum) 60 mil rubberized PVC
 - g. United States Coast Guard (USCG) approved Personal Flotation Device for activities that occur over or near water
 3. Level C:
 - a. Full-face piece, air purifying respirator equipped with filter cartridges approved by NIOSH for particulates and lead
 - b. Disposable, hooded, one-piece, full-body coveralls constructed of spun-bonded olefin or polypropylene fabrics (e.g., Tyvek or equivalent)
 - c. Nitrile, neoprene, or natural rubber gloves (when handling contaminated soils or water)
 - d. Gloves with cotton liners
 - e. Safety (steel toe/shank) shoes or boots (Boot cover: optional)
 - f. A USCG approved Personal Flotation Device
- E. Respiratory Protection
1. The Contractor's SHM shall establish in writing and implement a respiratory protection program in accordance with 29 CFR 1910.134, ANSI Z88.2. The Contractor shall provide each individual with respirators until lead exposure monitoring results indicate that respiratory protection can be modified. The Contractor's SHM shall make all determinations regarding respiratory protection modifications that will be implemented for the work. All modifications shall be in accordance with the OSHA Lead in Construction Standard (29 CFR 1926.62).
- F. PPE for Government Personnel
1. Five clean sets of PPE and clothing (excluding air-purifying negative-pressure respirators and safety shoes, which will be provided by individual visitors), as required for entry into the EZ and/or CRZ, shall be available at all times for use by the EPA's Representative or official visitors. The items shall be cleaned and maintained by the Contractor and stored and clearly marked: "FOR USE BY GOVERNMENT ONLY." The Contractor shall provide basic training in the use and limitations of the PPE provided, and institute administrative controls to check prerequisites prior to issuance. Such prerequisites include meeting minimum training requirements for the work tasks to be performed and medical clearance for site hazards and respirator use. Visitors shall be responsible for adhering to the

requirements of their Safety and Health Plan as well as the Contractor's Safety and Health Plan.

PART 3 - EXECUTION

3.1 SAFETY PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES

- A. The SSHP shall describe the standard operating safety procedures, engineering controls and safe work practices to be implemented. These shall include, but not be limited to, the following:
1. General site rules/prohibitions for personal hygiene
 2. Lock out/tag out procedures in accordance with 29 CFR 1910.147
 3. Work permit requirements including documenting utility clearances on a Field Safety Checklist. An example of this checklist is at the end of this section
 4. Material handling procedures to be followed in the handling, storage, and disposal of solids and/or liquids
 5. Spill and discharge control procedures including a description of prevention measures, such as building berms or dikes, spill control measures and material to be used (e.g., booms, vermiculite), location of the spill control material, PPE required to cleanup spills, disposal of contaminated material, and who is responsible to report the spill
 6. Drum and container handling procedures and precautions for the handling, storage, and disposal of encountered drums and containers
 7. Confined Space Entry procedures in compliance with 29 CFR 1910.146, "Permit Required Confined Spaces", if required
 8. Hearing conservation measures
 9. Illumination measures
 10. Sanitation measures including toilet and potable water facilities
 11. Fire Prevention
 12. Excavation and trenching as described in Paragraph 3.2 – Excavation

3.2 EXCAVATION

- A. The Contractor shall identify all buried utility lines within the work zones and take action to protect them before digging near them in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.
- B. Prior to mobilization, the Contractor shall coordinate work around existing utilities with the utility owners, which include but not limited to the Old Bridge Municipal Utilities Authority for the 20-inch force main and the Old Bridge Township for storm sewer system.
- C. The Contractor must coordinate with the OBMUA for all excavation work within 20 ft of the force main.
- D. The Contractor shall erect a visible barrier or fence at the edge of any open excavation. Members of the general public shall be kept away from the excavation. Neither heavy equipment nor excavated material may be placed within two feet of an open excavation. All mobile equipment shall be provided with working back-up alarms, brakes, and shut-off switches. Operators shall not leave their equipment while it is running.
- E. For trench excavation over 4 feet in depth, the Contractor shall comply with OSHA Confined Space Standards. The SSHA shall be required to approve the confined space entry procedures in compliance with 29 CFR 1910.146, "Permit-Required Confined Spaces," with the assistance of the SHM.

- F. Excavations shall comply with 29 CFR 1926 Subpart P and its appendices. The Contractor shall ensure proper sloping, shoring, benching and other applicable standards defined in Subpart P. The Contractor shall employ a Registered Professional Engineer to inspect and approve shoring or sloping prior to placing an individual into a trench or other excavation requiring compliance with this standard.
- G. The form at the end of this section entitled “Excavation Safety Signoff Sheet” shall be completed by the Contractor, City, and utility representatives listed before excavation commences.

3.3 SITE CONTROL MEASURES

- A. To prevent the spread of contamination and control the flow of personnel, vehicles, and materials into and out of work areas, site control measures shall be established and described in the SSHP. The SSHP shall describe site control measures similar to those described in the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (NIOSH Pub No. 85-115). The SSHP shall describe the methodology to be used by the SHM and SSHO in determining work zone designations and their modifications, and procedures to limit the spread of contamination. The SSHP shall include procedures for the implementation and enforcement of safety and health rules for all persons on the site, including employers, employees, outside contractors, the EPA’s Representative, and visitors.
- B. Work Zones
 - 1. Initial anticipated work zone boundaries (Exclusion Zone, including restricted and regulated areas, Contaminant Reduction Zone, and Support Zone) and access points shall be established, and the boundary delineations shall be included in the SSHP. Delineation of work zone boundaries shall be based on the contamination characterization data and the hazard/risk analysis to be performed as described in Paragraph 1.10 – Activity Hazard Analysis. As work progresses and field conditions are monitored, work zone boundaries may be modified with approval of the EPA’s Representative. Work zones shall be clearly identified and marked in the field (using fences, tape, signs, etc.). A site map, showing work zone boundaries and locations of decontamination facilities, shall be posted in the on-site office. Work zones shall consist of the following:
 - a. Exclusion Zone (EZ): The EZ is the area where hazardous contamination is either known or expected to occur and the greatest potential for exposure exists. Entry into this area shall be controlled and exit may only be made through the Contaminant Reduction Zone.
 - b. Contamination Reduction Zone (CRZ): The CRZ is the transition area between the EZ and the Support Zone. The personnel and equipment decontamination areas shall be separate and unique area located in the CRZ.
 - c. Support Zone (SZ): The SZ is defined as areas of the site, other than EZ and CRZ, where workers do not have the potential to be exposed to hazardous substances or dangerous conditions resulting from hazardous waste operations. The SZ shall be secured against active or passive contamination. Site offices, parking areas and other support facilities shall be located in the SZ.
 - 2. Site Control Log
 - a. A log of personnel visiting, entering, or working on the site shall be maintained. The log shall include the following: date, name, agency or company, time entering and exiting site, time entering and exiting the EZ (if applicable), and PPE used. Before visitors are allowed to enter the CRZ or EZ, they shall show proof of current training, medical surveillance, and respirator fit testing (if

respirators are required for the tasks to be performed) and shall fill out the Certificate of Worker or Visitor Acknowledgment, an example of which is included at the end of this section. This visitor information, including date, shall be recorded in the log.

3. Communications

- a. The SSHP shall identify the method by which Contractor personnel shall communicate in the event of an emergency. Communications with the office trailer, if it is outside vocal range, shall be by radio. Two-way radio communication shall be required during construction activity.
- b. Communications between Contractor and other organizations (e.g., the EPA's Representative, or the emergency response provider) shall be over the telephone. The EPA's Representative shall direct safety and health correspondence to the SHM through the Contractor's Project Manager. At a minimum, the following emergency telephone numbers must appear in the SSHP:
 - 1) Medical treatment facility and physician, including names and address
 - 2) Ambulance services
 - 3) Fire department
 - 4) Police department
 - 5) EPA Region 2
 - 6) EPA and NJDEP spill control
 - 7) EPA's Representative
 - 8) National Response Center
 - 9) Site security

4. Signs

- a. The Contractor shall provide, install, and maintain signs and other warning devices to inform site personnel and members of the public of hazards present on the site in accordance with SECTION 01580 – SIGNS.
- b. The Contractor shall post the following warning signs in English in each work area where the lead action level is exceeded, and shall incorporate universal symbology:

DANGER
LEAD
MAY DAMAGE FERTILITY OR THE UNBORN CHILD
CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM
DO NOT EAT, DRINK, OR SMOKE IN THIS AREA

3.4 PERSONAL HYGIENE AND DECONTAMINATION

- A. Personnel entering the EZ or CRZ or otherwise exposed or subject to exposure to hazardous chemical vapors, liquids, or contaminated solids shall adhere to the following personal hygiene and decontamination provisions. Decontamination shall be performed in the CRZ prior to entering the SZ from the EZ. Chapter 10.0 of NIOSH Pub No. 85-115 shall be consulted when preparing decontamination procedures. A detailed discussion of personal hygiene and decontamination facilities and procedures to be followed by site workers shall be submitted as part of the SSHP. Employees shall be trained in the procedures, and the procedures shall be enforced throughout site operations.

- B. A personnel decontamination facility shall be provided within the CRZ. This facility shall be used by both Contractor personnel and the EPA's Representative. The following facilities shall be made available to all on-site personnel:
1. Contained storage and legal disposal of used disposable outerwear.
 2. Hand and face washing facilities.
 3. A facility for changing into and out of and storing work clothing separate from street clothing.
 4. A lunch and/or break room.
 5. A smoking area.
- C. Disposable PPE used in the work zone shall not be reused, and, when removed, shall be discarded into properly labeled PPE impermeable receptacles located in the CRZ.
- D. Non-disposable PPE shall be washed with a low-sudsing detergent, rinsed with warm water, and then wiped dry with a disposable cloth. The Contractor shall evaluate the use of a qualified service to launder PPE. The decontamination wash water shall be collected, treated on-site, and discharged to surface water. Decontaminated PPE shall be stored in a secure area of the SZ. All PPE worn on-site shall be decontaminated or properly stored or disposed of at the end of the workday. The Site Superintendent shall be responsible for ensuring all PPE is decontaminated before being reissued, and the SSHO shall verify that this task is performed. The following guidelines are minimum requirements for the Contractor's personnel decontamination procedures:

Level C Decontamination

Section 1:	Equipment Drop	Deposit equipment (tools, sampling devices and containers, monitoring instruments, radios, clipboard, etc.) on plastic drop cloths. During hot weather, set up a cool down station within this area.
Section 2:	Outer Garment, Boots, and Gloves Wash and Rinse	Scrub outer boots, outer gloves, and splash suit with either decon solution or detergent water as appropriate. Rinse off using copious amounts of water.
Section 3:	Outer Boot and Glove Removal	Remove outer boots and gloves. Deposit in container with plastic liners.
Section 4:	Canister or Mask Change	If worker leaves EZ to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers donned, joints taped, and worker returns to duty.
Section 5:	Boot and Outer Garment Removal	Remove and deposit in separate containers lined with plastic.
Section 6:	Face piece Removal	Remove face piece. Avoid touching face with fingers. Deposit face piece on plastic sheets.
Section 7:	Gloves	Remove and deposit inner gloves in the container lined with plastic.
Section 8:	Field Wash	Thoroughly wash hands and face.

Modified Level D/Level D Decontamination

Section 1:	Equipment Drop	Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboard, etc.) on plastic drop cloths. During hot weather operations, cool down station may be set up within this area.
Section 2:	Boots, and Gloves Wash and Rinse	Scrub outer boots and gloves with either decon solution or detergent water as appropriate. Rinse off using copious amounts of water.
Section 3:	Outer Boot and Glove Removal	Remove outer boots and gloves. Deposit in container with plastic liner.
Section 4:	Boot, Gloves, and Outer Garment Removal	Remove and deposit boots, chemical-resistant splash suit, and inner gloves in separate containers lined with plastic.
Section 5:	Field Wash	Thoroughly wash hands and face.

- E. Smoking and chewing of tobacco or chewing gum shall be prohibited except in the designated smoking area, provided by the Contractor, in the SZ. Eating and drinking shall be prohibited except in the designated lunch or break area, provided by the Contractor, in the SZ. All outerwear shall be removed prior to entering the lunch area or smoking area, and prior to washing hands. Contractor personnel shall be required to thoroughly cleanse their hands and other exposed areas before entering the smoking or lunch area.

3.5 VEHICLE/EQUIPMENT DECONTAMINATION

- A. Vehicles and equipment used in the EZ shall be decontaminated in the CRZ prior to leaving the site. The procedures for decontamination of vehicles and equipment shall be addressed in the SSHP.
- B. A decontamination station shall be constructed within the CRZ for decontaminating vehicles and equipment leaving the EZ. As a minimum, this facility shall include a high-pressure wash area for equipment and vehicles and a steam cleaning system for use after the mud and/or site material has been cleaned from the equipment. At the decontamination pad, all visible contamination shall be removed with scrub brushes and high-pressure water sprays. The station shall be constructed to capture decontamination water, including overspray, and shall allow for collection and removal of the decontamination water using sumps, dikes and ditches as required. Decontamination water from these washing procedures shall be collected, stored, and discharged in accordance with SECTION 02140 – DEWATERING AND DRAINAGE and SECTION 13300 – WATER TREATMENT SYSTEM.
- C. Procedures for equipment decontamination shall be developed and used to prevent the spread of contamination into the SZ and off-site areas. These procedures shall address disposal of contaminated products and spent materials used on the site, including containers, fluids, oils, etc. Vehicles, equipment, and materials shall be decontaminated and inspected prior to leaving the site. Construction material shall be handled in such a way as to minimize the potential for contaminants being spread and/or carried off-site.

Prior to exiting the site, vehicles and equipment shall be monitored to ensure the adequacy of decontamination. Personnel engaged in vehicle decontamination shall wear protective equipment including protective clothing and respiratory protection consistent with the requirements of this Specification and the SSHP.

- D. A special "clean area" shall be established for performing equipment maintenance. This area shall be used when personnel are required by normal practices to expose themselves to contact with soil or sediment, (i.e., crawling under a vehicle to change engine oil). All equipment shall be decontaminated by wash down in the CRZ prior to maintenance work. Maintenance such as greasing heavy equipment need not require decontamination unless the job requires body contact with soil or sediment.
- E. Seats of equipment and vehicles used in the EZ shall not be cloth-covered. They shall be free from cracks or holes that would allow dust to enter seat padding or shall be covered with a temporary sheet vinyl covering.

3.6 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

- A. The SSHP shall describe the emergency and first aid equipment to be available on-site. The following items, as a minimum, shall be maintained on-site and available for immediate use:
 - 1. Advanced First Aid, including AED, equipment and supplies approved by the consulting physician
 - 2. Emergency eyewashes and showers which comply with ANSI Z358.1
 - 3. Emergency-use respirators. For rescue purposes, two positive pressure self-contained breathing apparatus (SCBA) shall be supplied. These shall be dedicated for emergency use only and maintained on-site in the CRZ.
 - 4. Fire extinguishers with a minimum rating of 20-A:120-B:C shall be provided at site facilities and in all vehicles and at any other site locations where flammable or combustible materials present a fire risk.
 - 5. Spill control materials and equipment that are sufficient to meet the requirements described in Paragraph 1.23– Spill and Discharge Control.
 - 6. Water emergency and personal protective equipment.

3.7 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

- A. An Emergency Response Plan (ERP) that meets the requirements of 29 CFR 1910, Section 120 (l), and 29 CFR 1926, Section 65 (l), shall be developed and implemented as a section of the SSHP. This plan must present procedures the Contractor shall follow in the case of an injury or in case the Contractor observes an emergency unrelated to the field work. In the event of any emergency associated with the remedial action, the Contractor shall, without delay, alert all on-site employees that there is an emergency situation, take action to remove or otherwise minimize the cause of the emergency, alert the EPA's Representative, and institute measures necessary to prevent repetition of the conditions or actions leading to, or resulting in, the emergency. The plan shall be rehearsed regularly as part of the overall training program for site operations. The plan shall be reviewed periodically and revised as necessary to reflect new or changing site conditions or information. Copies of the accepted SSHP and any revision shall be provided to the affected local emergency response agencies. The following elements, at a minimum, shall be addressed in the plan:

Pre-Emergency Planning: The local emergency response agencies shall be contacted and met with during the preparation of the ERP, and the Contractor shall be required to conduct a site visit for the appropriate response agencies. Involvement of local fire,

police, and rescue authorities is necessary to ensure better coordination and proper implementation of the plan. In all cases the site-specific Emergency Response Plan must be consistent with the community contingency plan regardless of whether local responders are used during remedial action. The form at the end of this section entitled “Agreement for Emergency Response Services” shall be used by the Contractor to develop an individual agreement between the Contractor, a local emergency responder, and EPA. The visit should provide the agencies with information on-site layout, nature and scope of work, schedule, hazardous potentials of materials associated with site activities, on-site personnel locations, locations of utility lines, entrance and egress routes, emergency communications, decontamination procedures, response times, evacuation routes, the SSHP, response constraints, and ERP components.

1. Acceptance letter of an Emergency Care Facility issued by SHM.
 2. Personnel roles, lines of authority, communications for emergencies and training.
 3. Emergency recognition and prevention.
 4. Site topography, layout, and prevailing weather conditions.
 5. Criteria and procedures for site evacuation (emergency alerting procedures, employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, site security and control).
 6. Specific procedures for decontamination and medical treatment of injured personnel.
 7. Route maps to nearest pre-notified medical facility. site support vehicles shall be equipped with maps. The Contractor shall visit the hospital designated in the SSHP to determine whether they can handle the types of injury that might occur at the site. At the beginning of project operations, drivers of the support vehicles shall become familiar with the emergency route and the travel time required.
 8. Emergency alerting and response procedures including posted instructions and a list of names and telephone numbers of emergency contacts (physician, nearby medical facility, fire and police departments, ambulance service, federal, state, and local environmental agencies as well as SHM, the Site Superintendent, the EPA’s Representative and/or their alternates).
 9. Criteria for initiating community alert program, contacts, and responsibilities.
 10. Procedures for reporting incidents to appropriate government agencies. In the event that an incident such as an explosion or fire, or a spill or release of toxic materials occurs during the course of the project, the appropriate government agencies shall be immediately notified. In addition, the EPA’s Representative shall be verbally notified immediately and receive a written notification within 24 hours.
 11. Procedures for critique of emergency responses and follow-up.
 12. Site security and control for incidents.
 13. Procedures to monitor and respond to severe weather, flooding, and blizzards.
 14. Procedures for dealing with fires, explosives, and spills.
 15. Procedures for decontaminating emergency response vehicles and equipment.
- B. Contingency Planning Procedures and Contractor personnel responsibilities for potential emergencies shall be identified in the SSHP. Emphasis in the contingency planning section shall be placed on procedures. Contingency planning shall include situations that will involve mobilization of the surrounding community. A meeting with the local emergency preparedness agency shall be scheduled by the Contractor to discuss the contingency measures that shall be followed in the event of a major emergency that may affect off-site areas. The EPA’s Representative, the Contractor and the SHM will all be required to attend. It shall be the responsibility of the Contractor to prepare an agenda and chair this meeting. This agenda shall be sent to all participating

parties prior to the scheduled meeting. At this meeting, the Contractor shall present suggested guidelines and requirements for protecting local residents in the event of major fires and explosions and the off-site migration of releases from the site. Contingency procedures shall be confirmed by consensus agreement of the attending parties. Elements of the discussion shall include:

1. Names, responsibilities, and authority of personnel assigned to implement emergency actions and the contingency plan
2. Procedures for detecting and quantifying airborne contamination that may migrate off-site in addition to air monitoring as required
3. Site security in the event of an emergency
4. Recordkeeping and reporting requirements
5. Criteria for initiating the community contingency plan
6. Emergency response procedures contained in the SSHP

C. The conclusions reached during the meeting discussion shall be formally documented.

3.8 SPILL AND DISCHARGE CONTROL

- A. The SSHP shall describe Spill and Discharge Control procedures. These procedures shall address dewatering sediment, operational fluid, hazardous wastes, and material handling equipment, including a description of prevention measures, such as building berms or dikes, spill control measures and material to be used (e.g., booms, vermiculite), location of the spill control material, PPE required to cleanup spills, disposal of contaminated material, and who is responsible to report the spill.
- B. Storage of contaminated material or hazardous materials shall be appropriately bermed, diked and/or contained to prevent any spillage of material on uncontaminated soil. The Contractor shall respond to any spill of hazardous substances (as designated in 40 CFR 302), or pollutant or contaminant that is in custody or care of the Contractor, pursuant to this contract. Response shall be implemented within one hour, or as soon as practicable, following any accident or release of debris, as directed by the EPA's Representative. Any direction from the EPA's Representative concerning a spill or release shall not be considered a change under the contract. The Contractor shall comply with all applicable requirements of Federal, State, or local laws or regulations regarding any spill incident.
- C. If the spill or discharge is reportable, and/or human health or the environment is threatened, the National Response Center, the State, and the EPA's Representative shall be notified as soon as possible. Notification of the accident shall include location of the accident, resultant damage or injury, person involved, probable cause, amount of waste spilled, and any other pertinent information concerning the accident.

3.9 DUST AND ODOR CONTROL

- A. Dust and odor control shall be used throughout the work at the site and off-site. A proposed Dust and Odor Control Plan shall appear in the SSHP. The Dust and Odor Control Plan shall identify materials, equipment, and methods to be used to control dust and odor during project operations. The SSHP shall ensure that dust suppression practices are effective and being used. At a minimum, the following provisions shall be incorporated into the Dust and Odor Control Plan:
- B. The Contractor shall be responsible for controlling dust and odor from the site on weekends and non-working hours in addition to working hours.
- C. The Contractor shall implement dust control measures during all activities that may potentially generate airborne dust including, but not limited to, excavation, truck

loading and transport. Visible, airborne dust shall be minimized at all times. The Contractor shall cease all dust generating activities when the wind speed, as measured by the on-site meteorological station, exceeds 15 mph for a sustained period of 15 minutes. Potential dust generating activities may resume based on the determination of the SSHO.

- D. The Contractor shall use water as a dust-suppressing agent to prevent the creation and dispersion of dust. The Contractor shall avoid methods that generate slippery conditions or sticky mud.
- E. Trucks in which the rubble and contaminated debris are carried shall be covered and sealed to control dust releases with a double, positive locking mechanism on the tailgates.
- F. The Contractor shall implement dust suppression practices on haul roads as necessary to minimize dusty conditions.
- G. The SSHO shall ensure that dust suppression practices are effective and are being utilized. The Contractor shall conduct periodic and frequent visual surveillance at the active work site along transportation routes at least once a day. No visible dust emission shall be present.
- H. If necessary, the Contractor must utilize odor control management techniques like spray-on foam blankets or equivalent methods. Before using the spray-on foam blanket for odor control management, the Contractor shall provide safety data sheets for review. The spray-on foam blanket or equivalent method must be approved by the EPA's Representative prior to its utilization on the site.

3.10 SEDIMENT CONTROL

- A. The Soil Erosion and Sediment Control Plan will identify materials, equipment, and methods to be used to control sediment during project operations, in accordance with the Soil Erosion and Sediment Control Plan certified by the Freehold Soil Conservation District and as detailed in SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT.

3.11 DEWATERING

- A. The Contractor shall not perform any excavation work within 5 feet of the sheet pile wall.

3.12 IGNITION SOURCES

- A. Refer to Paragraph 1.31, Fire Protection and Prevention and NFPA 241. A list of ignition sources shall be made, and procedures documented to prevent fire as part of the pre-emergency planning. All sources of ignition shall be prohibited within 50 feet of operations with a potential fire hazard. Such areas shall be conspicuously and legibly posted: "NO SMOKING, MATCHES, OR OPEN FLAME." Sufficient clearance and shielding shall be provided around heat sources to avoid ignition of combustible materials.

3.13 FIRE PROTECTION AND PREVENTION

- A. Every member of the site team shall be responsible to observe and report fires and conditions that could lead to fires. The Contractor shall observe fire prevention and protection requirements including:
 - 1. The Contractor shall not use fires or open flame devices.
 - 2. The Contractor shall prohibit smoking within the Exclusion Zone.

3. The Contractor shall place at least four fire extinguishers, rated at least 2-A:40-B:C, within the Exclusion Zone. Another fire extinguisher shall be placed in the Support Zone.
4. The Contractor shall inspect and tag all fire extinguishers on a monthly basis per the requirements of NFPA 10.
5. Contractor personnel will fight fires on-site that cannot be controlled through the use of extinguishers only if the Contractor has designated and trained a fire brigade, as described in OSHA Standard 29 CFR 1910.156 and 29 CFR 1926 Subpart F. Otherwise, Contractor personnel shall quickly evacuate the site and notify the appropriate authorities.

3.14 ELECTRICAL SAFETY

- A. Electrical installations and appliances used by the Contractor shall meet applicable 2014 National Electrical Code Specifications. All electrical devices utilized by the Contractor or subcontractors on this project shall be grounded and utilize ground fault circuit interrupter (GFCI) protected outlets.

3.15 GUARDING OF MACHINERY AND EQUIPMENT

- A. The Contractor shall secure their equipment on-site at the end of each workday. The site shall have 24-hour security during non-work hours in accordance with SECTION 01540 – SECURITY.

3.16 LOCKOUT/TAGOUT

- A. This shall be performed by competent employees only. Before an employee performs any servicing or maintenance on a system where the unexpected energizing, start up, or release of kinetic or stored energy could occur and cause injury or damage, the system shall be locked out/tagged out in accordance with 29 CFR 1910 Section 147. Hazardous energy control procedures shall be implemented for the protection of personnel and resources.

3.17 FALL PROTECTION

- A. The Contractor shall provide fall protection measures in accordance with 29 CFR 1926 Subpart M.

3.18 ILLUMINATION

- A. Illumination levels in the working zone shall be maintained at a minimum of 10 footcandles. If necessary, supplementary lighting shall be provided by the Contractor.

3.19 SANITATION

- A. The Contractor shall provide the following items to maintain a sanitary work environment:
 1. Portable toilet facilities.
 2. A source of potable water for employee consumption.
 3. A source of water and a location at which employees may wash up.
 4. Clean locations for food storage and consumption if food is consumed at the work site.

3.20 HEARING CONSERVATION

- A. The Contractor shall measure and document the noise exposure of on-site personnel, at a minimum. If necessary, the Contractor shall make hearing protection available to all personnel involved with equipment operation.

END OF SECTION

EXAMPLE CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGMENT

PROJECT NAME: Raritan Bay Slag Superfund Site – Seawall Sector

CONTRACT NO:

PROJECT ADDRESS:

CONTRACTOR'S NAME:

EMPLOYEE'S NAME:

The contract for the above project requires the following: that you be provided with and complete formal and Site-specific training, that you be supplied with proper personal protective equipment including respirators, that you be trained in its use, and that you receive a medical examination to evaluate your physical capacity to perform your assigned work tasks, under the environmental conditions expected, while wearing the required personal protective equipment. These things are to be done at no cost to you. By signing this certification, you are acknowledging that your employer has met these obligations to you.

I HAVE READ, UNDERSTAND AND AGREE TO FOLLOW THE SITE SAFETY AND HEALTH PLAN FOR THIS SITE.

Name: _____

Date: _____

FORMAL TRAINING: I have completed the following formal training courses that meet OSHA's requirements:

Date Completed

40 hour: _____

8 hour supervisory: _____

8 hour refresher: _____

SITE-SPECIFIC TRAINING: I have been provided and have completed the site-specific training required by this contract. The Site Safety and Health Officer conducted the training.

RESPIRATORY PROTECTION: I have been trained in accordance with the criteria in the Contractor's Respiratory Protection program. I have been trained in the proper work procedures and use and limitations of the respirator(s) I will wear. I have been trained in and will abide by the facial hair policy.

RESPIRATOR FIT-TEST TRAINING: I have been trained in the proper selection, fit, use, care, cleaning, and maintenance, and storage of the respirator(s) that I will wear. I have been fit-tested in accordance with the criteria in the Contractor's Respiratory Program and have received a satisfactory fit. I have been assigned my individual respirator. I have been taught how to properly perform positive and negative pressure fit-check upon donning negative pressure respirators each time.

MEDICAL EXAMINATION: I have had a medical examination within the last twelve months, which was paid for by my employer. The examination included health history, pulmonary function tests, and may have included an evaluation of a chest x-ray. A physician made determination regarding my physical capacity to perform work tasks on the project while wearing protective equipment including a respirator. I was personally provided a copy and informed of the results of that examination. My employer's industrial hygienist evaluated the

medical certification provided by the physician and checked the appropriate blank below. The physician determined that there:

_____ were no limitations to performing the required work tasks.

_____ were identified physical limitations to performing the required work tasks.

Date medical exam completed: _____

EXAMPLE CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGMENT (CONT'D)

Employee's Signature:

Date:

Printed Name: _

Social Security Number:

Contractor's Site Safety and Health Officer Signature: _

Date:

Printed Name: _

Social Security Number: _

EXAMPLE FIELD SAFETY CHECKLIST

Work Location: Raritan Bay Slag Superfund Site – Seawall Sector

1. Reviewed work plans with project engineer. _____
(initial/date)

2. Requested maps of aboveground and underground utilities.
(initial/date)

3. Reviewed utility maps:
(initial/date)

(Water supply, firewater, sewer, process sewer, electric, gas, telephone, other underground utilities)

4. Met with utilities representative to review utility locations and asked each representative the following questions:
(initial/date)

- a. Any underground utilities at work Site location?
- b. Any ongoing construction that would affect field activities?
- c. Any chemical releases associated with utilities?
- d. Any other hazards associated with utilities?
- e. Any special requirements?

Name of utilities and their representatives:

Utility Company	Representative
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

5. Determined if any permits are required:
(initial/date)

Type(s):

6. Obtained necessary permits:
(yes or no)

Permit Expiration date(s):

EXAMPLE FIELD SAFETY CHECKLIST (CONT'D)

7. Requested SDS for any known or expected on-site chemical:
(initial/date)

8. Client's established protocol, if any:

9. Obtained final approval for commencement of work:

Comments:

EXAMPLE EXCAVATION SAFETY SIGNOFF SHEET

(TO BE COMPLETED BEFORE EXCAVATION COMMENCES)

Field location of monitoring well/boring/excavation at the Raritan Bay Slag Superfund Site – Seawall’s Creek Sector has been evaluated for clearance of underground utilities (i.e., electrical, sewers, firewater, and other piping) as well as 10-foot clearance from overhead power lines. Additionally, clearance has been received from client, property owner, and other affected parties.

In addition, the Contractor Site Safety Supervisor and the drilling/excavation foreman have familiarized themselves with the site's safety and special considerations:

	Printed Name	Signature
Project Engineer		
Excavation Foreman		
Drilling Contractor		
City Engineer		
Gas & Water		
Electric		
Telephone		
TV Cable		
Old Bridge Municipal Utility Authority		
Old Bridge Township		

Note: Excavation will commence after all affected parties have signed off.

SECTION 01352
COMMUNITY HEALTH AND SAFETY PLAN

PART 1 - GENERAL

1.1 SUMMARY

- A. This section provides requirements for implementing practices and procedures for community health and safety and in compliance with the regulations and guidelines listed below, while performing remedial activities at the site. This section primarily addresses community health and safety for potential chemical and physical hazards associated with work performed at the site, which includes but is not limited to sheet pile wall installation, dewatering measures implementation, decontamination, excavation and removal of source materials and lead-contaminated and soil/sediment, dewatering and treatment of lead-contaminated construction water; off-site transportation and disposal, revetment construction, and site restoration.
- B. This section describes the responsibilities of the Contractor for community health and safety to support EPA's Community Involvement Plan. The work performed under these Specifications shall be actively managed so as to:
 - 1. Keep the exposure of area residents to air contaminants well below the levels established for general public exposure by OSHA, the United States Environmental Protection Agency (EPA), or the New Jersey Department of Environmental Protection (NJDEP).
 - 2. Prevent increasing off-site noise, odor, and dust
 - 3. Provide traffic control
 - 4. Provide off-site soil erosion and sediment control
 - 5. Provide perimeter air monitoring
- C. Any disregard for the provisions of the community safety and health requirements shall be deemed just and sufficient cause for termination of the contract without compromise or prejudice to the rights of the Contractor.

1.2 REFERENCES

- A. References
 - 1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of the standards below, the revision in effect at the time of contract award shall apply. If conflicts exist between these standards, regulations, or requirements, the most stringent of the documents shall apply.
 - a. Occupational Safety and Health Administration (OSHA)
 - 1) OSHA Industrial Hygiene Field Technical Manual
 - 2) TED 01-00-015 OSHA Technical Manual
 - b. U.S. Environmental Protection Agency (EPA)
 - 1) EPA Standard Operating Safety Guides
 - 2) EPA Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)
 - c. New Jersey Administrative Code (N.J.A.C.)
 - 1) N.J.A.C. 16:25A Soil Erosion and Sediment Control Standards
 - 2) N.J.A.C. 7:29 Noise Control
 - 3) N.J.A.C. 7:13 Flood Hazard Area Control Act Rules

- 4) N.J.A.C. 7:26G Hazardous Waste
- 5) N.J.A.C. 7:26 Solid Waste

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with a "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall provide each of the following documents to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES. The Contractor shall maintain a copy of all documents described in this section on-site at all times during construction.
 - 1. Community Health and Safety Plan; Pre-Construction Submittals; EA
 - a. The Contractor shall submit the Community Health and Safety Plan in accordance with Paragraph 1.5 to the EPA's Representative at least 28 calendar days prior to the first Pre-Work Conference. The Community Health and Safety Plan must be approved by the EPA's Representative prior to commencement of any field activities. The Contractor shall allow 30 calendar days for the approval process.

1.4 REGULATORY REQUIREMENT

- A. Work performed under this Contract shall comply with all applicable Federal, State, and local safety and occupational health laws and regulations and in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.

1.5 COMMUNITY HEALTH AND SAFETY PLAN

- A. The Contractor shall develop and implement a Community Health and Safety Plan that shall address all community safety and health hazards (traditional construction as well as contaminant-related hazards) associated with the removal action conducted at the site. The Community Health and Safety Plan is a dynamic document, subject to change as project operations/execution change. The Community Health and Safety Plan will require modification to address changes and previously unidentified community health and safety conditions. It is the Contractor's responsibility to ensure that the Community Health and Safety Plan is updated accordingly. The Contractor shall submit amendments to the Community Health and Safety Plan to the EPA's Representative as it is updated. The Community Health and Safety Plan must contain all updates.
- B. The Community Health and Safety Plan shall address in detail the significant aspects as listed below:
 - a. Site description and brief history
 - b. Types of concentrations of site contamination
 - c. Selected remedy for the site
 - d. Scope of construction work
 - e. Community concerns about the construction work
 - f. Work zones
 - g. Noise control plan
 - h. Community safety procedures and engineering controls
 - i. Additional site control measures, if required
 - j. Emergency response and contingency procedures
 - k. Emergency contacts
- C. Preparation and Implementation
 - 1. A Community Health and Safety Plan shall be prepared covering site control measures to be implemented by the Contractor and all subcontractors. The

Contractor shall be responsible for the development, implementation, and oversight of the Community Health and Safety Plan. The Community Health and Safety Plan shall establish, in detail, the protocols necessary for the anticipation, recognition, evaluation, and control of hazards associated with the work performed at the site.

D. Acceptance and Modifications

1. The EPA's Representative will review the Community Health and Safety Plan and return it to the Contractor with comments. Deficiencies in the Community Health and Safety Plan will be discussed at the Pre-Construction Safety Conference. The Contractor shall make all necessary amendments required by the EPA's Representative and resubmit it for approval. This procedure shall continue until the EPA's Representative gives final written approval. The Contractor shall not mobilize on-site prior to receiving written approval of the Community Health and Safety Plan.
2. On-site work shall not begin until the plan has been approved and accepted by the EPA's Representative. As work proceeds, the Community Health and Safety Plan shall be adapted to new situations and health and safety conditions. Requested modifications may not be implemented until authorized in writing by the EPA's Representative. Should any unforeseen hazard become evident during the performance of the work, the Contractor shall bring such hazard to the EPA's Representative, both verbally and in writing, for resolution as soon as possible. In the interim, necessary action shall be taken to re-establish and maintain safe working conditions in order to safeguard the community and the environment. Disregard for the provisions of this Specification or the accepted Community Health and Safety Plan shall be cause for stopping of work until the matter has been rectified.

1.6 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

- A. Site Description and contamination characterization are detailed in SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE and SECTION 01010 – SUMMARY OF WORK.
- B. The Contractor shall provide all equipment, materials, and personnel necessary to protect members of the public from injury or exposure to physical or chemical hazards.

1.7 POTENTIAL SITE HAZARDS

- A. The following potential hazards may be encountered during site work. This is not a complete list; therefore, the list shall be expanded and/or revised as necessary during preparation of the Community Health and Safety Plan.
 1. Physical Hazards – Hazards associated with noise.
 2. Chemical Hazards – Hazards involving chemical, physical, and toxicological properties of contaminant sources and pathways, anticipated off-site exposure levels, and regulatory (including federal, state, and local) or recommended protective exposure standards.
 3. Action Levels – Action levels shall be established at the perimeter of work zone boundaries in accordance with regulatory (including Federal, State, and local) or recommended action levels appear in Table 01352-1.

Table 01352-1 Minimum Acceptable Action Levels

CONTAMINANT	LEVEL	ACTION TO BE TAKEN*
<u>SITE PERIMETER</u>		
Noise	90 dBA when measured at any location on the perimeter of work zone boundaries on which the use or source of sound is located	Implement engineering or administrative control

Perimeter Air Monitoring

Refer to SECTION 01362 – PERIMETER AIR MONITORING for perimeter air monitoring and sampling requirements, action level and required actions.

Notes:

* Changes in these initial action levels may be required in the course of this project but will only occur with the written approval of the EPA's Representative.

Abbreviations:

dBA – decibels (A-weighted)

1.8 NOISE CONTROL PLAN

- A. The Contractor shall submit Noise Control Plan with the Community Health and Safety Plan to keep construction activities under surveillance and control to minimize environmental damage by noise.
- B. The Contractor shall comply with the provisions of the State of New Jersey and local rules.
- C. The Contractor shall make every effort to control noise levels during the allowable working hours (between 7:00 am and 6:00 pm Monday to Friday) to minimize impacts to the surrounding residential properties. The Old Bridge Township ordinance for noise is 90 dBA, when measured at any location outside of the lot on which the use or source of sound is located.
- D. At minimum, the Noise Control Plan shall include but not be limited to,
 1. A detailed inventory of construction activities that could potentially generate noise. This includes listing equipment, machinery, tools, and processes that are likely to produce significant noise during all construction activities identified in SECTION 01010 – SUMMARY OF WORK.
 2. Identification and assessment of specific noise sources within the construction activities inventory and identification of the sources contributing the most to overall noise levels that allows for targeted noise control measures.
 3. A requirement for the Contractor to collect noise measurements periodically throughout the day at the work site perimeters closest to residential properties.
 4. Appropriate noise control measures to minimize or mitigate the impact of construction noise. These measures may include:
 - a. Specific construction equipment and machinery that meets noise emission standards and regulations that considers utilizing modern, quieter equipment whenever possible.
 - b. Installation of temporary or permanent noise barriers to reduce noise propagation to the surrounding areas.

- c. Use of enclosures or sound-insulating covers for noisy equipment or processes to contain the noise within designated areas.
- d. Implementation of operational measures such as scheduling noisy activities during specific time windows, relocating noisy operations away from sensitive receptors, or using mufflers and silencers on equipment.
- e. Conducting training programs for construction personnel to raise awareness about noise control measures and encourage compliance.
- f. Establishment of procedures for regular monitoring of noise levels during construction and ensure the maintenance of noise control equipment to keep it in proper working condition.
- g. Defining process for ongoing monitoring and assessment of noise levels during construction to ensure compliance with the noise criteria listed in this Specification. This may involve periodic noise monitoring, data analysis, and reporting.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 SAFETY PROCEDURES AND ENGINEERING CONTROLS

- A. The Contractor shall erect a visible security fencing at the perimeter of work zone boundaries in accordance with SECTION 02100 – SITE PREPARATION. Members of the general public shall be kept away from the work zone boundaries.
- B. The Contractor shall provide, install, and maintain signs and other warning devices to inform members of the public of hazards present on the site in accordance with SECTION 01580 – SIGNS.
- C. The Contractor shall provide site security in accordance with SECTION 01540 – SECURITY.
- D. The Contractor shall perform perimeter air monitoring in accordance with SECTION 01362 – PERIMETER AIR MONITORING.
- E. The Contractor shall provide off-site erosion and sediment control in accordance with SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT.
- F. The Contractor shall provide spill and discharge control in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.
- G. The Contractor shall implement off-site dust and odor control measures in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.
- H. The Contractor shall provide traffic control in accordance with SECTION 01585 – TRAFFIC CONTROL.

END OF SECTION

SECTION 01355
ENVIRONMENTAL PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This section covers the requirements for protection of the human and natural environment during all site work. This includes furnishing all labor, materials, equipment, and incidentals required to provide environmental pollution and damage control.

1.2 REFERENCES

A. References

1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of the standards below, the revision in effect at the time of contract award shall apply. If conflicts exist between these standards, regulations, or requirements, the most stringent of the documents shall apply.
 - a. Code of Federal Regulations (CFR)
 - 1) 40 CFR 260 Hazardous Waste Management System: General
 - 2) 40 CFR 261 Identification and Listing of Hazardous Waste
 - 3) 40 CFR 262 Standards Applicable to Generators of Hazardous Waste
 - 4) 40 CFR 279 Standards for the Management of Used Oil
 - 5) 40 CFR 302 Designation, Reportable Quantities, and Notification
 - 6) 40 CFR 68 Chemical Accident Prevention Provisions
 - 7) 49 CFR 171 - 178 Hazardous Materials Regulations

B. Definitions

1. Environmental Pollution and Damage
 - a. Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.
2. Environmental Protection
 - a. Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.
3. Contractor-Generated Hazardous Waste
 - a. Contractor-generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e., methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, waste solvents, and excess pesticides, and pesticide-contaminated equipment rinse water.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with a "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall provide each of the following documents to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES. The Contractor shall maintain a current copy of all documents described in this Section on-site at all times during construction.
1. Environmental Protection Plan; Pre-Construction Submittals; EA
 - a. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern shall be defined within the Environmental Protection Plan as outlined in this section.
 - b. The Environmental Protection Plan shall not be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations. During construction, the Contractor shall be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.
 - c. The Contractor shall address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but which the Contractor considers necessary, shall be identified, and discussed after those items formally identified in this section.
 - d. The Environmental Protection Plan shall be current and maintained on site by the Contractor.
 - e. The Environmental Protection Plan shall include, but shall not be limited to, the following:
 - 1) Name of person within the Contractor's organization who will be responsible for ensuring adherence to the Environmental Protection Plan.
 - 2) Name and qualifications of person responsible for manifesting hazardous waste to be removed from the site.
 - 3) Name and qualifications of person responsible for training the Contractor's environmental protection personnel.
 - 4) Description of the Contractor's environmental protection personnel training program.
 - 5) A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris. The plan shall include schedules for disposal. The Contractor shall identify any subcontractors responsible for the transportation and disposal of solid waste. Licenses or permits shall be submitted for solid waste disposal sites that are not a commercial operating facility. Evidence of the disposal facility's acceptance of the solid waste shall be attached to this plan during the construction.
 - 6) Drawings showing locations of excavations, access roads, haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site.

- 7) Traffic control plans including measures to reduce erosion of access roads by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.
- 8) Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.
- 9) A spill prevention and response plan that identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. A copy of the Safety Data Sheets (SDS) and the maximum quantity of each hazardous material to be on site at any given time shall be included in the contaminant prevention plan. As new hazardous materials are brought on site or removed from the site, the plan shall be updated.
- 10) A wastewater management plan that identifies the methods and procedures for management and/or discharge of wastewaters which are directly derived from construction activities, such as decontamination water and water that comes into contact with contaminated material.
- 11) Appendix
 - a) Copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents shall be attached, as an appendix, to the Environmental Protection Plan.
2. Non-Hazardous Solid Waste Diversion Report; Product Data; FIO
 - a. The Contractor shall maintain an inventory of non-hazardous solid waste diversion and disposal of construction and demolition debris and report to the EPA's Representative in accordance with 40 CFR 302. The following shall be included in the report:
 - 1) Construction and demolition (C&D) debris disposed of in cubic yards (CY) or tons.
 - 2) Construction and demolition (C&D) debris recycled in CY or tons.
 - 3) Total C&D debris generated in CY or tons, as appropriate.

1.4 ADMINISTRATIVE REQUIREMENTS

A. General Requirements

1. The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract.
2. The Contractor shall comply with all applicable environmental Federal, State, Regional and local laws, and regulations. Any delays resulting from failure to comply with environmental laws and regulations will be the Contractor's responsibility.
3. Subcontractors
 - a. The Contractor shall ensure compliance with this Section by subcontractors.
4. Payment
 - a. No separate payment will be made for work covered under this section. Payment of fees associated with environmental permits, application, and/or

notices obtained by the Contractor, and payment of all fines/fees for violation or non-compliance with Federal, State, Regional and local laws and regulations are the Contractor's responsibility. All costs associated with this section must be included in the contract price.

5. Protection Features
 - a. Prior to start of any on-site construction activities, the Contractor and the EPA's Representative shall make a joint condition survey. Immediately following the survey, the Contractor shall prepare a brief report including a plan describing the features requiring protection along with the condition of trees, shrubs, and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. This survey report shall be submitted to the EPA's Representative for approval. The Contractor shall protect those environmental features included in the survey report and any indicated on the Design Drawings, regardless of interference which their preservation may cause to the Contractor's work under the contract.
6. Environmental Assessment of Contract Deviation
 - a. Any deviations, requested by the Contractor, from the Contract Documents which may have an environmental impact will be subject to approval by the EPA's Representative and may require an extended review, processing, and approval time. The EPA's Representative reserves the right to disapprove alternate methods, even if they are more cost effective, if the EPA's Representative determines that the proposed alternate method will have an adverse environmental impact.
7. Notification
 - a. The EPA's Representative will notify the Contractor in writing of any observed noncompliance with Federal, State, or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection Plan. The Contractor shall, after receipt of such notice, inform the EPA's Representative of the proposed corrective action (within 24 hours) and take such action when approved by the EPA's Representative. The EPA's Representative may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted, or equitable adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the EPA's Representative may take under the contract, or in accordance with the Federal acquisition regulation or Federal law.
8. Air Monitoring
 - a. For the protection of public health, monitor and control contaminant emissions to the air from remedial action area sources to minimize short-term risks that might be posed to the community during implementation of the remedial alternative in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE and SECTION 01362 – PERIMETER AIR MONITORING.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 ENVIRONMENTAL PERMITS AND COMMITMENTS

- A. The Contractor shall be responsible for complying with all environmental permits and commitments required by Federal, State, regional, and local environmental laws, and regulations and in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.

3.2 LAND AND AQUATIC RESOURCES

- A. The Contractor shall confine all activities to the Exclusion Zone defined by the Contract Documents. Prior to the beginning of any construction activity, the Contractor shall identify any land resources to be preserved within the park area, outside of the Exclusion Zone. Except in areas indicated on the Design Drawings or specified to be cleared, the Contractor shall not remove, cut, deface, insure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and landforms without approval. No ropes, cables or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. The Contractor shall provide effective protection for land, aquatic and vegetation resources at all times as defined in the following subparagraphs. Stone, soil, or other materials displaced into uncleared areas shall be removed by the Contractor.
- B. Work Area Limits
 - 1. Prior to commencing construction activities, the Contractor shall mark the areas that need not be disturbed under this contract. Isolated areas within the general work area which are not to be disturbed shall be marked or fenced. Monuments and markers shall be protected before construction operation commences.
- C. Landscape
 - 1. Trees, shrubs, vines, grasses, landforms, wetlands, shellfish beds, and other landscape features to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.
- D. Piping Plovers
 - 1. Piping plovers breed in New Jersey, nesting on beaches between the high tide line and primary dune area. No pairs are known to nest in or near the work area. however, if piping plovers are identified as nesting within the work area, The Contractor shall notify the United States Fish and Wildlife Service (USFWS) and state Endangered, and Nongame Species Program (ENSP).
 - 2. Based on the correspondence with these agencies, the Contractor will establish protective fencing around the nest and limit project activities for the duration of the plovers' breeding season.
- E. Soil Erosion and Sedimentation Control
 - 1. Providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations is the Contractor's responsibility. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. The Contractor shall construct or install temporary and permanent

erosion and sediment control best management practices (BMPs) in accordance with Soil Erosion and Sediment Control Plan certified by the Freehold Soil Conservation District and as specified in SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT. BMPs may include, but are not limited to, vegetation cover, stream bank stabilization, slope stabilization, silt fences, turbidity/silt curtains, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, and diversion channels and piping. The Contractor's BMPs must also be in accordance with the New Jersey Pollutant Discharge Elimination System (NJPDES) Request for Authorization (RFA) for Stormwater Discharge during construction, which shall be reviewed by the Bureau of Nonpoint Pollution Control, Division of Water Quality, New Jersey Department of Environmental Protection (NJDEP). The Contractor shall remove any temporary measures after the area has been stabilized.

F. Contractor Facilities and Work Areas

1. The Contractor's field offices, staging areas, stockpile areas, decontamination areas, and temporary buildings shall be placed in areas designated on the Design Drawings or as directed by the EPA's Representative. Temporary movement or relocation of Contractor facilities shall be made only when approved. Erosion and sediment controls shall be provided for disturbed earthen areas to prevent sediment from entering nearby water. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

3.3 WATER RESOURCES

- A. The Contractor shall monitor construction activities to prevent pollution of surface and groundwater. Toxic or hazardous chemicals shall not be applied to soil or vegetation unless otherwise indicated.
- B. Surface water body adjacent to the active excavations shall be monitored by the Contractor.
 1. The Contractor shall conduct surface water monitoring for turbidity in the areas where active removal is being conducted as follows:
 - a. Establish baseline turbidity value by collecting background turbidity readings for five days at Seidlens Beach located east of the site and upstream of the long-shore current.
 - b. The action level of the turbidity will be the greater of the average value of background level or the maximum value of 50 Nephelometric Turbidity unit (NTU)s.
 - c. At frequency listed in Table 01355-1, collect one turbidity reading every 100 feet of shoreline along the area with active construction activities (i.e., removal of source materials and excavation of soil/sediment has commenced until confirmation sampling shows completion). Measurements shall be completed at location directly adjacent to the turbidity barrier on the bayside.
 - d. Compare the turbidity values to the action levels listed in Table 01355-1 and implement corrective action in accordance with Table 01355-1.

Table 01355 -1 Surface Water Monitoring Requirements

Analyte	Action Level	Frequency per location	Sampling Method	Action Required
Turbidity	Greater than 50 NTUs or background	Twice Daily during ebbing high tide during disturbance activities	Direct reading with turbidity meter, e.g., HACH 2100Q Turbidimeter or equivalent	Step 1: Cease activities, inspect integrity of turbidity barriers, and make needed repairs; adjustment of turbidity barriers and/or deployment of additional barriers Step 2: Re-sample Step 3: Notify EPA's Representative and consult on appropriate additional actions.

- C. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water when required by State or Federally issued Clean Water Act permits.
- D. Dewatering Operations
 - 1. Dewatering operations will be controlled at all times to maintain compliance with existing state water quality standards and designated uses of surface water bodies. Any water that comes into contact with contaminated material shall be treated by the temporary water treatment plant prior to discharge.

3.4 AIR RESOURCES

- A. Equipment operation, activities, or processes performed by the Contractor shall be in accordance with all Federal and State air emission, and performance laws and standards.
- B. Sound Intrusions
 - 1. The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise. The Contractor shall comply with the provisions of the State of New Jersey and local rules.
- C. Burning
 - 1. Burning shall be prohibited on the project site.
- D. Particulates
 - 1. Dust particles, aerosols, and gaseous by-products from construction activities must be controlled at all times, including weekends, holidays, and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, access roads and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, or local air pollution standards to be exceeded or which would cause a hazard or a nuisance.
 - 2. Mulching, water sprinkling, temporary enclosures and other appropriate methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. Provide sufficient, competent equipment to accomplish these tasks. Properly maintain equipment to reduce gaseous pollutant emission.

3.5 AIR EMISSION CONTROL

- A. The Contractor shall implement the air monitoring programs in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE and SECTION 01362 – PERIMETER AIR MONITORING.

3.6 WASTE HANDLING, STORAGE AND DISPOSAL

- A. Solid Wastes
 - 1. Handling, storage, and disposal of solid waste shall be performed in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL and SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.
- B. Chemicals and Chemical Wastes
 - 1. Chemicals shall be dispensed ensuring no spillage to the ground or water. Periodic inspections of dispensing areas to identify leakage and initiate corrective action shall be performed and documented. This documentation will be periodically reviewed by the EPA's Representative.
 - 2. Chemical waste shall be collected in corrosion-resistant, compatible containers. Collection drums shall be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes shall be classified, managed, stored, and disposed of in accordance with Federal, State, and local laws and regulations. Chemical accident prevention provisions shall be made in accordance with 40 CFR 68.
- C. Contractor-Generated Hazardous Wastes/Excess Hazardous Materials
 - 1. Hazardous wastes are defined in 40 CFR 261 or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. At a minimum, the Contractor shall manage and store hazardous waste in compliance with 40 CFR 262. Take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. Segregate hazardous waste from other materials and wastes, protect it from the weather by placing it in a safe covered location, and take precautionary measures such as berming or other appropriate measures against accidental spillage. Storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178 and State and local laws and regulations are the Contractor's responsibility.
 - 2. Transport Contractor-generated hazardous waste in accordance with Environmental Protection Agency (EPA) and Department of Transportation (DOT) laws and regulations. Dispose of hazardous waste in compliance with Federal, State, and local laws and regulations. Spills of hazardous or toxic materials above the Superfund Reportable Quantities must be immediately reported to the EPA's Representative, EPA, the State, the National Response Center at 1-800-424-8802, and the State Spill Response Hotline at 1-877-927-6337.
 - 3. Cleanup and cleanup costs due to spills are the Contractor's responsibility. The disposal of Contractor-generated hazardous waste and excess hazardous materials is the Contractor's responsibility.
- D. Fuel and Lubricants
 - 1. Storage, fueling, and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants, and oil shall be managed and stored in accordance with all Federal, State, regional and local laws, and regulations. Used lubricants and

used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws, and regulations.

E. Wastewater

1. Wastewater from construction activities, such as decontamination water and water that comes into contact with contaminated material, shall not be allowed to enter waterways or to be discharged prior to being treated to remove pollutants. The Contractor shall dispose of the construction-related wastewater in accordance with all Federal, State, and local laws and regulations.
2. The Contractor shall collect and treat wastewater at the on-site treatment system as necessary, and discharge treated water in accordance with the New Jersey Pollutant Discharge Elimination System (NJPDES) permit.

3.7 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

- A. If, during excavation or other construction activities, any previously unidentified or unanticipated historical, archaeological, and/or cultural resources are discovered, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, walls, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery, the Contractor shall immediately notify the EPA's Representative so that the appropriate authorities may be notified, and a determination made as to their significance and what, if any, special removal of the finds should be made. The Contractor shall cease all activities that may result in impact to or destruction of these resources. The Contractor shall secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.8 PREVIOUSLY USED EQUIPMENT

- A. The Contractor shall clean all previously used construction equipment prior to bringing it onto the project site. The Contractor shall ensure that the equipment is free from soil residuals, noxious weeds, and plant seeds.

3.9 MAINTENANCE OF POLLUTION FACILITIES

- A. The Contractor shall maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for the length of time construction activities creates pollutants.

3.10 TRAINING OF CONTRACTOR PERSONNEL

- A. The Contractor's personnel shall be trained in all phases of environmental protection and pollution control. The Contractor shall conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. Additional meetings shall be conducted for new personnel and when site conditions change. The training and meeting agenda shall include: method of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative cover, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemical or wastes, and other regulated contaminants; and recognition and protection of archaeological sites,

artifacts, wetlands, and endangered species and their habitats that are known to be in the area.

3.11 POST CONSTRUCTION CLEANUP

- A. The Contractor shall clean up and restore all areas used for construction. The Contractor shall, unless otherwise instructed in writing by the EPA's Representative, remove all signs of temporary construction facilities such as work areas, storage areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The entire disturbed area shall be graded, filled, and seeded unless otherwise indicated.

END OF SECTION

SECTION 01362

PERIMETER AIR MONITORING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes the responsibilities of the Contractor for monitoring potentially contaminated particulates at the site perimeter fence line. This section is to be used in the preparation of Perimeter Air Monitoring Plan (PAMP). Work performed under these Specifications will be actively managed so that airborne dust and contaminants generated by site activities are maintained below the applicable allowable levels established for general public exposure by the United States Environmental Protection Agency (EPA) and the New Jersey Department of Environmental Protection (NJDEP).

1.2 REFERENCES

- A. References
1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.
 - a. Environmental Protection Agency (EPA)
 - 1) EPA-625/R-96/010a Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air June 1999
 - 2) EPA National Ambient Air Quality Standards (NAAQS)
 - 3) EPA-451/R-93-004 Air/Superfund National Technical Guidance Study Series: Estimation of Air Impacts from Area Sources of Particulate Matter Emissions at Superfund Sites April 1993
 - b. Matters of interpretation of these standards associated with perimeter air monitoring shall be identified and submitted to the EPA's Representative. All matters of interpretation shall be resolved before starting work. Where the requirements of this Specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
1. Perimeter Air Monitoring Plan; Pre-Construction Submittal; EA
 - a. The Contractor shall submit the PAMP to the EPA's Representative for approval in accordance with this section.
 - b. The Contractor shall develop, submit for review, and implement after acceptance a written PAMP for Remedial Action operations.
 - c. A PAMP shall be prepared covering remediation activities to be performed by the Contractor and all subcontractors. The PAMP shall establish, in detail, the protocols necessary for the anticipation, recognition, evaluation, and control of

emissions associated with each task performed based upon site-specific conditions.

- d. The PAMP shall be a stand-alone plan and shall include, but not be limited to, the following:
 - 1) Estimate of lead concentration in particulates as a starting point assumption
 - 2) Protocols for control of airborne contaminant emissions
 - 3) Air quality monitoring and sampling procedures
 - 4) Protocols for collection of meteorological data
 - 5) Detailed descriptions of equipment, O&M procedures, and calibration schedules
 - 6) Organizational structure indicating personnel responsibilities
 - 7) The qualifications of the Air Quality Monitoring Specialist
 - 8) Plans for response if the action levels are exceeded, and
 - 9) Acceptance and Modification.
 - e. The Contractor shall keep a copy of the written PAMP on-site for review by the EPA's Representative. As work proceeds, the PAMP shall be adapted to new situations and new conditions. Changes and modifications to the accepted PAMP shall be made with the knowledge and concurrence of the Air Quality Specialist (AQS), the Site Superintendent, and the EPA's Representative. The requested modification shall not be implemented until authorized in writing by the EPA's Representative. Should the EPA's Representative require a modification of any portion or provision of the PAMP, the EPA's Representative will notify the Contractor in writing of such modifications.
2. Progress Reports; Test Report, FIO
- a. The Contractor shall submit the following documents to the EPA's Representative on a weekly basis during the course of the project site work:
 - b. Air Sampling Log in accordance with Paragraph 3.1.E.1 of this section, including (but not limited to):
 - 1) Sample collection dates and times
 - 2) Sampling equipment and media
 - 3) Results of direct-reading instruments
 - 4) Summary printouts for instrumentation using automatic data logging, and
 - 5) Documentation of action level exceedances and corrective actions.
 - c. Air Sample Analysis Results – analytical results and accompanying laboratory quality control data/information.
 - d. Daily Perimeter Air Monitoring Summary Reports in accordance with Paragraph 3.1.E.2 of this section.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. The PAMP shall be submitted to the EPA's Representative at least 28 calendar days prior to the Pre-Work conference for review and approval. Any deficiencies in the PAMP will be discussed at the pre-construction safety conference, and the PAMP shall be revised to correct the deficiencies and resubmitted for acceptance. On-site work shall not begin until the plan has been accepted by the EPA's Representative.
- B. The EPA's Representative may stop all site work at any point if the Contractor shows any disregard for the provisions of this Specification or the accepted PAMP.

1.5 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

- A. Project site conditions and contamination characterization are detailed in SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE and in SECTION 01010 – SUMMARY OF WORK.

1.6 AIR QUALITY PROTECTION PRINCIPLES

- A. The Contractor shall provide all equipment, materials, and personnel necessary to monitor and quantify dust and airborne lead concentrations at the site perimeter.
- B. The PAMP shall include the air monitoring program that reflects the proximity of the residential areas and potential receptors while considering monitoring and evaluating impacts at the closest receptors to the remediation site. Given the configuration of the site, perimeter air monitoring locations will be placed at the perimeter location closest to the nearest receptor near the active work area to address site specific conditions over time.
- C. The PAMP shall include an estimation of lead concentration in particulate using soil/sediment lead concentrations provided in SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE. The Air/Superfund National Technical Guidance Study Series: Estimation of Air Impacts from Area Sources of Particulate Matter Emissions at Superfund Sites (EPA-451/R-93-004) and the simple air emission estimation procedures in the section entitled: Estimation of Particulate Matter Air Emissions, can be utilized for estimating the lead concentration in particulate.
- D. The PAMP shall describe procedures, equipment, and training needed to monitor and quantify the amount of airborne particulate and lead generated by site work activities. The Contractor shall operate a program of equipment maintenance in accordance with the manufacturer's Specifications. The EPA's Representative may reject the use of equipment if, in its opinion, it provides less protection than that specified in the PAMP.
 - 1. Action Levels
 - a. The Contractor shall perform remediation in a manner such that perimeter air quality objectives at the site perimeter are achieved in accordance with the action levels presented in Table 01362-1.
 - b. The action levels and required actions shall be presented in the PAMP in both text and tabular form in accordance with Table 01362-1.

1.7 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

- A. The Contractor's project team shall include:
 - 1. Air Quality Specialist
 - a. The services of an AQS, who is experienced in air monitoring and sampling, shall be utilized. The Safety and Health Manager (SHM) can also serve as the AQS if he/she meets the qualification requirements of an AQS listed herein. This specialist shall be familiar with the site's hazards and the scope of this project. The Contractor shall document the specialist's name and qualifications in the PAMP.
 - b. Qualifications – the Contractor shall demonstrate to the EPA's Representative that this AQS has the following credentials:
 - 1) At least three years of experience in air monitoring or sampling, including the following:
 - 2) Serving in responsible professional charge on at least one project in which the impacts of site work on community air was measured.

- 3) At least 100 hours of hands-on experience (each) in taking ambient air measurements and samples by EPA methods.
- 4) A scientific or engineering college degree that included the study of air quality issues. The EPA's Representative may accept equivalent training at its sole discretion.
- 5) Appropriate credentials for working on the site under the SSHP.
- c. Professional certification appropriate to this effort.
- d. Although the EPA's Representative may accept other credentials, the Certified Industrial Hygienist credential offered by the American Board of Industrial Hygiene and the Qualified Environmental Professional credential offered by the Institute for Professional Environmental Practice are both deemed appropriate.
- e. Responsibilities - the AQS shall be responsible for:
 - 1) Preparing the air monitoring and sampling protocols for the site work.
 - 2) Selecting the equipment to be used for air monitoring and sampling.
 - 3) Determining the times, durations, and locations of air measurements and samples.
 - 4) Developing protocols to determine upwind location and to adjust monitoring and sample results for ambient background.
 - 5) Approving the qualifications of any technicians that will collect air measurements or samples.
 - 6) Interpreting the results of the air monitoring and sampling effort.
 - 7) Approving and signing reports of air quality that the Contractor provides to the EPA's Representative.
 - 8) Periodically evaluating if the selected equipment and protocols are adequately representing perimeter conditions.
 - 9) Periodically auditing the implementation of the PAMP and taking corrective action when necessary.
2. Air Monitoring and Sampling Technician (AM&ST)
 - a. During intrusive activities by the Contractor, an AM&ST shall perform the air monitoring activities as specified in the PAMP. The Site Safety and Health Officer (SSHO) can also serve as the AM&ST, if the AQS approves. The AM&ST shall have appropriate training approved by the AQS.

PART 2 - PRODUCTS

- A. The Contractor shall provide all necessary sampling devices, pumps and collection media, and support equipment to perform the sampling per the approved Perimeter Air Monitoring Plan.

PART 3 - EXECUTION

3.1 AIR QUALITY MONITORING AND SAMPLING

- A. General
 1. The monitoring specified in the PAMP shall detect and quantify dust and airborne lead.
 2. The Contractor shall collect, at minimum, the number of air quality measurements and samples as shown in Table 01362-1. The Contractor shall use monitoring and analytical sampling/methods that accurately measure at detection limits that are consistent with the action levels listed in Table 01362-1. Air monitoring methods and equipment locations shall be proposed by the Contractor in the PAMP. The

Contractor shall ensure that the air monitoring equipment proposed are consistent with monitoring objectives and associated action levels presented in Table 01362-1.

3. Monitoring should occur in all three ordinal directions on landward side and at the bayside at end of First Jetty since wind direction may vary throughout the course of the cleanup and throughout any given day. Monitoring should occur at every 300 to 500 feet along the southern perimeter of the support zone where the nearest residential properties are located closer to the site. At a minimum, a total of six perimeter air monitoring stations are expected to be utilized simultaneously.
 - a. The continuous air monitoring equipment (dust monitoring) shall be capable of providing the following:
 - 1) Downloadable data capable of providing continuous graph of readings.
 - 2) Auto-Dialer, emergency lights or other alerting systems to promptly and effectively notify the Contractor that action levels have been exceeded. EPA will alert the state, where appropriate, if the air monitoring actions levels have been exceeded.
 - b. The AQS shall certify that the air monitoring equipment proposed is consistent with Perimeter Air Monitoring objectives and associated action levels presented in Tables 01362-1. Air monitoring methods and equipment locations shall be proposed by the Contractor in the PAMP.
4. Air sampling shall be conducted at the frequencies defined in Table 01362-1 and in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE. The EPA’s Representative may direct a change in air sampling frequency. EPA will notify the state, where appropriate, if a change in air sampling frequency occurs.
5. Equipment utilized for air monitoring or sampling in accordance with this section shall be calibrated at minimum, before and after each use, as required, and maintained as per specified methods, manufacturer's recommendations, and good industrial hygiene practices. Test instruments used in the calibration of air sampling equipment shall be calibrated and traceable to National Institute of Standards and Technology standards. Environmental laboratory services are to be provided only by laboratories possessing the pertinent and appropriate current New Jersey and NELAP accreditation for the matrix and analysis.
6. The Contractor shall document, in the site log or site files, the regular calibration of each instrument used. Only individuals trained to operate this equipment shall do so.

B. Meteorological Monitoring

1. The Contractor shall furnish, install, and maintain a portable meteorological station in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.
2. Meteorological data shall be recorded and utilized in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.

C. Real-time Air Monitoring

1. The Contractor shall provide real-time monitoring for dust using a total airborne dust monitor (MIE-Ram-1 or equivalent), and with data logging capabilities, at the designated perimeter stations.
2. The Contractor shall collect each air measurement over a duration that the AQS determines will yield an accurate representation of the air quality at that time and location. The Contractor may collect measurements more frequently than required herein or utilize other appropriate sampling techniques with approval of the EPA’s Representative.

D. Air Sampling

1. The sampling and analytical procedures to be followed for the collection, handling, and analysis of air samples are those prescribed by EPA Analytical Procedures listed in Table 01362-1.
2. Air samples shall be collected by drawing a known volume of air into a collector during the working period as specified in the EPA sampling guide.
3. The analytical results shall be compared to Action Levels established in Table 01362-1 standards and, if appropriate, action shall be undertaken (i.e., evaluation of work practices). The calibration protocols described in the EPA methods shall be followed. A qualified laboratory shall perform air sampling analysis for lead by EPA methods described in Table 01362-1 within 48 hours. A laboratory is “qualified” if it holds certificates required by the NJDEP for analysis of air samples for the contaminants of interest. NOTE: Monthly samples shall be analyzed with a seven-day turnaround time.

E. Perimeter Air Sampling and Monitoring Results Reporting

1. Air Sampling Log
 - a. The Contractor shall maintain an up-to-date log for all sampling activities. A copy of the log shall be submitted to the EPA’s Representative weekly during the course of the project site work. The log shall contain sufficient information to verify that proper procedures were followed and confirm the accuracy of results.
2. Daily Perimeter Air Monitoring Summary Report
 - a. The Daily Perimeter Air Monitoring Summary Report shall discuss calibration, calibration check, general observations, weather conditions, and discussion of all required corrective action. In addition, the report shall contain additional information where real-time sampling is utilized.
 - 1) A summary of real-time monitoring results shall be presented in tabular form. The table shall include results from all monitoring locations including background and at the minimum contain the following:
 - a) For dust, peak 15-minute average and daily time-weighted average with all results exceeding action levels clearly delineated and associated corrective action described.
 - b) Comparison of results corrected for background to peak 15-minute average, and time-weighted average action levels.
 - c) Summary of meteorological conditions during the sampling period.
3. Within 5 working days of month's end, the Contractor shall compile and submit copies of each Daily Perimeter Air Monitoring Summary Report including a figure indicating a general upwind and downwind perimeter station locations, and the weekly air sampling results, for which results were received from the previous calendar month.

3.2 RESPONSE TO AIR EMISSIONS

- A. The Contractor shall compare the highest of direct reading measurements for dust and airborne lead downwind of the site (minus the value upwind) to the action levels in Table 01362-1. If the wind is blowing from a direction for which there is no monitor, the upwind value shall be assumed to be the lowest of the values collected by any of the monitors, and the placement of the upwind monitors shall be modified to collect upwind data. If there is no upwind monitoring station data, then the value must be taken as is with no correction.

- B. When the perimeter air monitoring system reveals that action level has been exceeded for 15 or more minutes, the Contractor shall evaluate its engineering controls, and implement emission controls. An exceedance of the action level for 15 minutes or more shall be reported in the Daily Perimeter Air Monitoring Summary Report. If its process modifications succeed, the Contractor shall report the exceedance in its Daily Perimeter Air Monitoring Summary Report.
- C. When the air monitoring system reveals that the action level has been exceeded for an hour, the Contractor shall temporarily suspend intrusive activities, notify the EPA's Representative, and implement corrective action to reduce site-related emissions to below required action levels. The adequacy of these controls is subject to approval by the EPA's Representative prior to restarting intrusive activities. Before resuming work, the Contractor must consult with the EPA's Representative to verify that site-related emissions remain below the required action levels. . The Contractor shall report the exceedance in its Daily Perimeter Air Monitoring Summary Report.
- D. Site emissions control measures that may be needed to reduce the emissions to below action levels may include, but are not limited to:
 - 1. Working from the bottom of the seawall to top of the slope, and then, working from east towards west while maintaining the sequencing to minimize recontamination of the area along the bay.
 - 2. Adding moisture to the soil
 - 3. Applying a vapor barrier (plastic) to the soil or soil piles
 - 4. Using a misting system
 - 5. Reducing the speed of equipment that disturbs the soil
 - 6. Installing barriers to reduce wind speed, and
 - 7. Limiting the rate of excavation.
- E. When the perimeter air sampling system reveals that action level has been exceeded, the AQS shall use that information to adjust the action levels to be more stringent, with an approval of EPA's Representative, to which the direct-reading measurements are compared so that they will protect the community.

3.3 INSPECTIONS

- A. The Contractor shall perform daily inspections of the job site and the surrounding work in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE to ensure compliance with PAMP. The EPA's Representative may stop all site work at any point if the Contractor shows any disregard for the provisions of this Specification or the accepted PAMP.

3.4 DUST AND ODOR EMISSION CONTROL

- A. Dust and odor control shall be used throughout the work at the site and off-site in accordance with the Contractor's approved Dust and Odor Control Plan to be included in the Contractor's SSHP, as specified in SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.

END OF SECTION

Table 01362 -1 Perimeter Air Monitoring/Sampling Requirements

Analyte	Action Level ^{1, 2}	Frequency per location	Analytical Method	Action Required
Real Time Respirable Dust (PM10)	150 µg/m ³ <u>(15 minute)</u> 100 µg/m ³ (work shift)	Continuously during the workday, and for 1 hour before and after. Log 15-minute averages.	Direct-reading dust meter with data logger, e.g., MIE-DR-4	15 minutes: Evaluate engineering controls, implement dust control. 60 minutes: Stop dust-generating activities and notify the EPA’s Representative. Increase dust control measures.
Air Sampling ³ – Excavation and handling of contaminated material				
Particulate (PM 10)	150 µg/m ³	Once per day for the first two days of excavation in a new segment in Area1. Once per day for the first two days of excavation in Areas 9, 2, and 5. Once a month thereafter.	EPA IO-2.1 (PM 10) ⁴	Investigate and recommend corrective action. As deemed necessary, adjust real-time air monitoring action levels to be more stringent to achieve contaminant compliance.
Lead	1.2 µg/m ³		EPA IO-3.4 (ICP) ⁴	
	Trigger level of 0.15 ug/m ³			Investigate and notify the EPA’s Representative.

1. Total and compound-specific action levels are evaluated using data corrected for background values.
2. Downwind concentrations at fence line, over background.
3. To be performed during excavation activities and handling of contaminated materials only.
4. Analytical methods from the Compendium of Methods for the Determination of Inorganic Compounds in Air EPA/625/R-96/010a

SECTION 01380
PROJECT PHOTOGRAPHS

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all labor, equipment, materials, and incidentals required to provide photographic documentation of construction activities.

1.2 REFERENCES

- A. Not used.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. The Contractor shall submit the following items in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
 - 1. Pre-Construction, Progress, and Post-Construction Photographs; Product Data; FIO
 - a. The Contractor shall submit project photographs as specified in Paragraph 3.2. The Contractor shall also include photocopies of the logbook documentation as specified in Paragraph 3.4.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. All photographs are the government property and shall not be released by the Contractor to the public or news media.

PART 2 - PRODUCTS

2.1 DIGITAL CAMERA

- A. The Contractor shall use a digital camera to produce project photographs. The digital camera shall be capable of transferring digital photographs to a "JPEG" or "TIFF" electronic file format. -The digital camera shall be an auto-focusing type, with a minimum image resolution of 12 megapixels (3,264 x 2,448 pixels) or better with 48 Bit Color Depth. The digital camera shall be equipped with a flash for low-light conditions.

2.2 PHOTOGRAPHIC LOGBOOK

- A. The Contractor shall keep all written documentation concerning project photographs in a photographic logbook. The logbooks shall record the location, direction of each photographic shot, weather conditions and time of day, at minimum. The logbook shall be constructed of water-resistant paper and bound along the left edge.

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor shall furnish color photographs, taken on a digital camera using suitable equipment, to record the key features of the site, including the interior and exterior of all structures, prior to the commencement of work and after the work has been completed.

- B. The Contractor shall upload photographs to a cloud-based file sharing service, as compatible with EPA systems, at minimum once a month for review by stakeholders off-site.
- C. The actual number and location of views to be taken will be as directed by the EPA's Representative. The intent of this requirement is to capture the condition of the site prior to commencing work to counter any false damage claims once work is completed. The Contractor shall photograph all defects present pre-construction.

3.2 PROJECT PHOTOGRAPHS

- A. The Contractor shall furnish a minimum of approximately 400 photographs in an electronic file format approved by the EPA's Representative, taken with a digital camera by an experienced photographer using suitable equipment, to record the key features of the site prior to the commencement of work, during construction, and after the work has been completed.
 - 1. A minimum, the photographs shall include 50 digital photographs for each areas including Areas 1 to 5 and Area 9 plus 100 photographs for off-site public space to establish baseline conditions of the site and the development in the area, including but not limited to all entrances/exits to the site, utilities (including curb and gutter in the area), designated roadways up to major roadway system, vegetation, and fencing.
- B. Pre-Construction Photographs: Before work begins, the Contractor shall take digital construction photographs and video recordings of existing site conditions.
 - 1. Coverage shall include, but not be limited to:
 - a. Property boundary lines
 - b. All existing roadways and access roads
 - c. Aboveground utilities
 - d. Sewer outfalls
 - e. Underground utility access points
 - f. Landscaping, trees
 - g. Signage
 - h. Park facilities including playground, gazebo, beaches
 - i. Boardwalk
 - j. First Jetty
 - k. Community center building
 - l. Main parking lot
 - m. Interior east parking lot
 - n. Construction entrance
 - o. Wetlands, ribbed mussel beds, any shellfish beds within 20 feet outside the limit of disturbance (i.e., the sheet pile wall alignment)
 - p. Other physical features located within the zone of influence of the construction
 - 2. The coverage may be expanded if directed by the EPA's Representative.
- C. Progress Photographs: After construction operations have been started at the site, the Contractor shall photographically record the project. Each progress photograph shall be a separate electronic file and shall include coverage of:
 - 1. Site preparation activities
 - 2. Clearing
 - 3. Staging area construction
 - 4. Soil erosion and sediment control measures
 - 5. Installation of temporary drainage features

6. Installation and operation of temporary water treatment system and discharge location
 7. Decontamination area and exclusion zone setup
 8. Post-excavation, and waste characterization sampling
 9. Removal of source materials
 10. Excavation
 11. Dewatering
 12. Storm sewer flow diversion
 13. Backfilling and grading
 14. Site restoration including seawall reconstruction and upland areas
 15. Wetland restoration
 16. Decontamination of personnel, tools, and equipment
 17. unanticipated events or accidents
- D. In addition, at each successive period of photography, at least one digital photograph daily from the same reference point shall be taken.
- E. Post-Construction Photographs: After completion of work, the Contractor shall take a minimum of 400 digital photographs of the site. The locations shall be designated by the EPA's Representative and shall be similar to the photographs showing the site condition prior to commencement of construction activities.
- F. The actual number and location of views of progress photographs to be taken will be as directed by the EPA's Representative.

3.3 ELECTRONIC FILES FOR DIGITAL PHOTOGRAPHS

- A. At a minimum, the Contractor shall download digital photographs from the digital camera to a personal computer daily during photographic sessions for transfer to an electronic file format. The electronic file shall be either "JPEG" or "TIFF" format.
- B. The Contractor shall rename each downloaded electronic file at the time of download with a distinct filename that corresponds to the photographic logbook specified in Paragraph 3.4. The filename shall have the following format as defined below:
1. yyyy-mm-dd_hhnn_xxx
 - a. "yyyy" is the year the photograph was taken
 - b. "mm" is the month the photograph was taken
 - c. "dd" is the day the photograph was taken
 - d. "hh" is the hour the photograph was taken using military time nomenclature
 - e. "nn" is the minute the photograph was taken using military time nomenclature
 - f. "xxx" is a three-digit sequential number starting with 001 for each photograph taken during the preceding time period
 2. An example of the above filename format is 2022-05-15_1845_002. This example photograph filename would have been the second photo taken at 6:45 p.m. on May 15, 2022.
- C. The Contractor shall upload the electronic files directly to a cloud-based file sharing service, as compatible with EPA systems, after renaming as described in Paragraph 3.3.B is completed. An access to the cloud-based file sharing service, as compatible with EPA systems, shall be provided to the EPA by the Contractor. The Contractor shall upload two sets of digital photographs.
- D. The upload process shall be completed the same day the photographs are downloaded, except as approved by the EPA's Representative.

- E. If the EPA's Representative allows the upload process to be delayed, the Contractor shall backup the electronic files on at least one storage device other than the hard drive of the personal computer storing the electronic files until the upload process is completed.
- F. The Contractor shall submit an external drive containing electronic files of digital photographs a minimum of once monthly during photographic sessions.
- G. All digital photographs and related electronic files are U.S. Government property and shall not be released by the Contractor to the public or news media.

3.4 LOGBOOK AND GPS DOCUMENTATION OF DIGITAL PHOTOGRAPHS

- A. The Contractor shall record pertinent information concerning digital photographs in a photographic logbook as specified in Paragraph 2.2. Writing shall be done in a waterproof ink. The following information shall be recorded on the front cover of the logbook:
 - 1. Project name
 - 2. Contract number
 - 3. Contractor name
- B. The following information shall be included for each photographic entry, at a minimum:
 - 1. Date
 - 2. Time
 - 3. Photograph filename
 - 4. Location
 - 5. Direction
 - 6. Description
- C. The Contractor shall geotag all pictures using the GPS enabled digital camera.

3.5 VIEWS REQUIRED

- A. Prints are not required; however, the digital photographs shall be organized so that they shall illustrate condition and location of work and the state of progress as work progresses.
- B. At successive periods of photography, the Contractor shall take at least one photograph daily from the same reference point as previously required.
- C. The Contractor shall consult with the EPA's Representative at each period of photography for recommendations concerning views required.

END OF SECTION

SECTION 01381

VIDEOTAPING

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all labor, materials and equipment required to provide color, high- quality video/audio of the project site recording the site features prior to the commencement of work and after the work has been completed, and any important site features during construction.

1.2 REFERENCES

- A. Not used.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. The Contractor shall submit the following items in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
 - 1. Pre-Construction, Progress, and Post-Construction Video; Product Data; FIO
 - a. The Contractor shall furnish to the EPA's Representative two copies of each recording. Each recording shall be continuous, in color, and recorded in a digital format stored in an industry standard Moving Pictures Expert Group (MPEG) format transferable to an external computer capable of playing MPEG files and to a cloud-based file sharing service, as compatible with EPA systems. The disks shall be written in accordance with the ISO-9660 Level 2 Specification. Each disk shall be labeled with the appropriate identification of its content.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Under no circumstances shall construction begin until the EPA's Representative has received and accepted the pre-construction video recording. This recording will be used for reference during restoration, and as a record of pre-existing conditions should disputes or litigation arise.
- B. The EPA's Representative reserves the right to reject the recording because of poor quality, unintelligible audio or uncontrolled pan or zoom. Any recording rejected by the EPA's Representative shall be re-recorded at no cost to the EPA.

1.5 QUALITY ASSURANCE

- A. Video Quality
 - 1. At a minimum, the video recording device should be able to produce a resolution of 1920 (pixel) x 1080 (pixel) with a frame rate of 30 frames per second. Video files shall be stored in an industry standard MPEG format transferable to an external computer capable of playing MPEG files and to a cloud-based file sharing service, as compatible with EPA systems.
 - 2. Video recording shall be performed by a qualified, established video recording firm knowledgeable in construction practices and experienced in the implementation of established inspection procedures.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 VIDEO SURVEY

- A. The Contractor shall furnish a continuous, color videotape recording within and outside of the limits of the work site.
- B. Coverage shall include, but not be limited to, all existing roadways, structures, aboveground utilities, landscaping, trees, signage, fencing, wetlands, ribbed mussel beds, and any shellfish beds within 20 feet outside the limit of disturbance (i.e., the sheet pile wall alignment), and other physical features located within the construction limits and any other adjacent properties. Video coverage shall extend a minimum of 500 feet in each direction from the site entrance. The coverage may be expanded if directed by the EPA's Representative.
- C. A representative of the Contractor shall accompany the videographer during recording sessions to indicate the adjacent areas of potential construction activity and identify items and conditions to be recorded. The construction limits shall be flagged for identification, and excavation areas shall be physically marked with survey stakes and/or high-visibility paint, prior to production of audio/video recordings. EPA will include the state, where appropriate for the video survey.
- D. All recording shall be done during daylight hours. No recording shall be performed if weather is not acceptable to the EPA's Representative.
- E. To produce the proper detail and perspective, artificial lighting shall be required where it is necessary to illuminate the shaded area caused by trees, utility poles, road signs, and other such objects.

3.2 AUDIO AND VIDEO FILES

- A. Each audio/video electronic file shall contain metadata with the contract name and number, Contractor's name, and location information such as street name, direction of travel, viewing side, etc.
- B. Information appearing in the audio/video files must be continuous, and no editing or overlaying of information at a later date will be acceptable.
- C. The following information shall be included in the metadata tagged for each audio/video files:
 - a. Name of Contractor
 - b. Day, date, and time (will be auto populated)
 - c. Name of project
 - d. Route of travel
 - e. Viewing side
 - f. Direction of travel
- D. Time must be accurate within 1/10 of a second and continuously generated.
- E. Metadata of each audio/video file documentation must coincide with the information on each file name to facilitate easy retrieval of information.
- F. Audio shall be recorded in a clear, professional, and concise manner at the same time as the video recording and shall include the same information as displayed on the screen.

Special commentary shall be given for unusual conditions of streets, wetlands, Margaret's Creek, structures, trees, etc.

END OF SECTION

SECTION 01450

CHEMICAL DATA QUALITY CONTROL

PART 1 - GENERAL

1.1 SUMMARY

- A. This section covers requirements for the Contractor's Chemical Data Quality Control (CDQC) for Remedial Action (RA) work at the site. This section is to be used to prepare a Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP), contingency securing laboratory(ies), monitoring of subcontract laboratory performance, data validation, data reporting, and preparation of a chemical data final report, as defined in this section. The UFP-QAPP shall contain the necessary technical detail and directions for all sampling and field measurements and specifies all quality assurance (QA) and quality control (QC) procedures required for planning, implementation, and assessment of the RA.
- B. Field measurements and samples shall be collected by the Contractor to characterize cleared material, decontaminated riprap, excavated material, backfill materials, and topsoil; and characterize contact water generated from dewatering operations to verify that discharge water samples meet the New Jersey Pollutant Discharge Elimination System (NJPDES) Discharge to Surface Water (DSW) requirements; obtain post-excavation confirmatory sampling/closure data; and to obtain data from the riprap decontamination stations and stockpile areas to confirm no leakage occurred during dewatering and decontamination activities or stockpiling.

1.2 REFERENCES

- A. References
 - 1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of the standards below, the revision in effect at the time of contract award shall apply.
 - a. American Society for Testing and Materials (ASTM)
 - 1) ASTM D2216-10 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
 - 2) ASTM D5268-13 Standard Specification for Topsoil Used for Landscaping Purposes
 - b. Code of Federal Regulations (CFR)
 - 1) 40 CFR 261 Identification and Listing of Hazardous Waste
 - c. Environmental Protection Agency (EPA)
 - 1) EPA 450/4-89/015 Data Quality Objectives for Ambient Air Monitoring Around Superfund Sites (Stages I and II)
 - 2) EPA 450/4-89/005 Data Quality Objectives for Ambient Air Monitoring Around Superfund Sites (Stage III).
 - 3) EPA 402/B-04/001A Multi-Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual, Volume I.
 - 4) EPA/240/B-06/001 Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA/G-4. February 2006.
 - 5) EPA/240/R-02/009 Guidance for Quality Assurance Project Plans, EPA QA/G-5. December 2002.
 - 6) EPA/240/B-01/003 EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5. March 2001. Reissued May 2006.

- 7) EPA Region 2/SOP HW-3a, Hazardous Waste Support Section, SOP No. HW-3a Revision 1, ISM02.2, ICP-AES Data Validation. September 2016.
- 8) EPA Region 2/SOP HW-3b, Hazardous Waste Support Section, SOP No. HW-3b Revision 1, ISM02.2, ICP-MS CLP SOW SFAM01.1. September 2016.
- 9) EPA Region 2/SOP HW-3c, Hazardous Waste Support Branch, SOP No. HW-3c Revision 1, ISM02.2, Mercury, and Cyanide Data Validation. September 2016.
- 10) EPA Region 2 Hazardous Waste Support Section, SOPs No. HW-33A, 34A, 35A, Revision 1 SOM02.2 Low/Medium Volatile, Trace Volatile, and Semi-volatile Data Validation. September 2016.
- 11) EPA Region 2 Hazardous Waste Support Section, SOPs No. HW-36A, Revision 1 SOM02.2 Pesticide Data Validation. October 2016.
- 12) EPA Region 2 Hazardous Waste Support Section, SOPs No. HW-37A, Revision 0 SOM02.2 Polychlorinated Biphenyl (PCB) Aroclor Data Validation. June 2015.
- 13) EPA Region 2 Policy for Implementing the National Strategy for Procuring SOP HW-32 Analytical Services for all OSWER Programs Standard Operating Procedure (SOP), Revision 7. August 2009.
- 14) EPA 540/P-87/001B A Compendium of Superfund Field Operation Methods.
- 15) EPA 542-R-20-006 EPA Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Superfund Data Review. November 2020.
- 16) EPA 540-R-20-005 EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review. November 2020.
- 17) EPA 540-R-20-005 Contract Laboratory Program Guidance for Field Samplers. November 2020.
- 18) EPA 600/R-96/055 Guidance for the Data Quality Objective Process, August 2000 EPA SW-846 (Rev 0; updates I, II, IIA, IIB, III, IIIA, IIIB, IVA, and IVB) Test Methods for Evaluating Solid Waste (Vol. IA, IB, IC, and II)
- 19) EPA 505/B-04/900A Intergovernmental Data Quality Task Force (IDQTF), Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP) Part 1 - Evaluating, Assessing, and Documenting Environmental Data Collection and Use Programs. March 2005.
- 20) EPA 505/B-04/900B Intergovernmental Data Quality Task Force (IDQTF), Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP) Part 2B – Quality Assurance/Quality Control Compendium: Minimum QA/QC Activities. March 2005.
- 21) EPA 505/B-04/900C Intergovernmental Data Quality Task Force (IDQTF), Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP) Part 2A – Workbook for UFP for QAPP (March 2005). Optimized UFP-QAPP Worksheets. March 2012.
- 22) EPA 600/R-04/003 National Environmental Laboratory Accreditation Conference (NELAC) Standard, Chapter 5 – Quality Systems, June 2003 (or the 2009 NELAC Institute standards if already implemented by the applicable state accrediting body)
- 23) EPA 600/4-79/020 Methods for Chemical Analysis of Water and Wastes. March 1983.

- 24) Directive 9240.0-05A EPA Specifications and Guidance for Contaminant-Free Sample Containers, EPA/540/R-93/051, Office of Solid Waste and Emergency Response.
 - 25) Directive 9200.1-103 Inclusion of Scribe into the Role of Tracking Superfund Sampling Data
 - 26) EPA Contract Laboratory Program, Statement Of Work for Superfund Analytical Methods, Multi-Media, Multi-Concentration (SFAM01.1). November 2020.
 - 27) EPA Region 2 Electronic Data Deliverable Comprehensive Specification Manual (current edition), <https://www.epa.gov/superfund/region-2-superfund-electronic-data-submission>.
 - 28) EPA Electronic Data Deliverable (EDD) Comprehensive Specification Manual 4.0
 - d. New Jersey Administrative Code (N.J.A.C.)
 - 1) N.J.A.C. 7:14A New Jersey Pollutant Discharge Elimination System (NJPDES) Rules
 - 2) N.J.A.C. 7:26 Solid & Hazardous Waste Regulations
 - 3) N.J.A.C. 7:26D Remediation Standards
 - e. New Jersey Department of Transportation (NJDOT)
 - 1) NJDOTSS Standard Specifications for Road and Bridge Construction (NJDOTSS) and all addenda and supplements thereto
 - 2) NJDOTSS 917.01 Topsoil
 - f. New Jersey Department of Environmental Protection (NJDEP)
 - 1) NJDEP Fill Material Guidance for SRP Sites
- B. Definitions
1. The definition of acronyms used by the Contractor that pertain to CDQC shall be clearly defined for all contract related products and communications.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES:
1. Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP); Pre-Construction Submittals; EA
 - a. The UFP-QAPP shall be submitted to the EPA's Representative for approval at least 28 calendar days prior to the first Pre-Work Conference in accordance with Paragraph 3.3.
 2. Trip Report; Test Reports; FIO
 - a. The Contractor shall submit Trip Reports in accordance with Paragraph 1.5.H.1.a.
 3. Topsoil and Backfill Material Testing Results; Test Reports; EA
 - a. The Contractor shall submit topsoil and backfill sample results to the EPA's Representative for approval prior to use of such sources in accordance with Paragraph 3.5.A.2.
 4. Analytical Data; Test Reports; FIO
 - a. Electronic copy of all the analytical data collected at the site shall be submitted to the EPA's Representative in accordance with Paragraph 3.8.B.
 5. Field Screening Data; Test Reports; FIO

- a. Electronic copy of all field screening data collected at the site to verify the effectiveness of the decontamination method selected for cleaning the riprap and armor stone.
6. Non-Conformance Reports; Test Reports; FIO
 - a. Reports shall be submitted within 48-hours of the occurrence of any significant problem with sampling, analytical procedures, instrument calibration and maintenance, and project quality control. Significant problems shall include, without limitation, the items specified herein as requiring corrective actions by the Contractor.
7. Chemical Data Final Report (CDFR); Test Reports; EA
 - a. The CDFR as described in Paragraph 3.6 shall be submitted to the EPA's Representative within 30 calendar days of completing work at the Site and before final payment. Each report shall be labeled with the contract number, project name, and location.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination Meeting
 1. Before start of construction, the Contractor shall meet with the EPA's Representative at the construction site to discuss the Contractor Quality Control (CQC) Plan and the UFP-QAPP. EPA will include the state, where appropriate, for the coordination meeting.
 2. The coordination meeting shall be simultaneous to any CQC coordination meeting required in SECTION 01451 - CONTRACTOR QUALITY CONTROL unless otherwise indicated or directed.
 3. A list of definable features of work that involve chemical measurements shall be agreed upon. At a minimum, each matrix (soil, water, air, instrumental chemical parameter measurement, etc.) shall be a definable feature of work.
 4. Management of the chemical data quality system including project DQOs, project submittals, chemical data documentation, chemical data assessment, required sampling and analysis protocols, and minimum data reporting requirements shall be agreed upon.
 5. The meeting will serve to establish an interrelationship between the Contractor's chemical data quality management and EPA chemical quality assurance requirements.
 6. Minutes of the meeting shall be documented by the Contractor and shall be signed by both the Contractor and the EPA's Representative. The minutes shall include any or all unresolved chemical issues along with the conditions for resolution and shall become a part of the contract file.
 7. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures that may require corrective action by the Contractor.

1.5 QUALITY ASSURANCE

- A. The Contractor shall be responsible for the following QA/QC elements necessary to monitor and ensure the quality of chemical data produced.
- B. Analytical Testing Laboratories
 1. General
 - a. The Contractor shall comply with the Superfund Field and Analytical Services Teaming Advisory Committee (FASTAC) policy as detailed in SOP HW-32 in selecting and implementing analytical services for this project. This policy requires use of the tiered decision tree for procuring Superfund analytical

services for all non-time critical data collection projects. The decision tree tiers are as follows:

- 1) Tier 1: EPA Region II Laboratory Services and Applied Science Division (LSASD) including Environmental Services Assessment Team (ESAT) support
 - 2) Tier 2: National Analytical Services Contract Laboratories Program (CLP)
 - 3) Tier 3: Region Specific Analytical Services (SAS) Contract laboratories
 - 4) Tier 4: Contractor, Interagency Agreement (IAG) and Field Contractor Subcontract laboratories
- b. The Contractor shall submit the analytical service request (ASR) form to the EPA Regional Sample Control Center (RSCC) a minimum of four weeks prior to mobilization of the sampling event. The ASR shall be submitted to EPA's SharePoint site.
- C. The Contractor shall propose analytical subcontract laboratories in the UFP-QAPP for analytical services that cannot be accommodated through the LSASD and/or CLP. The use of subcontract laboratories shall be approved by the EPA's Remedial Project Manager (RPM). The Contractor shall provide justification for use of a subcontract laboratory to the EPA RPM along with the ASR indicating the required analyses, turnaround times, special requests, etc. The subcontract laboratory shall meet the certification requirements listed in Paragraph 1.5.E.
- D. Subcontracted Laboratory Analytical Requirements
1. The Contractor shall provide chemical analyses for all parameters by methods specified in the project Specifications to achieve the project DQOs.
- E. Subcontract Laboratory Certification
1. Environmental laboratory services are to be provided only by laboratories compliant with the most recently published version of the DOD Quality Systems Manual (QSM), including the National Environmental Laboratory Accreditation Conference (NELAC) Standard Chapter 5 and Appendix requirements (EPA/600/R-04/003), holding a current National Environmental Laboratory Accreditation Program (NELAP) accreditation for all appropriate fields-of-testing, and certified by the State of New Jersey. Before testing services can be performed by the laboratory, the Contractor shall verify the candidate laboratory's acceptability by reviewing their certifications. NELAP accreditation information is to be provided annually. The laboratory shall notify the EPA's Representative immediately of any change in status of laboratory operations that may affect ongoing compliance with these requirements. The EPA may, at any time, conduct audits (including requests for pertinent data or information) that support an environmental laboratory's self-declaration of compliance with this policy. If the EPA finds the laboratory is in non-compliance, the Contractor shall utilize alternate, compliant laboratory services until such time as compliance is again demonstrated. Before performing environmental testing, the laboratory shall have access to the approved UFP-QAPP.
- F. Subcontracted Laboratory Performance
1. The Contractor shall provide oversight to ensure continued acceptable analytical performance and shall establish a procedure to address data deficiencies noted by review and/or quality control sample results. The Contractor shall provide and implement a mechanism for providing analytical laboratories with the UFP-QAPP, for monitoring the laboratory's performance and for performing corrective action procedures. The Contractor shall acquire analytical services with NELAP-accredited and State of New Jersey-certified laboratories.

G. Contractor QC Sample Collection and Analysis

1. QC samples shall be collected and analyzed by the Contractor in accordance with the Contract Laboratory Program Guidance for Field Samplers (EPA 540/R-014/013) and other guidance documents and the Contractor's approved UFP-QAPP. Standard Reference Materials (SRMs) from the National Institute of Standards and Technology (NIST) shall be utilized when available for the matrix and analytes of interest. QC samples shall be collected as described in the Contractor's approved UFP-QAPP. The following summarizes the minimum QC sampling requirements:
 - a. Field duplicates shall be collected at a rate of at least one per every 20 samples to assess the overall precision of the field sampling technique.
 - b. One trip blank shall be included with each daily shipment that contains aqueous samples collected for VOC analysis to verify the presence or absence of cross contamination in VOC samples during handling and shipment from the field to the laboratory.
 - c. One field (or equipment/rinsate) blank shall be collected at a frequency of one per decontamination event, not to exceed one per day, for each equipment type and for each sample matrix to assess the effectiveness of equipment decontamination.
 - d. One cooler temperature indicator or "temperature blank" will be placed in each cooler containing samples (solid and aqueous) for analysis to verify that samples have been maintained at 0-6° C.
 - e. One matrix spike/matrix spike duplicate (MS/MSD) will be collected at a rate of one per sample delivery group (SDG), as defined by the Contract Laboratory Program Guidance for Field Samplers to demonstrate the accuracy of laboratory analysis. MS/MSDs are not required for VOC and SVOC analysis in EPA Region 2.

H. Documentation of Sample Collection and Analysis

1. CLP Laboratory
 - a. The Contractor shall submit a trip report to the EPA RSCC within seven days of collection of the final sample in a CLP case for samples analyzed by a CLP laboratory. The trip report shall include sample locations, dates of collection and shipment, identification of QC samples, and names of laboratories to which samples were submitted. The trip report shall be submitted via email or hardcopy mail to the RSCC coordinator, Ms. Christina Leung, at the EPA Region 2 office, MS-215, 2890 Woodbridge Avenue, Edison, New Jersey 08837.
2. Subcontract Laboratory

I. Review of Primary Laboratory Data

- a. The Contractor shall be responsible for the independent review of the entire data set.

J. Data Validation

1. The Contractor shall validate analytical data for samples analyzed by the Contractor's subcontract laboratory. The data shall be evaluated in accordance with new validation SOPs for CLP Method SFAM01.1 as appropriate or accordance with EPA Contract Laboratory Program National Functional Guidelines referenced in Paragraph 1.2. The Contractor shall contact Jennifer Feranda at Feranda.jennifer@epa.gov for new validation SOPs for CLP Method SFAM01.1. The Contractor shall provide validation SOPs for any methods not covered by these documents. Radionuclide data shall be evaluated in accordance with MARLAP Chapter 8, Section 5 (EPA/402/B-04/001A). Items listed below shall be assessed as part of the data validation. The data validation criteria shall be consistent with project DQOs and discussed in the approved UFP-QAPP. The Contractor shall prepare a data validation report, which shall include a

summary of the independent data reviewer's findings. The summary shall consist of a table listing each QC result outside of established criteria, the established criteria, and the validation actions. Comments shall be included on how these data affect the validity of analytical results of the samples including data qualifiers used. The data validation report shall include, but not be limited to, the following parameters:

- a. Data completeness
 - b. Method blank and field blank results
 - c. Holding time including sample integrity
 - d. Surrogate recovery results
 - e. Instrument calibration
 - f. Matrix spike results
 - g. Continuing calibration verification
 - h. Laboratory and field duplicate results
 - i. Laboratory control samples
 - j. Verification of sample results
2. The Contractor shall have the laboratory data validated by an organization independent of the organization generating the data. The data validation reports shall be submitted as an appendix to the Chemical Data Final Report discussed in Paragraph 3.6.

PART 2 - PRODUCTS (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

- A. The Contractor shall be responsible for chemical sample acquisition, sample analysis, instrumental measurements of chemical parameters and for CDQC. An effective CDQC system that meets the requirements for the chemical measurement DQO applicable to the project shall be established. The chemical data QC system shall consist of a chemical Quality Management staff responsible for the UFP-QAPP, analytical procedures, minimum data reporting requirements and the organization necessary to produce the required chemical data. The system shall cover chemical measurements pertaining to and required for Contractor- and subcontractor-produced chemical data. The Contractor shall control field screening, sampling, and testing in conjunction with remedial activities to meet all DQOs, minimize the amount of excavated material requiring temporary storage, prevent dilution of contaminated soils with clean soils, and ensure completion of work within the required time.

3.2 CONTRACTOR QUALITY CONTROL PLAN

- A. General
 1. In addition to the quality control requirements specified in SECTION 01451 - CONTRACTOR QUALITY CONTROL, the CQC Plan shall incorporate the qualifications, authority and responsibilities of all chemical quality management and support personnel.
- B. Chemistry Elements of the CQC Plan
 1. To cover contract related chemical measurements by the Contractor and all subcontractors, the CQC Plan shall include the following at a minimum:
- C. Qualifications
 1. Names, education, experience qualifications, authorities, and decision-making responsibilities of all chemical quality management and support personnel. The CQC

Plan shall contain a copy of a letter from the project QC manager designating and authorizing a Chemical Quality Control Officer and chemical quality control organization staff.

D. Authority and Responsibility

1. A diagram, flow chart, or figure clearly depicting the chemical data quality management and support staff and the authority and responsibility of each of the staff for chemical sampling and analysis, procedures for corrective actions, deliverables and submittals, deviations and changes, chemical quality documentation, data validation, minimum data reporting requirements, and DQO for chemical parameter measurement by the Contractor and subcontractors. The contents of this section of the CQC Plan shall be included in the applicable "Project Organization" elements of the QAPP.

3.3 UNIFORM FEDERAL POLICY QUALITY ASSURANCE PROJECT PLAN (UFP-QAPP)

A. General

1. The UFP-QAPP shall describe all chemical parameter measurements for all phases of the remedial action. The Contractor must provide sufficient detail for the project team to obtain data that meet the DQOs of the project. The Contractor's QAPP shall be in accordance with the UFP-QAPP Manuals referenced in Paragraph 1.2.

B. Level of Detail

1. The UFP-QAPP shall contain necessary technical detail and direction such that field and laboratory personnel understand all sampling and field measurement requirements. It shall document all aspects of the project, planning, implementation, assessment, corrective actions, and reconciliation of completed tasks with documented planned objectives. It shall contain sufficient direction and detail that on-site personnel can perform all on-site activities required to attain project DQOs, including collection of samples for off-site chemical analysis, shipment of samples for off-site analyses, performance of on-site instrument measurements, and documentation and reporting requirements. The level of detail in the UFP-QAPP shall be such that any technically competent personnel unfamiliar with the Site can follow the plan and perform all required work. It shall contain sufficient direction and detail that analytical laboratory personnel understand the analytical methods required and project-required reporting limits, project DQIs measurement performance criteria, and project data validation and reporting requirements.

C. Appendices

1. The Appendices section of the UFP-QAPP shall contain all Contractor standard forms, project figures and tables, and SOPs, and all references pertaining to the project requirements included in the UFP-QAPP relating to project DQOs, standard and non-standard measurement methods, equivalency data, U.S. Government and regional agency guidance and regulatory documents, existing Site-related documents, and other contract-related chemical analysis documents. Reference to all applicable SOPs from EPA/540/P-87/001B, Compendium of Superfund Field Operations Methods, or Contractor SOPs, where applicable, shall be included.

D. Content

1. The UFP-QAPP shall meet the requirements of the UFP-QAPP Manual and shall cover, at a minimum, the following topics:
 - a. Distribution List
 - b. Title and Approval Page
 - c. Project Description

- d. Introduction, including Summary of Scope and Objectives, Site History and Contaminants
 - e. Existing Site Data Summary – Evaluation of Secondary Data and Use Limitations
 - f. Project Description/Problem Definition/Site-Specific Analysis Problems
 - g. Project Objectives/Systematic Planning Documentation/Data Quality Objectives
 - h. Sampling Design and Rationale
 - i. Scope and Objectives
 - j. Project Schedule and Timelines
 - k. Project Organization and Responsibility
 - l. Personnel Responsibilities, Qualifications and Special Training Requirements
 - m. Field Activities and Standard Operation Procedures (SOPs)
 - n. Field and Laboratory QC Samples
 - o. Sampling Procedures and Container/Preservation Requirements
 - p. Sample Custody, Chain-of-Custody/Sample Documentation
 - q. Sample Handling/Identification
 - r. Field Logbooks and Contents; Documentation Procedures
 - s. Sample Packaging and Shipping
 - t. Equipment Decontamination
 - u. Contractor Quality Control
 - v. Daily Quality Control Reports
 - w. Field Quality Control and Corrective Actions
 - x. Sampling Apparatus and Field Instrumentation
 - y. Data Quality Objectives and Measurement Performance Criteria
 - z. Sample Custody and Holding Times
 - aa. Analytical Procedures
 - bb. Reference Limits and Evaluation of Quantitation Limit Goals
 - cc. Laboratory Calibration Procedures and Frequency
 - dd. Internal QC Checks
 - ee. Calculation of Data Quality Indicators
 - ff. Laboratory Corrective Actions
 - gg. Data Reduction, Review, Validation and Reporting
 - hh. Laboratory Reporting Requirements
 - ii. Preventive Maintenance (Field and Laboratory)
 - jj. Performance and System Audits
 - kk. QC Reports to Management
 - ll. Appendices
- E. The UFP-QAPP shall include a table of contents; crosswalk showing that all UFP-QAPP elements have been addressed; definitions, acronyms, and references pertaining to the project; and other related chemical analysis documents such as the data validation SOPs.
 - F. The “Sampler’s Guide: Contract Laboratory Program Guidance for Field Samplers” (EPA 540/R-014/013), October 2014 procedures shall be followed for sample packing and shipment.
 - G. All Department of Transportation (DOT) regulations under 40 CFR 261 shall be followed regarding shipment of the samples.

3.4 CHEMISTRY REQUIREMENTS

- A. Chemical data shall be acquired, documented, verified, and reported in a manner that assures that the precision, accuracy, and completeness requirements are achieved, as specified in the Contractor’s approved UFP-QAPP. The Contractor must demonstrate

the analytical chemistry methods' ability to meet the project data quality objectives (DQOs). Where national standard methods are not available for the medium, methods published by reputable technical organizations (e.g., ASTM) shall be utilized. Sampling, analysis, and measurement requirements listed in the following subsections shall be included in the UFP-QAPP.

B. Data Quality Objectives

1. Project Objective - the overall project objective is to remove the contaminated material (source materials including slag, battery casings, associated wastes, and contaminated soil/sediment) from the site, decontaminate newer and weathered riprap and reuse, and backfill the excavation with certified clean fill material in accordance with the Contract Documents.
2. Sampling Objectives
 - a. Samples shall be acquired, and chemical parameter measurements shall be performed in such a manner that the resulting data meets and supports data use requirements. Both definitive and field screening data are anticipated for this project, as defined by the EPA Guidance for Systematic Planning (EPA 240/B-06/001).
 - b. Field screening quality data shall be generated for health and safety purposes as well as to identify media or samples that may be subject to further analysis.
 - 1) The Contractor shall include a field screening method such as utilizing handheld X-ray fluorescence (XRF) in conjunction with startup pilot testing to verify the effectiveness of the decontamination method selected for cleaning the riprap and armor stone.
 - 2) If the Contractor includes a pre-confirmatory XRF screening to assist in determining the extent of contamination for secondary excavation, then the soil/sediment sample will need to be dried before conducting the screening analysis.
 - c. Definitive level quality data shall be used to delineate soil/sediment contamination, characterize excavated material, demonstrate backfill materials and topsoil quality, characterize water prior to discharge, verify that discharge water samples meet the surface water discharge requirements, verify that the remediation cleanup levels have been met, and determine if contamination occurred below decontamination areas as a result of remedial activities. Definitive quality data shall be acquired, documented, verified, and reported to ensure that the specified data quality indicators (DQIs) (precision, accuracy, representativeness, comparability, completeness, and sensitivity) measurement performance criteria are achieved. Sampling objectives are discussed in detail to ensure that the data obtained will be of sufficient quality and quantity to meet the DQOs.
 - 1) Waste characterization samples from excavated soil/sediment shall be analyzed in accordance with an approved disposal facility / RCRA Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDFs) sampling requirements. The analytical results obtained by the Contractor shall be sufficient to address any and all requirements of the selected disposal facility/TSDFs. The sampling requirements to be contained in the Contractor's UFP-QAPP shall include specific disposal facility/TSDFs requirements for sampling, analysis, and reporting.
 - 2) Samples of topsoil and backfill materials from each off-site source shall be collected and analyzed for the parameters listed in Paragraph 3.5.A.2. Sample data shall be sufficient to demonstrate that topsoil and backfill materials do not contain contaminant levels that are hazardous to human

health or the environment. The Contractor shall compare chemical sample data to the NJDEP RDCSRS. Radiological sample data shall be compared to the criteria specified in Paragraph 3.5.A.2.c. Sample results exceeding the RDCSRS (Table 01450-2), and radiological criteria specified herein, where those numbers are not below method detection levels, shall be unacceptable as topsoil or backfill. The gamma spectroscopy sample summary shall include all detectable radionuclides. No backfill or topsoil shall be brought to the site without written approval from the EPA's Representative.

- 3) Process water samples from the on-site temporary water treatment system shall be collected and analyzed to monitor treatment plant performance and refine operating conditions. Effluent samples (water) shall be collected and analyzed in accordance with discharge permit equivalency requirements (surface water discharge). The sampling requirements to be contained in the Contractor's UFP-QAPP shall include effluent limits for all compounds required under the discharge permit equivalency.
 - 4) Post-excavation soil/sediment samples shall be analyzed for lead to confirm the final limits of excavation. The analytical results obtained by the Contractor shall be sufficient to confirm the final limits of excavation. The sampling requirements to be contained in the Contractor's UFP-QAPP shall include specific chemical concentrations as stated in the remedial action levels defined in Table 01450-1.
 - 5) Samples from the riprap decontamination pads and from contaminated soil/sediment stockpile areas, if any, located outside of the Exclusion Zone, shall be collected after removal of the decontamination pad or stockpiles to verify that no cross-contamination has occurred in the area due to leakage. The samples shall be analyzed for lead and shall be compared to the remedial cleanup level of 400 milligrams per kilogram (mg/kg). Areas where sample results exceed the above criteria shall be excavated to remove the contamination in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL and be re-sampled.
 - 6) Air samples shall be analyzed, and conditions shall be monitored in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE and SECTION 01362 – PERIMETER AIR MONITORING. The analytical results obtained by the Contractor shall be sufficient to assess worker and resident health risks associated with site activities. The sampling requirements to be contained in the Contractor's Safety and Health Plan shall include specific compound concentrations for upgrading levels of protection and stopping work, and specific reporting requirements.
3. Chemical DQO
- a. Chemical data shall be acquired, documented, verified, and reported in a manner that ensures that the precision, accuracy, and completeness requirements provided in Table 01450-3 are achieved. The UFP-QAPP shall comply with the DQO process requirements as specified in EPA 600/R-96/055.

3.5 SAMPLING, ANALYSIS, AND MEASUREMENT REQUIREMENTS

A. Sampling, analysis, and measurement requirements listed in the following subsections shall be included in the UFP-QAPP.

1. Waste Characterization Sampling Requirements

- a. Samples from excavated contaminated soil, sediment, slag, and battery casing shall be collected and analyzed in accordance with the Contractor's approved TSDFs requirements.
 - b. Samples shall be analyzed for waste characteristics to determine handling, transportation, and disposal requirements. The number and volume of samples will be determined by the TSDFs.
 - c. Standard analytical requirements for waste characterization samples are listed below:
 - 1) Paint Filter Liquid Test
 - 2) Corrosivity
 - 3) Ignitability
 - 4) Reactivity – Hydrogen Cyanide
 - 5) Reactivity – Hydrogen Sulfide
 - 6) Toxicity Characteristic Leaching Procedure (TCLP) – Metals
 - 7) TCLP – Volatile Organic Compounds (VOCs)
 - 8) TCLP – Semi-volatile Organic Compounds (SVOCs)
 - 9) TCLP – Pesticides
 - 10) TCLP – Herbicides
 - 11) Polychlorinated Biphenyls (PCBs)
 - 12) Moisture Content
 - d. Analytical methods for the above parameters are included in Table 01450-4.
 - e. The Contractor shall ensure that all the TSDFs requirements are met prior to shipment of the waste. EPA approval is required to utilize a TSDFs for hazardous waste generated from the Site.
2. Backfill and Topsoil Sampling Requirements
- a. Clean backfill and topsoil material samples shall be collected as stated in SECTION 02201 – BACKFILL, COMPACTION AND GRADING and NJDEP guidance document “Fill Material Guidance for SRP Sites, Version 4.0” to ensure that they are free of chemical contamination.
 - b. Analytical parameters to verify that backfill and topsoil are free of chemical contamination include:
 - 1) EPA TAL metals, mercury, and cyanide
 - 2) EPA Target Compound List (TCL) compounds + Acrolein, Acrylonitrile, Benzidine, 1,2-Diphenylhydrazine, N-Nitrosodimethylamine and Tertiary Butyl Alcohol
 - 3) Extractable Petroleum Hydrocarbon (EPH)
 - 4) Radium-226 (Gamma Spectroscopy)
 - 5) Gamma Radiation Exposure Rate (Field Screening)
 - 6) Soil pH (using method SW-846 9045D)
 - c. Analytical methods for the above parameters are included in Table 01450-4.
 - 1) The criteria for backfill to be free of radiological contamination are listed below:
 - a) Radium-226 < 3 picoCuries per gram (pCi/g) (assuming background level of 1 pCi/g)
 - b) Gamma Radiation Exposure Rate < 30 micro-Roentgen per hour (µR/hr)
 - d. Analytical parameters for topsoil shall include, at a minimum, total organic carbon, pH, and nutrients (nitrogen, phosphate, and potassium). Sample data shall be sufficient to demonstrate that topsoil materials meet the NJDOTSS 917.01 and ASTM D5268 requirements in accordance with SECTION 02900 – SITE RESTORATION.

3. Treatment Water Sampling Requirements
 - 1) The Contractor shall collect and analyze treated water samples in accordance with the discharge permit NJPDES DSW. The Contractor shall prepare a table that shows effluent criteria for each chemical analyte/compound/test parameter included in the water testing program.
4. Post-Excavation Sampling Requirements
 - a. Post-excavation samples shall be collected as per SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL and as shown on the Design Drawings. The samples shall be sent to the off-site laboratory for lead analysis to confirm or revise excavation requirements in accordance with EPA Cleanup Criteria listed in Table 01450-1.
5. Decontamination Area Sampling Requirements
 - a. Samples from the decontamination areas shall be collected to verify that no cross-contamination has occurred in these areas due to leakage. The samples shall be collected as per SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. The samples shall be sent to the off-site laboratory for lead analysis to verify the results are below the EPA Cleanup Criteria listed in Table 01450-1.
6. Stockpile Areas Located Outside of Exclusion Zone Sampling Requirements
 - a. Samples from the contaminated soil stockpile areas, if any, outside of the limits of excavation shall be collected to verify that no cross-contamination has occurred in these areas due to leakage. The samples shall be collected as per SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. The samples shall be sent to the off-site laboratory for lead analysis to verify the results are below the EPA Cleanup Criteria listed in Table 01450-1.
7. Air Monitoring Sampling Requirements
 - a. The Contractor shall conduct air monitoring throughout the project. Air monitoring, including sampling, shall be performed as outlined in SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE and SECTION 01362 – PERIMETER AIR MONITORING.

3.6 CONTROL OF CHEMICAL DATA QUALITY

A. General

1. Contractor CDQC shall ensure that a quality control program is in place that assures sampling and analytical activities and the resulting chemical parameter measurement data comply with the DQO and the requirements of the QAPP. The Contractor shall utilize the three phased control system that includes a preparatory, initial and follow up phase for each definable feature of work. The Contractor's three phase chemical data control process shall ensure that data reporting requirements are achieved and shall be implemented according to SECTION 01451 - CONTRACTOR QUALITY CONTROL. When possible, the three phase chemical data control process shall be combined with that under SECTION 01451 - CONTRACTOR QUALITY CONTROL.

B. Three Phase Process

1. The preparatory phase shall include a review of the Specifications, UFP-QAPP, and all relevant SOPs for the chemical parameter measurement and/or chemical sample acquisition and shipment. It shall include a physical examination of all required forms, materials, and equipment to ensure conformance with the UFP-QAPP and that all materials are on Site. It shall include a demonstration of sampling procedures by the Contractor's field sampling personnel.

2. The initial phase shall be performed at the initiation of each definable feature of work by the CQC Representative to confirm compliance with the UFP-QAPP, including instrument calibration, operation and performance checks, sample acquisition, labeling, and shipment in accordance with required SOPs, sampling equipment decontamination, and completion of all required documentation.
3. The follow up phase shall require daily inspections to ensure compliance with the UFP-QAPP.

3.7 SUBCONTRACT ANALYTICAL TESTING LABORATORIES

A. General

1. The Contractor shall propose the analytical laboratories to be used for the sample analyses in case of LSASD or CLP cannot accept the samples. Laboratory certification requirements shall be in accordance with Paragraph 1.5.E. The Contractor may utilize its own laboratory or utilize subcontract laboratories to achieve the required sample analyses.

B. Laboratory Analytical Requirements

1. The Contractor shall provide the chemical analyses specified in this Specifications through the LSASD/CLP and/or subcontractor's laboratory. The Contractor shall provide chemical analyses for all parameters by methods specified in the project Specifications to achieve the project DQOs.

C. Laboratory Performance

1. The Contractor shall monitor and ensure continued acceptable analytical performance and shall establish a procedure to address data deficiencies noted by review and/or quality assurance sample results. The Contractor shall provide and implement a mechanism for providing analytical laboratories with the QAPP, for monitoring the laboratories' performance and for performing corrective action procedures. The Contractor shall acquire analytical services with NELAP-accredited and State of New Jersey-certified laboratories in case of LSASD or CLP cannot accept the samples.

3.8 ANALYTICAL DATA

A. Electronic Copy

1. The chemistry data packages shall be reproduced and provided to the EPA's Representative no later than 4 weeks after receipt of the analytical data package from the laboratory. The chemistry data package shall contain information to demonstrate that the project's DQO have been fulfilled.

B. Electronic Data Deliverables (EDD)

1. The Contractor shall prepare and submit to EPA a final EDD for all samples collected by the Contractor in accordance with the procedures and requirements set forth in the Comprehensive Specification Manual (current edition) and as described at the following website. <https://www.epa.gov/superfund/epa-superfund-electronic-data-submission-multi-regions-edd>
2. The EDD shall include sample information including sample locations (horizontal coordinates and surface elevation) and sample results. The EDD shall also include an updated geo- referenced electronic base map in AutoCAD drawing exchange (DXF) format showing Site features, monitoring well locations, and updated Site grades following the soil remediation program.
3. The Contractor shall provide the EPA's Representative with a copy of the transmittal letter for all EDD submissions, identifying what data were provided in the EDD. The Contractor shall also provide the EPA's Representative with a copy of the notice from EPA that the EDD submittal was successfully uploaded.

3.9 QUALIFICATIONS

A. Chemical Quality Control Officer

1. As a minimum, the Contractor's Chemical Quality Control Officer shall have a bachelor's degree (B.A. or B.S.) in Chemistry, three years of experience with Hazardous Toxic and Radioactive Waste (HTRW) Quality Control including hazardous waste manifesting. The Chemical Quality Control Officer shall ensure that all chemistry-related requirements including responsibilities for DQO definitions, sampling and analysis, project requirements for data documentation and validation, and final project reports are attained. The Chemical Quality Control officer need not be present on Site during routine sampling but shall be available for consultation with the EPA's Representative and Contractor personnel.

B. Environmental Sampler

1. As a minimum, the Contractor's Environmental Sampler shall have a B.A. or B.S. degree in Chemistry or closely related scientific/technical field, 1 year of experience in and knowledge of EPA methods for collecting environmental and hazardous waste samples and 1 year of experience in calibration and operation of field screening equipment e.g., XRF (X-ray fluorescence) analyzer. The Environmental Sampler shall collect all on-site samples as well as perform all field-screening tests. The Environmental Sampler shall review the sampling results and provide recommendations for the Contractor's sampling program. The Environmental Sampler shall be on-site during excavation and stockpiling operations involving soil to be checked for contamination.

C. Project Chemist

1. At a minimum, the Contractor's Project Chemist shall have: a B.A. or B.S. degree in chemistry; 3 years of experience related to investigations, studies, design, and remedial actions at Hazardous, Toxic, and Radioactive Waste (HTRW) sites; 2 field seasons of experience in calibrating and operating various field monitoring devices; and 2 years of sample analysis experience in HTRW program and activities. The Project Chemist shall ensure that all chemistry-related goals of the program are attained.

3.10 CHEMICAL DATA FINAL REPORT (CDFR)

- A. The CDFR shall be produced after project completion; it shall include a summary of quality control practices employed and all chemical parameter measurement activities. This includes, but is not limited to, all data analyzed by the Contractor's subcontract laboratories, if any, and shall include all definitive data. At a minimum, the CDFR shall contain the following:
1. Summary of project scope and description
 2. Summary of any deviations from the design chemical parameter measurement Specifications
 3. Summary of chemical parameter measurements performed as contingent measurements
 4. Summary discussion of resulting data including achieving data reporting requirements
 5. Summary of DQO parameters including achieving sampling project specific DQO
 6. Presentation and evaluation of the data to include an overall assessment on the quality of the data for each method and matrix
 7. Internal QC data generated during the project, including tabular summaries correlating sample identifiers with all blank, matrix spikes, surrogates, duplicates, laboratory control samples, SRMs from the NIST (if used), and batch identifiers.

8. A list of the affected sample results for each analyte (indexed by method and matrix) including the appropriate data qualifier flag (J, U, UJ, and R), where sample results are potentially impacted by quality control outliers
9. Summary of field and laboratory oversight activities, providing a discussion of the reliability of the data, QC problems encountered, and a summary of the evaluation of data quality for each analysis and matrix as indicated by the laboratory QC data and any other relevant findings
10. Conclusions and recommendations
11. Appendices containing chemistry data packages for all subcontract laboratory data (hardcopy and electronic copy on disk) and data validation reports.

3.11 NOTIFICATION OF NON-COMPLIANCE

- A. The EPA's Representative will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice.

END OF SECTION

Table 01450-1

Record of Decision Remediation Cleanup Levels for Soil/Sediment

Soil/Sediment Contaminant of Concern	Remediation Cleanup Level mg/kg (milligrams/kilograms)
Lead	400

Source: Raritan Bay Slag Superfund Site Record of Decision (EPA, 2013)

Table 01450-2 Residential Direct Contact Soil Remediation Standards

Contaminant	CAS No.	Residential Direct Contact Soil Remediation Standard (mg/kg)
Acenaphthene	83-32-9	3,400
Acenaphthylene	208-96-8	NA
Acetone (2-Propanone)	67-64-1	70,000
Acetophenone	98-86-2	2
Acrolein	107-02-8	0.5
Acrylonitrile	107-13-1	0.9
Aldrin	309-00-2	0.04
Aluminum	7429-90-5	78,000
Anthracene	120-12-7	17,000
Antimony	7440-36-0	31
Arsenic	7440-38-2	19*
Atrazine	1912-24-9	210
Barium	7440-39-3	16,000
Benzaldehyde	100-52-7	6,100
Benzene	71-43-2	2
Benzidine	92-87-5	0.7
Benzo(a)anthracene (1,2-Benzanthracene)	56-55-3	0.6
Benzo(a)pyrene	50-32-8	0.2
Benzo(b)fluoranthene (3,4-Benzofluoranthene)	205-99-2	0.6
Benzo(ghi)perylene	191-24-2	380,000
Benzo(k)fluoranthene	207-08-9	6
Beryllium	7440-41-7	16
1,1'-Biphenyl	92-52-4	3,100
Bis(2-chloroethyl)ether	111-44-4	0.4
Bis(2-chloroisopropyl)ether	108-60-1	23
Bis(2-ethylhexyl)phthalate	117-81-7	35
Bromodichloromethane (Dichlorobromomethane)	75-27-4	1
Bromoform	75-25-2	81
Bromomethane	74-83-9	25
2-Butanone (Methyl ethyl ketone) (MEK)	78-93-3	3,100
Butyl benzyl phthalate	85-68-7	1,200
Cadmium	7440-43-9	78
Caprolactam	105-60-2	31,000
Carbazole	86-74-8	24
Carbon disulfide	75-15-0	7,800

Table 01450-2 Residential Direct Contact Soil Remediation Standards (Continued)

Contaminant	CAS No.	Residential Direct Contact Soil Remediation Standard (mg/kg)
Carbon tetrachloride	56-23-5	0.6
Chlordane (alpha and gamma)	57-74-9	0.2
Chlorobenzene	108-90-7	510
Chloroethane (Ethyl chloride)	75-00-3	220
Chloroform	67-66-3	0.6
Chloromethane (Methyl chloride)	74-87-3	4
2-Chlorophenol (o-Chlorophenol)	95-57-8	310
Chrysene	218-01-9	62
Cobalt	7440-48-4	1,600
Copper	7440-50-8	3,100
Cyanide	57-12-5	1,600
4,4'-DDD	72-54-8	3
4,4'-DDE	72-55-9	2
4,4'-DDT	50-29-3	2
Dibenz(a,h)anthracene	53-70-3	0.2
Dibromochloromethane (Chlorodibromomethane)	124-48-1	3
1, 2-Dibromo-3-chloropropane	96-12-8	0.08
1,2-Dibromoethane	106-93-4	0.008
1,2-Dichlorobenzene (o-Dichlorobenzene)	95-50-1	5,300
1,3-Dichlorobenzene (m-Dichlorobenzene)	541-73-1	5,300
1,4-Dichlorobenzene (p-Dichlorobenzene)	106-46-7	5
3,3'-Dichlorobenzidine	91-94-1	1
Dichlorodifluoromethane	75-71-8	490
1,1-Dichloroethane	75-34-3	8
1,2-Dichloroethane	107-06-2	0.9
1,1-Dichloroethene	75-35-4	11
1,2-Dichloroethene (cis) (c-1,2-Dichloroethylene)	156-59-2	230
1,2-Dichloroethene (trans) (t-1,2-Dichloroethylene)	156-60-5	300
2,4-Dichlorophenol	120-83-2	180
1,2-Dichloropropane	78-87-5	2
1,3-Dichloropropene (cis and trans)	542-75-6	2
Dieldrin	60-57-1	0.04
Diethyl phthalate	84-66-2	49,000
2,4-Dimethyl phenol	105-67-9	1,200
Di-n-butyl phthalate	84-74-2	6,100

Table 01450-2 Residential Direct Contact Soil Remediation Standards (Continued)

Contaminant	CAS No.	Residential Direct Contact Soil Remediation Standard (mg/kg)
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	534-52-1	6
2,4-Dinitrophenol	51-28-5	120
2,4-Dinitrotoluene	121-14-2	0.7
2,6-Dinitrotoluene	606-20-2	0.7
2,4-Dinitrotoluene/2,6-Dinitrotoluene (mixture)	25321-14-6	0.7
Di-n-octyl phthalate	117-84-0	2,400
1,2-Diphenylhydrazine	122-66-7	0.7
Endosulfan I and Endosulfan II (alpha and beta)	115-29-7	470
Endosulfan sulfate	1031-07-8	470
Endrin	72-20-8	23
Ethyl benzene	100-41-4	7,800
Fluoranthene	206-44-0	2,300
Fluorene	86-73-7	2,300
alpha-HCH (alpha-BHC)	319-84-6	0.1
beta-HCH (beta-BHC)	319-85-7	0.4
Heptachlor	76-44-8	0.1
Heptachlor epoxide	1024-57-3	0.07
Hexachlorobenzene	118-74-1	0.3
Hexachloro-1,3-butadiene	87-68-3	6
Hexachlorocyclopentadiene	77-47-4	45
Hexachloroethane	67-72-1	35
Indeno(1,2,3-cd)pyrene	193-39-5	0.6
Isophorone	78-59-1	510
Lead	7439-92-1	400
Lindane (gamma-HCH) (gamma-BHC)	58-89-9	0.4
Manganese	7439-96-5	11,000
Mercury	7439-97-6	23
Methoxychlor	72-43-5	390
Methyl acetate	79-20-9	78,000
Methylene chloride (Dichloromethane)	75-09-2	34
2-Methylnaphthalene	91-57-6	230
2-Methylphenol (o-Creosol)	95-48-7	310
4-Methylphenol (p-Creosol)	106-44-5	31
Methyl tert-butyl ether	1634-04-4	110
Naphthalene	91-20-3	6
Nickel (Soluble salts)	7440-02-0	1,600

Table 01450-2 Residential Direct Contact Soil Remediation Standards (Continued)

Contaminant	CAS No.	Residential Direct Contact Soil Remediation Standard (mg/kg)
2-Nitroaniline	88-74-4	39
Nitrobenzene	98-95-3	31
N-Nitrosodimethylamine	62-75-9	0.7
N-Nitrosodi-n-propylamine	621-64-7	0.2
N-Nitrosodiphenylamine	86-30-6	99
Pentachlorophenol	87-86-5	3
Phenanthrene	85-01-8	NA
Phenol	108-95-2	18,000
Polychlorinated biphenyls (PCBs)	1336-36-3	0.2
Pyrene	129-00-0	1,700
Selenium	7782-49-2	390
Silver	7440-22-4	390
Styrene	100-42-5	90
Tertiary butyl alcohol	75-65-0	1,400
1,1,2,2-Tetrachloroethane	79-34-5	1
Tetrachloroethene (PCE) (Tetrachloroethylene)	127-18-4	2
Thallium	7440-28-0	5
Toluene	108-88-3	6,300
Toxaphene	8001-35-2	0.6
1,2,4-Trichlorobenzene	120-82-1	73
1,1,1-Trichloroethane	71-55-6	290
1,1,2-Trichloroethane	79-00-5	2
Trichloroethene (TCE) (Trichloroethylene)	79-01-6	7
Trichlorofluoromethane	75-69-4	23,000
2,4,5-Trichlorophenol	95-95-4	6,100
2,4,6-Trichlorophenol	88-06-2	19
Vanadium	7440-62-2	78
Vinyl chloride	75-01-4	0.7
Xylenes	1330-20-7	12,000
Zinc	7440-66-6	23,000

Table 01450-3 Data Quality Objectives for Chemical Parameters

Data Use	Parameter	Precision (RPD)		Accuracy		Completeness
		Field Duplicate	Laboratory Duplicate	Lab LCS ¹	Lab MS ²	
Waste Characterization	TCLP Analytes ³	NA	<25	80-120%	75-125%	90 %
	PCBs	≤100	≤25	50-130%	40-140%	
	RCRA Characteristic Parameters ⁴	NA	<25	NA	NA	
Post-Excavation Soil/Sediment Stockpile & Decontamination Area Sampling	Lead	<100	<25	90-110%	75-125%	
Backfill and Topsoil Characterization	TCL VOCs	≤50	≤25	90-110%	75-125%	
	TCL SVOCs	≤50	≤25	50-130%	30-150%	
	TCL Pesticide/PCBs	≤50	≤25	50-130%	40-140%	
	TAL Metals, Mercury, and Cyanide	≤100	≤25	90-110%	75-125%	
	EPH	≤50	≤25	50-130%	30-150%	
	Radium-226	≤50	≤25	80-110%	NA	
	Nutrients	<100	<25	NA	NA	
	pH	NA	<25	NA	NA	

Footnotes:

1. The laboratory established control limits may be used in place of the listed control limits.
2. Limits are advisory. The laboratory must calculate and document the precision (lab duplicate) and accuracy of the sample matrix spike results from this Site.
3. TCLP analytes include TCLP VOCs, SVOCs, pesticides, herbicides, and metals.
4. RCRA characteristic parameters are listed in [Paragraph 1.5.E.3](#).

Table 01450-3 Data Quality Objectives for Chemical Parameters (Continued)

EPH	extractable petroleum hydrocarbons	RPD	Relative Percent Difference
TAL	Target analyte list of EPA Contract Laboratory Program	TCL	Target compound list of EPA Contract Laboratory
VOC	Volatile Organic Compound	SVOC	Semi-Volatile Organic Compound
MS	Matrix Spike	TCLP	Toxicity Characteristic Leaching Procedure
NA	Not Applicable	LCS	Laboratory Control Sample
PCBs	Polychlorinated Biphenyls		

Table 01450-4 Analytical Methods for Chemical Parameters

Data Use	Parameter	Analytical Method (All methods are based on SW-846 except as noted)	
		Extraction	Analysis
Waste Characterization	TCLP VOC	1311, 5030B	8260B
	TCLP SVOC	1311, 3510C/ 3520C	8270D
	TCLP Pesticide	1311, 3510C/ 3520C	8081B
	TCLP Herbicide	1311, 8151A	8151A
	TCLP Metals	1311, 3010A	6010C, 7471A
	PCBs	3540C/3541	8082A
	Paint Filter Test	NA	9095B
	Reactivity, Corrosivity, and Ignitability	NA	Reactivity-Cyanide-9014; Reactivity-Sulfide-9034 Corrosivity –1110A/9040C; Ignitability – 1010A
	Moisture Content	NA	ASTM D 2216 - 10
Post-Excavation Soil/Sediment, Stockpile Area Sampling	Lead	3050B	6010C, 7471B
Backfill and Topsoil Characterization	TCL VOC ¹	5030B/5031	8260B
	TCL SVOC	3540C	8270D
	TCL Pesticide/PCBs	Pesticide: 3510C/3520C PCBs: 3540C/3541	Pesticides – 8081B PCBs – 8082A
	TAL Metals including Mercury and Cyanide	3050B; Cyanide - 9013	Metals – 6010C, 7471B; Cyanide – 9012B/ 9010C
	EPH	NA	NJDEP EPH Method Revision 3
	Radium- 226	NA	HASL-300 or EPA approved method
	Nutrients	Potassium and phosphate – 3050B or Mehlich Nitrogen – KCl	Potassium and phosphate - 6010D Nitrogen - KCl-extraction/Cd- reduction or other approved method
	pH	NA	9045D, ASTM D 4972

Footnotes:

1. Additional analytes to be analyzed with TCL compound list include Acrolein, Acrylonitrile, Benzidine, 1,2-Diphenylhydrazine, N-Nitrosodimethylamine and Tertiary Butyl Alcohol

Table 01450-4 Analytical Methods for Chemical Parameters (Continued)

BOD	biological oxygen demand
COD	chemical oxygen demand
EPH	extractable petroleum hydrocarbons
NA	not applicable
PCBs	polychlorinated biphenyls
TAL	target analyte list of EPA Contract Laboratory Program
TCL	target compound list of EPA Contract Laboratory Program1
TDS	total dissolved solids
TOC	total organic carbon
TSS	total suspended solids
VOC	volatile organic compound
SM	Standard Methods
SVOC	semi-volatile organic compound

SECTION 01451
CONTRACTOR QUALITY CONTROL

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall provide all labor, supervision, materials, equipment, and services required to prepare a Contractor Quality Control (CQC) Plan for approval by the EPA's Representative and to perform Contractor quality control in accordance with the approved CQC Plan.

1.2 REFERENCES

- A. References
1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. Where reference is made to one of the standards below, the revision in effect at the time of contract award shall apply.
 - a. American Society for Testing and Materials (ASTM)
 - 1) ASTM D3740 (2012a) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
 - 2) ASTM E329 (2014a) Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES:
1. Contractor's Quality Control Plan; Pre-construction Submittals; EA
 - a. The Contractor shall prepare and submit the Contractor's Quality Control Plan in accordance with Paragraph 3.2.
 2. CQC Organizational Changes; Product Data; EA
 - a. Any CQC organizational changes made during the Contract Period shall be submitted to the EPA's Representative for acceptance.
 3. CQC Reports; Product Data; FIO
 - a. The Contractor shall submit CQC reports, as specified in Paragraph 3.10.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. EPA will include the state, where appropriate, for the quality/inspection meetings.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

- A. The Contractor is responsible for quality control and shall establish and maintain an effective quality control system.
- B. The CQC system shall consist of plans, procedures, and organization necessary to produce an end product that complies with the contract requirements. The system shall cover all construction operations, both on-site and off-site, and shall be keyed to the proposed construction sequence. In this section the term “construction” shall include all items of work, activities, materials, and equipment as indicated in the Contract Documents. Other sections of the Contract Documents may also require separate, specially qualified individuals in such areas as chemical data acquisition, sampling and analysis, medical monitoring, industrial hygiene, safety officer, etc. The CQC organization shall coordinate the activities of these individuals.
- C. The EPA’s Construction Management Contractor, herein referred to as the Contractor shall be held responsible for the quality of work on the job and is subject to removal by the EPA’s Representative for non-compliance with quality requirements specified in the contract. The Contractor in this context shall mean the on-site individual with the responsibility for the overall management of the project including logistics and production.

3.2 CONTRACTOR QUALITY CONTROL (CQC) PLAN

- A. The Contractor shall furnish for review by the EPA’s Representative, no later than 28 calendar days prior to the first Pre-Work Conference, the Contractor Quality Control Plan proposed to implement the requirements herein. The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the definable features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.
- B. Content of the CQC Plan
 - 1. Include, as a minimum, the following to cover all construction-operations, both on-site and off-site, including work by subcontractors’ fabricators, suppliers and purchasing agents:
 - a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three-phase control system for all aspects of the work specified. The staff shall include the Contractor, the CQC Manager and alternate as defined in Paragraph 3.5, and a Subcontractor Quality Control (SQC) Manager. The SQC Manager shall report to an officer in the Contractor’s organization above the Contractor’s superintendent and is responsible for both quality and production.
 - b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.
 - c. A copy of the letter to the Contractor signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the Contractor, including authority to stop

work which is not in compliance with the contract. The Contractor shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the EPA's Representative.

- d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, off-site fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
- e. Control, verification, and acceptance testing procedures for each specific test to include the test name, Specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. Laboratory facilities will be approved by the EPA's Representative. The Contractor shall incorporate all tests required by the Contract Documents (including systems commissioning and operating tests) to derive the above list of testing information which shall be presented in matrix form as part of the CQC Plan. This matrix shall be suitable for use by the Contractor and the EPA's Representative as a checklist to control testing to be done on the contract.
- f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation. Provide matrix of Preparatory and Initial Inspections including Specification reference paragraph, the name of the Definable Feature of Work, and spaces for date performed, results, and names of attendees.
- g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures will establish verification that identified deficiencies have been corrected.
- h. Reporting procedures, including proposed reporting formats.
- i. A list of the definable features of work. A definable feature of work is a task that is separate and distinct from other tasks and has separate control requirements. It could be identified by different trades or disciplines, or it could be work by the same trade in a different environment. Although each section of the Specifications may generally be considered as a definable feature of work, there is frequently more than one definable feature under a particular section. This list shall cover all features of work on the project and shall be agreed upon during the coordination meeting.
- j. A brief explanation of the duties of the CQC organization with respect to safety. A separate Accident Prevention Plan and Hazards Analysis is required for submission and acceptance within the Site Safety and Health Plan.
- k. Contractor's plan for training all CQC personnel.

C. Acceptance of Plan

- 1. Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The EPA's Representative reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

D. Notification of Changes

1. After acceptance of the CQC Plan, the Contractor shall notify the EPA's Representative in writing of any proposed changes. Proposed changes are subject to approval by the EPA's Representative.

3.3 QUALITY CONTROL OF DESIGN ACTIVITIES

- A. All design work products shall undergo thorough and continuous checking in accordance with the Contractor's approved CQC Plan. Checking shall be done by staff who are knowledgeable in the work being checked and independent of the specific work product.
- B. The reviewer's name and date shall be printed on each work product. Whenever practical, work shall be performed on standard computation sheets, which contains a header requiring this information. The title box of drawings also requires this information. The reviewer's name and date are considered evidence that work products have been checked and shall be provided to the technical reviewer of the design report.
- C. Checking Calculations, Tables, Charts, and Data Sheets
 1. Calculations, tables, charts, and data sheets shall be checked by an independent reviewer. Checking shall be performed throughout the design process. The complete thought process and mathematics shall be reviewed. The applicable formulas and design criteria shall be referenced on the computation paper or spreadsheets and reviewed during the checking process.
 2. Corrections shall be clearly noted on the calculations and erroneous figures shall be crossed out. Revisions shall be reviewed with the individual who made the original calculations.
- D. Checking Drawings, Maps, and Sketches
 1. Drawings, maps, and sketches shall be checked by an independent reviewer. Checking of all drawings, maps, and sketches shall be performed prior to the design submittals. Questions or corrections shall be clearly noted and discussed with the preparer of the work product.
- E. Technical Review
 1. All work including shop drawing submittals shall be subject to independent technical reviews. Technical reviews of all documents shall be performed prior to submission. Technical document review is a critical review of work by one or more qualified reviewers who are independent of the document reviewed. The review is performed to ensure technical accuracy, accomplishment of project objectives, and conformance to established requirements.

3.4 PRE-CONSTRUCTION QUALITY CONTROL CONFERENCE

- A. After the Pre-Work Conference, before the start of construction, and prior to acceptance by the EPA's Representative of the CQC Plan, the Contractor shall meet with the EPA's Representative and discuss the CQC system. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both on-site and off-site work, and the interrelationship of Contractor's management and control with the EPA's Quality Assurance. Minutes of the meeting shall be prepared by the Contractor in accordance with SECTION 01201 – PRE-CONSTRUCTION AND PRE-WORK CONFERENCES and signed by both the Contractor and the EPA's Representative. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences shall be called by

either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures that may require corrective action by the Contractor.

3.5 QUALITY CONTROL ORGANIZATION

A. Personnel Requirements

1. The requirements for the CQC organization are a CQC Manager and sufficient number of additional qualified personnel to ensure contract compliance. The number of CQC personnel shall be increased as required during times of high construction workload. The Contractor shall provide a CQC organization that shall be at the site at all times during progress of the work and with complete authority to take any action necessary to ensure compliance with the contract. All CQC staff members shall be subject to acceptance by the EPA's Representative. Complete records of all letters, material submittals, shop drawing submittals, schedules and all other project documentation shall be promptly furnished to the CQC organization by the Contractor. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the EPA's Representative.

B. CQC Manager

1. The Contractor shall identify as CQC Manager an individual within his organization at the site of the work who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC Manager shall be a graduate engineer, graduate architect, or a graduate of construction management, or shall hold a state Professional Engineer's license, with a minimum of 2 years construction experience on construction similar to this contract, one year of which as a QC Representative. The CQC Manager may also be a construction person with a minimum of 4 years in related work, one year of which as a QC Representative. This CQC Manager shall be on the site at all times during construction and shall be employed by the Contractor. An alternate for the CQC Manager shall be identified in the CQC Plan to serve in the event of the CQC Manager's absence. The requirements for the alternate shall be the same as for the designated CQC Manager. The CQC Manager shall be assigned no duties other than Quality Control.

C. CQC Personnel

1. The CQC organization must as a minimum possess general corporate technical knowledge of all aspects of the project and must successfully execute the CQC System on all aspects of the project. Individuals possessing experience in specialized areas shall be added to the organization as required during periods when such specialty areas are being executed. Examples of such specialized areas would include heating, ventilation, and air-conditioning (HVAC), electrical distribution and substations, roofing, tele-communication systems, fire protection and alarm systems, computer installations, specialized welding, specialized finishes, pre-cast concrete installation, modular housing, surveying, chemical data acquisition, hazardous material removal and disposal, medical monitoring, etc., depending on the nature of the particular project. The Contractor must demonstrate that such additional qualified personnel have received sufficient training and indoctrination into the CQC System, and that these personnel properly execute the requirements of the CQC System within their areas of expertise.
2. Example experience matrix for a CQC personnel is provided below but not limited to,

Table 01451 -1 Experience Matrix

Area	Qualifications
Civil	Graduate Civil Engineer or Construction Manager with 2 years of experience in the type of work being performed on this project or technician with 5 years related experience.
Mechanical	Graduate Mechanical Engineer with 2 years of experience or person with 5 years of experience supervising mechanical features of work in the field with a construction company
Electrical	Graduate Electrical Engineer with 2 years related experience or person 5 years of experience supervising electrical features of work in the field with a construction company
Structural	Graduate Civil Engineer (with Structural Track or Focus) or Construction Manager with 2 years of experience or person 5 years of experience supervising structural features of work in the field with a construction company
Environmental	Graduate Environmental Engineer with 3 years of experience
Submittals	Submittal Clerk with 1 year experience
Concrete, Pavements and Soils	Materials Technician with 2 years of experience for the appropriate area

D. Additional Requirement

1. In addition to the above experience and education requirements, the Contractor Quality Control (CQC) Manager and Alternate CQC Manager are required to have completed the Construction Quality Management (CQM) for Contractor's course. If the CQC Manager does not have a current certification, obtain the CQM for Contractor's course certification within 90 days of award. This course is given by Government personnel and is of two-day duration. The Government shall provide one instruction manual for the course.
2. The Construction Quality Management Training certificate expires after 5 years. If the CQC Manager's certificate has expired, retake the course to remain current.

E. Organizational Changes

1. The Contractor shall maintain the CQC Organization at full strength at all times. When it is necessary to update the organization, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the EPA's Representative for acceptance.

3.6 SUBMITTALS AND DELIVERABLES

- A. Submittals shall be in compliance with the requirements in SECTION 01330 – SUBMITTAL PROCEDURES. The CQC organization is responsible for certifying that all submittals and deliverables are in compliance with the contract requirements.

3.7 CONTROL

- A. CQC is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least

three phases of control are required to be conducted by the CQC Manager for each definable feature of the construction work as follows:

B. Preparatory Phase

1. This phase is performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase includes:
 - a. A review of each paragraph of applicable Specifications, references, codes, and standards. A copy of those sections of referenced codes and standards applicable to the portion of the work to be accomplished in the field shall be made available by the Contractor at the preparatory inspection. These copies shall be maintained in the field and available for use by the EPA's Representative until final acceptance of the work.
 - b. A review of the Design Drawings.
 - c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.
 - d. Review of provisions that have been made to provide required control inspection and testing.
 - e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.
 - f. A physical examination of required materials, equipment, and sample work to ensure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
 - g. A review of the appropriate activity hazard analyses to assure safety requirements are satisfied.
 - h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.
 - i. A check to ensure that the portion of the plan for the work to be performed has been approved by the EPA's Representative.
 - j. Discussion of the initial control phase.
 - k. The EPA's Representative shall be notified at least 48 hours in advance of beginning the preparatory control phase meeting. This phase shall include a meeting conducted by the Contractor and attended by other CQC personnel (as applicable), and the superintendent responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC Manager and attached to the daily CQC report. The Contractor shall clearly indicate its intent and plan for communication of the results of the preparatory phase to applicable workers, to include materials, construction methods, workmanship standards, safety considerations and procedures, and preparatory phase meeting minutes.

C. Initial Phase

1. This phase shall be accomplished at the beginning of a Definable Feature of Work (DFW) when the accomplishment of a representative sample of the work is impending. The following shall be accomplished:
 - a. A check of the portion of work done to ensure that it is in full compliance with contract requirements.
 - b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.
 - c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

- d. Resolve all differences.
- e. Check safety to include compliance with and upgrading of the Site Safety and Health Plan. Review the activity hazard analysis with each worker.
- f. The EPA's Representative shall be notified at least 48 hours in advance of beginning the initial phase meeting. This phase shall include a meeting conducted by the Contractor and attended by other CQC personnel (as applicable), and the superintendent responsible for the definable feature and the work crew(s) for the appropriate DFW. Separate minutes of this phase shall be prepared by the CQC Manager and attached to the daily CQC report. Exact location (i.e., CQC Report number) of initial phase shall be indicated for future reference and comparison with follow-up phases.

D. Follow-up Phase

- 1. Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted, and all deficiencies corrected prior to the start of additional features of work that may be affected by the deficient work. The Contractor shall not build upon or conceal non-conforming work.

E. Additional Preparatory and Initial Phases

- 1. Additional preparatory and initial phases shall be conducted on the same DFW if the quality of on-going work is unacceptable, if there are changes in the applicable CQC staff, on-site production supervision or work crew, if work on a definable feature is resumed after a substantial period of inactivity, or if other problems develop.

F. Definable Feature of Work: Definition and Discussion

- 1. A DFW is a portion of work consisting of materials, equipment, supplies and procedures which are closely related to each other, have the same control, and shall be accomplished by the same work crew to completion. A DFW must be sufficiently small so that control of the work (i.e., communication of requirements to workers, inspection of materials and workmanship and correction of deficiencies) will be easily accomplished. Examples for various types of DFWs are:
 - a. Topographic, bathymetric, and excavation survey
 - b. Site preparation/clearing
 - c. Staging area construction
 - d. Soil erosion and sediment control
 - e. Installation of sheet pile wall
 - f. Installation and operation of temporary wastewater treatment and discharge system
 - g. Decontamination area and Exclusion Zone setup
 - h. Sampling and chemical data acquisition
 - i. Source Materials Removal
 - j. Excavation
 - k. Soil/sediment and waste disposal
 - l. Backfilling, soil compaction testing, and grading
 - m. Wetlands and upland site restoration
 - n. Seawall reconstruction

3.8 TESTS

A. Testing Procedure

1. The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product that conforms to contract requirements. Upon request, the Contractor shall furnish to the EPA's Representative duplicate samples of test specimens for possible testing by EPA. Testing includes operation and/or acceptance tests when specified. The Contractor shall perform the following activities and record and provide the following data:
 - a. Verify that testing procedures comply with contract requirements.
 - b. Verify that facilities and testing equipment are available and comply with testing standards.
 - c. Check test instrument calibration data against certified standards.
 - d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
 - e. Results of all tests performed, both passing and failing tests, shall be recorded on the CQC report for the date performed. Specification paragraph reference, location where tests were performed, and the sequential control number identifying the test shall be given. If approved by the EPA's Representative, actual test reports may be submitted later with a reference to the test number and date performed. An information copy of tests performed by an off-site or commercial test facility shall be provided directly to the EPA's Representative. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

B. Testing Laboratories

1. Capability Check
 - a. The EPA's Representative reserves the right to check laboratory equipment and calibration in the proposed laboratory for compliance with the standards set forth in the contract Specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils shall meet criteria detailed in ASTM D 3740 and ASTM E 329. A capability check of the laboratory that the Contractor proposes to perform tests on soils shall be performed and documented.
2. Capability Recheck
 - a. If the selected laboratory fails the capability check, the Contractor shall be assessed a charge to reimburse the EPA for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory.

C. Furnishing or Transportation of Samples for Testing

1. Costs incidental to the transportation of samples or materials shall be borne by the Contractor. Samples of materials for test verification and acceptance testing by the EPA's Representative shall be delivered to the EPA-designated Quality Assurance (QA) laboratories.
2. Coordination of each specific test, exact delivery location, and dates shall be made through the EPA-designated QA laboratories. The Contractor shall ensure that sufficient notice is given to EPA prior to sample delivery.

3.9 COMPLETION INSPECTION

A. Completion inspections will be performed at two stages during the construction.

1. The first set of inspections shall be conducted after all pre-excavation site preparation work is complete, including construction of decontamination areas, soil

erosion and sediment controls, stormwater controls, sheet pile wall installation, and the temporary water treatment plant. At this stage, performance of the temporary water treatment plant shall be demonstrated through successful completion of start-up testing, during which the Contractor shall demonstrate that the temporary water treatment plant is capable of meeting the discharge criteria as specified in SECTION 13300 – WATER TREATMENT SYSTEM. Excavation operations shall not commence until all testing and inspection of pre-excavation site construction work has been completed to the satisfaction of the EPA's Representative.

2. The second set of inspections will be conducted after site restoration activities are complete and prior to demobilization.

B. Punch-Out Inspection

1. Near the completion of all work or any increment thereof established by the EPA's Representative or stated elsewhere in the Specifications, the CQC Manager shall conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved drawings and Specifications. Such a list of deficiencies shall be included in the CQC documentation as required herein and shall include the estimated date by which the deficiencies will be corrected. The CQC Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished the Contractor shall notify the EPA's Representative that the facility is ready for the "Pre-Final" inspection.

C. Pre-Final Inspection

1. The EPA's Representative will perform this inspection to verify that the requirements detailed in the Contract Documents have been met. A "Pre-Final Punch List" will be developed as a result of this inspection. The Contractor shall ensure that all items on this list have been corrected and shall notify the EPA's Representative so that a "Final" inspection with the EPA can be scheduled. Any items noted on the "Pre-Final" inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment thereof if the project is divided into increments by separate completion dates.

D. Final Inspection

1. The Contractor's Quality Control Inspection personnel, plus the Contractor or other primary management person and the EPA's Representative will be in attendance at this inspection.
2. Additional Government personnel including, but not limited to, those from EPA, and State and local officials may also be in attendance. The Final Inspection will be formally scheduled by the EPA's Representative based upon results of the Pre-Final Inspection. Notice shall be given to the EPA's Representative at least 14 calendar days prior to the Final Inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, shall be complete and acceptable by the date scheduled for the Final Inspection.

3.10 DOCUMENTATION

- A. The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on the applicable forms, Daily CQC Reports, List of Outstanding Deficiencies, CQC Test Report List, and Record of

Preparatory and Initial Inspections that includes, as a minimum, the following information:

1. Contractor/subcontractor and their area of responsibility.
2. Operating plant/equipment with hours worked, idle, or down for repair.
3. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.
4. Test and/or control activities performed with results and references to Contract Document requirements. The control phase should be identified (Preparatory, Initial, and Follow-up). List deficiencies noted along with corrective action.
5. Quantity of materials received at the site with statement as to acceptability, storage, and reference to Contract Document requirements.
6. Submittals reviewed, with contract reference, by whom, and action taken.
7. Off-site surveillance activities, including actions taken.
8. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
9. Instructions given/received and conflicts in the Contract Documents.
10. Contractor's verification statement.
 - a. These records shall indicate a description of trades working on the project, the number of personnel working, weather conditions encountered, and any delays encountered. "N/A" shall be entered into any field for which no entry is intended. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the EPA's Representative daily within 24 hours after the date(s) covered by the report, except those reports need not be submitted for days on which no work is performed. At a minimum, one report shall be prepared and submitted for every seven days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the Contractor. The report from the Contractor shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel. All documentation is expected to be legible and complete.

3.11 SAMPLE FORMS

- A. The 2-page form at the end of the section shall be used for the basic daily CQC Report. CQC personnel shall attach continuation sheets as required for any entries that cannot fit on the basic form. Preparatory and Initial Inspections, when performed, shall be indicated on the basic CQC report and minutes for each inspection shall be attached. Minutes shall consist of a list of specific requirements for materials, procedures, or equipment to be employed and shall also include any understandings reached or items of special importance discussed.
- B. In addition, outstanding deficiencies shall be listed on the form "List of Outstanding Deficiencies" at the end of this section and shall be attached to each CQC report. As deficiencies are corrected, they are to be acknowledged on the basic CQC report and shall be deleted from the list.
- C. The form at the end of this section titled "CQC Test Report List" shall be used by the Contractor to track testing to be done as the project progresses, and also to summarize the Contractor's Quality Control testing to be reported on the CQC Plan.

- D. Form "Record of Preparatory and Initial Inspections" at the end of this section shall be used by the Contractor to track Preparatory and Initial inspections as the project progresses and to summarize these required inspections as part of the CQC Plan.
- E. Additional reporting forms pertaining to specialized activities may be included herein or elsewhere in the contract and shall be used for reporting as indicated.

3.12 NOTIFICATION OF NONCOMPLIANCE

- A. The EPA's Representative will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the EPA's Representative may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor. Deficiencies cited and verbal instructions given to the Contractor by the EPA's Representative shall be entered into that day's CQC Report.

END OF SECTION

CQC REPORT # _____ **DATE:** _____

1. Project Title: _____ Location: _____ Contract No.: _____

2. List Contractors and Subs Working This Day and Areas of responsibility of each

3. Weather:

4. Description and Location of Work of the Project (Also indicate days of no work and reasons for delay)

5. Labor and Equipment Breakdown by Trade (Attach Continuation)

6. Preparatory Phase Inspections Held (See attached minutes)

7. Initial Phase Inspections Held (See attached minutes)

8. Follow-Up Phase Inspections Performed, Results and Corrective Actions Taken

9. Job Safety. Indicate What Was Checked, Results, Instructions Received and Corrective Actions Taken

10. Additional Activities and Remarks (Check Appropriate Box)

- (Use Space Below to Describe Checked Items)

Signed _____ Date: _____
CQC Representative

LIST OF OUTSTANDING DEFICIENCIES

Page of

PROJECT TITLE: _____ CONTRACTOR: _____

LOCATION: _____ CQC REPORT#: _____ CONTRACT #: _____

SPEC REF OR DWG#	LOCATION ON PROJECT	DESCRIPTION OF DEFICIENCY	DATE FOUND	DATE TO BE CORRECTED	DATE CORRECTED	REMARKS

NOTE: THIS FORM SHALL BE USED BY THE CONTRACTOR TO TRACK OUTSTANDING CONSTRUCTION DEFICIENCIES

CQC TEST REPORT LIST

Page of

CQC REPORT# _____
 CONTRACTOR: _____
 PROJECT TITLE: _____

DATE: _____
 CONTRACT #: _____
 LOCATION: _____

SPEC REF OR DWG#	TYPE OF TEST	DATE PERFORMED	RESULTS	REMARKS

NOTE: THIS FORM SHALL BE USED BY THE CONTRACTOR TO TRACK CQC TESTING. PROVIDE ATTACHMENTS AS REQUIRED

RECORD OF PREPARATORY AND INITIAL INSPECTIONS

Page of

PROJECT TITLE: _____ CONTRACTOR: _____

LOCATION: _____ CQC REPORT#: _____ CONTRACT #: _____

DATE OF INSPECTION	TYPE OF INSPECTION	DEFINABLE FEATURE OF WORK (DESCRIBE)	REPORT NUMBER		PERSONS ATTENDING INSPECTION	WAS MATERIAL &/OR EQUIPMENT PHYSICALLY INSPECTED?
			QA	QC		

NOTE: - THIS FORM SHALL BE USED BY THE CONTRACTOR TO TRACK PREPARATORY/INITIAL INSPECTIONS
- ATTACH ADDITIONAL RESULTS OR COMMENTS AS REQUIRED

SECTION 01500
TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall provide all the temporary construction support facilities required to execute this contract and comply, at minimum, with the requirements specified herein. All structures installed under this section shall be removed at the completion of the project.
- B. The Contractor shall ensure that all work is performed safely in accordance with the safety requirements of SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.
- C. Facilities shall be temporary structures or rented permanent structures and may consist of the following:
 - 1. EPA's field office
 - 2. Contractor's field office
 - 3. Security office trailer
 - 4. Equipment and material storage areas
 - 5. On-site sanitary facilities for workers
 - 6. Parking Area
- D. Temporary construction facilities shall be located at the staging area shown on the Design Drawings or as approved by the EPA's Representative.

1.2 REFERENCES

- A. Not used.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with a "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall provide each of the following documents to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES. The Contractor shall maintain a copy of all documents described in this section on-site at all times during construction.
 - 1. Temporary Site Facility Layout Plan; Shop Drawings, EA
 - a. The Contractor shall submit a Temporary Site Facility Layout Plan to the EPA's Representative for approval at least 30 days prior to field mobilization for on-site construction. At a minimum, the Contractor's Temporary Site Facility Layout Plan drawing shall include the following information:
 - 1) General layouts of temporary site facilities including trailers, emergency medical facilities, equipment storage area, and other staging areas.
 - 2) Trailer(s) - floor plans, fixtures, and materials of construction.
 - 3) Electricity supply and lighting shop drawings - source point, layout locations, fixtures, and materials.
 - 4) Water supply, contaminated wastewater handling, and sanitary facilities - locations, layout, fixtures, materials, and methods of sanitary waste disposal.

- 5) Fences - proposed location and dimensions, avenues of ingress/egress and details of installation.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Not used.

1.5 REGULATORY REQUIREMENTS

- A. The Contractor shall obtain all necessary construction, building, zoning permits required by local authorities.
- B. The Contractor shall provide notification to the EPA's Representative regarding all permits required by the local authorities prior to pursuing and obtaining such permits.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All structures other than storage sheds installed under this section shall be provided with, at a minimum, the following services:
 1. Lighting. Electric light, non-glare type luminaries to provide a minimum illumination level of 50 foot-candles at desk height level.
 2. Heating and Cooling. Adequate equipment to maintain an ambient air temperature of 70-degrees Fahrenheit (F) +/- 3 degrees.
 3. Potable bottled water.
 4. Fire Extinguisher - Non-toxic, dry chemical, fire extinguisher meeting Underwriters Laboratories, Inc., approval for Class A, Class B and Class C fires with a minimum rating of 2A; 10B; and 10C.
 5. First Aid Kit. At a minimum, the first aid kit shall include an antiseptic kit, eyewash solution, bandages, insect sting medication, aspirin and acetaminophen, and cold pack(s).
 6. Automated external defibrillator (AED) approved by the United States Food and Drug Administration.
 7. Janitorial services on a daily basis including but not limited to sweeping, emptying wastebaskets, servicing of toilets, weekly mopping of floors, sanitizing toilet seats, providing towels and soap to the lavatories and monthly washing of floors and windows (inside and out). The time of the cleaning shall be coordinated with the EPA's Representative.
 8. Sufficient supply of electrical outlets.
 9. All parking areas shall be provided with adequate outdoor lighting as specified rein.
 10. All structures and facilities shall be designed for year-round operation.

2.2 EPA'S FIELD OFFICE

- A. The Contractor shall provide a temporary office trailer for use by the EPA and EPA's Representative, as deemed appropriate. The office trailer shall have two offices and one partitioned meeting area. At a minimum, the office trailer shall be outfitted with the following items as well as the ones listed in Paragraph 2.1, which may be rented, used, or new:
 1. Two desks
 2. Four chairs
 3. One oversize desk surface for drawings
 4. Lockable file cabinets
 5. Wastebasket
 6. Bulletin board

7. Microwave
 8. Mini fridge
 9. Coffee Maker
 10. Paper Shredder
 11. Two-way radios
 12. One office conference table with eight chairs
 13. HEPA Filter Air Purifier
- B. A minimum of four telephone lines, and one dedicated wireless router shall be installed for the EPA's temporary field office. All telephone and internet connection costs, including installation, service charged, and discontinuance, are the responsibility of the Contractor. If high speed internet service is not available, the Contractor shall provide a wireless high speed internet connection service for computers.
- C. In addition to the above, the Contractor shall provide the following office equipment, and other items for use by the EPA's Representative during the contract. No separate payment will be made for providing the following items and all costs in connection therewith will be considered the obligation of the Contractor.
1. Personal Computer Accessories Requirements:
 - a. The Contractor shall provide a computer docking station, monitor, and keyboard compatible with the EPA's Representative's personal computers. The Contractor shall verify the proper make/model with the EPA's Representative at the time of purchase so all accessories will be compatible. The accessories shall have the following requirements:
 - 1) 6-outlet surge protector
 - 2) All required connecting cables and plugs
 2. Printer:
 - a. A multi-function color printer, including scanner and copier functions. Supply of paper and toner shall be replenished by the Contractor as required by the EPA's Representative.
 3. Copier:
 - a. Plain-paper, desktop, auto feed, reduction, enlargement, sorting, stapling, monochrome, minimum 10 copies per minute (may be shared by Contractor and EPA's Representative if approved by EPA's Representative). The copier shall be equipped with individual trays for 8.5" x 11", 8.5" x 14", and 11" x 17" paper. The supply of paper and toner shall be replenished by the Contractor as required by the EPA's Representative. The Contractor shall also provide copier service as required.
 4. Telephone:
 - a. 2-line phone with conferencing and speaker phone capabilities compatible with phone service.
 5. Telephone Answering Machine (or voice mail):
 - a. Standard, compatible with standard telephone line and local service, with remote message retrieval capability.
 6. First Aid Kit:
 - a. As a minimum the kit shall include an antiseptic kit, eyewash solution, bandages, insect sting medication, aspirin and acetaminophen, and cold pack(s).
- D. The temporary office trailer for use by the EPA's Representative shall include sanitary facilities with hand washing capabilities within the trailer. The Contractor shall provide at least one designated sanitary facility with hand washing capabilities for women in the

EPA's field office trailer. EPA's field office trailer's toilet/sanitary facilities will not be available to Contractor's personnel.

2.3 CONTRACTOR'S TEMPORARY FACILITIES

A. Administrative Field Office

1. The Contractor shall provide and maintain an administrative field office and facilities at the site. The field offices shall be outfitted to the discretion of the Contractor. At minimum, continuous, hardline telephone service shall be provided for emergencies.

B. Security Office Trailer

1. The Contractor shall provide and maintain a trailer exclusively as the security office trailer and clearly mark where visitors can sign in and receive the required health and safety training prior to entering the construction zone. The security office trailer shall be outfitted to the discretion of the Contractor. At minimum, continuous, hardline telephone service shall be provided for emergencies.

C. Parking

1. The Contractor's parking area shall be selected by the Contractor and included in the Temporary Site Facility Layout Plan. Adequate space shall be provided for workers and visitors in the designated area.
2. The Contractor shall provide a minimum of two parking spaces exclusively designated for use by the EPA and EPA's Representative only.
3. Off-site parking of privately owned vehicles on residential streets is prohibited.
4. Adequate staging area for haul vehicles shall be provided on-site or in a designated off-site area limited to the access road through the Margaret's Creek Area.
5. All parking areas shall be provided with adequate outdoor lighting.

D. Equipment Storage/Lunch Area

1. The Contractor shall provide a separate, uncontaminated lunch area of sufficient size for all Contractor on-site personnel. Such an area may be combined with equipment storage, as specified below. The Contractor shall furnish all the furniture required in the lunchroom to accommodate the maximum number of Contractor personnel working on any single day.
2. A separate or partitioned equipment storage area shall also be provided and shall have access through a lockable door. The area for equipment storage shall not be less than 96 square feet. Sufficient shelving shall be installed for storage and inventory control of small items. In addition, this area shall contain one four-drawer lockable filing cabinet and a wooden lockable locker sufficient for the storage of surveying and testing instruments.
3. This area shall not include storage of any contaminated equipment or materials. Contaminated equipment and materials shall be handled in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS.

2.4 SANITARY WASTE SYSTEM

- ### **A. On-site sanitary facilities shall consist of chemical type toilets. No toilet facilities shall be provided in areas proposed for excavation. The Contractor shall periodically empty wastes, which shall be disposed of at an approved facility. Waste may be emptied to a municipal, district or station sanitary sewer if approval from the system owner is obtained.**

- B. The Contractor shall provide a portable wash unit and collection system for hand washing, and as specified elsewhere.

2.5 PARKING

- A. The Contractor shall designate a location for vehicle refueling and equipment parking for overnight, to minimize the potential contamination from equipment spills and leaks during demobilization.
- B. Workers may also park privately owned vehicles in an off-site area, except in the residential streets, designated by the EPA's Representative. This area will be within reasonable walking distance of the site. All parking areas shall be provided with adequate outdoor lighting.

2.6 OUTDOOR LIGHTING

- A. The Contractor shall furnish and install a complete operating outdoor lighting system through the designated support zone. The lighting system shall include wood pole mounted 400-watt high-pressure sodium luminaries supported on 4-foot steel arms with 30-foot mounting height above grade. The system shall include all equipment and materials and conductors. Shop drawings shall be submitted showing the layout, equipment and material details, and circuits prior to installation.

PART 3 - EXECUTION

3.1 LOCATION

- A. The Contractor shall utilize the staging area shown on the Design Drawings for all temporary facilities or as approved by the EPA's Representative.

3.2 AVAILABILITY AND USE OF UTILITY SERVICES

- A. Temporary Utilities
 - 1. The Contractor shall provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions, and not violate applicable codes and standards.

3.3 PAYMENT FOR UTILITY SERVICES

- A. General
 - 1. The Contractor shall be responsible for providing all utilities to the site necessary to do the work. The Contractor shall be responsible for the operation of all systems, including maintenance, to assure that necessary services are provided.
 - 2. Existing utility lines in the park are available for the Contractor to tie into. Any extension, connection or alteration needed for temporary power will be performed by the Contractor at the Contractor's expense and coordinated with the Old Bridge Township. All modifications to existing utilities for temporary construction facilities and existing temporary utilities will be removed at the completion of the project by the Contractor.
 - 3. The Contractor is required to coordinate, maintain, and pay for all required utilities available to the Contractor from existing outlets and supplies, as specified in the contract.
 - 4. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor.

5. The Contractor shall submit for review electrical supply and lighting shop drawings and water supply, wash water handling and sanitary facilities source points, layout locations, fixtures, materials, and methods of disposal.
- B. Electrical
1. All electric power shall be purchased directly by the Contractor.
 2. The Contractor shall make the necessary arrangements with the appropriate power authority for service and shall be responsible for installation, maintenance, and shutoff costs for onsite power connections.
 3. All power service lines shall be removed prior to project closeout.
- C. Sanitation
1. The Contractor is responsible for providing or arranging for a potable water supply for any water to be used on the site during the duration of the contract.
 2. The Contractor shall provide and maintain within the construction area minimum field-type sanitary facilities approved by the EPA's Representative.
- D. High-Speed Internet and Telephone Service
1. The Contractor shall make arrangements and pay all costs for high-speed internet and telephone services. The Contractor shall make the necessary arrangements with the local internet company to install equipment and services to meet site requirements and shall be responsible for all related installation service and disconnection costs.
 2. The Contractor shall be responsible for all high-speed internet and telephone charges.
- E. Fire Protection
1. Provide temporary fire protection equipment for the protection of personnel and property during construction.
 2. Remove debris and flammable materials monthly or as necessary to minimize potential hazards.

3.4 MAINTENANCE

- A. The Contractor shall maintain all temporary construction facilities and shall perform all necessary repairs, replacement, cleaning, and any other maintenance required as directed by the EPA's Representative. Included in this maintenance shall be sweeping and any other cleaning necessary to keep the project vicinity area free of soil, dust, and debris.

3.5 REMOVAL OF TEMPORARY FACILITIES AND SERVICES

- A. Unless otherwise requested by the EPA's Representative, all temporary facilities shall be removed when the need has ended.
- B. The Contractor shall repair damaged work, clean exposed surfaces, and replace work, which cannot be satisfactorily repaired. The Contractor shall remove all materials contaminated with oil, asphalt, or other materials, which might impair the growth of plant materials or lawns.
- C. The Contractor shall repair or replace street paving, curbs, and sidewalks at temporary entrances.

END OF SECTION

SECTION 01510

DECONTAMINATION PLAN

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes requirements for decontamination and set-up and operations of decontamination facilities.
- B. The Contractor shall furnish all labor, materials, equipment, and incidentals necessary to provide proper decontamination of approximately 5,900 cubic yards of riprap (including post-Sandy and weathered riprap) from the existing seawall and approximately 2,400 cubic yards of armored stone from the First Jetty as specified herein as riprap and armored stone, respectively.
- C. The Contractor shall furnish all labor, materials, equipment, and incidentals necessary to provide proper decontamination of all equipment and personnel working on site for the duration of the project.
- D. Work shall be performed as specified herein and in the approved Contractor's Decontamination Plan.

1.2 REFERENCES

- A. References
 - 1. Not used.
- B. Definitions
 - 1. Source Materials
 - a. In general, principal threat waste (PTW) are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health, or the environment should exposure occur. Principal threat wastes at the site include:
 - 1) Slag and battery casings/associated wastes, including particles of slag and battery casings/associated wastes identified in the soil and sediment media.
 - 2) Highly impacted soil in the Seawall Sector in portions of Areas 1 and 2, and in the upland portion of the Margaret's Creek Sector.
 - 3) Highly impacted sediment located in Areas 1 and 2 in the Seawall Sector.
 - 2. Debris
 - a. Demolition debris in the form of concrete and a variety of bricks, including fire bricks that is considered debris and is to be segregated based on visual observation.
 - 3. Riprap
 - a. The on-site riprap, consisting of newer rock material along the Old Bridge Waterfront Park (referred to as post-Sandy riprap), is located within the Extent of Riprap but outside the Footprint of Seawall. The post-Sandy riprap can be visually identified as gray to dark gray large rocks, with a size approximately ranging from 18 to 36 inches in diameter, and it is not mixed with any other waste or stone.
 - b. On-site weathered riprap, consisting of older rock material, is found within the Footprint of Seawall. The weathered riprap can be visually identified as brown

- to dark gray rocks with sizes approximately 12 to 24 inches in diameter and is mixed with debris, slag, and lead pots.
- c. Both types of riprap will be segregated, decontaminated, and reused on-site.
- 4. Armored Stone
 - a. The existing jetty armoring capstone placed above ground around the First Jetty located in Area 5.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
 - 1. Decontamination Plan; Pre-Construction Submittal; EA
 - a. Prior to the commencement of construction operations, the Contractor shall submit for approval a Decontamination Plan, detailing the proposed decontamination program for the site operations and providing proper decontamination of riprap and armored stone.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Not used.

PART 2 - PRODUCTS

2.1 GENERAL

- A. The Contractor shall furnish all the equipment and materials required to construct decontamination facilities as shown on the Design Drawings and per SECTION 02100 – SITE PREPARATION.

PART 3 - EXECUTION

3.1 GENERAL

- A. Riprap and armored stone from the site shall be decontaminated by the Contractor and approved by the EPA's Representative prior to reuse.
- B. Any riprap or armored stone deemed unsuitable for on-site reuse must be properly disposed of off-site at an approved landfill, in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL. Prior to disposal, approval must be obtained from the EPA's Representative.
- C. Contaminated and possibly uncontaminated fluids are anticipated to result from decontamination of riprap and armored stone, equipment, and personnel working on-site. The Contractor will collect, store, and test the decontamination fluids before discharging to surface water as per SECTION 02140 – DEWATERING AND DRAINAGE and SECTION 13300 – WATER TREATMENT SYSTEM.
- D. Contaminated soil/sediment with lead particles are anticipated to result from decontamination of riprap and armored stone, equipment and personnel working on-site. The Contractor shall collect and manage this contaminated soil/sediment in accordance with the Section 02111 - EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS.

- E. Sampling methods and equipment shall be chosen to minimize decontamination requirements and the possibility of cross contamination. Any sampling equipment used in more than one location shall be decontaminated between locations.

3.2 DECONTAMINATION PLAN

- A. The Decontamination Plan may be submitted as part of the Excavation and Handling Plan. The Plan shall include the decontamination procedures for riprap and armored stone, excavation/transport equipment and personnel working on-site and reference the detailed decontamination procedures for the riprap and armored stone, and sampling equipment. At a minimum, the following items shall be addressed in the Plan:
 - 1. Decontamination procedures for all riprap and armored stone
 - 2. Field screening procedures to be implemented at the start-up to verify the effectiveness of the decontamination method
 - 3. Details and drawings of decontamination stations and equipment
 - 4. Details and drawings of frac tank locations with secondary containment, if required
 - 5. Locations of decontamination stations/facilities
 - 6. Collection and treatment/disposal procedures for all decontamination by-products including liquids and soil/sediments

3.3 DECONTAMINATION BY-PRODUCTS

- A. The Contractor will furnish multiple frac tanks with secondary containment of 100% capacity of the largest tank, to store all water resulting from decontamination procedures.
- B. Water resulting from decontamination including equipment rinsate shall be collected, stored, and tested to confirm that water can be discharged to the bay through the dewatering system without treatment. If testing confirms contamination is present in the water from suspended solids, then the water will be treated via filtration and/or settling and re-tested. If based on analytical testing contamination is present in the water in the dissolved phase, then the water will be treated via ion exchange units. The Contractor shall propose the specific water treatment setup. If necessary, water will be properly treated using the on-site temporary water treatment system in accordance with applicable regulations at the expense of the Contractor.
- C. Contaminated soil/sediment with lead particles collected on the liner from decontamination shall be collected and managed in accordance with Section 02111-EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS.

3.4 DECONTAMINATION FACILITIES

- A. The Contractor shall provide designated decontamination stations at suitable locations within the Contamination Reduction Zone for removing soil/sediment from the riprap and armored stone. Riprap and armored stone brought to the decontamination stations shall remain in the area until cleaned. Riprap and armored stone shall be handled in such a way as to minimize the potential for being re-contaminated. Separate, clearly marked areas for storing the decontaminated riprap and armored stone shall be established in the Support Zone.
 - 1. The Contractor shall include a field screening method such as utilizing handheld x-ray fluorescence (XRF) in conjunction with startup pilot testing to verify the effectiveness of the decontamination method proposed in the approved workplan.
 - 2. All riprap and armored stone shall be cleaned and decontaminated in accordance with the Decontamination Plan to the satisfaction of the EPA's Representative.

- B. The Contractor shall provide equipment decontamination stations within the Contamination Reduction Zones for removing soil from all vehicles and equipment leaving the working area. As a minimum, these stations shall include a high-pressure water wash area with wire brushes for equipment and vehicles. A designated clean area shall be established within the Contaminant Reduction Zone for performing equipment maintenance.
- C. The Contractor shall provide decontamination stations for personnel within the Contamination Reduction Zones as per SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE. This area shall be used when personnel are required to come in contact with contaminated soil, i.e., crawling under a vehicle to change engine oil.
- D. A temporary decontamination pad shall be constructed as shown on the Design Drawings Details with an HDPE liner overlain with a cushion geotextile and compacted gravel in accordance with SECTION 02100 – SITE PREPARATION. The pad shall be capable of handling on- and off-site vehicles without loss of integrity and shall include a sump for collection of decontamination water. The Contractor shall provide equipment to pump water from decontamination to the on-site storage tanks. All equipment within the Exclusion or Contamination Reduction Zones shall be decontaminated prior to use for restoration purposes and prior to maintenance work as per SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.
- E. Any item taken into an Exclusion Zone must be assumed to be contaminated and must be carefully inspected and/or decontaminated before the item leaves the area. Vehicles, equipment, and materials brought into the Exclusion Zone shall remain in the Exclusion Zone until no longer necessary to the project. All construction material shall be handled and brought on-site in such a way as to minimize the potential for contaminants being brought onto the site. Separate, clearly marked parking and delivery areas shall be established in the Support Zone. All contaminated vehicles, equipment and materials shall be cleaned and decontaminated to the satisfaction of the EPA's Representative prior to leaving the site.

3.5 DECONTAMINATION PROCEDURE

- A. The Contractor shall furnish all labor, equipment, materials, supplies, power, water, and incidentals required for equipment and riprap/armored stone decontamination.
 - 1. Prior to performing any decontamination activities, the Contractor shall construct a temporary decontamination pad on-site to collect water and solids.
 - 2. All parts of heavy equipment which come in contact with potentially contaminated materials shall be cleaned of all foreign matter and cleaned with a pressure washer prior to each excavation and prior to departure from the site. If required, for removal of product from equipment, the Contractor shall use a non-phosphate detergent and heavy-duty scrub brush.
 - 3. All sides of riprap and armored stone shall be cleaned of soil/sediment particles in such a way that prevents spreading soil/sediment particles outside of the decontamination pad.
 - 4. Water generated from decontamination shall be managed as per SECTION 02140 – DEWATERING AND DRAINAGE and SECTION 13300 – WATER TREATMENT SYSTEM. All water generated from decontamination shall be removed from the decontamination pad at the end of each workday.
 - 5. Decontamination pads shall be covered with a liner when not used to prevent filling up with rainwater.

6. Solids generated from the decontamination shall be handled in accordance with Section 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS.
7. The Contractor is responsible for ensuring the upkeep of the temporary decontamination pads to effectively carry out decontamination activities, otherwise the decontamination pads shall be replaced as needed.
8. The decontamination pads shall be removed from the site and properly disposed of by the Contractor at the completion of the project. Soil underneath the decontamination pad shall be collected and sampled as per the post-excavation confirmatory sampling criteria provided in SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL, to confirm cross-contamination did not occur in the underlying soil. Insufficient enclosure or undersized construction of the decontamination pads may result in overspray, causing the decontamination fluids and associated solids to potentially spread beyond the intended boundaries, especially when decontaminating riprap. In such cases, sampling should be carried out at a distance of at least 10 feet beyond, on all four sides of the decontamination pad's limits.

END OF SECTION

SECTION 01540

SECURITY

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all labor, materials, equipment, and incidentals necessary to provide security for the duration of the project. Work shall be performed as specified herein and in the approved Contractor's Security Plan.

1.2 REFERENCES

- A. Not used.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
 - 1. Security Plan; Pre-Construction Submittal; EA
 - a. Prior to the commencement of construction operations, the Contractor shall submit for approval a Security Plan, detailing the proposed security program for the site.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Not used.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor shall be responsible for maintaining site security and furnishing all labor, materials, equipment, and incidentals to provide security for the project site, 24 hours a day, seven days a week, including holidays, throughout the duration of the contract.
- B. The Contractor shall establish a security program prior to any field construction activities.
- C. The Contractor shall be both responsible and liable for site security.
- D. Maintain/erect warning and security signs around the site perimeter in accordance with SECTION 01580 – SIGNS.
- E. The Contractor shall provide control of all persons and vehicles entering and leaving the site.
- F. The Contractor shall provide security identification specific to the site, for all on-site personnel and Contractor personnel authorized to enter the site.

3.2 SECURITY PROGRAM OBJECTIVES

- A. The principal objectives of the Security Program are:
 - 1. Deter, restrict, and/or control financial losses to the Government and the Contractor. This includes prevention or detection of theft, vandalism, sabotage, and arson.
 - 2. To keep unauthorized people from entering the site and receiving any injuries.
 - 3. To keep unauthorized people from entering the site and removing equipment or hazardous substances.
 - 4. To keep unauthorized people from taking action on the site that might exacerbate the environmental problem or interfere with its remediation.

3.3 SECURITY PERSONNEL

- A. Conditions of employment for all Site Security Officers shall include the following:
 - 1. Detailed pre-employment history establishing moral character and dependability.
 - 2. Applicant shall submit to a current physical examination conducted by the Contractor's designated physician. This physical shall include drug testing, and a list of all medicine the applicant is currently taking or has taken during the last year. Physical shall also include vital statistics and tests to ensure the capability of the applicant to function on site without health restrictions.
 - 3. Investigation that clears applicant of felony convictions.
 - 4. Failure to maintain attentive and alert status in performance of duties, which includes sleeping while on duty, intoxication on the job, and bringing unauthorized personnel on-site, is completely unacceptable and shall be grounds for not employing or for terminating employment.
 - 5. In general, Security Officers shall be physically fit, literate in the English language, experienced, stable, reliable, and possess the physical and psychological skills that are necessary to control unauthorized persons on the site.
 - 6. If the Security Officer carries a weapon consisting of side arms and/or shotgun or rifle, weapon(s) shall be catalogued, including type, model, caliber, serial number, and inspected by the security firm. The Security Officer shall have proficiency training and maintain proficiency rating with the particular type of weapon carried, as required by State law.

3.4 SITE SECURITY REQUIREMENTS

- A. A Security Officer shall be on the site 24 hours a day, seven days a week, including holidays, throughout the duration of the contract. A Security Officer shall patrol the Support, Contamination Reduction, and Exclusion Zones.
- B. A Security Office shall be established in the Support Zone. A small, temporary trailer or office building shall be equipped with a telephone, two-way radios, lights, and a desk. The office shall be established for the purposes of record-keeping and administering security.
- C. The Contractor shall maintain a log of all security incidents. This log shall be furnished to the EPA's Representative upon request.
- D. The EPA's Representative will have the right of approval and rejection of any and all security-assigned personnel of the Contractor for the duration of the contract. If approved by the EPA's Representative, the Contractor may designate a member of its staff as Security Officer during normal working hours. The EPA's Representative may revoke this approval without cause or justification, at which time the Contractor shall immediately provide independent site security.

- E. Gates in all fences shall remain locked, except when in use by authorized personnel.
- F. Security Officers shall be responsible for touring the perimeter of the site on an hourly basis when there is no construction activity being performed for the entire contract duration. The exact timing of the hourly tours shall be varied as to not allow a definable routine to develop. There shall be a log of the tours, with observed conditions recorded, maintained at the Security Center Office.
- G. Security Officers shall be responsible for controlling conditions to ensure against any unauthorized entry. Should persons attempt unauthorized entry, the Security Officer shall be responsible for warning the individuals. If unauthorized persons ignore the warnings, the Security Officer shall notify appropriate law enforcement personnel to remove the persons.
- H. The EPA's Representative will maintain a list of personnel approved to be present on the job site. A copy of the list will be provided to the Contractor. Only authorized personnel may make changes to the job site list.
- I. A copy of the emergency checklist, providing all emergency numbers for hospitals, ambulance service, law enforcement, paramedics, and fire departments, shall be posted in all on-site offices and at the designated project information board.
- J. Temporary lighting shall be provided to ensure effective surveillance at night at active construction areas. The Contractor shall take steps necessary to ensure lights left on overnight for security purposes do not impact local residents.

3.5 PERSONNEL IDENTIFICATION

- A. The Contractor shall provide security identification specific to the site for all on-site personnel and Contractor personnel entering the site, showing:
 - 1. Name of individual
 - 2. Occupation
 - 3. Name of employer
- B. The Contractor shall be responsible for and guarantee that security identification is worn by each individual and visible at all times while the individual is on site. Badge assignments shall be based on criteria included in the Contractor's Site Safety and Health Plan (SSHP) or as established by the EPA's Representative.
- C. Improperly identified personnel shall be excluded from the site.

3.6 ENTRANCE CONTROL

- A. The Contractor shall provide control of all persons, equipment, and vehicles entering and leaving the site as follows:
- B. Require each person to display proper identification.
- C. Require all personnel and visitors having access to the site to sign in and sign out and maintain a log of all site access.
- D. Vehicular access within the site shall be restricted to authorized vehicles only. Use of site-designated parking areas shall be restricted to vehicles of the EPA's Representative, Government personnel, Contractor, subcontractors, on-duty service personnel assigned to the site and visitors approved by the EPA's Representative.
- E. The Contractor shall accommodate and coordinate visits with local law enforcement agencies, including police, sheriff, highway patrol, emergency medical care units, fire department, and utility emergency teams.

- F. Site visitors shall not be permitted to enter active work areas unless approved by the EPA's Representative.
- G. The Contractor shall maintain a list of persons authorized for site entry and submit a copy of the list to the EPA's Representative on request.

3.7 BONDING AND UNIFORM REQUIREMENTS

- A. The security firm shall be bonded.
- B. Each Security Officer shall wear a uniform that displays the name of the security firm. These uniforms are to be complete, including hat, shirt, trousers, belt, and boots. Uniforms shall be pressed, and boots shined. Each officer shall present a neat, professional appearance.
- C. During patrols, security personnel shall be in proper safety attire, including steel-toe boots and additional PPE as required by site conditions/activities.

3.8 VISITOR CONTROL

- A. All visitors must be approved by the EPA's Representative.
- B. All visitors shall be required to read and sign an approved synopsis of the SSHP prior to entering the site.
- C. Visitors shall be escorted at all times, except EPA and NJDEP employees and representatives.

3.9 TRAFFIC CONTROL

- A. The Contractor shall be responsible for controlling vehicular traffic on and through the site in order to ensure safe and efficient operations. Traffic control shall be performed in accordance with SECTION 01585 – TRAFFIC CONTROL.
- B. Parking areas shall be regulated to ensure free entry and egress to and from the site.

3.10 NON-PERMITTED PROCEDURES

- A. The Security Officer shall remain on the site until the next shift replacement arrives. The site shall not be left unsecured.
- B. Security personnel shall, in general, monitor, authorize entry to, and inspect all areas of the project on a continuing basis and shall not serve any production work effort of the project.
- C. In scheduling the site security personnel, the same employee shall not be scheduled for consecutive shifts.

END OF SECTION

SECTION 01550 SURVEYING

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all labor, materials, equipment, and incidentals required to provide surveying services prior to remedial activities, after remedial activities, and as measurement during remediation activities.
- B. The Contractor shall prepare a pre-construction and post-construction land and bathymetric surveys prior to site preparation activities and shall prepare As-Built Drawings detailing the actual conditions of surface and subsurface construction upon the completion of work.

1.2 REFERENCES

- A. References
 - 1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.
 - a. United States Federal Geodetic Control Committee (FGCC)
 - 1) Standards and Specifications for Geodetic Control Networks.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with a "EA" designation; submittals having an "FIO" designation are for information only. The Contractor shall provide each of the following documents to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES. The Contractor shall maintain a copy of all documents described in this section on-site at all times during construction.
 - 1. Pre-Construction Survey; Pre-Construction Submittal; FIO
 - a. Submit a pre-construction topographic and utility, and bathymetric surveys prior to site preparation activities.
 - b. Submit a pre-construction tree inventory, wetland delineation and documentation of percent vegetative cover in tidal and freshwater wetland areas, as described in SECTION 02955 – TRANSITION AND WETLAND AREA RESTORATION.
 - 2. Surveyor Qualifications; Pre-Construction Submittal; FIO
 - a. Submit the name, address, New Jersey Land Surveyor registration number, and telephone number of the surveyor to the EPA's Representative before starting survey work.
 - 3. Survey Accuracy Documentation; Product Data; FIO
 - a. On request, documentation verifying accuracy of survey work shall be submitted to the EPA's Representative by the Contractor.
 - b. Certificates signed by the surveyor stating that elevations and locations of site construction features are in conformance, or nonconformance, with Contract Documents shall be submitted to the EPA's Representative at the completion of work requiring services of the surveyor.
 - 4. Surveyor Field Notes; Product Data; FIO

- 1) Copies of the surveyor's field notes, calculations, and graphical layouts shall be submitted to the EPA's Representative as requested.
- 2) Compliance Surveys; Closeout Submittals: Submit compliance surveys of all excavation, backfill, and wetland restoration operations.
5. As-Built Drawings; Closeout Submittals: FIO
 - 1) As-Built Drawings shall be submitted in accordance with Paragraph 3.1.B.5.
6. Post-Construction Survey; Closeout Submittal; FIO
 - a. Submit a post-construction topographic and utility, and bathymetric surveys after completing the site restoration activities.
7. Project Record Documents; Closeout Submittal; FIO
 - a. A complete, accurate log of control and survey work as it progresses shall be maintained at the work site by the Contractor.
 - b. Upon completion of the work, all record documents must be submitted to the EPA's Representative.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. The Contractor shall contact EPA's Representative at least 5 days in advance so that an EPA's wetland scientist can accompany the Contractor's surveyor during the Pre-and Post-Construction Survey.

1.5 QUALITY ASSURANCE

- A. The Contractor shall verify the existing conditions, contours, and locations of structures within the limits of work defined on the Design Drawings.
- B. The Contractor shall establish the exact position or location of all work control points. All work shall be referenced to and established from the control points, re-established where necessary and maintained throughout the life of the contract. Any error or apparent discrepancies found on the Design Drawings or Specifications shall be called to the attention of the EPA's Representative for interpretation prior to proceeding with the work.
- C. The Contractor shall be responsible for all the surveying done at the site. The surveyor shall be a qualified and Registered Land Surveyor in the State of New Jersey. The Contractor's surveyor shall also have a minimum of two years of experience in topographic and utility, construction, and bathymetric surveying, and layout and maintenance of As-Built Construction Drawings, with a record of performing horizontal and vertical control requirements as stated in this section.
- D. The surveyor shall check all equipment including, but not limited to electronic survey instruments, compasses, transits, and levels for accuracy and maintain records of such checks. The subcontractor shall make records of the checks available to the Contractor upon request.
- E. All survey work will be according to third-order accuracy standards as specified by the FGCC in the "Standards and Specifications for Geodetic Control Networks," published September 1984. The units of measure shall be U.S. Survey Feet.
- F. Furnish all necessary equipment, materials, and labor to effectively measure the site in accordance with these Specifications. Additional local surveying requirements for local platting, mapping, etc., shall be researched and followed by the surveyor.
- G. The Contractor shall be responsible for all damage to public and private property resulting from the operations of its employees.

- H. The Contractor shall be responsible for gaining permission to access any site(s) required for surveying. Any site-specific training to access the property shall be the responsibility of the Contractor.

PART 2 - PRODUCTS – (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 SURVEY

- A. Survey Reference Points
1. The Contractor shall locate and/or establish all site reference points for completion of site survey.
 2. The Contractor shall take all reasonable measures to protect site reference points prior to starting site work. Reference points shall not be relocated without prior written approval of the EPA's Representative.
 3. The EPA's Representative will be immediately notified of loss, damage, or destruction of any reference point, or any relocation required because of changes in grade or other reasons.
 4. Temporary monuments shall be set as necessary to perform the surveying. They may be wood, metal or marks scribed on permanent site features. All monuments shall be described in the field notes and marked on site maps for future reference.
 5. X, Y, and Z coordinates of benchmarks and survey control points shall be determined and recorded with a maximum permissible error of 0.10 feet in any coordinate direction.
- B. Survey Requirements
1. The Contractor shall establish the exact position or location of all work control points. All work shall be referenced to and established from the control points, re-established where necessary and maintained throughout the life of the contract. Any error or apparent discrepancies found in the Contract Documents shall be called to the attention of the EPA's Representative for interpretation prior to proceeding with the work.
 - a. All horizontal coordinates shall be referenced to North American Datum of 1983 (NAD83) New Jersey State Plane Coordinate System, Zone 2900, U.S. Survey Foot. The elevation shall be referenced to the North American Vertical Datum of 1988 (NAVD88), U.S. Survey Foot.
 - b. The survey shall be sufficient to generate digital topographic mapping on 1-foot contour intervals, except for wetland mitigation, which shall be 6-inch contour intervals. For the pre-construction and post-construction surveys, survey points shall document existing elevations every 50 feet along the center of the wetland remediation work areas if this requirement is more stringent than elevations to generate contour intervals.
 - c. The topographic map accuracy shall meet the U.S. National Map Accuracy Standards.
 - d. Bathymetric survey work will be done before the construction and after the construction. When bathymetric surveying equipment is used to complete the survey transects, boat-based echo sounding data shall be corrected to compensate for water-level fluctuations caused by surface waves and astronomical tides.

2. The Contractor shall verify the existing conditions, contours, and locations of structures within the clearing and excavation limits defined on the Design Drawings.
 3. The Contractor shall establish lines and levels and locate and lay out by instrumentation and similar appropriate means, all site features to be constructed or executed. These include, but are not limited to, the following:
 - a. Support zone facility layout.
 - b. Temporary discharge point for discharge to surface water.
 - c. Stockpile and load out area.
 - d. Sheet pile wall area.
 - e. Temporary Water Treatment area.
 - f. Decontamination area.
 - g. Access roads.
 - h. Fence lines.
 - i. Excavation depths and limits.
 - j. Final site grading.
 - k. Limits of wetland and upland restoration.
 4. The Contractor shall re-verify layouts periodically during construction by same means.
 5. As-Built Drawings
 - a. The Contractor shall prepare an As-Built Drawing that identify the features listed in Paragraph 3.1.B.2 above. All areas disturbed and restored shall be clearly identified.
 - b. The drawing shall also include as-built features of the temporary water treatment system. The drawing shall show the as-built position, size, and arrangement of, but not be limited to, treatment equipment, piping, controls, instrumentation, and containment structures.
 - c. The Contractor shall submit one (1) electronic copy and two (2) paper copies. The submittal shall include the Contractor's standard title block with the surveyor's subtitle block, signature, and Land Surveyor's seal. The drawing size shall be 34 inches by 44 inches and the cut lines shall be discussed with the Contractor prior to performing the work. The paper copies shall be exact duplicates of the electronic files and shall be signed and sealed by a New Jersey Licensed Surveyor. All survey data shall be compiled and digitized for use with AutoCAD 2018. A tabulated delimited text or excel file of the survey points shall also be submitted. The file shall include the description, horizontal and vertical coordinates, and unique point number for each point.
 - d. The Contractor shall submit an electronic copy of as-built drawing Shape Files (.shp, .shx, .dbf, .prj, .sbx, .sbn in accordance with the EPA Region 2 GIS Deliverables Guidance (<https://www.epa.gov/geospatial/epa-region-2-gis-deliverables-guidance>)).
- C. The following shall be included in the Post-Construction Survey including bathymetric and topography survey:
1. Survey datum and units: the vertical and horizontal datum shall meet state and local guidelines. The datum and units shall be provided with the survey, including coordinate system, foot units (international, U.S. survey), ground conversion factors (as applicable), etc.
 - a. All surveys shall be spatially tied in and geo-referenced. A datum specific only to the development area shall not be used.

- b. The Contractor shall provide all digital source data (i.e., for Trimble equipment, the job file) and the RTK survey report.
- D. Easements: All utility, property, landscape, road, road right-of-way, floodplain, and public and private easement information shall be included and displayed with the survey file for plat and/or its development. Road centerlines shall be provided for structure setback requirements.
 - 1. Research of site easements shall be the Contractor's responsibility prior to site surveying.
 - a. Title reports shall be requested as needed by the Contractor.
- E. Monuments: All monuments shall be clearly surveyed and labeled within survey file. All section corners and existing property pins shall be located. Section corners (minimum of three) shall be located or established for development of new property parcels. Research of monuments shall be the responsibility of the Contractor prior to site visit.
- F. Control shall be clearly established on the site. Contractor will be responsible for establishing a minimum of three control points that can be located within the site development area. Control shall be clearly established in an area that will preserve the horizontal and vertical information. Marked rebar (12 IN minimum depth) shall be used for control points.
- G. Underground utilities shall be located and surveyed in via ["Call before you dig 811"] locate services. All private and public underground utilities shall be located. Utilities survey information shall include the name of the corresponding utility company with the field marking.
- H. Power and electrical utilities shall be located and surveyed. All power poles, anchors, electrical structures, etc., shall be surveyed. Overhead electric lines crossing the survey site shall have the next adjacent pole(s) in all directions surveyed in. Utility owner information shall be provided with survey.
- I. Any additional surface utilities, including but not limited to manholes, light structures, storm drains, fiber optics, railroads, inlets, utility boxes, hydrants, and valves shall be provided. Research of site utilities shall be completed prior to field survey visit.
- J. All visible site structures, including but not limited to buildings, fences, gates, junk piles, signs, mailboxes, concrete structures (top and bottom of concrete), walk paths, and cattle guards shall be surveyed.
- K. Culverts shall be located and surveyed; inlets and outlet elevation shall be provided along with culvert size and type.
- L. A 3D TIN surface shall be developed with the approved CAD software. Contractor shall review and prepare a 3D TIN surface to be used for grading and volume calculations.
- M. Survey notes and legend information shall be included in survey deliverables.
- N. Site photos shall include site features, including but not limited major structure, utilities or any additional items that may require removal to allow for site development. Adjacent roads, structures, property boundaries, etc., shall be photographed. All storm drains, culverts, and storm structures shall be clearly photographed.

3.2 WORKMANSHIP AND METHODS

- A. Provide equipment capable of recording horizontal and vertical measurements within 1/100 feet degree of accuracy.
- B. Contractor is responsible for meeting local surveying best practices and plat recording requirements.
- C. Contractor is responsible for providing additional survey equipment if needed when GPS equipment may not be suitable.
- D. Aerial surveys are not to be used unless requested and approved by the EPA's Representative.

END OF SECTION

SECTION 01580

SIGNS

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all labor, equipment, materials, and incidentals required to provide and erect a U.S. Environmental Protection Agency (EPA) project site sign, safety signs and a bulletin board.
- B. The Contractor shall provide and erect an EPA project site sign and safety signs meeting the requirements of this section, at a location to be determined by EPA's Representative. The sign requirements are shown on the Design Drawings. Wording to be included on the sign shall be provided by the EPA's Representative afterward.

1.2 REFERENCES

- A. References
 - 1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. Where reference is made to one of the standards below, the revision in effect at the time of contract award shall apply.
 - a. Code of Federal Regulations (CFR)
 - 1) 29 CFR 1903 Inspections, Citations, and Proposed Penalties

1.3 SUBMITTALS

- A. Not used.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Not used.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials shall conform to the requirements as shown on the Design Drawings and shall be suitable for use in an unprotected exterior environment.
- B. Dollar amounts and wording changes shall be provided by the EPA's Representative after award.

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor shall place the following "No Trespassing" signs in English, Spanish, and in Gujarati on the work area fence that bear the legend, in letters at least four inches high:

NO TRESPASSING
AND
NO DUMPING
VIOLATORS WILL BE PROSECUTED

- B. The Contractor shall post hazard warning banners at areas of special hazard including, but not limited to the perimeter of the Exclusion Zone.
- C. The Contractor shall provide all signs required on the Design Drawings. Letters shall be at least four inches high.

3.2 INSTALLATION REQUIREMENTS

- A. The EPA project site signs are to be mounted on 4-inch by 4-inch by 8-foot treated timbers and set firmly into the ground above prevailing grade to permit public viewing and shall be installed during site preparation. Two EPA project site signs shall be installed: one at the Laurence Parkway entrance to the Old Bridge Waterfront Park and the other at the Bayview Drive entrance to the park, or at locations approved by EPA's Representative. The EPA project signs shall remain in place for all phases of the remedial action.
- B. "No Trespassing" signs shall be mounted to the security fence during site preparation and shall remain in place until the security fence is removed. The "No Trespassing" signs shall be displayed as a set of three signs – one in English, one in Spanish, and one in Gujarati. These signs shall be prominently displayed to discourage any unauthorized entry into the work area. A minimum of eight sets of signs shall be required. Additional signs may be requested at the direction of EPA's Representative.

3.3 BULLETIN BOARD

- A. Immediately upon beginning of work, the Contractor shall provide a weatherproof glass-covered bulletin board not less than 36-inches by 48-inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, the Wage Rate Information poster and other information approved by the EPA's Representative. The bulletin board shall be located at the project site in a conspicuous place easily accessible to all employees, as approved by the EPA's Representative. Legible copies of the aforementioned data shall be displayed until work is completed. Upon completion of work, the bulletin board shall be removed by and remain the property of the Contractor.
- B. The Contractor shall post and keep posted a notice or notices, to be furnished by the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor, informing employees of the protections and obligations provided for in the Occupational Safety and Health Act as per OSHA 29 Code of Federal Regulations 1903.2(a)(1). The Contractor shall post such notice or notices in a conspicuous place or places where notices to employees are customarily posted. The Contractor shall take steps to ensure that such notices are not altered, defaced, or covered by other material.

3.4 CLOSURE REQUIREMENTS

- A. The EPA project, bulletin board and the "No trespassing" signs are to be removed from the site after contract completion or as approved by the EPA's Representative.

END OF SECTION

SECTION 01585

TRAFFIC CONTROL

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all labor, materials, equipment, and incidentals required to provide traffic control during the remediation. Traffic control shall include, but not be limited to notification and coordination with the Townships of Old Bridge and Sayreville, local police, fire, and emergency response authorities; traffic control signage and devices to maintain safe traffic around the site, along the Laurence Parkway and nearby residential streets, and as necessary to safely route traffic along New Jersey Route 35 during heavy equipment and truck movements to and from the site.
- B. The traffic control shall include site access from the Laurence Parkway, Bayview Drive, and New Jersey Route 35. Construction-related traffic shall only be accessed through Margaret's Creek Area from the New Jersey Route 35. The site access from the Laurence Parkway parking lot shall be utilized only during emergencies such as major storm events in which flooding restricts access through the Margaret's Creek area from New Jersey Route 35. The site access from the Bayview Drive shall be utilized for personal vehicles only, if required.

1.2 REFERENCES

- A. References
 - 1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.
 - a. Code of Federal Regulations (CFR)
 - 1) 23 CFR 655F Traffic Control Devices on Federal-Aid and Other Streets and Highways
 - b. United States Department of Transportation (DOT)
 - 1) DOT Manual on Uniform Traffic Control Devices (MUTCD)

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
 - 1. Traffic Control Plan; Pre-Construction Submittals; EA
 - a. Prior to the commencement of construction operations, the Contractor shall submit for approval a Traffic Control Plan, detailing the proposed truck route, signage, and traffic control devices to be implemented for the maintenance of traffic and access around the site. The Contractor will specify the approach, temporary facilities, responsibilities, and operations necessary to allow safe and convenient passage of construction vehicular traffic to and from New Jersey Route 35 and Laurence Parkway in the Traffic Control Plan. Maintenance and protection of traffic includes, but is not limited to furnishing, assembling, placing, relocating, and removing traffic control devices (including pavement

markers, traffic cones, barriers, warning signs and lighting); providing a traffic control coordinator and necessary trained signalers; and engaging local traffic control officers, as necessary.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Not used.

PART 2 - PRODUCTS

2.1 TRAFFIC CONTROL

- A. All traffic control devices shall conform to DOT MUTCD.

PART 3 - EXECUTION

3.1 GENERAL

- A. Traffic control shall be accomplished in accordance with 23 CFR 655F.
- B. The Contractor shall provide traffic control at the entrances to the site that includes but not limited to the Laurance Parkway and nearby residential streets, the New Jersey Route 35, during heavy equipment movement to and from the site, and as otherwise necessary to meet local requirements. Note that New Jersey Route 35 is a divided highway.
- C. The Contractor shall coordinate with, notify, and obtain written approval from Townships of Old Bridge and Sayreville, and all local emergency response authorities (police, fire, etc.) prior to the remediation or restricting traffic on emergency fire access road or anyroads.
- D. The entrance from New Jersey Route 35 is not expected to be blocked during on-site operations, but if it is necessary to block the entrance periodically, the Contractor shall make every effort to limit the number and duration of closures and shall notify nearby residents so as not to adversely impact neighboring businesses and residences.
- E. The Contractor shall conduct construction operations in such a manner as to offer the least possible obstruction to the safe and satisfactory movement of traffic over the existing roads during the life of the contract.
- F. The Contractor shall be responsible for providing, erecting, maintaining, and removal of all traffic signs, barricades, and other traffic control devices necessary for maintenance of traffic.
- G. All barricades, warning signs, lights, temporary signals, other devices, and signaling devices shall meet or exceed the minimum requirements of the local DOT requirements.

END OF SECTION

SECTION 01670

GREEN REMEDIATION REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall incorporate green remediation practices during construction activities whenever feasible in accordance with the EPA Region 2 “Clean & Green” Policy, issued on March 17, 2009, and updated on March 11, 2010. This section covers the requirements for performing green remediation practices at the site, including furnishing all labor, materials, equipment, and incidentals required to complete the work described herein.

1.2 REFERENCES

- A. Not used.

1.3 SUBMITTALS

- A. Approval from the EPA’s Representative is required for submittals with an “EA” designation; submittals with an “FIO” designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA’s Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
 - 1. Renewable Energy Program; Product Data; EA
 - a. The Contractor shall submit details regarding the renewable energy program that will be used to purchase renewable energy through the local energy supplier for all site activities, including name of the renewable energy supplier; type and percentage of renewable energy to be used (solar, wind, etc.); and method of supply (direct or Renewable Energy Certificates [RECs]).
 - 2. Fuel; Product Data; EA
 - a. The Contractor shall submit details regarding the fuel providers and types of fuel, including sulfur content, to be purchased during the construction activities.
 - 3. Paper Product Literature; Product Data; EA
 - a. The Contractor shall submit product literature for all copy papers, file folders, and other paper office supplies indicating that the supplies meet the minimum requirements for recycled content as specified herein.
 - 4. Green Remediation Documentation; Certificates; FIO
 - a. The Contractor shall submit documentation to support the green remediation activities implemented, including, but not limited to:
 - 1) Receipts for energy purchased.
 - 2) Receipts for fuel purchased.
 - 3) Disposal certificates for waste sent to recycling and regeneration facilities.
 - 4) Receipts for paper products purchased.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Not used.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 RENEWABLE ENERGY

- A. The Contractor shall purchase 100 percent renewable energy through the local utility provider, Public Service Electric and Gas Company (PSE&G), for all electricity used during the remedial construction.
- B. The Contractor shall submit receipts to document that 100 percent renewable energy was used for all electricity consumed during the remedial construction.

3.2 FUEL

- A. Only ultra-low sulfur diesel (ULSD) fuel shall be used during the remedial construction. The Contractor and its subcontractors shall supply receipts for purchase of all fuel to document that only ULSD fuel was consumed.
- B. Vehicle idling shall not be allowed for longer than 5 minutes during remedial construction, including, but not limited to, drill rigs and earth moving equipment.
- C. Local labor shall be used, when possible, to reduce fuel consumption associated with driving to the site. Locally supplied materials shall be used when possible.
- D. The number of field mobilizations shall be minimized, when possible, to reduce fuel consumption.
- E. Sequencing and scheduling shall be performed in such a manner to minimize transportation and/or shipping fuel consumption whenever possible. This shall include consideration for sample shipments, transportation of waste material for off-site disposal, import of clean material, and on-site handling of materials during removal and restoration activities.

3.3 MATERIAL REUSE, REDUCTION, AND RECYCLING

- A. Non-hazardous construction waste generated during remediation shall be sent to an approved recycling facility. The Contractor shall submit disposal certificates documenting that the waste was sent to a recycling facility.
- B. Non-hazardous cleared vegetation material and existing fence (if not reused) shall be transported off-site for disposal at an approved recycling facility. The Contractor shall submit disposal certificates documenting that the cleared vegetation and fence was sent to a recycling facility.
- C. One hundred percent of the copy papers, file folders, and other paper office supplies shall come from recycled sources. Required recovered materials content ranges shall be as recommended by EPA's Comprehensive Procurement Guidelines (CPGs) at <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>. The Contractor shall submit receipts indicating that the purchased products contain the required recycled content.

END OF SECTION

SECTION 01720
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all labor, materials, equipment, and incidentals required to maintain accurate and comprehensive records of all site activities.

1.2 REFERENCES

- A. Not used.

1.3 SUBMITTALS

- A. Not used.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. The Contractor shall maintain accurate and comprehensive records of all site activities as well as all additions, substitutions of materials, variations in work and any other revisions to the Contract Documents.
- B. The Contractor shall maintain at the site for the EPA's Representative one record copy of:
 - 1. Record drawings showing Progress of Work
 - 2. Technical Specifications
 - 3. Addenda
 - 4. Modifications to the Contract
 - 5. EPA's Representative's Directives
 - 6. Written reports of any significant quality assurance problems
 - 7. Progress Meeting Minutes
 - 8. Final As-Built Drawings
 - 9. Daily work activity summary reports, including:
 - 10. Electronic copies of videos and photographs
 - 11. Reports on any emergency response actions
 - 12. Reports on all daily site activities
 - 13. Chain-of-custody documents
 - 14. Construction schedule and progress chart of work
 - 15. Change orders and other modifications to the contract
 - 16. All laboratory analytical results
 - 17. Meteorological records
 - 18. Air monitoring data
 - 19. All safety and accident reports
 - 20. All spill incident reports
 - 21. Daily construction quality control reports
 - 22. Truck load tickets
 - 23. Treated water discharge volume
 - 24. Records of quantity of contaminated and uncontaminated material removed from the site
 - 25. All waste disposal manifests
 - 26. Other items as required by the EPA's Representative

- C. Where appropriate, one copy of all project record documents shall be maintained on a cloud-based file sharing service, as compatible with EPA systems.

1.5 MAINTENANCE OF DOCUMENTS

- A. The Contractor shall store record documents and samples in the Contractor's Field Office trailers apart from documents used for construction work.
- B. The Contractor shall provide files and racks for the storage of documents; storage space that can be secured and locked; and a storage area that is clean and dry. Documents and samples should be filed to facilitate retrieval.
- C. The Contractor shall make documents available at all times for inspection by EPA's Representative.
- D. The Contractor shall keep up to date a complete record set of red-line drawings, which shall be corrected daily to show every change, and the approved shop drawings. This set shall be legibly marked.
- E. The Contractor shall keep up to date a complete set of Specifications and addenda to record changes made by directive or by change order. This set shall be legibly marked.
- F. The set shall be submitted to the EPA's Representative at the completion of construction.
- G. The Contractor shall be responsible for final handling and storage of project record documents, including boxing, labeling, and shipping to a final destination as determined by EPA. If approved by the EPA's Representative, the Contractor may instead scan project record documents for electronic storage to eliminate physical storage costs.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

END OF SECTION

SECTION 01780

PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall be responsible for the project closeout activities outlined in this Specification.
- B. The work activities shall include, but not be limited to, the following:
 - 1. Decontamination and removal of all equipment operated by the Contractor
 - 2. Cleaning the project site
 - 3. Disconnection and removal of temporary utilities and facilities
 - 4. Collection and disposal of all Contractor-generated contaminated equipment on the site for which decontamination is inappropriate
 - 5. Restoration of any disturbed areas outside of the Exclusion Zone
 - 6. Submittal of the Remedial Action Report

1.2 REFERENCES

- A. References
 - 1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. Where reference is made to one of the standards below, the revision in effect at the time of contract award shall apply.
 - a. U.S. Environmental Protection Agency (EPA)
 - 1) Office of Superfund Remediation and Technology Innovation, OLEM Directive 9320.2-23 Close Out Procedures for National Priorities List Sites, June 2022

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
 - 1. Remedial Action (RA) Report; Closeout Submittal; EA
 - a. The Contractor shall submit the RA Report to the EPA's Representative within 90 calendar days of the Final Inspection, as specified in Paragraph 3.5.
 - 2. Remedial Closeout Package; Closeout Submittal; FIO
 - a. The Contractor shall provide the required documentation as part of the remedial closeout package in addition to other items that are specified in Paragraph 3.6 and elsewhere by the contract Specifications.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Not used.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 DECONTAMINATION

- A. All contaminated material and equipment shall be decontaminated by the Contractor prior to final removal from the site.
- B. Tools and items for which decontamination is difficult or unachievable shall remain on site until completion of the work for subsequent packing and disposal by the Contractor at an approved disposal facility. Examples of such items are wire, rope, lumber, PPE, and apparel.
- C. Prior to removal from the site, all decontaminated equipment and material shall be inspected and approved by the Site Safety and Health Officer (SSHO) and the EPA's Representative.
- D. Certification of decontamination shall be attested to by the SSHO.
- E. A copy of each decontamination certificate shall be provided to the EPA's Representative.

3.2 TEMPORARY FACILITIES AND UTILITIES

- A. The Contractor shall remove all temporary facilities and associated utilities from the site within 30 days of completion of the project or as directed by the EPA's Representative.
- B. The Contractor shall coordinate with the appropriate utility owners to disconnect the temporary telephone, cable, internet, and electric service and remove all associated aboveground wires.

3.3 SITE CLOSURE

- A. At the completion of the work, the Contractor shall restore all areas affected by the construction activities to conditions equivalent to or better than the original conditions or as indicated on the Design Drawings.

3.4 FINAL ACCEPTANCE INSPECTION

- A. Prior to final inspection, the Contractor shall submit a list of completed final clean-up activities to the EPA's Representative. The Contractor and the EPA's Representative shall jointly perform a Final Acceptance Inspection, which shall include an inspection of the site and off-site areas including the Margaret's Creek Area 9 to ensure that all work was completed as outlined in the Contractor's list of final clean-up activities, SECTION 01010 – SUMMARY OF WORK, SECTION 01451 – CONTRACTOR QUALITY CONTROL, and the Design Drawings. The Contractor shall address any deficiencies immediately.
- B. Upon completion of work, submit to the EPA's Representative written notification that Contract Documents and approved plans have been reviewed, work has been inspected for compliance with Contract Documents and approved plans, work has been completed in accordance with Contract Documents and approved plans, deficiencies listed with Certificate of Substantial Completion have been corrected, and work is complete and ready for final inspection. Should the EPA's Representative find work incomplete, he/she will promptly provide written notification, listing observed deficiencies.
- C. Correct the deficiencies and send a second request for certification of Final Completion. This procedure will continue until such time when the EPA's Representative is satisfied with such repairs and corrections. When the EPA's Representative finds work is

complete, he/she will consider closeout submittals, and a Final Acceptance Certification will be issued. When the Final Acceptance Certification is received, submit the final invoice for final payment.

3.5 REMEDIAL ACTION REPORT

- A. The Contractor shall provide a RA report and data to the EPA's Representative in accordance with OLEM Directive 9320.2-23, including, but not limited to, the following, within 90 calendar days of the Final Inspection.
1. Site background information
 2. Step-by-step summary of remedial activities conducted including but not limited to:
 - a. Site preparation activities, including temporary facilities, clearing, and grubbing, sanitary and potable water supply, electrical and telecommunication installation, site security, fencing, construction of stockpile/loadout area, construction of decontamination pad, and temporary drainage features
 - b. Installation of dewatering and temporary water treatment systems including sheet pile wall installation and removal, collection trench and piping, frac tank storage and removal. Quantity of water treated and discharged. Operation and maintenance procedure, sampling data and data collected during the operation
 - c. Construction activities, including dewatering methods, source materials removal and excavation methods and quantities, riprap and armor stone decontamination methods and screening data, sampling methods and data, dust control, erosion control, work zone air monitoring, and perimeter air monitoring and sampling
 - d. Off-site treatment and/or disposal of all waste types including copies of all manifests and land disposal restriction notifications, copies of all certifications of final disposal signed by the responsible disposal facility official, and copies of waste profile sheets
 - e. Soil/sediment and water sampling results, including collection data such as date and time of collection, and sample chain-of-custody forms
 - f. Site restoration including revetment construction, source of backfill material and quantity including physical and chemical tests performed and results; removal of decontamination area, stockpile/loadout area if any constructed outside of the Exclusion Zone, temporary water treatment system containment area; final site grading, and transition, upland, and wetland area restoration
 3. List of chronological events.
 4. Any changes to the approved Remedial Design
 5. Assessment and discussion of performance standards and analytical data, including quality assurance and quality control procedures followed
 6. Waste management
 7. All inspection and certification reports including punch list items for pre-final and final inspections
 8. Project organization and contract information for the major design and remediation contractors, EPA oversight contractors, and the project managers for EPA and the State of New Jersey
 9. Schedule
 10. Cost and performance summary
 11. Observations and lessons learned
 12. Contingency Plan
 13. Green Remediation
 14. Site Maintenance and Monitoring
 15. Required tables and figures

16. Appendices including but not limited to
 - a. Survey and as-built drawings
 - b. GIS Shape files showing areas of, but not limited to, excavation, restoration, and surveys
 - c. Copies of all project plans
 - d. Copies of all permits
 - e. Wetland restoration and monitoring plan
 - f. Analytical data reports in electronic format
 - g. Waste manifests
 - h. All daily and monthly reports in electronic format
 - i. The digital photo log in electronic format
 - j. Pre/Post-construction photographs and videos
 - k. Air monitoring summary reports
 - l. Delivery tickets for backfill materials
 - m. Copies of all decontamination certifications
 - n. Construction logs
 - o. Records of field change requests

3.6 REMEDIAL CLOSEOUT PACKAGE

- A. Submit the Remedial Closeout Package for all work under this contract within 30 days of Final Acceptance Certification.
 - 1) Construction schedule and progress records
 - 2) As-built drawings showing limits of each excavation area, limits of contamination, known underground utilities within 50 feet of excavations, sample locations with identification numbers, location of temporary stockpiles, treatment, loading and disposal areas, and final drawings shown restored conditions of site including cover materials, topography and any remaining structures and improvements
 - 3) Contract Work Plans
 - 4) Excavation logs
 - 5) Field screening readings
 - 6) Quantity of materials removed from each excavation area
 - 7) Quantity of water/product removed during dewatering
 - 8) Sampling locations and methods
 - 9) Sample collection data such as time of collection and method of preservation
 - 10) Source of backfill along with analytical sample results and documentation of approval for use at the site
 - 11) Copies of all physical test results
 - 12) Waste profile sheets and sample results
 - 13) Waste disposal data
 - 14) Modifications to the Contract – Project Change Orders (PCOs)
 - 15) EPA's Representative's Directives
 - 16) Decontamination area verification and analytical results
 - 17) Analytical Sample Results
 - 18) Final inspection and certification
 - 19) Daily and monthly field reports
 - 20) Site photographs and videos
 - 21) Safety and accident documentation and reports
 - 22) Air monitoring data and reports
 - 23) Chain-of-custody documentation

- 24) Other items as may be required by the EPA's Representative or by other sections not specifically listed above
- 25) Copy of GIS Shape Files of pre- and post-remediation elevations and remediation areas, habitats impacted, and site restoration by habitat type (e.g., wetland, upland, transition, shellfish beds)

END OF SECTION

SECTION 02100

SITE PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all labor, materials and equipment required to perform all site preparation activities as specified herein and presented on the Design Drawings.
- B. The Contractor shall obtain all permits required for site preparation work prior to proceeding with the work. All local permit requirements shall be coordinated in advance with the EPA's Representative.
- C. Prior to performing any site preparation activities, the Contractor shall document existing site conditions via photographs, in accordance with SECTION 01380 – PROJECT PHOTOGRAPHS and SECTION 01381 – VIDEOTAPING and shall report in writing to the EPA's Representative prior to the commencement of any site preparation work. The Contractor shall also field verify the existing site conditions in accordance with SECTION 01550 – SURVEYING. Any significant difference between the assumed existing conditions and actual conditions at the time of construction shall be discussed with the EPA's Representative prior to the work.
- D. The Contractor shall be responsible for notifying the Old Bridge Municipal Utilities Authority (OBMUA) of the planned remedial excavation prior to beginning excavation in order to address any concerns raised by OBMUA regarding the force main protection. See SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL for additional requirements for coordinating with OBMUA.
- E. The Contractor shall ensure that all work is performed safely in accordance with the safety requirements of SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.

1.2 REFERENCES

- A. References
 - 1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only.
 - a. New Jersey Administrative Code (N.J.A.C.)
 - 1) N.J.A.C. 7:26 Solid and Hazardous Waste Management Regulations
 - 2) N.J.A.C. 7:30 Subchapters 1-13; Pesticide Control Code
 - b. New Jersey Statutes Annotated (NJSA)
 - 1) NJSA 13:1 New Jersey Solid Waste Management Act
 - c. American Society for Testing and Materials (ASTM)
 - 1) ASTM C 33 Standard Specification for Concrete Aggregates
 - 2) ASTM D 638 Standard Test Method for Tensile Properties of Plastics
 - 3) ASTM D 1004 Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting
 - 4) ASTM D 1204 Standard Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperatures
 - 5) ASTM D 4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity

- 6) ASTM D 4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
- 7) ASTM D 4751 Standard Test Method for Determining Apparent Opening Size of a Geotextile
- 8) ASTM D 4833 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products
- 9) ASTM D 5199 Standard Test Method for Measuring the Normal Thickness of Geosynthetics
- 10) ASTM D 5261 Standard Test Method for Measuring Mass per Unit Area of Geotextiles

B. Definitions

1. Source Materials

- a. In general, principal threat waste (PTW) are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health, or the environment should exposure occur. Principal threat wastes at the site include:
 - 1) Slag and battery casings/associated wastes, including particles of slag and battery casings/associated wastes identified in the soil and sediment media.
 - 2) Highly impacted soil in the Seawall Sector in portions of Areas 1 and 2, and in the upland portion of the Margaret's Creek Sector.
 - 3) Highly impacted sediment located in Areas 1 and 2 in the Seawall Sector.

2. Debris

- a. Demolition debris in the form of concrete and a variety of bricks, including fire bricks that is considered debris and is to be segregated based on visual observation.

3. Riprap

- a. The on-site riprap, consisting of newer rock material along the Old Bridge Waterfront Park (referred to as post-Sandy riprap), is located within the Extent of Riprap but outside the Footprint of Seawall. The post-Sandy riprap can be visually identified as gray to dark gray large rocks, with a size approximately ranging from 18 to 36 inches in diameter, and it is not mixed with any other waste or stone.
- b. On-site weathered riprap, consisting of older rock material, is found within the Footprint of Seawall. The weathered riprap can be visually identified as brown to dark gray rocks with sizes approximately 12 to 24 inches in diameter and is mixed with debris, slag, and lead pots.
- c. Both types of ripraps will be segregated, decontaminated, and reused on-site.

4. Armored Stone

- a. The existing jetty armoring capstone placed above ground around the First Jetty located in Area 5.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with a "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall provide each of the following documents to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES. The Contractor shall maintain a copy of all documents described in this section on-site at all times during construction.

1. Site Preparation Plan; Pre-Construction Submittals; EA

- a. Site Preparation Plan shall be submitted at least 28 calendar days prior to first Pre-Work conference. The Site Preparation Plan shall address in detail all the

work listed in SPECIFICATION 01010 – SUMMARY OF WORK. In addition, it shall include a drawing showing the proposed decontamination pads/facilities, access point and roads, staging area including trailers and parking, Exclusion Zone demarcation, stockpile/loadout area within the Exclusion Zone, and stormwater diversion features. A proposed layout plan is shown on the Design Drawings. The Site Preparation Plan shall also include detailed design for constructing the stockpile/loadout area outside of the Exclusion Zone. The Site Preparation Plan shall include Contractor-designed temporary culvert across the Margaret's Creek required for accessing the site through the Margaret's Creek Area.

2. Herbicide Application Plan; Pre-Construction Submittals; EA
 - a. The Herbicide Application Plan shall be submitted at least 28 calendar days prior to first Pre-Work conference. The Herbicide Application Plan shall address in detail all the work listed under Paragraph 3.13 of this Specification section and specific requirements for personal protective equipment. The plan components shall comply with, and the proposed work shall be implemented pursuant to, N.J.A.C. 7:30 Subchapters 1-13: Pesticide Control Code.
3. Crushed Stone Aggregate Certificate of Compliance; Certificates; EA
 - a. The Contractor shall submit certificates of compliance, furnished by the crushed stone facilities, stating the physical properties of the crushed stone to be used on-site meet the Specification requirements as described in Paragraph 2.1.
4. No. 2 Stone Certificate of Compliance; Certificates; EA
 - a. The Contractor shall submit certificates of compliance, furnished by the No. 2 Stone facilities, stating the physical properties of the No. 2 Stone to be used on-site meet the Specification requirements as described in Paragraph 2.
5. Dense Graded Aggregate Certificate of Compliance; Certificates; EA
 - a. The Contractor shall submit certificates of compliance, furnished by the Dense Graded Aggregate (DGA) facilities, stating the physical properties of the DGA to be used on site meet the Specification requirements as described in Paragraph 2.3.
6. Non-woven Geotextile Filter Fabric Certificates of Compliance; Certificates; EA
 - a. The Contractor shall submit certificates of compliance, furnished by the geotextile fabric manufacturer or supplier, stating the physical properties of the geotextile fabric to be used on site meet the Specification requirements as described in Paragraph 2.4.
7. Geomembrane Liner Certificates of Compliance; Certificates; EA
 - a. The Contractor shall submit certificates of compliance, furnished by the geomembrane liner manufacturer or supplier, stating the physical properties of the geomembrane liner to be used on site meet the Specification requirements as described in Paragraph 2.5.
8. Pipe Bedding Gravel Certificate of Compliance; Certificates; EA
 - a. The Contractor shall submit certificates of compliance, furnished by the pipe bedding gravel facilities, stating the physical properties of the pipe bedding gravel to be used on-site meet the Specification requirements as described in Paragraph 2.6.
9. Site Preparation Riprap Certificate of Compliance; Certificates; EA
 - a. The Contractor shall submit certificates of compliance, furnished by the riprap facilities, stating the physical properties of the riprap to be used on-site meet the Specification requirements as described in Paragraph 2.7.

10. Permits; Certificates; FIO

- a. Copies of all permits obtained not submitted under other sections.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. The Contractor shall obtain all necessary construction, building, zoning permits required by local authorities.
- B. The Contractor shall provide notification to the EPA's Representative regarding all permits required by the local authorities prior to pursuing and obtaining such permits.

PART 2 - PRODUCTS

2.1 CRUSHED STONE AGGREGATE

- A. Crushed stone shall be sound, hard, and durable and shall meet the following gradation requirements and shall conform to ASTM C 33 Size No. 57.

<u>U.S. Sieve Size</u>	<u>Percent Finer by Weight</u>
1-½ inch	100
1-inch	95-100
½-inch	25-60
No. 4	0-10
No. 8	0-5

2.2 NO. 2 STONE

- A. No. 2 Stone shall be hard, durable, clean crushed angular stone and shall meet the following gradation requirements and shall conform to ASTM C 33 Size No. 2.

<u>U.S. Sieve Size</u>	<u>Percent Finer by Weight</u>
3-in	100
2-1/2-in	90-100
2-in	35-70
1-1/2-in	0-15
3/4-in	0-5

2.3 DENSE GRADED AGGREGATE

- A. DGA shall be hard, durable, rounded, or sub-angular particles of proper size and gradation, and shall be free from sand, loam, clay, excess fines, and other deleterious materials. DGA shall be graded within the following limits:

<u>U.S. Sieve Size</u>	<u>Percent Finer by Weight</u>
2-in	100
1-1/2-in	70-100
¾-in	50-85
No. 4	30-55
No. 50	8-24
No. 200	3-10

2.4 NON-WOVEN GEOTEXTILE FABRIC

- A. The geotextile fabric shall be a non-woven fabric consisting only of continuous chain polymer filaments or yarns of polyester, formed into a stable network by needle

punching. The fabric shall be mildew and rot resistant. The fabric shall contain the properties listed in Table 02100-1.

Table 02100-1 Non-woven Geotextile Fabric Properties

Fabric Property	Test Method	Minimal Physical Properties
Fabric Weight	ASTM D 5261	16 oz/yd ²
Fabric Thickness	ASTM D 5199	175 mils
Grab Strength	ASTM D 4632	380 lbs
Puncture Resistance	ASTM D 4833	145 lbs
Water Flow Rate	ASTM D 4491	50 gpm/ft ²
Permeability, K	ASTM D 4491	0.25 cm/sec
Apparent Opening Size	ASTM D 4751	Sieve Size 100

2.5 GEOMEMBRANE LINER

- A. The geomembrane liner shall be High Density Polyethylene (HDPE) 60 mil Smooth black style as manufactured by Layfield Geosynthetics and Industrial Fabrics Ltd. or equal. The surface on which the geomembrane is to be placed shall be free of rocks greater than 0.5 inches in diameter and any other objects, which could damage the membrane. The seams shall be watertight. The material shall be laid loosely but with intimate contact with soil as to not stretch or tear the liner. Geomembrane liners that are exposed to direct sunlight shall be UV-resistant. The geomembrane liner shall contain the properties listed in Table 02100-2.

Table 02100-2 Geomembrane Properties

Membrane Property	Test Method	Minimal Physical Properties
Thickness	ASTM D 5199	60 mil
Tensile Strength at Break	ASTM D 638	225 ppi
Tear Resistance	ASTM D 1004	42 lbs
Dimensional Stability	ASTM D 1204 Max Change	±2%
Puncture Resistance	ASTM D 4833	108 lbs

2.6 PIPE BEDDING GRAVEL

- A. Screened gravel used for drainage pipe bedding shall consist of hard, durable rounded particles of proper size and gradation, free from sand, loam, clay excess fines and deleterious materials. The size of the particles shall be uniformly graded gravel such that not less than 95% of the particles shall pass a 3/4-inch sieve and not more than 5 percent shall pass a 3/8-inch sieve.

2.7 SITE PREPARATION RIPRAP

- A. Material to be used to protect drainage outlets from soil erosion. Riprap size shall be between 4-12 inches.

PART 3 - EXECUTION

3.1 CLEARING AND GRUBBING

- A. Clearing and grubbing shall be performed in accordance with SECTION 02230 – CLEARING AND GRUBBING and as specified on the Design Drawings prior to any site preparation activities.
- B. For the duration of construction, the Contractor shall remove and store the following Old Bridge Waterfront Park features at a secured location within the Support Zone or at location identified by the County of Middlesex and Old Bridge Township. Prior to removing any park features, the Contractor shall coordinate with the County of Middlesex and Old Bridge Township. The Contractor shall provide protection of the remaining park features such as light poles, park pathways, and miscellaneous features located within and outside of the Support Zone, as necessary.
 - 1. Gazebo
 - 2. Playground
 - 3. Other park features including but not limited to benches, lamp posts, guardrails, requiring removal prior to construction
- C. The Contractor shall remove piling remnants within the Exclusion Zone that will impede installation of the dewatering measures and excavation as shown in the Design Drawings. Requirements for disposing the piling remnants are provided in SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.

3.2 SITE SECURITY FENCING

- A. The Contractor shall remove the existing chain link fence from the site and shall reuse for the temporary site security fence as described herein, if the existing chain link fence meets the design criteria or recycle, otherwise.
- B. The Contractor shall install a 6-foot temporary site security fence to deter unauthorized personnel, including local residents, from entering the site during working and non-working hours. The Contractor shall provide a temporary site security fence as shown on the Design Drawings. The fence is located on the southern side of the Seawall Sector encompassing Areas 1, 2, 4 and 5. The fence extends to the tree line in Area 9 and the Second Jetty in Area 5. No fence is proposed on the bayside of the site. The Contractor shall adjust the location of the fence based on its Temporary Site Facility Layout Plan.
- C. The temporary security fence shall meet the requirements in the Design Drawings details and of New Jersey Department of Transportation Standard Specifications for Road and Bridge Construction 2019 Section 605.03.04 Temporary Fencing. The Contractor shall submit the proposed temporary fencing as part of their Temporary Site Facility Layout Plan in accordance with SECTION 01500 – TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS for review and approval by the EPA's Representative.
- D. Portions or all of the existing fencing and gates may be reused as the security fence if they meet the requirements.
- E. At the conclusion of restoration work, the Contractor shall remove the temporary security fence and gates and transport to a licensed recycling facility approved by the EPA's Representative. If used, the posts shall be cut at the top of the concrete foundation. The foundations shall be excavated and disposed off-site as construction debris, as needed.

3.3 EXCLUSION ZONE DEMARCATION

- A. The Contractor shall erect a visible barrier or fence immediately outside the boundary of the Exclusion Zone (e.g., a combination of barricades and orange snow fencing) on the upland side.

3.4 STAGING AREA

- A. The staging area shall be constructed at the locations shown on the Design Drawings and in accordance with this Specification. The crushed stone shall be underlain by geotextile filter fabric meeting the requirements specified herein.

3.5 DECONTAMINATION FACILITIES

- A. The Contractor shall provide the equipment and materials necessary to properly decontaminate existing riprap and armored stone, and for decontaminating vehicles, personal, and equipment leaving the Exclusion Zone.
- B. Decontamination facilities shall be constructed within the Contamination Reduction Zone and in accordance with the Contractor's approved Decontamination Plan.
- C. Decontamination equipment shall include pressure washing equipment and wire brushes for the riprap, and armored stone decontamination.
- D. Where needed, the facility shall also include a high-pressure wash area for equipment and vehicles and a steam cleaning system, if required, for use after the mud and/or site material has been cleaned from the equipment. At the decontamination pad, all visible contamination shall be removed with scrub brushes and high-pressure water sprays. The station shall be constructed to capture decontamination water, including overspray, and shall allow for collection and removal of the decontamination water using sumps, dikes and ditches as required. Decontamination water from these washing procedures shall be collected, stored, sampled, and treated as per SECTION 02140 – DEWATERING AND DRAINAGE and SECTION 13300 – WATER TREATMENT SYSTEM.
- E. Any temporary decontamination area, if determined to be necessary, shall be constructed in accordance with the Contractor's approved plan.

3.6 CONSTRUCTION ENTRANCES, ACCESS ROAD, AND PARKING

- A. The Contractor shall use No. 2 stone to construct the access road and parking area to support construction traffic as shown on the Design Drawings. The Contractor shall construct and maintain stabilized construction entrances as shown in the Design Drawings and Details.
- B. The Contractor shall ensure emergency access is available at all times for emergency and OBMUA vehicles during construction.
- C. The access road through the Margaret's Creek Area shall be used for waste hauling as indicated on Design Drawings during remedial excavation. The access road and gravel access path in Margaret's Creek shall be improved as required to support one-way construction traffic, as shown in the Design Drawings.
- D. The secondary access road from the Laurence Parkway parking lot shall only be used during emergencies. The access road from the Bayview Drive shall only be used by privately owned vehicles.
- E. The Contractor shall designate a location for vehicle refueling and equipment parking for overnight, to minimize the potential contamination from equipment spills and leaks during demobilization.

3.7 MARGARET'S CREEK TEMPORARY CROSSING

- A. The Contractor shall install temporary culvert supporting two-way traffic at the Margaret's Creek crossing as shown in Design Drawings when providing temporary access road through the Margaret's Creek Area.
- B. The Contractor shall design, furnish, construct, and maintain the temporary culvert crossing required for accessing the site through the Margaret's Creek Area for waste hauling.
- C. As a minimum, the culvert shall be designed to pass the flow from a 2-year frequency, 24-hour duration storm without overtopping. In addition, the culvert shall be designed to ensure that no erosion will result from the 10-year peak storm.
- D. Multiple culverts may be used in place of one large culvert if the equivalent capacity of the larger one is determined to be unsuitable based on the existing site conditions. If multiple culverts are used, they shall be separated by at least 12 inches of compacted aggregate fill.
- E. Clearing and excavation of the stream bed and banks shall be kept to a minimum.
- F. The culvert(s) shall extend a minimum of one foot beyond the upstream and downstream toe of the aggregate placed around the culvert. In no case shall the culvert exceed 40 feet in length.
- G. Culvert shall be constructed using pipe bedding gravel as per Paragraph 2.6 or larger to form the crossing and geotextile fabric as per Paragraph 2.4.
- H. The depth of pipe bedding gravel cover over the culvert shall be a minimum of 10 inches excluding the access road thickness or as recommended by the pipe manufacturer for the design loading for heavy construction equipment. The culvert shall be strong enough to support its cross-sectioned area under maximum expected loads.
- I. Riprap shall be used to protect the sides of the stone from erosion. Typical culvert details are presented in the Design Drawings.
- J. The minimum-sized culvert that may be used is 24 inches.
- K. The length of the culvert shall be adequate to extend the full width of the crossing, including side slopes.
- L. The slope of the culvert shall be at least 0.25 inch per foot.
- M. Crossing alignment may vary 15 degrees from a line drawn perpendicular to the center line of the stream at the intended crossing location.
- N. The centerline of the access road on both sides of the crossing shall coincide with the crossing alignment centerline for a minimum of 50 feet from each bank of the stream crossed. If physical right-of-way restraints preclude the 50 feet minimum, a shorter distance may be provided.
- O. The access road to the structure shall consist of stone pads meeting the following Specifications:
 - 1. Stone as per Paragraph 2.2
 - 2. Minimum thickness: 8 inches
 - 3. Minimum Width: equal to the width of the structure
- P. A water diverting structure such as a dike or swale shall be constructed (along the access road on both sides) 50 feet (maximum) on either side of the stream crossing.

This will prevent roadway surface runoff from directly entering the stream. The 50 feet is measured from the top of the stream bank. If the access road is constructed with a reverse grade away from the stream, a diverting structure is not required.

- Q. When the crossing has served its purpose, all structures including culverts, bedding and geotextile fabric shall be removed. Removal of the structure and clean-up of the area shall be accomplished without construction equipment working in the creek.
- R. Upon removal of the structure, the creek shall immediately be shaped to its original cross-section and properly stabilized.

3.8 TEMPORARY DIVERSION OF MARGARET'S CREEK

- A. The Contractor shall verify the Margaret's Creek alignment along the eastern end of the existing seawall.
- B. If required, temporary diversion of the portion of Margaret's Creek shall be installed as interim measure to facilitate dewatering and drainage control in the area during construction. Diversion location shall be determined by outlet conditions, topography, land use, soil type and length of slope. Consideration must be given to the effects caused by changing natural water courses.
- C. As minimum, the diversion structure shall be designed to handle the flow from a 2-year frequency, 24-hour duration storm.
- D. The diverted runoff shall outlet onto the bay as shown on the Design Drawings.
- E. The Contractor shall inspect at minimum once a week and as soon as possible after any major storm and provide required maintenance to the diversion and outlet structures.
- F. During site restoration, all structures including diversion and outlet structures shall be removed. Removal of the structure and clean-up of the area shall be accomplished without construction equipment working in the creek.
- G. Upon removal of the structure, the creek shall immediately be diverted to its original location and properly stabilized.

3.9 STOCKPILE/LOADOUT AREA

- A. A stockpile area shall be located in the areas to be remediated to isolate stored impacted material from the environment within the Exclusion Zone as shown on the Design Drawings. The stockpile areas shall be used to place source materials, debris, and excavated soil/sediment prior to off-site transportation. The stockpile area for staging all riprap prior to performing decontamination shall also be located within the Exclusion Zone.
- B. Lining the soil/sediment stockpiles shall not be required. However, if it is determined by the EPA's Representative that the stockpiles require a liner, the Contractor shall include a geomembrane liner underneath the stockpiles as per Paragraph 2.5 and as shown on the Design Drawings.
- C. The Contractor must not stockpile any impacted material outside of the Exclusion Zone or beyond the areas to be remediated. However, if necessary, the Contractor shall request a permission from the EPA's Representative to stockpile impacted material outside of the Exclusion Zone but still within the Support Zone. In such cases, adjustments shall be made to expand the demarcation of Exclusion Zone to incorporate these additional designated stockpiling areas. The stockpile areas shall be fully operational when required. The Contractor shall be responsible for submitting detailed

drawings that demonstrate the construction of the stockpile area outside of the Exclusion Zone, meeting the specified requirements in this Specification.

1. The liner and barrier requirements specified herein shall apply to any stockpile areas to be constructed outside of the Exclusion Zone:
 - a. The stockpile pile area outside of the Exclusion Zone shall be contained using a minimum 3-foot-high pre-cast concrete Jersey barrier wall extending to a minimum elevation of 14.5 feet above mean sea level.
 - b. If the stockpile/loadout area is constructed at a location other than the location shown on the Contractor's approved plan, the elevation of the Jersey barrier wall shall be set a minimum of 0.5 feet above the flood hazard area elevation.
 - c. The geomembrane liner as specified in Paragraph 2.5 shall be placed under the stockpiles and adhered to the Jersey barriers where the potential exists for water to infiltrate the site soil within the stockpile area.
 - d. The liner system shall be sloped to a sump area to allow for the collection of water from the stockpiled area. Water from these stockpile areas shall be collected, stored, sampled, and treated as per SECTION 02140 – DEWATERING AND DRAINAGE and SECTION 13300 – WATER TREATMENT SYSTEM.
2. The Contractor shall collect confirmatory samples beneath the stockpile area(s) in accordance with post-excavation confirmatory sampling criteria as per SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.

3.10 STORMWATER DIVERSION

- A. Stormwater shall be diverted around the excavation areas in accordance with SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT, SECTION 02140 – DEWATERING AND DRAINAGE, and the Contractor's approved plan.

3.11 PROTECTION

- A. Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction operations by the erection of barriers or by such other means as the circumstances require.
- B. The Contractor shall repair all damage to trees, shrubs, and plants scheduled to remain, by properly dressing, cutting, and painting, or replacing those items that cannot be repaired.
- C. The Contractor shall seed all grassed areas, beyond the limits of construction shown on the Design Drawings, which have been damaged as a result of the Contractor's operation in accordance with SECTION 02921 – UPLAND SEEDING.
- D. The Contractor shall take steps necessary, where possible, to retain well established vegetation (trees and shrubs) within the Support Zone. EPA will approve in consultation with the state if any of the trees are worth saving based on the future development of the Support Zone.
- E. The OBMUA's force main, manholes and air vents located within excavation areas shall be protected in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.
- F. The Old Bridge Township's storm sewer system within the excavation areas shall either be protected or bypassed in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.

- G. All monitoring wells located within the Exclusion Zone and support zone shall be decommissioned in accordance with SECTION 02957 – DECOMMISSION GROUNDWATER MONITORING WELL.

3.12 WASTE HANDLING AND DISPOSAL

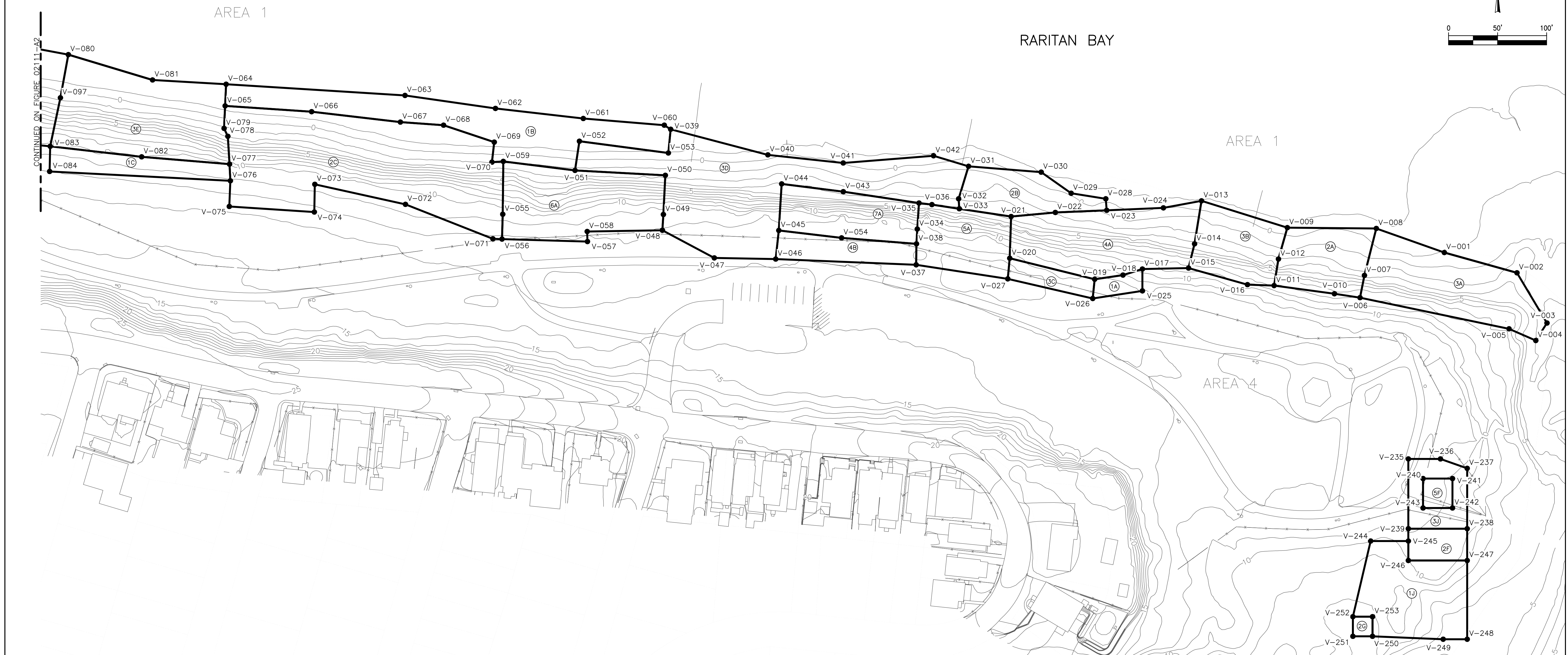
- A. Construction and demolition debris shall be loaded into roll-off containers for off-site disposal. The Contractor shall dispose of materials and debris from site preparation operations at an approved off-site disposal facility in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.
- B. Burning of any materials for disposal of refuse/debris, or other fires for any reason, will not be permitted.
- C. No rubbish or debris of any kind shall be buried on the project site.
- D. The Contractor shall be responsible for all wastes until they are accepted by the disposal facility. It is the Contractor's responsibility to ensure that all waste shipments comply with the disposal facility's requirements at the time of receipt of the shipments at the disposal facility.

3.13 HERBICIDE APPLICATION PLAN

- A. The purpose of herbicide application is to eradicate or kill back living stands of Common Reed (*Phragmites australis*) present in the work area prior to clearing and grubbing. The Contractor shall submit an Herbicide Application Plan prepared in accordance with N.J.A.C. 7:30 Subchapters 1-13 Pesticide Control Code, and industry best practices to achieve this goal.
- B. The Herbicide Application Plan shall identify the proposed herbicide or mix of herbicides for this purpose and approved for use in and adjacent to aquatic environments, e.g., Glyphosate or a mix of Imazapyr and Glyphosate. The Herbicide Application Plan shall also present the proposed application method and protective equipment required for proposed method for the application. Applicators of herbicides and others potentially exposed during and after application must be professionally trained and protected if herbicides are used on-site.
- C. The Contractor, certified in and approved by the state of New Jersey, shall apply approved herbicide 6 to 8 weeks prior to cutting common reed (*Phragmites australis*) to allow the herbicide to be translocated to the roots and rhizomes to kill the plants. If the Contractor proposes less than a 6-week absorption and translocation time, the Contractor shall provide assurances that effectiveness will be the same as applying 6 weeks prior to cutting.

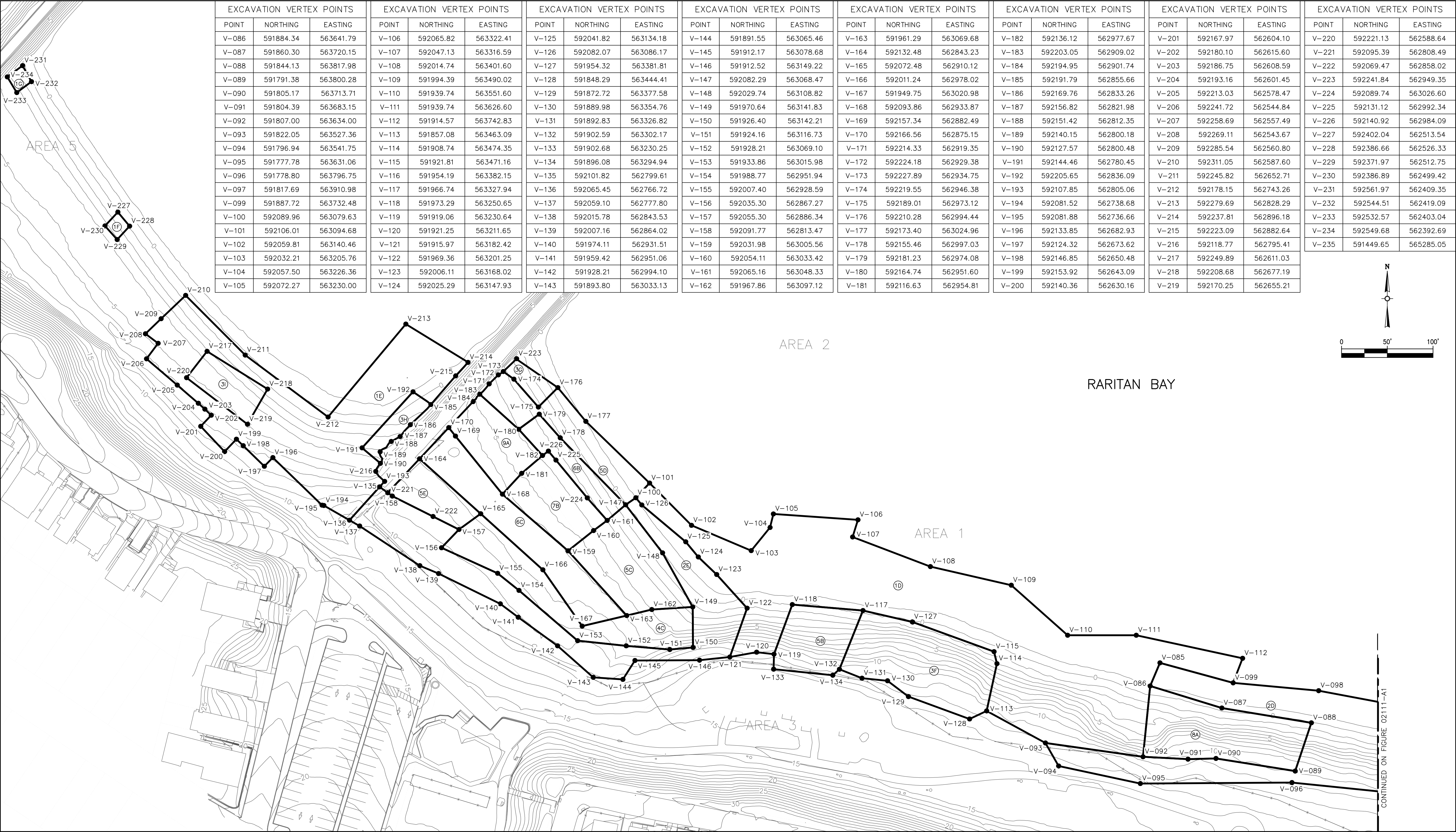
END OF SECTION

EXCAVATION VERTEX POINTS			EXCAVATION VERTEX POINTS			EXCAVATION VERTEX POINTS			EXCAVATION VERTEX POINTS			EXCAVATION VERTEX POINTS			EXCAVATION VERTEX POINTS			EXCAVATION VERTEX POINTS			EXCAVATION VERTEX POINTS			EXCAVATION VERTEX POINTS		
POINT	NORTHING	EASTING	POINT	NORTHING	EASTING	POINT	NORTHING	EASTING	POINT	NORTHING	EASTING	POINT	NORTHING	EASTING	POINT	NORTHING	EASTING	POINT	NORTHING	EASTING	POINT	NORTHING	EASTING	POINT	NORTHING	EASTING
1	591660.01	565321.74	13	591712.63	565074.21	25	591620.91	565013.96	37	591647.46	564783.31	49	591698.75	564525.66	61	591796.56	564444.02	73	591729.50	564170.34	97	591817.69	563910.98	246	591346.16	565285.05
2	591639.30	565395.77	14	591668.84	565067.09	26	591613.12	564963.31	38	591668.86	564783.68	50	591738.69	564527.64	62	591806.84	564354.49	74	591701.26	564169.86	235	591449.65	565285.05	247	591346.16	565345.05
3	591588.13	565426.39	15	591644.13	565060.99	27	591633.15	564876.71	39	591785.58	564533.09	51	591743.69	564435.55	63	591820.06	564262.27	75	591706.95	564083.16	236	591449.65	565317.80	248	591265.94	565345.05
4	591570.31	565414.94	16	591627.27	565121.03	28	591714.74	564976.60	40	591759.52	564632.18	52	591773.41	564440.04	64	591831.47	564079.93	76	591733.10	564084.29	237	591440.08	565345.02	249	591265.94	565320.56
5	591582.26	565387.69	17	591643.17	565013.96	29	591720.38	564941.33	41	591751.23	564708.97	53	591761.43	564530.69	65	591809.45	564078.90	77	591750.05	564083.38	238	591738.59	565345.05	250	591268.92	565248.51
6	591613.99	565235.78	18	591637.02	564994.17	30	591741.88	564910.77	42	591758.62	564801.02	54	591674.90	564707.28	66	591803.51	564167.06	78	591778.45	564081.69	239	591378.59	565285.05	251	591268.92	565228.51
7	591636.70	565240.28	19	591632.72	564965.29	31	591747.87	564836.76	43	591722.00	564709.05	55	591699.01	564361.90	67	591792.88	564257.56	79	591786.52	564077.82	240	591429.65	565300.05	252	591288.92	565228.51
8	591684.53	565252.38	20	591654.18	564878.74	32	591714.74	564826.60	44	591729.94	564646.26	56	591673.70	564361.17	68	591789.74	564301.60	80	591861.64	563919.05	241	591429.65	565330.05	253	591288.92	565248.51
9	591685.34	565161.67	21	591696.66	564880.16	33	591704.61	564827.29	45	591682.46	564643.31	57	591671.18	564448.25	69	591772.46	564353.25	81	591835.86	564004.92	242	591399.65	565330.05	N		
10	591618.00	565209.69	22	591700.83	564925.22	34	591683.94	564784.47	46	591653.35	564640.14	58	591681.44	564448.01	70	591752.11	564350.93	82	591757.49	563993.80	243	591399.65	565300.05			
11	591626.30	565148.20	23	591703.02	564977.53	35	591710.40	564786.21	47	591654.50	564367.52	59	591752.86	564362.48	71	591673.97	564351.85	83	591768.22	563900.61	244	591365.98	565246.62			
12	591653.36	565152.64	24	591705.49	565035.38	36	591708.81	564799.37	48	591682.66	564524.64	60	591789.74	564526.60	72	591709.10	564262.73	84	591742.61	563899.98	245	591365.98	565285.05			



EXCAVATION VERTEX COORDINATES

DATE 09/27/2023



EXCAVATION VERTEX POINTS		
POINT	NORTHING	EASTING
V-086	591884.34	563641.79
V-087	591860.30	563720.15
V-088	591844.13	563817.98
V-089	591791.38	563800.28
V-090	591805.17	563713.71
V-091	591804.39	563683.15
V-092	591807.00	563634.00
V-093	591822.05	563527.36
V-094	591796.94	563541.75
V-095	591777.78	563631.06
V-096	591778.80	563796.75
V-097	591817.69	563910.98
V-099	591887.72	563732.48
V-100	592089.96	563079.63
V-101	592106.01	563094.68
V-102	592059.81	563140.46
V-103	592032.21	563205.76
V-104	592057.50	563226.36
V-105	592072.27	563230.00

EXCAVATION VERTEX POINTS		
POINT	NORTHING	EASTING
V-106	592065.82	563322.41
V-107	592047.13	563316.59
V-108	592014.74	563401.60
V-109	591994.39	563490.02
V-110	591939.74	563551.60
V-111	591939.74	563626.60
V-112	591914.57	563742.83
V-113	591857.08	563463.09
V-114	591908.74	563474.35
V-115	591921.81	563471.16
V-116	591954.19	563382.15
V-117	591966.74	563327.94
V-118	591973.29	563250.65
V-119	591919.06	563230.64
V-120	591921.25	563211.65
V-121	591915.97	563182.42
V-122	591969.36	563201.25
V-123	592006.11	563168.02
V-124	592025.29	563147.93

EXCAVATION VERTEX POINTS		
POINT	NORTHING	EASTING
V-125	592041.82	563134.18
V-126	592082.07	563086.17
V-127	591954.32	563381.81
V-128	591848.29	563444.41
V-129	591872.72	563377.58
V-130	591889.98	563354.76
V-131	591892.83	563326.82
V-132	591902.59	563302.17
V-133	591902.68	563230.25
V-134	591896.08	563294.94
V-135	592101.82	562799.61
V-136	592065.45	562766.72
V-137	592059.10	562777.80
V-138	592015.78	562843.53
V-139	592007.16	562864.02
V-140	591974.11	562931.51
V-141	591959.42	562951.06
V-142	591928.21	562994.10
V-143	591893.80	563033.13

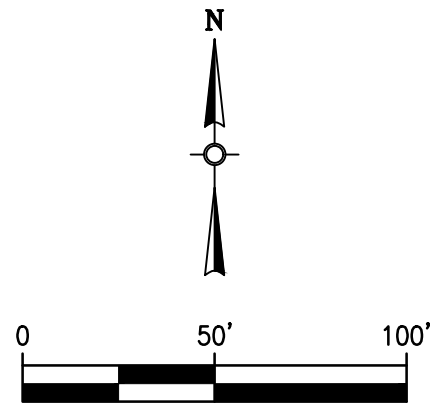
EXCAVATION VERTEX POINTS		
POINT	NORTHING	EASTING
V-144	591891.55	563065.46
V-145	591912.17	563078.68
V-146	591912.52	563149.22
V-147	592082.29	563068.47
V-148	592029.74	563108.82
V-149	591970.64	563141.83
V-150	591926.40	563142.21
V-151	591924.16	563116.73
V-152	591928.21	563069.10
V-153	591933.86	563015.98
V-154	591988.77	562951.94
V-155	592007.40	562928.59
V-156	592035.30	562867.27
V-157	592055.30	562886.34
V-158	592091.77	562813.47
V-159	592031.98	563005.56
V-160	592054.11	563033.42
V-161	592065.16	563048.33
V-162	591967.86	563097.12

EXCAVATION VERTEX POINTS		
POINT	NORTHING	EASTING
V-163	591961.29	563069.68
V-164	592132.48	562843.23
V-165	592072.48	562910.12
V-166	592011.24	562978.02
V-167	591949.75	563020.98
V-168	592093.86	562933.87
V-169	592157.34	562882.49
V-170	592166.56	562875.15
V-171	592214.33	562919.35
V-172	592224.18	562929.38
V-173	592227.89	562934.75
V-174	592219.55	562946.38
V-175	592189.01	562973.12
V-176	592210.28	562994.44
V-177	592173.40	563024.96
V-178	592155.46	562997.03
V-179	592181.23	562974.08
V-180	592164.74	562951.60
V-181	592116.63	562954.81

EXCAVATION VERTEX POINTS		
POINT	NORTHING	EASTING
V-182	592136.12	562977.67
V-183	592203.05	562909.02
V-184	592194.95	562901.74
V-185	592191.79	562855.66
V-186	592169.76	562833.26
V-187	592156.82	562821.98
V-188	592151.42	562812.35
V-189	592140.15	562800.18
V-190	592127.57	562800.48
V-191	592144.46	562780.45
V-192	592205.65	562836.09
V-193	592107.85	562805.06
V-194	592081.52	562738.68
V-195	592081.88	562736.66
V-196	592133.85	562682.93
V-197	592124.32	562673.62
V-198	592146.85	562650.48
V-199	592153.92	562643.09
V-200	592140.36	562630.16

EXCAVATION VERTEX POINTS		
POINT	NORTHING	EASTING
V-201	592167.97	562604.10
V-202	592180.10	562615.60
V-203	592186.75	562608.59
V-204	592193.16	562601.45
V-205	592213.03	562578.47
V-206	592241.72	562544.84
V-207	592258.69	562557.49
V-208	592269.11	562543.67
V-209	592285.54	562560.80
V-210	592311.05	562587.60
V-211	592245.82	562652.71
V-212	592178.15	562743.26
V-213	592279.69	562828.29
V-214	592237.81	562896.18
V-215	592223.09	562882.64
V-216	592118.77	562795.41
V-217	592249.89	562611.03
V-218	592208.68	562677.19
V-219	592170.25	562655.21

EXCAVATION VERTEX POINTS		
POINT	NORTHING	EASTING
V-220	592221.13	562588.64
V-221	592095.39	562808.49
V-222	592069.47	562858.02
V-223	592241.84	562949.35
V-224	592089.74	563026.60
V-225	592131.12	562992.34
V-226	592140.92	562984.09
V-227	592402.04	562513.54
V-228	592386.66	562526.33
V-229	592371.97	562512.75
V-230	592386.89	562499.42
V-231	592561.97	562409.35
V-232	592544.51	562419.09
V-233	592532.57	562403.04
V-234	592549.68	562392.69
V-235	591449.65	565285.05



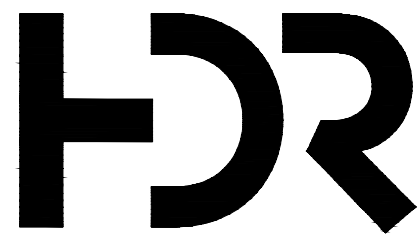
AREA 2

RARITAN BAY

AREA 1

AREA 3

CONTINUED ON FIGURE 02111-A1



EXCAVATION VERTEX COORDINATES

SEAWALL SECTOR
RARITAN BAY SLAG SUPERFUND SITE
TOWNSHIPS OF OLD BRIDGE/SAYERVILLE NEW JERSEY

DATE

09/27/2023

FIGURE

02111-A2

SECTION 02111
EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS

PART 1 - GENERAL

1.1 SUMMARY

- A. The purpose of this section is to provide the Contractor with the minimum requirements and constraints for removal of source materials including slag and battery casings and associated wastes, excavation and handling of contaminated soil/sediment, and collection and analysis of post-excavation confirmatory samples as specified in this section and as shown on the Design Drawings, specified herein, and in accordance with the Contractor's approved Excavation and Handling Plan.
- B. The work shall include, without limitation, removal and decontamination of post-Sandy and weathered riprap from existing seawall, removal and disposal of source materials, excavation of contaminated soil/sediment; segregation of different wastes identified herein and in the Design Drawings; and collection and off-site analysis of post-excavation confirmatory soil/sediment samples.
- C. Excavation shall extend to the widths and depths shown in the Design Drawings or as specified herein and shall include side slopes.
- D. The work consists of the following:
 - 1. Removal and decontamination of approximately 3,500 cubic yards of post-Sandy riprap.
 - 2. Removal of approximately 6,200 cubic yards of slag and battery casings, and associated waste comingled with weathered riprap and construction debris among which approximately 3,500 cubic yards of large slag pieces and 300 cubic yards of debris will be disposed off-site and 2,400 cubic yards of weathered riprap will be decontaminated.
 - 3. Excavation of approximately 1,910 cubic yards of source materials including hazardous soil/sediment with slag/riprap less than six inches and 44,180 cubic yards of contaminated soil/sediment.
- E. Approximate locations of contaminated material are shown on the Design Drawings. The Contractor shall submit an Excavation and Handling Plan, specified herein.
- F. The Contractor shall notify the EPA's Representative within 24 hours, and before excavation, if contaminated material is discovered that has not been previously identified or if other discrepancies between data provided and actual field conditions are discovered. Backfill material is not available on-site.
- G. All required sampling and chemical analysis shall be conducted in accordance with the requirements of SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.
- H. Excavations shall be completed in accordance with Occupational Safety and Health Administration (OSHA) regulations as specified in 29 CFR 1926, Subpart P. No site personnel shall be allowed to enter the excavated area unless determined to be safe by the Competent Person.
- I. The Contractor shall obtain the services of a New Jersey-licensed Surveyor to document the limits of excavation for the purposes of measurement and payment, and for preparation of As-Built drawings.

1.2 REFERENCES

A. References

1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.
 - a. New Jersey Administrative Code (NJAC):
 - 1) N.J.A.C 7:26D New Jersey Administration Code Title 7 Remediation Standards
 - 2) NJAC 7:26E Technical Requirements for Site Remediation
 - b. New Jersey Department of Environmental Protection (NJDEP) – Site Remediation Program
 - 1) NJDEP Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil
 - c. Code of Federal Regulation (CFR)
 - 1) 29 CFR 1910.1000 Air Contaminants
 - 2) 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response
 - 3) 29 CFR 1926, Subpart P Safety and Health Regulations for Construction - Subpart P: Excavations
 - 4) 40 CFR 261 Identification and Listing of Hazardous Waste
 - 5) 40 CFR 264 Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

B. Definitions

1. Source Materials
 - a. In general, principal threat waste (PTW) are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health, or the environment should exposure occur. Principal threat wastes at the site include:
 - 1) Slag and battery casings/associated wastes, including particles of slag and battery casings/associated wastes identified in the soil and sediment media.
 - 2) Highly impacted soil in the Seawall Sector in portions of Areas 1 and 2, and in the upland portion of the Margaret's Creek Sector.
 - 3) Highly impacted sediment located in Areas 1 and 2 in the Seawall Sector.
2. Debris
 - a. Demolition debris in the form of concrete and a variety of bricks, including fire bricks that is considered debris and is to be segregated based on visual observation.
3. Riprap
 - a. The on-site riprap, consisting of newer rock material along the Old Bridge Waterfront Park (referred to as post-Sandy riprap), is located within the Extent of Riprap but outside the Footprint of Seawall. The post-Sandy riprap can be visually identified as gray to dark gray large rocks, with a size approximately ranging from 18 to 36 inches in diameter, and it is not mixed with any other waste or stone.
 - b. On-site weathered riprap, consisting of older rock material, is found within the Footprint of Seawall. The weathered riprap can be visually identified as brown to dark gray rocks with sizes approximately 12 to 24 inches in diameter and is mixed with debris, slag, and lead pots.
 - c. Both types of riprap will be segregated, decontaminated, and reused on-site.
4. Armored Stone

- a. The existing jetty armoring capstone placed above ground around the First Jetty located in Area 5.
- 5. Hazardous Waste
 - a. A waste that meets criteria established in Resource Conservation and Recovery Act (RCRA) or specified by the EPA in 40 CFR 261 or which has been designated as hazardous by a RCRA authorized state program.
- 6. Non-hazardous Waste
 - a. Any waste that does not meet the criteria of hazardous waste.
- 7. Post-Excavation Confirmatory Sample
 - a. Soil/sediment sample collected subsequent to primary and secondary excavation to confirm that the Remediation Cleanup Levels have been met.
- 8. In-the-Dry
 - a. "In-the-Dry" means soil conditions where dewatering is performed to drawdown water level below the bottom of any soil/sediment subgrade and no standing water exists on soil subgrades. The drawdown shall be sufficient to prevent disturbance or softening of the subgrade during all anticipated construction activities, collection of post-excavation confirmatory samples, and backfilling.
- 9. Severe Storm
 - a. In general, a severe or large storm event is a Category 1 or higher hurricane, tropical storm, or a nor'easter, resulting in more than 1.0 inches of rainfall in 1-hour period and 3.0 inches of rainfall in 24-hour period.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals with an "FIO" designation is for information only. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES
 - 1. Excavation and Handling Plan; Pre-Construction Submittals; EA
 - a. The Contractor shall submit an Excavation and Handling Plan at least 28 calendar days prior to the Pre-Work Conference. The Contractor should note that adverse conditions (heavy rain or snow) may be encountered during excavation operations and provisions should be made for such an event. No work at the site, with the exception of site visits and pre-construction surveys shall be performed until the plan is approved. The Contractor shall allow 30 calendar days in the schedule for review by the EPA's Representative.
 - b. At a minimum, the Excavation and Handling Plan shall include all elements listed below.
 - 1) Schedule of Activities – provide a schedule for all activities. This schedule should include a phasing plan and sequence of events for all construction activities required to complete the work.
 - 2) Personnel requirements.
 - 3) Decommissioning Procedures to be used for decommissioning existing monitoring wells in accordance with SECTION 02957 – DECOMMISSION GROUNDWATER MONITORING WELL.
 - 4) Removal and excavation approach and sequence:
 - a) Equipment and methods for removing armored stone, post-Sandy riprap, and weathered riprap, as well as transporting riprap to the decontamination pads.
 - b) Equipment and methods for removing source materials and debris.
 - c) Equipment and methods of excavation and backfill.

- 5) Measures to dewater the excavation area and divert stormwater that can potentially accumulate in the excavation area during precipitation events and coordinating site dewatering activities as detailed in the SECTION 02140 – DEWATERING AND DRAINAGE.
- 6) Storage methods and locations for contaminated fluids and solids. Methods for prevention of cross-contamination at the stockpile area to be built within the Exclusion Zone.
- 7) Waste Characterization Sampling – Provide a plan for sampling required for waste characterization of the soil/sediment to be disposed of off-site.
- 8) Handling of source materials and contaminated soil/sediment.
- 9) Stockpiling procedures including but not limited to:
 - a) Locations and size of stockpiles – A plan showing the location of proposed stockpile areas within the Exclusion Zone and how stockpiles will be protected to prevent the runoff of contaminated soil/sediment.
 - b) Designation of hazardous and non-hazardous material stockpiles.
 - c) Tracking analytical data associated with each stockpile, including data where the material was excavated and waste characterization data were collected.
- 10) Coordinating waste segregation and stockpiling logistics which shall include but not be limited to:
 - a) Locations for off-site treatment and disposal of the excavated soil/sediment and source materials designated as hazardous and disposing of non-hazardous soil/sediment and debris.
 - b) A truck route and a traffic plan. The plan shall also include an on-site truck route and sequencing plan for how removed source materials, debris, and soil/sediment will be transported for off-site treatment and/or disposal.
- 11) Decontamination and temporary storage of riprap and armored stone – The Contractor shall provide a description and plan showing where the decontamination stations shall be set up and used.
- 12) Shoring, bracing, and sloping as per the applicable OSHA requirements.
- 13) Coordinating with the Site Safety and Health Plan for spill and discharge control.
- 14) Vibration Monitoring Plan – A plan for performing vibration monitoring of the force main. The plan shall include means and methods for conducting vibration monitoring during intrusive work within the 20-ft Old Bridge Municipal Utilities Authority (OBMUA) force main easement, as required by OBMUA.
- 15) Post-excavation confirmatory sampling and analysis procedures.
- 16) Coordination of haul routes with Waste Management and Transportation Plan.
- 17) Surveying of excavated areas and determination of excavation quantities.
2. Post-Excavation Confirmatory Sampling Results; Test Reports; FIO
 - a. The Contractor shall provide the post-excavation confirmation sampling results in a format consistent with the requirements of NJAC 7:26E. The analysis and reporting shall meet the requirements of SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.
3. Surveys; Shop Drawings; EA
4. Closure Report; Product Data; EA
5. Sampling Liquid; Test Reports; EA
6. Excavation field logs; Closeout Submittals; EA

7. Field screen readings; Closeout Submittals; EA
8. Quantity of materials removed from each area of contamination; Closeout Submittals; EA
9. Quantity of water/product removed during dewatering; Closeout Submittals; EA
10. Sampling locations; Closeout Submittals; EA
11. Scaled drawings; Closeout Submittals; EA
 - a. Scaled drawings (a scale of no more than 30 ft/in) showing limits of excavation, design limits of contamination, known underground utilities within 50 feet of excavation, sample locations, sample identification numbers. On-site stockpiles and loading areas shall also be shown.
12. Progress photographs; Closeout Submittals; FIO
 - a. Digital, color photographs with correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion, shall be used to document work progress. A minimum of four views of the site showing the location of the contaminated areas, entrance/exit road, and any other notable site conditions shall be taken before work begins. After work has started, activities at each work location shall be photographed daily. Photographs shall meet the requirements of SECTION 01380 – PROJECT PHOTOGRAPHS and shall include:
 - 1) Source materials removal and staging
 - 2) Soil/sediment removal and sampling
 - 3) Dewatering operations
 - 4) Unanticipated events such as spills and the discovery of additional source materials
 - 5) Contaminated material/water storage, handling, treatment, and discharge/disposal.
 - 6) Fill placement and grading
 - 7) Post construction photographs shall be taken after completion of the work.
 - 8) A minimum of four views of each excavation segment.
 - b. Electronic copies of the progress photographs shall be uploaded to a cloud-based file sharing service, as compatible with EPA systems, at minimum once a week for review by stakeholders off-site.
13. Other Submittal Requirements; Closeout Submittal; EA
 - a. Submit separate cross-sections of each segment before and after excavation and after backfilling, test results, and the Closure Report within 14 calendar days of work completion at the site.
14. Daily quality control reports; FIO

1.4 ADMINISTRATIVE REQUIREMENTS

A. Not used.

1.5 REGULATORY REQUIREMENTS

A. Permits and Licenses

1. These requirements governing transportation, administrative requirements and methods of treatment and disposal of hazardous wastes, and all other applicable Federal, State, or local laws, codes and ordinances which govern or regulate hazardous wastes shall apply to the work of this section. The Contractor shall be responsible for obtaining permits necessary for excavation, dewatering, stockpiling and any other features of work associated with the removal of source materials and excavation of contaminated soil/sediment.

B. Air Emissions

1. Air emissions shall be monitored and controlled in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE and SECTION 01362 – PERIMETER AIR MONITORING.

1.6 QUALITY ASSURANCE

A. Shoring Plan

1. The Contractor shall submit drawings describing the methods for shoring of excavations. Drawings shall include material sizes and types, arrangement of members, and the sequence and method of installation and removal. Calculations shall include data and references used. Shoring systems not provided per 1926.652(c)1, 2, or 3 shall be designed and certified by a professional engineer per 1926.652(c)4

B. Dewatering and Drainage Plan

1. The Contractor shall submit procedures for accomplishing dewatering work in accordance with SECTION 02140 – DEWATERING AND DRAINAGE
2. The Contractor shall provide a plan for how the open excavations will be maintained free of storm water and/or groundwater during the excavation work. The plan shall discuss the methods that will be used to divert, collected, and disposed of non-contact water and storm water runoff. Plan shall include a discussion of how work will proceed in order to minimize the time that excavations are kept open.

1.7 DESIGN AND PERFORMANCE RESPONSIBILITY

- A. The Contractor is responsible for the design and execution of the means and methods to achieve the target excavation depths, dewatering, and minimize disturbance.
- B. The Contractor is responsible for any damage to properties, structures including the First Jetty, sewers and other utility installations, roadways, and work that may result from excavation and associated operations.
- C. The Contractor is responsible for monitoring the water quality and controlling the impact to the surface water bodies (bay) affected by the work specified herein and in SECTION 01355 – ENVIRONMENTAL PROTECTION.
- D. Any design review and field monitoring activities performed by the EPA's Representative shall not relieve the Contractor of responsibility for the work.

1.8 SITE REMEDIATION CLEANUP LEVEL

- A. The Remediation Cleanup Level for this project for lead is 400 milligrams per kilogram (mg/kg) for both soil and sediment.

1.9 POST-EXCAVATION CONFIRMATORY SAMPLING CRITERIA

- A. All excavations require verification in accordance with the NJDEP post remedial action requirements defined in N.J.A.C. 7:26E, Subchapter 5.2, and NJDEP Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil.
- B. One sidewall sample for every 30 linear feet of excavation sidewall, with a minimum of one sample located on each sidewall. Post-excavation confirmatory sampling from areas requiring one sample shall be collected from the center of the sidewall (e.g., 1 foot for a 2-foot excavation). Similarly, the post-excavation depths for areas requiring two sidewall samples shall be collected at the top and bottom of each sidewall. In addition

to the post-excavation confirmatory sampling, QA/QC sampling shall also be performed in accordance with the SECTION 01450 – CHEMICAL DATA QUALITY CONTROL. Excavation sidewalls to be sampled include the overall perimeter sidewalls and interior sidewalls between adjoining excavations. For excavation depth more than two feet deep, collect sample at the top and bottom of each sidewall sample to demonstrate vertical compliance with the remediation cleanup level. The Contractor shall bias sidewall sample locations and sample depths for each sidewall to the highest concentration based on field screening and data from previous investigations sample locations, type and characteristics of contaminant, and other indicators of potential contamination.

- C. One bottom sample from the excavation bottom for every 30- by 30-foot grid, or every 900 square feet of excavation floor.
- D. The post-excavation bottom samples within each 900 square feet of bottom area should be biased to the highest concentration based on the data from RI and PDI sample locations and visual indicators of potential contamination.

1.10 WASTE TYPES

- A. Riprap will be removed, separated from the associated waste, and decontaminated in accordance with the Contractor's approved decontamination plan as per SECTION 01510 – DECONTAMINATION PLAN and will be reused, as deemed appropriate as per SECTION 03530 – REVETMENT CONSTRUCTION. The Contractor shall maximize reuse when practical to minimize disposal of riprap as waste.
- B. The following types of wastes are expected from the removal and excavation operation:

Table 02111 - 1 Summary of Expected Waste Types

Waste Type	Waste Definition
Hazardous – RCRA, No Treatment	• Soils/sediment/water treatment residuals with lead concentrations greater than or equal to Toxicity Characteristic Leaching Procedure (TCLP) criteria (5 milligrams per liter) and less than 10 times (7.5 milligrams per liter) Universal Treatment Standard (UTS) criteria (0.75 milligrams per liter).
Hazardous – RCRA, Treatment (Source Materials)	• Soils/sediment with lead concentrations greater than or equal to TCLP criteria (5 milligrams per liter) and at least 10 times (7.5 milligrams per liter) UTS criteria (0.75 milligrams per liter) will require treatment based on the TCLP results. • Hazardous soil/sediment with small slag/riprap pieces and battery casings & associated waste. • Large hazardous slag pieces.
Non-Hazardous – Subtitle D	• Soils/sediment/water treatment residuals with lead concentrations below TCLP criteria (5 milligrams per liter) but greater than remediation cleanup level (400 milligrams per kilograms). • Tree stumps from grubbing operations. • Miscellaneous Construction Debris including wood piling remnants.
Non-Hazardous – Municipal Landfill or Subtitle D	• Post-Sandy and Weathered Riprap not able to be used on-site.
Recyclable – Non-hazardous	• Trees and vegetation from clearing operations. • Existing chain link fence not reused.

PART 2 - PRODUCTS

2.1 GEOMEMBRANE LINER

A. As specified in SECTION 02100 – SITE PREPARATION.

2.2 TARPAULINS (TARP)

A. As specified in SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.

PART 3 - EXECUTION

3.1 SURVEYS

- A. Surveys shall be performed immediately prior to and after excavation of contaminated material to determine the volume of contaminated material removed.
- B. The Contractor may utilize the coordinates of primary excavation area vertices provided as Attachment A1 and A2 to perform a survey prior to initiating excavation of contaminated soil/sediment.
- C. Surveys shall also be performed after backfill showing final grade.

- D. Locations of all post-excavation confirmation samples, including but not limited to the locations provided on the Design Drawings, shall also be surveyed.
- E. Surveys shall be performed in accordance with SECTION 01550 – SURVEYING.

3.2 EXISTING STRUCTURES AND UTILITIES

- A. The majority of the excavation at the site is along Old Bridge Waterfront Park west of Margaret Creek to the beach area located at the foot of Laurence Parkway. The limit of excavation also includes additional beach area between the First and Second Jetty as well as an upland portion of Area 9, the Margaret Creek Sector, located south of the eastern edge of the seawall.
- B. The Contractor will be responsible for utilizing the appropriate New Jersey One-Call utility service and independently performing a geophysical investigation at the site prior to commencement of subsurface activities.
- C. The Contractor shall discuss the approach to managing utilities with the utility owners including the OBMUA and the Old Bridge Township (Old Bridge) prior to commencement of subsurface activities.
- D. The Contractor shall field-verify and mark the locations of all utilities within the work area prior to mobilizing heavy construction equipment, supplies, and facilities and to protect all existing utilities for the duration of construction in accordance with this Section and Design Drawings.
- E. Site utilities will include but may not be limited to water, electric, force main, stormwater drainpipe, sanitary, gas, and communications. In addition to the water, electric, gas, and communications lines, a 20-inch ductile iron pipe force main (force main) owned by the OBMUA and storm sewer system owned by the Old Bridge Township are critical underground utilities at the site. The storm sewer system consists of storm sewer inlets, piping, and manholes north of Laurence Parkway, and discharges seaward of the First Jetty. Several existing manholes are located near the excavation area. Manholes along the active 30-inch sewer pipe have been surveyed and were used to identify the approximate location of the sewer pipe. Below is a summary of utilities identified within the Support and Exclusion Zone:
 - 1. The force main alignment crosses the site in an east-west direction, running under the Area 5 boardwalk, Area 5 and Area 2 beaches, and the upland portions of Areas 3, 2, 4, and 9. A 20-ft easement is centered on the length of the alignment (10 ft to either side of the force main). The force main passes through proposed excavations in Area 5 (excavation areas 1E and 3I), Area 2 (excavation area 2E), and Area 9 (excavation areas 3J and 5F). On average, the force main conveys approximately 2.5 million gallons per day raw sewage to the treatment facility located at the northeastern end of Margaret Creek area. It is critical that all necessary precautions are taken during the RA to ensure no damages occur. The Contractor shall take the necessary precautions to ensure no damage occurs to the existing force main, including coordination with OBMUA.
 - 2. A stormwater sewer runs along the southern edge of Area 2 near the main park parking lot, connecting to a storm sewer inlet in the park lot. This line connects to a 42" reinforced concrete pipe (RCP) through the core of the First Jetty, emptying into the bay. The 42" RCP stormwater sewer running through the First Jetty enters proposed excavations in Area 2 (excavation areas 2E, 3G, 5D, 5E 9A, and 6D) and Area 5 (excavation areas 1E and 3H).

3. Underground electrical runs between the park path lights from the northern edge of the main parking lot in Area 2 to the Area 4 gazebo. The electrical line also branches to a transformer near the park's east parking lot in Area 1. The line is buried at approximately three ft bgs. The electrical line may run through the southern edge of proposed excavations in Area 4 near the east parking lot (excavation areas 3D and 4B). The line is buried at approximately three ft bgs. Electric supply to light poles in the park will need to be located by the Contractor prior to disturbing the areas. Protection or de-energizing of electrical utilities will be required.
4. A 4-inch PVC storm sewer line runs from the Area 4 east parking lot to an inlet grate to the west, and discharges at an unknown point in the seawall in Area 1 via a 12" RCP pipe. The 12" RCP stormwater sewer runs through proposed excavations in Areas 4 and Area 1 (excavation area 6B).
5. A 48-inch storm sewer runs from Bayview Drive, between the path park roundabout and playground, to the Area 1 seawall. The storm sewer runs through proposed excavations in Area 1 (excavation areas 1D and 2D).
6. Four stormwater drains with unknown size lead from the Area 3 playground to the seawall. The drain lines run into proposed excavations in Area 1 (excavation areas 2E and 5B).
7. An unknown object was identified by GPRS at 3 ft bgs on the Area 2 beach within the proposed excavations (excavation area 5E).
8. Overhead electrical utilities run along the southern edge of Bayview Drive, over Wilson Ave, the community center near the Area 2 beach and the main park parking lot. The electrical then continues up the western edge of Laurence Parkway and the southern edge of Shoreland Circle. This utility will not be impacted by the remedial construction activities.

F. Force Main

1. The force main will be a critical utility to protect when conducting the following activities during the RA.
 - a. Excavating near and along the force main.
 - b. Installing access road and providing a crossing of heavy equipment traffic across the force main.
 - c. Restoring the existing boardwalk in Areas 2 and 5 near the force main, if it was required to be removed during the excavation.
2. The Contractor shall coordinate with OBMUA to ensure the Excavation and Handling Plan includes a Vibration Monitoring Plan for the force main, measures for protecting the force main, and emergency response. The workplan will need to include precautionary steps and procedures for the Contractor to follow during the RA. It is the Contractor's responsibility to field-verify the location and depth of the force main prior to the mobilization of heavy equipment at the site.
3. Access road crossings over the force main will require protective matting to distribute the weight of heavy construction vehicles/equipment.
4. Heavy equipment and materials shall not be staged above the force main.
5. After site preparation and staging is complete, the Contractor shall coordinate with the OBMUA so that they can inspect the Contractor's protective measures for the force main (e.g., protective matting for the access road).
6. The Contractor shall coordinate with the OBMUA prior to all excavation work within 20 feet of the force main. An OBMUA representative must be present during all intrusive work within the 20-ft OBMUA force main easement. If an OBMUA

representative is not present, no intrusive work within the 20-ft OBMUA force main easement may be performed.

7. Excavations below 1 feet bgs within 20 feet of the force main shall be conducted using a soft-dig method.
8. The Contractor shall conduct vibration monitoring of the force main in accordance with the approved Vibration Monitoring Plan.
9. The Contractor shall take necessary precautions to ensure no damage occurs to the OBMUA force main, manholes and air vents, other existing utilities.

G. Existing Storm Sewer System

1. The Contractor will be responsible for coordinating with the Old Bridge Township for all existing storm sewer system.
2. The Contractor shall take the necessary precautions to ensure no damage occurs to any existing active storm sewers located outside of the excavation areas.
3. The Contractor shall manage and divert stormwater flows within the active excavation area in accordance with the Contractor's approved Dewatering and Drainage Plan as per SECTION 02140 – DEWATERING AND DRAINAGE.

H. The Contractor shall locate electric supply to light poles in the Old Bridge Waterfront Park prior to disturbing the areas. Protection or de-energizing of electrical utilities shall be required.

I. The Contractor shall take the necessary precautions to ensure no damage occurs to existing structures (manholes, flagpole, boardwalk adjacent property items, etc.) and utilities outside the excavation limits that are not part of the scope of work. Damage to existing structures and utilities outside the scope of work shall be repaired at no additional cost to the EPA.

J. Unexpected active utilities encountered during excavation shall not be disturbed without written approval from the EPA's Representative.

3.3 CLEARING

- A. Clearing shall be performed to the limits shown on the Design Drawings in accordance with SECTION 02230 – CLEARING AND GRUBBING.
- B. The Contractor shall dismantle park facilities prior to construction in accordance with SECTION 02100 – SITE PREPARATION. The park facilities removed during construction shall be reconstructed back to their original locations in accordance with SECTION 02900 – SITE RESTORATION.
- C. The contractor shall remove wood piling remnants within the Exclusion Zone that will impede installation of the dewatering measures and excavation. Any existing piling remnants removed as part of the clearing activities shall be disposed of off-site with miscellaneous construction debris.

3.4 SITE PREPARTION

- A. Site preparation shall be completed prior to excavation in accordance with SECTION 02100 – SITE PREPARATION and SECTION 01500 – TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS.

3.5 SOURCE MATERIALS REMOVAL AND EXCAVATION SEQUENCING

- A. Removal of source materials and excavation shall be conducted in a phased approach. The purpose of this phased approach is to effectively coordinate the different aspects of

the remedial activities. As shown on the Design Drawings, the overall remedial removal and excavation is divided into the following stages:

1. Install sheet pile wall in accordance with SECTION 03150 – METAL SHEET PILE prior to initiating removal of source materials and riprap, and excavation in areas 1, 2, 4 & 5. Excavations in the upland Areas 4 and 9 excavations may begin prior to the sheet pile wall installation, as shown in the Design Drawings.
2. Perform dewatering activities in accordance with SECTION 02140 – DEWATERING AND DRAINAGE to allow for removal of source materials, excavation of soil/sediment, post-excavation confirmatory sampling, backfilling, and revetment construction.
3. Stage frac tanks and construct contingency temporary water treatment system
4. Construct riprap and armored stone decontamination stations within the Contamination Reduction Zone.
5. Removal of source materials and excavation
 - a. During the site preparation, remove and relocate approximately 50 cubic yards of post-Sandy riprap from the eastern end of the seawall in Area 4, to construct a portion of access road for providing access through Margaret Creek Area.
 - b. Perform excavation and backfill to existing grade in Area 9.
 - c. Remove seawall riprap and source materials and debris in stages starting from eastern side of the seawall in Area 4 & 9, working west towards the beach in Area 2.
 - 1) Remove pre-Sandy riprap from the existing seawall and stage within the Exclusion Zone first before removing large slag pieces, weathered riprap and debris from the seawall.
 - 2) Perform decontamination of riprap following decontamination procedures in accordance with SECTION 01510 – DECONTAMINATION PLAN. Post-Sandy riprap shall be reused for the seawall re-construction in accordance with SECTION 03530 – REVETMENT CONSTRUCTION.
 - 3) Next, remove and segregate visually large slag pieces along with construction debris and weathered riprap and stage within the Exclusion Zone.
 - a) Large slag pieces shall be stockpiled separately for an off-site treatment and disposal.
 - b) Perform decontamination of riprap following decontamination procedures in accordance with SECTION 01510 – DECONTAMINATION PLAN.
 - c) Debris shall be stockpiled separately for an off-site disposal.
 - 4) Lastly, scrape the soil/sediment comingled with smaller pieces of slag/riprap material, battery casings/associated wastes beneath and at the toe of the seawall and stage within Exclusion Zone in a separate stockpile.
 - 5) Segregate any slag/riprap material, battery casings/associated wastes greater than 4 inches that are buried within or comingled with the soil/sediment requiring the off-site treatment and disposal.
 - d. Proceed with soil/sediment excavation in stages starting from eastern side of the seawall in Area 4 & 9, working west towards the beach area located in Area 2 & 5.
 - 1) Stockpile contaminated soil/sediment within the Exclusion Zone.
 - 2) Excavate contaminated soil/sediment at minimum to the excavation depths as shown on the Design Drawings.
 - e. Perform removal of contamination around the First Jetty

- 1) Remove armored stone from the portions of the jetty to excavate impacted material in adjacent areas 2 and 5 as close to the jetty structure as possible.
- 2) The source materials is not expected to be found in the First Jetty; however, if discovered, remove source materials visually after removing the armored stone
- 3) Perform post-excavation confirmatory sampling based on the Post-Excavation Confirmatory Sampling Criteria listed in Paragraph 1.9.
- 4) In case post-excavation confirmatory sample analytical results show contaminant concentrations greater than the Remediation Cleanup Level near the jetty/sand interface, then, pause the excavation and contact EPA's Representative for further direction.
- f. Implement dewatering and additional measures as necessary to keep the excavation in-dry in accordance with SECTION 02140 – DEWATERING AND DRAINAGE.
6. Collect, store and test contact water from excavation areas and from decontamination in accordance with the SECTION 01510 – DECONTAMINATION PLAN and SECTION 02140 – DEWATERING AND DRAINAGE.
7. Inspect the excavation bottom and side slope for visual contamination, slag, and battery casings.
8. Perform post-excavation confirmatory sampling to confirm that the site Remediation Cleanup Level has been achieved. During the excavation, perform a civil survey in accordance with SECTION 01550 – SURVEYING to confirm the horizontal and vertical extent of excavation meets the Design Drawings.
9. Conduct waste disposal sampling and soil/sediment load out activities concurrently with the excavation activity.
10. Perform secondary excavation of contaminated material based on the results of post-excavation confirmation sample analysis and/or field observations with an approval from EPA's Representative.

3.6 SOURCE MATERIALS REMOVAL

- A. The Contractor shall install and implement the dewatering system in accordance with SECTION 02140 – DEWATERING AND DRAINAGE and the Contractor's approved plan prior to removing source materials and riprap from the existing seawall.
- B. The Contractor shall remove the post-Sandy riprap first from the existing seawall before removing large slag pieces, weathered riprap and debris from the seawall. The riprap shall be transferred to the designation area for decontamination and storage.
- C. The Contractor shall segregate large slag pieces/battery casings and associated waste from the weathered riprap and debris visually and create separate stockpile for each waste type within the Exclusion Zone.
- D. The Contractor shall perform decontamination of riprap following decontamination procedures in accordance with the Contractor's approved Decontamination Plan.
- E. Removal of slag pieces, battery casings and associated waste shall be performed in a manner that will limit spills and the potential for contaminated material to be mixed with uncontaminated material. A daily log describing visible signs of contamination encountered shall be maintained during the removal of source materials.

- F. The Contractor shall remove and dispose any material that becomes contaminated as a result of the Contractor's operation of source materials removal at no additional cost to the EPA.
- G. The Contractor shall segregate smaller pieces of slag pieces (greater than 4 inches) and battery casings/associated wastes that are buried within or comingled with the soil/sediment to the extent possible unless otherwise directed by the EPA's Representative.
- H. The soil beneath and at the toe of the seawall is potentially hazardous waste and shall be scraped and segregated from the potential non-hazardous soil/sediment stockpiles. The Contractor shall scrape the top 6 inches of soil/sediment comingled with smaller pieces of source materials beneath and at the toe of the existing seawall, and temporarily place in a separate stockpile within the Exclusion Zone. The Contractor shall remove additional surface material, if necessary, found based on visual observations.
- I. The EPA's Representative shall be notified as soon as possible but no later than 24 hours if hazardous material (slag or battery casings) or visual contamination is discovered that has not been identified in the Contract Documents. Any visible sign of contamination, and slag or battery casing encountered during excavation shall be maintained for each area of excavation. The EPA's Representative shall then notify the Contractor whether this material shall be excavated.
- J. Loading and transporting source materials shall be in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL. The stockpile area shall be built within the Exclusion Zone in accordance with the Design Drawings and SECTION 02100 – SITE PREPARATION.

3.7 EXCAVATION

A. General

- 1. An electronic copy of the Design Drawings will be provided to the Contractor to establish sampling locations and the corners of all primary excavation areas, as shown on the Design Drawings. The Contractor shall use New Jersey state plane coordinates to lay out sample locations and the limits of excavation, using the services of a NJ State Licensed Surveyor.
- 2. The Contractor shall perform all excavations to the lines, grades, and elevations shown on the Design Drawings. The survey work to measure quantities shall be performed by the Contractor prior to backfilling the excavation, and shall be accurate to the nearest 0.1 ft.
- 3. Excavation shall be performed in a manner that will limit spills and the potential for contaminated material to be mixed with uncontaminated material. An excavation log describing visible signs of contamination encountered shall be maintained for each area of excavation.
- 4. The Contractor shall remove and dispose any material that becomes contaminated as a result of the Contractor's operation at no additional cost to the EPA.
- 5. The Contractor shall stage operations to minimize the time the contaminated soil/sediment is exposed to the weather.
- 6. The Contractor shall be responsible for benching or sloping the excavation, as necessary, or for providing other temporary supports to prevent soil slippage along the side slopes and any other slope stability issues in accordance with the Contractor's approved Excavation and Handling Plan. All Contractor-designed sloping shall comply with the requirements of OSHA 1926, Subpart P. The soil type shall be considered Type C.

7. All slopes shall be inspected daily by a qualified staff member for cracks in the soil at the head or along the face of the slopes and other changed conditions such as bulges or sloughs on the slopes. Inspection results shall be documented in a Daily quality control report and any unusual or changed conditions shall be brought to the attention of the EPA's Representative.
8. The Design Drawings show a maximum slope of 2H:1V for excavation of each area exceeding 4 feet in depth. However, if the excavation is to remain open for an extended period of time (beyond the contracted turnaround time of post-excavation confirmatory samples), if water is present, to prevent soil slippage along the side slopes, or if any other slope stability issues arise, the Contractor shall stabilize the slope to 3H:1V or flatter.
9. The Contractor shall maintain an excavation of sufficient size to allow workers ample room to complete the work.
10. The Contractor shall be responsible for dewatering excavations in accordance with SECTION 02140 – DEWATERING AND DRAINAGE and the Contractor's approved Dewatering and Drainage Plan. The work area shall be kept in-the-dry during excavation, post-excavation confirmatory sampling, backfilling, and revetment construction until the work has been completed to such extent that the fill area will not be damaged by allowing bay water to return to natural levels.
11. The Contractor shall be responsible for implementing drying measures such as tilling as necessary to facilitate drying, prior to off-site disposal. The stockpiles shall be covered prior to any storm events to prevent re-saturation of dried material. Contaminated stockpiles shall meet the regulations defined in 40 CFR 264.250.
12. Because of the variation of contaminant concentration in the waste material, the Site Safety and Health Officer (SSHO) shall direct the rate and manner of excavation to ensure the safety of all on-site personnel.
13. Blasting shall not be permitted.
14. Loading and transporting contaminated material shall be in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL. Following the receipt of waste characterization sample results collected in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL, the Contractor may perform loading of all excavation materials for off-site transport and disposal, unless moisture conditions require stockpiling and drying. The stockpile area shall be built in accordance with SECTION 02100 – SITE PREPARATION.
15. Dust control and mitigation, and air monitoring shall be performed in accordance with the Contractor's approved Site Safety and Health Plan, as specified under SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.
16. Areas being excavated shall be maintained in a clean condition, free from leaves, brush, sticks, trash, and other debris. Organic materials including stumps, roots, and debris encountered during excavation shall be considered grubbed material and shall be disposed as a contaminated material in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.
17. All items having any apparent historical or archeological interest which are discovered in the course of any construction activities shall be carefully preserved in accordance with SECTION 01355 – ENVIRONMENTAL PROTECTION. The Contractor shall leave the archeological find undisturbed and shall immediately report the find to the EPA's Representative so that the proper authorities may be notified. Historical or archeological finds that might require work stoppages are not

anticipated to occur during construction. Contaminated finds shall be decontaminated by the Contractor prior to removal from the site.

18. Surface water shall be directed away from open excavation and construction areas to prevent soil erosion, surface water runoff from coming in contact with contaminated material, and the accumulation of surface water in excavation areas. Diversion ditches, dikes, and grading shall be provided as necessary and soil erosion controls shall be implemented in accordance with SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT and the Soil Erosion and Sediment Control Plan certified by the Freehold Soil Conservation District. The Contractor shall stop work and reduce the exposed surface when severe or major storm is predicted.
19. At the completion of both the excavation and backfilling stages of construction, all trapped sediment in the Contamination Reduction Zones and from decontamination of riprap and armored stone shall be collected and removed as contaminated material.
20. All vehicles and equipment used for excavation shall be decontaminated in accordance with the Contractor's approved Site Safety and Health Plan, prior to entering clean areas.
21. If turtles or other wildlife are identified within work areas, the Contractor shall immediately notify the EPA's Representative of their presence. The Contractor shall cease site operations if directed by EPA's Representative.

B. Primary Excavation

1. In total, 41 primary excavation areas have been designed to remove the observed contamination as shown on the Design Drawings.
2. The Contractor shall conduct excavation based on the approved Excavation and Handling Plan to the limits and depths shown on the Design Drawings. Excavation areas shall be excavated to not more than 0.2 feet beyond the final elevation or depths, and extent shown on the Design Drawings unless as directed by the EPA's Representative.
3. The Contractor shall install and implement the dewatering system prior to initiating excavations in Area 1, 2, 3, 4 & 5 in accordance with SECTION 02140– DEWATERING AND DRAINAGE and the Contractor's approved plan.

C. Removal of Contamination Around the First Jetty

1. The Contractor shall remove armored stone from the portions of the jetty to excavate impacted material in excavation areas 5E, 6D, 9A, 5D, 3G, and 3H as close to the jetty structure as possible.
2. The Contractor shall decontaminate jetty armored stone as per the SECTION 01510 – DECONTAMINATION PLAN and stockpile until excavations in the vicinity are complete and the stones can be returned to the jetty.
3. The Contractor shall remove any source materials found based on visual observations after removing the armored stone.
4. The Contractor shall perform additional excavation and collect post-excavation confirmatory samples.
5. In case post-excavation confirmatory sample analytical results show contaminant concentrations greater than the Remediation Cleanup Level near the jetty/sand interface, then, the excavation shall be halted. The EPA's Representative shall be notified as soon as possible but no later than 24 hours and the Contractor shall wait for further direction.

6. The Contractor shall not remove any armored stone or jetty core stone or implement other deconstruction that will jeopardize the engineered structure of the First Jetty or as otherwise directed by the EPA's Representative.
7. If it is determined that impacted soils/sediments extend beneath a portion of the First Jetty or may have migrated into the voids within the jetty structure, EPA will conduct an evaluation of the data and/or any existing information to determine if additional information is needed or if a modification of the RD is required to complete the remediation of the First Jetty.

3.8 POST-EXCAVATION CONFIRMATORY SAMPLING AND SECONDARY EXCAVATION

- A. The Contractor shall collect post-excavation bottom and sidewall samples at the locations shown on the Design Drawings. Samples shall be sent to an off-site laboratory for lead analysis with a turn-around-time (TAT) of 48 hours. All post-excavation sample results shall be compared to the Site Remediation Cleanup Levels.
- B. Secondary Excavation beyond the Primary Excavation Limits shown on the Design Drawings shall be performed based solely on analytical results of post-excavation samples and/or visual observations of soil contamination, slag, and battery casings. Secondary Excavation shall be performed only with the approval from the EPA's Representative.
- C. If analytical results of a bottom post-excavation sample exceed the Remediation Cleanup Levels, the Contractor shall perform secondary excavation in 1-foot vertical increments within that grid, and then collect a new bottom sample. This process shall be repeated until the Remediation Cleanup Levels are met, or as otherwise directed by the EPA's Representative. Additional sidewall post-excavation samples shall be collected for every 2 vertical feet of new sidewall exposed during secondary excavation. The Contractor may use pre-confirmatory XRF screening in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL to aid in determining the extent of contamination requiring secondary excavation prior to collecting confirmatory samples in a given area.
- D. If analytical results of a sidewall sample exceed the Remediation Cleanup Levels, the Contractor shall perform secondary excavation of the entire sidewall of that sampling grid, shown on the Design Drawings, in 1-foot horizontal increments, and then collect new post excavation sidewall samples. This process shall be repeated until the Remediation Cleanup Levels are met, or as otherwise directed by the EPA's Representative. As the excavation expands horizontally, the Contractor shall monitor the overall excavation area to determine whether additional bottom samples are required to ensure that the post-excavation confirmatory sampling criteria listed herein are met.
- E. All required sampling and chemical analysis shall be conducted in accordance with the Contractor's approved UFP-QAPP and the requirements of SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.

3.9 WASTE HANDLING

- A. The Contractor shall segregate the excavated material into distinct stockpiles corresponding to their respective categories listed in Table 02111 - 1. All excavated material shall be transported off-site and routed to the appropriate Treatment, Storage and Disposal Facilities (TSDFs) for treatment and/or disposal in accordance with 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIALS.

- B. Soil/sediment mixed with small slag/riprap pieces from the area beneath and at the toe of the existing seawall shall be managed and disposed of separately from soil/sediment excavated from other areas. The soil/sediment can be separated from the small slag/riprap pieces through screening and then disposed of off-site separately, depending on results of waste characterization sampling. Small slag/riprap is considered a hazardous and shall be transported off-site and routed to the appropriate TSDFs for treatment and/or disposal in accordance with 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIALS.

3.10 UNDERGROUND STORAGE TANKS (USTS)

- A. No known USTs are present within the site. If an UST is encountered during the course of excavation, the EPA's Representative shall be immediately notified.

3.11 CONTAMINATED MATERIAL STORAGE

- A. Material shall be placed in temporary stockpiles immediately after excavation within the Exclusion Zone.
1. The stockpiles shall be constructed within the Exclusion Zone in accordance with SECTION 02100 – SITE PREPARATION and shall meet the regulations defined in 40 CFR 264.250.
 2. The Contractor must not stockpile any impacted material outside of the Exclusion Zone. However, if necessary, the Contractor shall request permission to do so from the EPA's Representative. Any stockpiles to be constructed outside the Exclusion Zone shown in the Design Drawings must meet the requirements in accordance with SECTION 02100 – SITE PREPARATION.
 3. If multiple stockpiles are required, each unit shall be clearly labeled with an identification number.
 4. The excavated material shall not be mixed, and waste shall be segregated from soil/sediment into a separate stockpile to minimize the amount of RCRA waste requiring off-site treatment. Solid waste material shall be stockpiled and covered or loaded into roll-off containers using a loading system approved by the EPA's Representative.
 5. Each stockpile shall be covered with tarps free of holes or other damage to prevent precipitation from entering the stockpile. The cover material shall be extended over the berms and anchored to prevent it from being removed or damaged by wind.
 6. The combined volume of all stockpiles shall be a size that is manageable and not create excess odors.
 7. Each stockpile shall not be more than 10 feet in height. The maximum size of each stockpile shall be 500 cubic yards. Stockpiles of excessive size with height more than 10 feet and 500 cubic yards shall be subject to approval by EPA's Representative.
 8. Creation and maintenance of stockpiles shall not interfere with the excavation, dewatering, and other on-site activities.
 9. All stockpiles shall be inspected and maintained daily.

B. Contact Water Storage

1. Contact water shall be temporarily stored in frac tanks, sampled, and treated, if required, using the temporary water treatment system in accordance with SECTION 13300 – WATER TREATMENT SYSTEM before being discharged.

3.12 SAMPLING BENEATH THE SOIL STOCKPILE AREAS

- A. Soil underneath the stockpile/loadout areas, located outside the Exclusion Zone (as shown in the Design Drawings), and/or over the remediated areas, shall be collected and sampled after the removal of the soil/sediment stockpiles. Soil sampling shall be conducted in accordance with the post-excavation confirmatory sampling criteria provided in Paragraph 1.9 to confirm that cross-contamination did not occur in the underlying soil. Samples locations shall be biased toward areas based on visual indications of potential leaks. Samples shall be analyzed for lead only in accordance with the requirements of SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.
- B. In areas showing lead sample results above the remediation cleanup level, the Contractor shall scrape and remove 4-6 inches and then re-sample those areas.

3.13 SPILLS

- A. In the event of a spill or release of a hazardous substance (as designated in 40 CFR 302), pollutant, contaminant, or oil (as governed by the Oil Pollution Act (OPA), 33 U.S.C. 2701 et seq.), the Contractor shall notify the EPA's Representative immediately. If the spill exceeds the reporting threshold, the Contractor shall follow the pre-established procedures as described in the RCRA Contingency Plan for immediate reporting and containment. The Contractor shall take immediate containment actions to minimize the effect of any spill or leak. Cleanup shall be in accordance with applicable federal, state, and local regulations. As directed by the EPA's Representative, additional sampling and testing shall be performed to verify spills have been cleaned up. Spill cleanup and testing shall be done at no additional cost to the EPA.

3.14 BACKFILLING

- A. Confirmation Test Results
1. Excavations shall be backfilled immediately after all contaminated materials have been removed and confirmation test results have been approved by the EPA's Representative. Backfill shall be in accordance with SECTION 02201 – BACKFILL, COMPACTION AND GRADING.
- B. Compaction
1. Compaction shall be in accordance with SECTION 02201 – BACKFILL, COMPACTION AND GRADING.

3.15 DISPOSAL REQUIREMENTS

- A. Off-site treatment and/or disposal of contaminated material shall be in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.

END OF SECTION

SECTION 02120

TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL

PART 1 - GENERAL

1.1 SUMMARY

- A. The purpose of this section is to provide the Contractor the minimum requirements for the transportation and disposal of contaminated materials.
- B. The Contractor shall be responsible for obtaining all permits required for off-site transportation of waste in accordance with applicable Federal, State, and local regulations.
- C. At a minimum, the Contractor shall be required to furnish all labor, material, equipment, and incidentals necessary for on-site preparation and off-site transportation, treatment, and disposal of materials from the remediation and associated activities. Waste generated shall be treated and disposed at approved Resource Conservation and Recovery Act (RCRA) Treatment, Storage, and Disposal Facilities (TSDFs), RCRA Subtitle C landfill(s), Subtitle D landfill(s), or a Construction and Demolition (C&D) landfill, depending on waste characteristics.
- D. The Contractor shall prepare and maintain waste shipment records and manifests required by RCRA, U.S. Federal Department of Transportation (DOT), and State transportation department.
- E. The Contractor shall be required to perform all sampling required for waste characterization and landfill acceptance of removed source materials and excavated soil/sediment, debris, and cleared vegetation. The Contractor shall also be required to provide all waste profile information to the landfill, per their requirements.
- F. The Contractor shall ensure that all operations for loading and hauling of wastes comply with Federal and State DOT regulations, and all other applicable Federal, State, and local requirements.

1.2 REFERENCES

- A. References
 - 1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. Where reference is made to one of the standards below, the revision in effect at the time of contract award shall apply.
 - a. Code of Federal Regulations (CFR)
 - 1) 29 CFR 1904 Recording and Reporting Occupational Injuries and Illnesses
 - 29 CFR 1910 Occupational Safety and Health Standards
 - 2) 29 CFR 1926 Safety and Health Regulations for Construction
 - 3) 40 CFR 261 Identification and Listing of Hazardous Waste
 - 4) 40 CFR 262 Standards Applicable to Generators of Hazardous Waste
 - 5) 40 CFR 263 Standards Applicable to Transporters of Hazardous Waste
 - 6) 40 CFR 264 Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
 - 7) 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

- 8) 40 CFR 266 Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
- 9) 40 CFR 268 Land Disposal Restrictions
- 10) 40 CFR 270 EPA Administered Permit Programs: The Hazardous Waste Permit Program
- 11) 40 CFR 300 National Oil and Hazardous Substances Pollution Contingency Plan
- 12) 40 CFR 302 Designation, Reportable Quantities, and Notification
- 13) 49 CFR 107 Hazardous Materials Program Procedures
- 14) 49 CFR 172 Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans
- 15) 49 CFR 173 Shippers – General Requirements for Shipments and Packaging
- b. New Jersey Administrative Code (N.J.A.C.)
 - 1) N.J.A.C. 7:26 Solid and Hazardous Waste Management Regulations
- c. United States Code (U.S.C.)
 - 1) 33 U.S.C. 2701 et seq. Oil Pollution Act (OPA)
 - 2) 42 U.S.C. 6901 et seq. Resource Conservation and Recovery Act
 - 3) 42 U.S.C. 9601 et seq. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
 - 4) 49 U.S.C. 1801 et seq. Hazardous Materials Transportation Act (HMTA)

B. Definitions

- 1. Source Materials
 - a. In general, principal threat waste (PTW) are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health, or the environment should exposure occur. Principal threat wastes at the site include:
 - 1) Slag and battery casings/associated wastes, including particles of slag and battery casings/associated wastes identified in the soil and sediment media.
 - 2) Highly impacted soil in the Seawall Sector in portions of Areas 1 and 2, and in the upland portion of the Margaret's Creek Sector.
 - 3) Highly impacted sediment located in Areas 1 and 2 in the Seawall Sector.
- 2. Debris
 - a. Demolition debris in the form of concrete and a variety of bricks, including fire bricks that is considered debris and is to be segregated based on visual observation.
- 3. Riprap
 - a. Newer rock material along Old Bridge Waterfront Park, referred to as post-Sandy riprap, is located within the Extent of Riprap but outside the footprint of seawall. The post-Sandy riprap can be visually identified as gray to dark gray large rocks, with a size approximately ranging from 18 to 36 inches in diameter, and it is not mixed with any other waste or stone.
 - b. On-site weathered riprap, consisting of older rock material, is found within the Footprint of Seawall. The weathered riprap can be visually identified as brown to dark gray rocks with sizes approximately 12 to 24 inches in diameter and is mixed with debris, slag, and lead pots.
 - c. Both types of riprap will be segregated, decontaminated, and reused on-site.

4. Armored Stone
 - a. The existing jetty armoring capstone placed above ground around the First Jetty located in Area 5.
5. Hazardous Material
 - a. A substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated pursuant to 49 U.S.C. 1801 et seq. The term includes materials designated as hazardous materials under the provisions of 49 CFR 172.101 and 49 CFR 172.102, and materials that meet the defining criteria for hazard classes and divisions in 49 CFR 173. EPA-designated hazardous wastes are also hazardous materials.
6. Hazardous Waste
 - a. A waste that meets criteria established in RCRA or specified by the EPA in 40 CFR 261, or that has been designated as hazardous by a RCRA-authorized state program.
7. Non-Hazardous Waste
 - a. Any waste that does not meet the criteria of hazardous waste.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals with an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
 1. Waste Management and Transportation Plan; Pre-Construction Submittals; EA
 - a. The Contractor shall prepare and submit to the EPA's Representative for approval at least 28 days prior to the Pre-Work Conference a Waste Management and Transportation Plan. Deficiencies in the Waste Management and Transportation Plan will be discussed at the Pre-Work Conference. The Contractor shall make all necessary amendments required by the EPA's Representative and resubmit it for approval. This procedure shall continue until the EPA's Representative gives final written approval. The Contractor shall make necessary effort so that only one resubmittal is required. The plan shall include, at a minimum, the following:
 - 1) Procedures for contaminated material management on-site and the management practices to be utilized.
 - 2) Details on managing the various waste streams prior to disposal.
 - 3) Waste minimization methods.
 - 4) Soil stockpile area where contaminated material is to be handled.
 - 5) Proposed TSDFs for off-site treatment and waste disposal, including alternate facilities in the event that the primary facility cannot accept the waste.
 - 6) Stabilization Plan for conducting off-site stabilization of source materials.
 - 7) Names, certificates, permits, licenses, EPA identification (ID) numbers, locations, and telephone numbers for the proposed TSDFs and waste haulers.
 - 8) RCRA waste classification and volume estimates for the waste types, if existing sample results are sufficient for landfill acceptance. Otherwise, the Contractor shall conduct waste characterization sampling to meet landfill acceptance requirements.

- 9) Letters of commitment from the proposed waste haulers and TSDFs, certifying acceptance of the Raritan Bay Slag Superfund Site waste.
 - 10) Methods and equipment to be used to ensure accurate weight measurements of waste material.
 - 11) Waste manifesting procedures.
 - 12) Locations and procedures for the on-site waste handling areas for various waste streams.
 - 13) Types of transport vehicles to be used for each type of material.
 - 14) Packaging and transporting requirements for each type of waste, including any special requirements of the TSDFs.
 - 15) Proposed truck routes from the worksite to the TSDFs. The route(s) to and from the TSDFs shall be in accordance with the TSDF requirements and all Federal, State, and local regulations, laws, ordinances, and weight restrictions. The established truck routes from the site to the closest major freeway, minimizing transport on residential streets as much as feasible. Use of these routes shall be strictly enforced.
 - 16) Methods to contain and clean up spills.
 - 17) Procedures for incident response, including details of manpower and equipment available and the coordination necessary to mobilize forces in an emergency.
 - 18) The Emergency Response Name and Telephone number that will be available on a 24/7 basis during the shipment period, and this information will be included in the Shipments Manifests as per the USDOT Regulations.
2. Notices of Non-Compliance and Notices of Violation; Product Data; EA
 - a. Notices of non-compliance or notices of violation issued by a Federal, State, or local regulatory agency issued to the Contractor in relation to any work performed under this contract. The Contractor shall immediately provide copies of such notices to the EPA's Representative. The Contractor shall also furnish all relevant documents regarding the incident and any information requested by the EPA's Representative and shall coordinate its response to the notice with the EPA's Representative prior to submission to the notifying authority. The Contractor shall also furnish a copy to the EPA's Representative of all documents submitted to the regulatory authority, including the final reply to the notice, and all other materials, until the matter is resolved.
 3. Contaminated Material Stockpile Reports; Product Data; EA
 - a. When contaminated materials are in interim storage, submit on a weekly basis, an inventory of the types, quantity, and locations of all contaminated materials in interim storage, and a record of the date, quantity, source, and disposition of all contaminated materials placed into or taken out of interim storage. Report all test results from sampling of stored material.
 4. Annual and Biennial Reports; Test Reports; EA
 - a. Information necessary to file State annual or EPA biennial reports for waste transported, treated, stored, or disposed of under this contract shall be submitted to the EPA's Representative at the specified time and shall not be forwarded directly to the regulatory agency. The submittal shall contain all the information necessary for filing of the formal reports in the form and format required by the governing Federal, State, and local regulatory agency. A cover letter shall accompany the data including the contract number, Contractor name and project locations.
 5. Spill Response; Test Reports; EA

- a. In the event of a spill or release of a pollutant, contaminant, hazardous substance (as designated in 40 CFR 302), or oil (as governed by 33 U.S.C. 2701 et seq.), the Contractor shall notify the EPA's Representative immediately and contact the National Response Center as per SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE. If the spill exceeds a reporting threshold, the Contractor shall follow the pre-established procedures for immediate reporting to the EPA's Representative.
6. Manifest Exception Reports; Test Reports; EA
 - a. In the event that a manifest copy documenting receipt of waste at the disposal facility is not received within 35 days of shipment initiation, the Contractor shall prepare and submit an exception report to the EPA's Representative within 37 days of shipment initiation.
7. Certification; Certificates; EA
 - a. Copies of the current certificates of registration required by 49 CFR 107, Subpart G issued to the Contractor and/or Subcontractors or written statements certifying exemption from these requirements.
8. Transportation and Disposal Coordinator; Certificates; EA
 - a. Transportation and Disposal Coordinator qualifications including proof of at least one year of specialized experience in management and transportation of hazardous wastes; proof of current Department of Transportation Hazardous Materials Training Certification.
9. Training; Certificates; EA
 - a. Documentation that employees preparing or transporting hazardous materials have been trained, tested, and certified per 49 CFR 172, Subpart H, including general security awareness requirements and, where applicable, site-specific security plan requirements.
10. EPA Off-Site Policy; Certificates; FIO
 - a. A letter certifying that EPA considers the facilities to be used for all off-site disposal to be acceptable in accordance with the Off-Site Policy in 40 CFR 300.440. This certification shall be provided for wastes from sites governed by 42 U.S.C. 6901 et seq. or 42 U.S.C. 9601 et seq. A sample Off-Site Policy certification memo is provided in Attachment A.
11. Transport Certification; Certificates; FIO
 - a. The Contractor shall submit certification that all operators and vehicles used to transport contaminated material meet all existing Federal, State, and local regulations for vehicle operations.
12. Certificates of Disposal; Certificates; EA
 - a. Certificates documenting the ultimate disposal of CERCLA remediation wastes are required within 180 days of initial shipment. Receipt of these certificates will be required for final payment.
13. Shipping Documents; Certificates; EA
 - a. Submit all transportation-related shipping documents to the EPA's Representative for review including draft waste manifests, draft bills of lading, lists of corresponding proposed labels, packages, marks, and placards to be used for shipment, waste profiles, supporting waste analysis documents, for review a minimum of 14 calendar days prior to the anticipated shipping date. Packaging assurances shall be furnished prior to transporting the material, "generator copies" of hazardous waste manifests, bill of landings, and supporting waste analysis documents shall be furnished when shipments are originated. "Receipt copies" of waste manifests at the designated disposal

facility shall be furnished no later than 35 days after acceptance of the shipment.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Qualifications

1. Transportation and Disposal Coordinator

- a. The Contractor shall designate, by position and title, one person to act as the Transportation and Disposal Coordinator (TDC) for this contract. The TDC shall serve as the single point of contact for all environmental regulatory matters and shall have overall responsibility for total environmental compliance at the site including, but not limited to, accurate identification and classification of hazardous waste and hazardous materials; determination of proper shipping names; identification of marking, labeling, packaging and placarding requirements; completion of waste profiles, hazardous waste manifests, bill of lading, exception and discrepancy reports; and all other environmental documentation. The TDC shall have at a minimum, one year of specialized experience in the management and transportation of hazardous waste and have been DOT-certified under 49 CFR 172, Subpart H.

2. Training

- a. The Contractor's hazardous materials employees shall be trained, tested, and certified to carry out their assigned duties safely and effectively in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE. The Contractor's employees transporting hazardous materials or preparing hazardous materials for transportation, including samples, shall be trained, tested, and certified in accordance with 49 CFR 172, Subpart H, including security awareness and any applicable security plans. Contractor employees making determinations that shipments do not constitute DOT regulated hazardous materials shall also be trained, tested, and certified in accordance with 49 CFR 172, Subpart H.

1.5 LAWS AND REGULATORY REQUIREMENTS

- A. Work shall meet or exceed the minimum applicable requirements established by Federal, State, and local laws and regulations. These requirements are amended frequently, and the Contractor shall be responsible for complying with amendments as they become effective. In the event that compliance exceeds the scope of work or conflicts with specific requirements of the contract, the Contractor shall notify the EPA's Representative immediately. At a minimum, the requirements stipulated in the regulations referenced in Paragraph 1.2 shall be met.
- B. The Contractor shall comply with the Land Disposal Restrictions (LDR) 40 CFR 268 when treating and disposing of hazardous wastes.
- C. The Contractor shall comply with 40 CFR 268.49, Alternative LDR Treatment Standards for Contaminated Soil, when treating and disposing contaminated soil.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. The Contractor shall provide all the materials required for the packaging, labeling, marking, placarding and transportation of hazardous materials, hazardous waste, and non-hazardous wastes in conformance with DOT standards. Details in this Specification shall not be construed as establishing the limits of the Contractor's responsibility.

B. Spill Response Materials

1. The Contractor shall provide spill response materials including, but not limited to, containers, adsorbent, shovels, and personal protective equipment. Spill response materials shall be available at all times during which wastes are being handled or transported. Spill response materials shall be compatible with the type of material being handled.

2.2 CONTAINERS

A. Shipping Containers

1. Impermeable containers shall be suitable to receive and retain contaminated materials until they are disposed of at an approved facility. The containers shall meet the standards of a “Strong, Tight Container” and conform to DOT Standard 49 CFR 173.24. Containers in a shipment must be loaded and braced securely to prevent shifting and damage during transport. Cover systems shall meet the criteria for a closed transport vehicle as specified in 49 CFR 173.403.

2.3 EQUIPMENT AND TOOLS

- A.** The Contractor shall provide miscellaneous equipment and tools necessary to handle wastes in a safe and environmentally sound manner. The Contractor shall provide equipment that is appropriate to accomplish this type of work and shall maintain and use of it in strict compliance with Occupational Safety and Health Administration (OSHA) requirements. The Contractor shall take all necessary precautions for safe operation of the equipment and the protection of the public from injury and damage from such equipment.

2.4 FACILITIES

- A.** The Contractor shall provide, install, and maintain any temporary loading facilities as required for the material handling operations as show on the Design Drawings.

2.5 LABELING

- A.** The Contractor shall provide primary and subsidiary labels for materials/wastes consistent with the Federal, State, and local requirements. Labels shall be durable and weather resistant and capable of withstanding, without deterioration or substantial color change, a 180-day exposure to conditions reasonably expected to be encountered during container storage and transportation.

2.6 PLACARDS

- A.** For each off-site shipment of materials/wastes, the Contractor shall provide primary and subsidiary placards as required by Federal, State, and local regulations. Placards shall be provided for each side and each end of bulk packaging, freight containers, and transport vehicles requiring such placarding. Placards may be plastic, metal, or other material capable of withstanding, without deterioration, a 30-day exposure to open weather conditions.

2.7 TARPAULINS

- A.** Waterproof tarpaulins (tarps) shall be nylon vinyl-coated on both sides with a tearing strength of 70 lbs conforming to ASTM D 1117, or equal. All edges shall be hemmed, with reinforced grommets on maximum 4 feet on centers.

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor shall ensure that all transport vehicles containing waste are covered with tarps before leaving the site. In addition to tarping all loads, all transport vehicles containing waste shall be equipped with a liner to prevent leakage. Tailgates and bumpers shall be swept to remove any spillage from the loading operation.
- B. The Contractor shall position transport vehicles on the access road alongside the Exclusion Zone, to allow for loading of materials into the transport vehicles from the Exclusion Zone. The Contractor shall take all precautions during the loading process, including the placement of poly sheeting around the vehicle's base to collect any potential spillage. Transport vehicles shall be decontaminated when leaving the loading area at one of the several decontamination pads located along the access road, as indicated in the Design Drawings, if required.
- C. The Contractor shall coordinate the schedule for vehicle arrival and material deliveries at the construction site to meet the approved project schedule. The schedule shall be compatible with the availability of equipment and personnel for material handling operations. No claims shall be made by the Contractor for additional compensation due to a delay in the schedule related to vehicle arrival or material availability.
- D. The Contractor shall organize and maintain the material shipment records required by the Federal and the State of New Jersey regulations.
- E. The Contractor is responsible for obtaining and filling out waste profile sheets required by the TSDFs. The quantity of sheets per contained waste shall be in accordance with Federal, State, or local regulations. The Contractor shall submit each profile sheet to the EPA's Representative.
- F. The Contractor shall notify the EPA's Representative immediately upon learning that a job-related accident has occurred. Notification of the accident shall include location of the accident, resultant damage or injury, person(s) involved, probable cause, amount of waste spilled, and any other pertinent information concerning the accident.
- G. Accident cleanup operations shall be performed as directed by the EPA's Representative at the expense of the Contractor. Cleanup shall be performed immediately.
- H. The Contractor shall provide transportation of the waste directly to the TSDFs.
- I. The Contractor shall provide all sampling and analytical services necessary for disposal in accordance with TSDF requirements, and all applicable Federal, State, and local regulations, and as specified in SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.

3.2 CHARACTERIZATION AND SEGREGATION OF WASTE MATERIALS

- A. The Contractor shall excavate contaminated material, stockpile material, and collect waste disposal samples per TSDF requirements and in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.
- B. The Contractor shall utilize the existing data found in Appendix A to the maximum extent possible for landfill acceptance. The Contractor shall perform additional waste characterization sampling and testing required by the landfill for acceptance.

- C. The Contractor shall be responsible for segregating all wastes generated as a result of construction and remedial activities. Removed source materials and excavated soil/sediment shall be segregated as described in SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS.
- D. Temporary stockpiles of both non-hazardous and hazardous materials shall be covered with plastic sheeting (i.e., tarp) or equivalent material to protect waste from adverse weather conditions and to prevent dust emissions. Erosion and sedimentation controls shall be installed around all stockpiles.

3.3 NON-HAZARDOUS WASTE MANAGEMENT

- A. Non-hazardous waste from the site shall be disposed of off-site in an approved landfill in accordance with the approved Waste Management and Transportation Plan and N.J.A.C. 7:26.
- B. Contaminated sediment, soil, water treatment residuals, and debris with concentrations less than Toxicity Characteristic Leaching Procedure (TCLP) criteria shall be considered non-hazardous and disposed of at an approved Subtitle D landfill. The following non-hazardous wastes are expected from the site:
 - 1. Excavated soil/sediment with lead concentration less than TCLP criterion of 5 milligrams per liter
 - 2. Vegetative debris from clearing activities
 - 3. Water treatment residuals with lead concentration less than TCLP criterion of 5 milligrams per liter
 - 4. Debris with analyte concentrations less than TCLP criteria
- C. Non-hazardous wastes above Remediation Cleanup Levels shall not be used as backfill, topsoil or sub-grade material.

3.4 HAZARDOUS WASTE MANAGEMENT

- A. The Contractor shall be responsible for ensuring compliance with all Federal, State, and local hazardous waste laws and regulations and shall verify those requirements when preparing reports, waste shipment records, hazardous waste manifests, or other documents.
- B. Hazardous Waste Characterization
 - 1. The Contractor shall be required to perform any and all sampling required for landfill acceptance of the source materials including slag, battery casings and associated wastes, excavated soil and sediments, water treatment residuals, and debris. The Contractor shall also be required to provide all waste profile information to the landfill, per their requirements. Sampling and field screening methods shall be in accordance with TSDF requirements and applicable Federal, State, and local regulations. The Contractor shall complete the waste profile information and submit it to the EPA's Representative for approval prior to sending it to the TSDFs.
 - 2. The Contractor, in consultation with the EPA's Representative, shall identify all hazardous waste codes applicable to each hazardous waste stream based on requirements set forth in this section, 40 CFR 261, and applicable state and local laws or regulations. The Contractor shall also identify all applicable treatment standards in 40 CFR 268 and state LDRs and shall determine whether or not the waste meets or exceeds the standards. Waste profiles, analyses, classification, and treatment standards information shall be submitted to the EPA's Representative for review and approval.

3. Solid waste material other than source materials and soil/sediment, including vegetation from clearing and other debris encountered in excavations areas, shall be stockpiled, covered, and disposed of with non-hazardous soil/sediment.
 4. The EPA is the owner and generator of the hazardous wastes for the Raritan Bay Slag Superfund Site. Based on the available historical information and investigation results, the following hazardous wastes are expected from the remedial activities from the Raritan Bay Slag Superfund Site:
 - a. RCRA, No Treatment: Soils/sediment/water treatment residuals with lead concentrations greater than or equal to TCLP criteria of 5 milligrams per liter and less than 10 times (7.5 milligrams per liter) Universal Treatment Standard (UTS) criteria (0.75 milligrams per liter)
 - b. RCRA, Treatment: Source materials and soils/sediments with lead concentrations greater than or equal to TCLP criteria and at least 10 times UTS criteria
- C. Loadout
1. The Contractor shall load hazardous soil as specified in SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS.
- D. Sampling of Stored Material
1. Samples of contaminated material shall be collected at a frequency consistent with the requirements of the off-site TSDFs. The contractor shall analyze the stored material for disposal purposes. Analytical levels for material to be shipped to the off-site TSDFs shall conform to Federal, State, and local criteria as well as to the requirements of the off-site TSDFs. Documentation of all analyses performed shall be furnished to the EPA's Representative.
- E. Waste Management and Transportation Plan
1. The Contractor's Waste Management and Transportation Plan shall provide comprehensive information regarding the management of hazardous wastes. This plan shall include the expected types and quantities of hazardous wastes to be managed, as well as the specific practices to be employed for waste management. The plan shall also identify techniques for minimizing hazardous waste and establish a method to ensure accurate piece counts and/or weights of shipments. The Contractor shall include a Stabilization Plan for off-site stabilization of hazardous materials and incorporate quality control/quality assurance requirements for each hazardous material batch to confirm that the waste has been rendered non-hazardous. The Contractor will be responsible for identifying and contracting with a licensed off-site treatment facility for the off-site treatment of source materials. The plan shall specify the designated areas on-site where hazardous wastes will be handled and indicate whether transfer facilities will be utilized. If transfer facilities are involved, the plan shall address how the wastes will be monitored, treated, and tracked until their ultimate disposal.
- F. Treatment, Storage and Disposal Facility (TSDFs) and Transporter
1. The Contractor shall provide the EPA's Representative with EPA ID numbers, names, locations, and telephone numbers of TSDFs and transporters. This information shall be contained in the Waste Management and Transportation Plan and shall be approved by the EPA's Representative prior to waste disposal.
- G. Status of the Facility
1. Facilities receiving hazardous waste must be permitted in accordance with 40 CFR 270 or operating under interim status in accordance with 40 CFR 265 requirements

or must be permitted by a state authorized by the Environmental Protection Agency to administer the RCRA permit program. Additionally, prior to using a TSDF, the Contractor shall contact the EPA Regional Office specified in 40 CFR 300.440 to determine the facility's status and document all information necessary to satisfy the requirements of the EPA Off-Site policy and furnish this information to the EPA's Representative.

H. Shipping Documents and Packaging Certification

1. The Contractor shall be responsible for obtaining all permits and shipping documents to ship contaminated soil off-site.
2. Prior to shipment of any hazardous material off-site, the Contractor's TDC shall provide written certification to the EPA's Representative that hazardous materials have been properly packaged, labeled, and marked in accordance with Department of Transportation and EPA requirements. The Contractor's TDC shall also provide written certification regarding waste minimization efforts documenting the efforts that have been taken to reduce the volume and toxicity of waste to the degree economically practicable and that the method of treatment, storage, or disposal selected minimizes threats to human health and the environment.

I. Vehicle Inspection

1. Vehicles may be inspected by the EPA's Representative at the site prior to loading to ensure that the vehicles have no fluids leaks, no unusually noisy mufflers or tailpipes, tires that are in good condition, and operational brakes, horn, steering, operating controls, and safety devices. Vehicles shall be free of excess dirt, debris, oil, grease, and excessive rust. Vehicle beds used for hauling shall be free from drain holes, cracks, or other conditions that might permit waste material or contaminated water to leak from the vehicle beds. If the vehicle used for hauling has tailgates for dumping, the Contractor shall demonstrate to the EPA's Representative that the tailgates can be sealed watertight during operation. Any vehicle bed not providing an adequate leakproof seal shall be repaired or replaced as required. Tarpaulin covers shall be placed over all vehicle beds during waste transport to the TSDFs. Covers shall be placed over trucks, trailers or other conveyances used for bulk shipment to avoid spillage of the waste material and entrance of rain or snow during transport. The covers shall completely enclose the bulk shipment with no open areas along the sides or openings on the top. Cover systems shall meet the criteria for a closed transport vehicle as specified in 49 CFR 173.403. Failure of the shipping container, liner, seals, hatches, doors, or tarpaulin system to meet the above requirements which causes material to be rejected by disposal facility shall be addressed at the Contractor's expense.
2. The Contractor shall coordinate recording quantities of waste leaving the site with the EPA's Representative.
3. Vehicles/containers, either empty or loaded, shall not remain at the site, unless specific arrangements are made otherwise. Immediately after loading, they shall be sealed, weighed, and transported directly to the TSDFs.
4. The Contractor shall provide clean containers/hauling vehicles for loading during normal work hours.
5. Each vehicle/container shall be monitored for external contamination by the Contractor prior to leaving the worksite. The Contractor shall perform and document decontamination procedures prior to leaving the worksite and again before leaving the disposal site.

J. Transportation

1. The Contractor shall meet all existing Federal, State, and local regulations for vehicle operations in transporting the waste on public roads and highways. All construction vehicles shall be decontaminated prior to leaving the site using the temporary decontamination facility. All haul and access roads shall be maintained in a clean condition so that no dirt or contamination is tracked onto clean areas or public roads and highways.
2. Manifests requiring shipper's certification number shall be signed by the EPA's Representative. Copies of all manifests and waste profiles shall be submitted to the EPA's Representative within five days following shipment, and within five days after notification of receipt at the permitted disposal facility. Any manifest discrepancies shall be reported immediately to the EPA's Representative and resolved by the Contractor. A detail report documenting the final disposal of all materials removed from the site shall be submitted to the EPA's Representative.
3. The Contractor shall prepare land disposal restriction notifications as required by 40 CFR 268 or any applicable state or local law or regulation for each shipment of hazardous waste. Notifications shall be submitted with the manifest to the EPA's Representative for review and approval.
4. The Contractor shall prepare a manifest for each shipment of hazardous waste which fulfills the shipping paper requirements. The bill of landing shall satisfy the requirements of 49 CFR 172, Subpart C, and any applicable state or local law or regulation, and shall be submitted to the EPA's Representative for review and approval. Bill of lading requiring shipper's certifications shall be signed by the Contractor.
5. The Contractor shall be responsible for any and all actions necessary to remedy situations involving material spilled or leaked in transit on- or off- site, or mud and dust tracked off-site. This cleanup shall be accomplished at the Contractor's expense.
6. Transportation routes to and from project areas shall be in accordance with the approved Waste Management and Transportation Plan. No deviation from transportation routes shall be allowed without prior written approval from the EPA's Representative.
7. The Contractor shall be responsible for all repair costs for damages to structures, roads, bridges, and any other features affected by the Contractor's off-site transportation and disposal operations.

K. Treatment and Disposal of Hazardous Wastes

1. The Contractor shall ship hazardous wastes only to facilities that are properly permitted to accept the hazardous waste or operating under interim status. The Contractor shall propose the TSDFs via submission of the Waste Management and Transportation Plan, subject to the approval of the EPA's Representative.
2. RCRA Subtitle C permitted facilities shall meet the requirements of 40 CFR 264 or facilities operating under interim status which meet the requirements of 40 CFR 265. All TSDFs must be accepted by the EPA. Off-site treatment, storage, and/or disposal facilities with significant RCRA violations or compliance problems (such as facilities known to be releasing hazardous constituents into groundwater, surface water, soil, or air) shall not be used.
3. The Contractor shall not deliver waste to any facility other than those listed on the shipping manifest.
4. In the event that an identified and approved facility ceases to accept the stated materials or ceases operations, it is the Contractor's responsibility to locate an alternate facility and make the necessary arrangements to utilize the alternate

facility. The alternate facility must be approved in writing by EPA in the same manner and with the same requirements as the original facility.

5. The Contractor shall ensure wastes are treated to meet land disposal requirement standards in 40 CFR 268 prior to land disposal. Selected treatment facilities for treatment of slag/battery casings or contaminated soil shall be responsible for the ultimate disposal of the treated wastes or soil. Under no condition shall the treated wastes or soil be returned to the site to be used as fill material.

L. Hazardous Materials Management

1. The Contractor, in consultation with the EPA's Representative, shall evaluate, prior to shipment of any material off-site, whether the material is regulated as a hazardous waste in addition to being regulated as a hazardous material; this shall be done for the purpose of determining proper shipping descriptions, marking requirements, etc., as described below.
2. Identification of Proper Shipping Names
 - a. The Contractor shall use 49 CFR 172, Section 101 to identify proper shipping names for each hazardous material (including hazardous wastes) to be shipped off-site. Proper shipping names shall be submitted to the EPA's Representative in the form of draft shipping documents for review and approval.
3. Packaging, Labeling, and Marking
 - a. The Contractor shall package, label, and mark hazardous materials/wastes using the specified materials and in accordance with the referenced authorizations. The Contractor shall mark each container of hazardous waste of 110 gallons or less with the following:

“HAZARDOUS WASTE - Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency.

Generator's name: The US Environmental Protection Agency

Manifest Document Number: _____.”

3.5 SHIPPING DOCUMENTS

- A. The Contractor shall ensure that each shipment of waste sent off-site is accompanied by properly completed shipping documents as specified in Paragraph 1.3.A.13. This includes shipments of samples that may potentially meet the definition of a Department of Transportation regulated hazardous material. Documents shall be submitted to the EPA's Representative for review and approval.

3.6 EPA ID NUMBERS

- A. EPA Region II will provide waste generator identification number for use on the manifest.

3.7 RECORDKEEPING

- A. The Contractor shall organize and maintain the material shipment records/manifests required by 42 U.S.C. 6901 et seq., the State of New Jersey, and the state in which the disposal facility is located.

3.8 SPILL RESPONSE

- A. The Contractor shall respond to any spills of hazardous material or hazardous waste which are in the custody or care of the Contractor, pursuant to this contract. Any direction from the EPA's Representative concerning a spill or release shall not be

considered a change under the contract. The Contractor shall comply with all applicable requirements of Federal, State, or local laws or regulations regarding any spill incident.

3.9 EMERGENCY CONTACTS

- A. The Contractor shall be responsible for complying with the emergency contact provisions in 49 CFR 172.604. Whenever the Contractor ships hazardous materials, the Contractor shall provide a 24-hour, 7-day a week monitoring telephone service emergency response contact. The person must be knowledgeable about the hazardous materials being shipped and who has comprehensive emergency response and incident mitigation information for that material or has immediate access to a person who possesses such knowledge and information.
- B. The phone must be monitored on a 24-hour basis at all times when the hazardous materials are in transportation, including during storage incidental to transportation.
- C. The Contractor shall ensure that information regarding this emergency contact and phone number are placed on all hazardous material shipping documents. The Contractor shall designate an emergency coordinator and post the following information at areas in which hazardous wastes are managed:
 - 1. Emergency coordinator's name
 - 2. Emergency coordinator's phone number
 - 3. Local fire department phone number
 - 4. Fire extinguishers and spill control materials location

END OF SECTION

ATTACHMENT A
SAMPLE OFF-SITE POLICY CERTIFICATION MEMO

Project/Contract #: _____

Waste Stream: _____

Primary TSDF, EPA ID # and Location: _____

Alter. TSDF, EPA ID # and Location: _____

EPA Region Contact

I (617) 918-1752

II (212) 637-4130

III (214) 814-5267

IV (404) 562-8591

V (312) 353-8207

VI (214) 665-2282

VII (913) 551-7154

VIII (303) 312-6419

IX (415) 972-3304

X (206) 553-2859

EPA's Representative contacted: _____

EPA's Representative phone number: _____

Date contacted: _____

Comment: _____

The above EPA Representative was contacted on _____. As of that date,
the above site was considered acceptable in accordance with the Off-Site Policy in 40 CFR 300.440.

Signature: _____ Date: _____

Phone number: _____

SECTION 02140
DEWATERING AND DRAINAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall design, furnish, install, operate, monitor, and maintain a dewatering system as required for
 - 1. Controlling tidal water, surface, and subsurface water from entering excavations.
 - 2. Collecting, treating (if required based on testing), and discharging of surface and subsurface water coming in contact with the contamination and that collects in excavations.
 - 3. Ensuring that excavation is free of standing water during removal, post-excavation confirmatory sampling, backfill, and revetment construction.
- B. The Contractor is solely responsible for the means, methods and cost associated with
 - 1. Primary non-contact water dewatering system involving collection and discharge, and,
 - 2. Contact water dewatering system involving collection, storage, testing, and discharge.
- C. The dewatering system shall ensure safe and dewatered subsurface conditions for all areas in which work of this Contract shall be performed.
- D. The Contractor is responsible for permitting, management, testing and disposal of all water coming in contact with contaminated material from dewatering operations and stormwater runoff encountered at the site.
- E. The Contractor shall perform dewatering in accordance with the Contractor's approved Dewatering and Drainage Plan.
- F. The Contractor shall be responsible for all repair of damage caused by dewatering system installation and operations.

1.2 REFERENCES

- A. References
 - 1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.
 - a. NJDEP New Jersey Pollution Discharge Elimination System (NJPDES) Discharge to Surface Water (DSW) Permit-Equivalency (N.J.A.C. 7:14A)
 - b. NJDEP NJPDES Request for Authorization (RFA) for Stormwater Discharge during Construction (N.J.A.C. 7:14A)
 - c. New Jersey State Soil Conservation Committee (SSCC)
 - 1) SSCC Standards for Soil Erosion and Sediment Control
 - d. Old Bridge Municipal Utilities Authority (OBMUA)
 - 1) Rules and Regulations for the Old Bridge Municipal Utilities Authority, Sewer Division, September 2006
 - e. Middlesex County Utilities Authority (MCUA)
 - 1) Rules and Regulations of the Middlesex County Municipal Utilities Authority, Wastewater Division, November 2010

B. Definitions

1. Non-contact water
 - a. Any water on the site that does not come into direct contact with the contaminated soil/sediment and contains dissolved phase contaminant concentrations comparable to underlying groundwater is identified as “non-contact water.” Water collected from the non-contact dewatering system such as collection trench with sump or well point dewatering system outside of the excavations is identified as non-contact water.
 - b. Groundwater at the site does not exceed the Groundwater Quality Standards (GWQS) and non-contact water does not require treatment prior to discharge.
2. Contact water
 - a. Any water on the site that has come into contact with the contaminated soil/sediment and has potential for contaminant concentrations greater than the GWQS is identified as “contact water.” Water in contact with contaminated material that collects in excavations shall be designated as contact water. Any water collected in decontamination pad sumps shall also be designated as contact water. Contact water shall be managed assuming it contains contaminated suspended solids and dissolved phase contaminant concentrations greater than the GWQS.
 - b. Contact water shall be collected, containerized, and tested to determine if and the type of treatment that is required prior to discharge. Treatment and discharge shall meet the requirements of the NJPDES DSW permit equivalent.
3. In-the-Dry
 - a. "In-the-Dry" means soil conditions where dewatering is performed to drawdown water level below the bottom of soil/sediment subgrades during excavation or construction so that no standing water exists within the work area. The drawdown shall be sufficient to prevent disturbance or softening of the subgrade during all anticipated construction activities, collection of post-excavation confirmatory samples, and backfilling.
4. Severe Storm
 - a. In general, a severe or large storm event is Category 1 or higher hurricane, tropical storm, or a nor'easter, resulting in more than 1.0 inches of rainfall in 1-hour period and 3.0 inches of rainfall in 24-hour period.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an “EA” designation; submittals having an “FIO” designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
 1. Dewatering and Drainage Plan; Pre-Construction Submittals; EA
 - a. The Contractor shall submit the Dewatering and Drainage Plan for the dewatering system as shown on the Design Drawings or propose alternatives to the EPA's Representative. The Contractor-designed dewatering system shall conform to the overall dewatering system shown on the Design Drawings. The Dewatering and Drainage Plan shall be signed and sealed by a licensed Professional Engineer registered in the State of New Jersey. The Contractor remains responsible for the adequacy and safety of construction means, methods and techniques. The Dewatering and Drainage Plan shall indicate the following, at minimum:
 - 1) Identification of the anticipated area influenced by the dewatering system.

- 2) Proposed means and methods for handling the non-contact water including the containment, collection, and discharge.
- 3) Proposed means and methods for handling the contact water, including the containment, collection, storage, testing, and ultimate discharge of contact water from dewatering operations and stormwater runoff that come into contact with the contaminated soil/sediment.
- 4) Proposed means and methods to manage and divert drainage/storm sewer flow away from the active excavation as shown on the Design Drawings.
- 5) Dewatering system design calculations, shop drawings, and technical literature used to prepare the plan. The plan shall indicate the following, at a minimum
 - 6) Complete description of equipment and instrumentation to be used for proposed type of dewatering system for the non-contact and contact water.
 - 7) Proposed type of well point dewatering system for controlling non-contact water for deeper excavations.
 - 8) Specific products and materials such as supersacks and infill materials, the type, quantity and intended use
 - 9) Arrangement, locations, and depths of system components.
 - 10) Pump and pipe sizes and capacities.
 - 11) Filter types and sizes.
 - 12) Water discharge method and location.
 - 13) Tidal water control devices.
 - 14) System operation, monitoring, and maintenance procedures.
 - 15) Method of monitoring water quality.
 - 16) Signed and sealed by professional engineer.
2. Analytical Results; Test Reports; FIO
 - a. The Contractor shall provide the treatment effluent and the discharge water sampling results. The analysis and reporting shall meet the requirements of SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Not used.

1.5 REGULATORY REQUIREMENTS

- A. EPA will be responsible for obtaining a NJPDES DSW permit equivalent and Treatment Works Approval.
- B. Obtaining all other construction permits shall be the sole responsibility of the Contractor unless noted elsewhere within the Contract Documents.
- C. The Contractor shall obtain, pay for all permits, and comply with conditions and terms of applicable permits unless directed otherwise by the EPA's Representative. Original permits shall be prominently displayed on the site prior to constructing dewatering systems.

1.6 CONTAMINANTS OF CONCERN

- A. The Contractor shall be responsible for verifying all contaminants that will require treatment and for treating contaminants to levels below applicable discharge limits. Based on the available data from previous investigations, treatment shall need to be provided for total suspended solids (TSS) and potentially for dissolved phase lead concentrations greater than the GWQS.

PART 2 - PRODUCTS

2.1 WATER CONTROL EQUIPMENT

- A. The Contractor shall furnish all materials, tools, equipment, facilities, and services required to provide control of water and maintain a dry state in the Exclusion Zone. The Contractor shall maintain diversion features in a manner sufficiently water-tight to keep the work areas dry and free of standing water.
- B. Metal sheet pile wall and supersack wall shall be used to control water from entering the work areas.
 - 1. A metal sheet pile wall to control tidal water and subsurface water from entering excavation areas in accordance with SECTION 03150 – METAL SHEET PILE.
 - 2. Supersacks such as by Big Bag USA™ flood barrier system, <https://www.bigbagsusa.com/>, or equal. The Contractor shall provide supersack infill materials consisting of clean common fill material.

2.2 DEWATERING EQUIPMENT

- A. The Contractor shall select dewatering equipment to meet specified performance requirements. The system shall be appropriately sized to collect, convey, store, and/or treat the quantity of water generated so that water management does not impact construction work. In general, the system may include some combination of the following components:
 - 1. Pumping systems from excavations, dewatering systems, stormwater controls, and/or decontamination facilities
 - 2. Piping to convey water from the point of generation to storage/treatment and final discharge points
 - 3. Contact water storage facilities to temporarily store untreated, treated, and/or water designated for treatment and discharge
 - 4. Systems for controlling and metering discharge as required by the permit
 - 5. Water treatment equipment such as multiple settling tanks, particulate filtration systems, granular activated carbon (GAC) adsorption, ion exchange, and/or other components necessary to meet applicable permit limits.
 - 6. The dewatering trench sumps shall be concrete, as shown in the drawings, or an equivalent alternative.

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor shall prevent tidal water and groundwater from entering the excavation area during the source materials removal, excavation, backfilling, and until the new revetment construction is complete.
- B. The Contractor shall control non-contact water with the dewatering system, and contact water generated from within the open excavation area and stormwater runoff within the work limits as established in the Contract Documents.
- C. The Contractor shall furnish labor, materials, and equipment necessary for collecting, treating, and discharging of contact water in excavations at the site. Conduct excavation operations at the site in a manner that minimizes the amount of contact water that may collect in the open excavation.
- D. The Contractor shall install piping to convey water to the point of discharge in accordance with the manufacturer's recommendations. The piping conveying contact

water shall be double walled or placed on an impermeable liner when installed outside the Exclusion Zone. The piping conveying non-contact water can be single walled.

- E. The conveyance piping shall be installed above ground and the Contractor shall take measures to prevent the pipes from freezing.

3.2 DESIGN AND PERFORMANCE RESPONSIBILITY

- A. The Contractor is responsible for design and execution of methods for controlling non-contact water, contact water, and stormwater runoff.
- B. The Contractor shall implement non-contact water dewatering measures to dewater the excavation areas adequately so that excavation is conducted in-the-dry and minimizes contact-water generation.
- C. The Contractor shall control surface and subsurface water flowing toward or into excavations to prevent sloughing of excavation slopes and walls, uplift, and heave in the excavation and to eliminate interference with orderly progress of construction. The Contractor shall take control measures by the time the excavation reaches the water level in order to maintain the integrity of the in-situ material. While the excavation is open, the Contractor shall maintain the water level continuously below the working level.
- D. The Contractor shall operate dewatering system continuously until construction work below existing water levels is complete.
- E. The Contractor shall submit performance records weekly. Measure and record performance of dewatering system at the same time each day by use of observation wells or piezometers installed in conjunction with the dewatering system.
- F. The Contractor is responsible for damage to properties, drainage pipes, sewers and other utility installations, pavements and work that may result from dewatering or tidal water control operations.
- G. Any design review and field monitoring activities performed by the EPA's Representative shall not relieve the Contractor of Contractor's responsibilities for the work.

3.3 TIDAL AND SUBSURFACE WATER CONTROL

- A. The Contractor's approved Dewatering and Drainage Plan shall include detailed methods for controlling the tidal water and subsurface water entering from the excavation areas.
- B. Sheet Pile Wall
 - 1. The Contractor shall install a metal sheet pile wall to control tidal water and subsurface water from entering excavation areas in accordance with SECTION 03150 – METAL SHEET PILE and maintain this measure as necessary during construction.
 - 2. The sheet pile wall shall be installed prior to initiating removal of riprap from the existing seawall and shall be removed after the new revetment is constructed.
- C. Supersack
 - 1. The Contractor shall use supersacks at the eastern and western end of the sheet pile wall as shown on the Design Drawings to meet the design flood elevations of 10 feet above mean sea level at both ends of the sheet pile wall.

2. The Contractor can use sandbags to construct the wall to the design flood elevations of 10 feet above mean sea level at the western end if the existing boardwalk prevents the use of supersacks.
3. At the completion of the construction, the supersacks shall be recovered off site including the bag and infill materials.

3.4 NON-CONTACT WATER CONTROL

- A. The Contractor shall implement non-contact water dewatering measures including but not limited to the collection trench, sumps, well point dewatering system, and other methods to dewater the excavation areas.
- B. The trailer-mounted portable pumps used for dewatering shall be mounted on a floating dock or platform if required.
- C. Non-contact water will be discharged to surface water (Raritan Bay) over the sheet pile wall using a diffuser tee pipe with a perforated end pipe connection as shown in Design Drawings to prevent erosion.
- D. Excavation shall not be conducted through standing water.
- E. If standing water is observed during excavation, where applicable or necessary, additional non-contact dewatering measures including well point dewatering system and/or second collection trench with sumps outside of the excavation area shall be implemented to ensure that excavation is free of standing water during removal. The Contractor shall confer with the EPA's representative before implementing dewatering measures for areas requiring excavations deeper than -5 feet above mean sea level.
- F. The Contractor shall maintain all dewatering measures as necessary during construction.

3.5 STORMWATER CONTROL

- A. The Contractor must manage stormwater flows within the excavation areas and not allow un-managed flows of water into the active excavation segment. The Contractor shall control the stormwater that discharges at the top of the sea wall slope to the bottom of the slope beach area by diverting the flow around the active excavation areas to the dewatering system during typical rain events.
- B. The Contractor shall construct stormwater control measures, including dikes, ditches, sumps, and other methods to prevent, as necessary, flow of stormwater in the excavation areas in accordance with SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT and the Design Drawings, and maintain these measures as necessary during construction.
- C. Stormwater runoff must be directed away from the open excavation area to prevent flow into the excavation areas. Any ponding of water due to rainfall shall be removed as contact water prior to initiating excavation activities.
- D. During severe storm events, the Contractor shall manage stormwater flow in accordance with the approved Severe Storm Plan as per SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.

3.6 CONTACT WATER

- A. All contact water collected from the dewatering activities shall be collected and stored in frac tanks on-site.
- B. Contact water shall be collected and treated (if required based on testing) as described in SECTION 13300 – WATER TREATMENT SYSTEM.

3.7 DISCHARGE OF TREATED WATER

- A. The treated contact water shall be discharged to the surface water (Raritan Bay). The surface water is identified as the primary discharge location.
- B. The discharge of water collected during dewatering activities will be permitted only if it meets the discharge criteria specified by the applicable permit after sampling as specified herein and in SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.
- C. The Contractor shall not discharge any treated contact water until prove-out tests results demonstrate that discharged water will meet the effluent standards defined in the NJPDES DSW permit equivalent. Once prove-out test results meeting the effluent permit limits are received subsequent discharges and sampling shall be performed as required by the discharge permit equivalency. The Contractor shall provide erosion control at outlet of piping to minimize erosion.
- D. Should the Contractor be required to shut down the dewatering for a violation of a discharge, it will not in any case constitute a right to a delay claim or an associated change order.

3.8 ANALYTICAL SAMPLING

- A. Discharge Water Sampling
 - 1. The Contractor shall collect discharge water samples from dewatering operations of the contact water prior to discharge to the surface water. Prior to discharge, the Contractor shall collect discharge water samples in accordance with NJDPES DSW permit.
 - 2. All required sampling and chemical analysis shall be conducted in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.
 - 3. If sample results indicate water exceeds the permit requirement for any compounds, discharge shall not be performed, water shall undergo additional treatment and treatment shall be modified as needed in order to ensure compliance with all discharge requirements.

END OF SECTION

SECTION 02201
BACKFILL, COMPACTION AND GRADING

PART 1 - GENERAL

1.1 SUMMARY

- A. The purpose of this section is to provide the Contractor with the minimum requirements and constraints for backfill and compaction of earthen material in the excavated areas, and site-wide grading as defined in this section.
- B. The Contractor shall furnish all labor, materials, equipment, and incidentals necessary to perform all backfilling, compaction, and grading cover presented on the Design Drawings and specified herein.
- C. All earthen materials used for backfilling and final grading shall be suitable for use as backfill, as specified in this section. In addition, all backfill shall be analyzed by an off-site laboratory and certified clean in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.

1.2 REFERENCES

- A. References
 - 1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.
 - 2. American Society for Testing and Materials (ASTM)
 - a. ASTM D6913/D6913M-17 Standard Test Method for Particle-Size Analysis of Soils
 - b. ASTM D 1556M-15e1 Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
 - c. ASTM D 1557-07 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³))
 - d. ASTM D 2487-17 Standard Practice for Classification of Soils for Oversight Engineering Purposes (Unified Soil Classification System)
 - e. ASTM D 4355M-14(2018) Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus
 - f. ASTM D 4632M-15a Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
 - g. ASTM D 4751-16 Standard Test Method for Determining Apparent Opening Size of a Geotextile
 - h. ASTM D 4972-19 Standard Test Method for pH of Soils
 - i. ASTM D 5268-22 Standard Specification for Topsoil Used for Landscaping and Construction Purposes
 - j. ASTM D 6241-14 Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe
 - k. ASTM D 6938-17a Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

- l. ASTM D 7013M-15 Standard Guide for Calibration Facility Setup for Nuclear Surface Gauges
 - m. ASTM D 7759M-14 Standard Guide for Nuclear Surface Moisture and Density Gauge Calibration
 - 3. New Jersey Department of Transportation (NJDOT)
 - a. NJDOTSS Division 200 – Earthwork and Division 900 – Materials
 - 4. New Jersey State Soil Conservation Committee (SSCC)
 - a. SSCC Standards for Soil Erosion and Sediment Control
 - 5. New Jersey Administrative Code (N.J.A.C.)
 - a. N.J.A.C. 7:26D Remediation Standards
 - 6. New Jersey Department of Environmental Protection (NJDEP)
 - a. Fill Material Guidance for SRP Sites Version 4.0
- B. Definitions
- 1. Satisfactory materials
 - a. Satisfactory materials for common fill shall comprise any uncontaminated off-site materials classified by ASTM D 2487-17 as well-graded gravels (GW), well-graded sands (SW), clayey gravels (GC), silty gravels (GM), clayey sands (SC), or silty sands (SM).
 - b. The testing requirements for classifying materials shall be in accordance with the standards of ASTM D6913/D6913M-17. All imported backfill material, including common backfill, beach sand fill and riprap brought to the site shall be free of organic material, frozen material, rubbish, or other unsuitable materials. Topsoil and wetland backfill brought to the site shall be free of frozen material, rubbish, or other unsuitable materials. Satisfactory materials shall meet the criteria outlined in Paragraph 1.5.A and shall meet the requirements of PART 2 – PRODUCTS of this Specification.
 - 2. Unsatisfactory Materials
 - a. Unsatisfactory materials shall comprise any materials not meeting the standards of Paragraph 1.2.B.1. This shall include any construction and demolition materials, contaminated materials/soils, trash/refuse, materials containing frozen or excessive organic matter, or materials classified by ASTM D 2487-17 as PT, OH and OL.
 - 3. Common backfill
 - a. Fill used for upland and other areas specified as common fill in Design Drawings, grading, and restoration, as well as base fill in all areas except wetland and intertidal/subtidal areas, and anywhere else not specifically designated, shall be classified as common fill.
 - 4. Topsoil
 - a. Topsoil used for upland, upland transition, and forested transition areas restoration and other upland areas specified as turf seeding mix in Design Drawings.
 - b. The topsoil whether manufactured or imported from an approved off-site source shall consist of natural, friable soil that is representative of the soils in the vicinity which produce heavy growths of crops, grass, or other vegetation and is reasonably free from clay clumps, brush, weeds, litter, matted roots, stumps, stones, toxic substances, or any material that might be harmful to plant growth or be a hindrance to grading, planting, or maintenance operations, and any other objectionable material.
 - 5. Beach Sand fill

- a. Clean beach sand fill used for as cover fill in all intertidal/subtidal areas in Areas 1, 2 and 5 except wetland areas in Area 1 and 5.
- 6. Riprap
 - a. Riprap used for constructing a new revetment in place of the existing seawall.
- 7. Wetland backfill
 - a. Fill used for tidal and freshwater wetland areas reconstruction

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES:
 - 1. Samples of proposed common backfill, topsoil, beach sand fill, and wetland backfill; Samples; EA
 - a. The Contractor shall submit samples of each earthen materials weighing approximately 50 pounds. The Contractor shall not use these materials as part of the contract work until receiving written authorization from the EPA's Representative.
 - 2. Laboratory and Field Test Results; Test Reports; EA
 - a. The Contractor shall submit the results of all laboratory and field testing, as specified in Paragraph 3.6, within 24 hours of receipt. These shall include the results of all chemical testing, sieve analyses performed, in-place density testing, moisture-density testing, shear strength and bearing capacity testing, and all other testing performed of backfill materials and compaction requirements.
 - 3. Backfill Materials Sources and Certification; Certificates; EA
 - a. The Contractor shall submit the proposed source for all backfill materials including common backfill, topsoil, beach sand fill, riprap, and wetland backfill. The Contractor shall include certificates of compliance attesting those materials meet the specified requirements for particle size, pH, organic matter content, textural class, soluble salts, chemical, and mechanical analyses, as appropriate.
 - 4. Laboratory Certification Credentials; Certificates; EA
 - a. The Contractor shall submit licenses or certifications of qualifications of the commercial testing laboratory and/or associated personnel for the Contractor's testing facilities, for the performance of field and laboratory testing.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Not used.

1.5 QUALITY ASSURANCE

- A. Certification of Materials
 - 1. All materials used as fill, including common backfill, topsoil, beach sand fill, riprap, and wetland backfill shall be tested to ensure they are free from chemical and radiological contamination as defined in NJAC 7:26D, Table 1A – Residential Direct Contact Health Based Criteria and Soil Remediation Standards, and as specified in SECTION 01450 – CHEMICAL DATA QUALITY CONTROL. Results shall be certified in writing. The EPA's Representative will accompany the Contractor to visit all backfill sources during sample collection and inspect all backfill materials. At a minimum, chemical analysis of material for each source or

- borrow area will be performed in accordance with the NJDEP's Fill Material Guidance for SRP Sites (Version 4.0) or as requested by the EPA's Representative.
2. Analytical parameters to verify that fill materials are free of chemical contamination are included in SECTION 01450 - CHEMICAL DATA QUALITY CONTROL.

1.6 DELIVERY, STORAGE AND HANDLING

- A. If granular fill materials are delivered to the site prior to placement approval, materials shall be stockpiled on site within the support zone as directed by the EPA's Representative. Provisions shall be implemented to minimize surface water impact on the stockpile. Stockpiles shall be covered when not in use and encircled with silt fence. Removal and placement of granular fill material shall be done in a manner to minimize intrusion of soils adjacent to and beneath the stockpile.

PART 2 - PRODUCTS

2.1 COMMON BACKFILL

- A. Off-site common backfill shall meet the requirements of Paragraph 1.2.B.1 and shall meet the following gradation requirements:

<u>U.S. Sieve Size</u>	<u>Percent Passing</u>
2-inch	100
1-inch	85 – 100
3/8-inch	70 – 100
No. 10	50 – 100
No. 30	30 – 100
No. 60	15 – 65
No. 200	0 – 5

2.2 BEACH SAND FILL

- A. Except for the tidal wetland areas, all disturbed intertidal/subtidal areas shall be backfilled with clean beach sand. Beach sand shall meet the requirements of Paragraph 1.2.B.1 and classify as SP in accordance with ASTM D2487-17, be consistent in color to existing beach sand, have less than 15% gravel size particles, and have less than 5 percent fines passing a 200 sieve.
- B. If the quantities of beach sand fill necessary to backfill all intertidal/subtidal areas are not readily available, the Contractor should notify the EPA's Representative to request an approval for backfilling with a minimum of six (6) inches of clean beach sand fill.

2.3 RIPRAP

- A. Riprap as specified in SECTION 03530 – REVETMENT CONSTRUCTION shall be used to construct a revetment in place of the existing seawall. The Contractor shall be responsible for procurement of the required riprap for the revetment construction.

2.4 TOPSOIL

- A. Upland Area and Transition Area Topsoil
 1. For upland and transition areas, topsoil shall be as specified in SECTION 02955 – TRANSITION AND WETLAND AREA RESTORATION.

2.5 WETLAND BACKFILL

1. For wetland areas, wetland backfill and topsoil shall be as specified in SECTION 02955 – TRANSITION AND WETLAND AREA RESTORATION.

PART 3 - EXECUTION

3.1 GENERAL

- A. All backfill material brought on site shall be clean, in accordance with Paragraph 1.5.A. Written certification attesting to this shall be submitted to the EPA's Representative.
- B. The Contractor shall coordinate the delivery of backfill materials with the performance of backfilling work to minimize the quantities of materials requiring on-site stockpiling. In cases where stockpiling of backfill material on site is unavoidable, the Contractor shall place all such materials upon a 10-mil thick sheet of plastic, which will be stretched across the ground surface in a location approved by the EPA's Representative. Fill materials shall be stored in a manner that prevents the clean fill from becoming saturated, airborne, or mixed with contaminated soil in accordance with the Contractor's approved Waste Management and Transportation Plan and SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.
- C. The Contractor shall be responsible for scheduling the delivery of all backfill materials with the overall project schedule such that no delays in construction occur.
- D. The Contractor shall be responsible for maintaining excavation dewatering and surface water controls in place prior to and during backfilling operations to ensure that no water accumulates in open excavations. Backfill material shall not be placed on surfaces that are muddy, frozen, contain frost or standing water.

3.2 SUBGRADE PREPARATION

- A. Prior to the placement of any backfill, the ground surface with the substrate remaining in the remediated area on which fill is to be placed shall be stripped of any vegetation, rubbish, debris, and any other unsatisfactory materials, including contaminated materials. The subgrade ground surface shall then be prepared, as necessary to allow for an adequate bond between the subgrade and backfilled material. When necessary, the Contractor shall plow, disc, or otherwise break up the existing soil to a depth of 6 inches, and moisten or aerate the subgrade as necessary to achieve the specified moisture content and density for proper compaction, taking care not to damage any existing structures or utilities. When subgrades are less than the specified density, the ground surface shall be scarified and compacted to a depth of 6 inches to the same density as the backfill to be placed over it.

3.3 DELIVERY, STORAGE AND HANDLING

- A. If granular fill materials are delivered to the site prior to placement approval, materials shall be stockpiled on site as directed by the EPA's Representative. Provisions shall be implemented to minimize surface water impact on the stockpile. Removal and placement of granular fill material shall be done in a manner to minimize intrusion of soils adjacent to and beneath the stockpile.

3.4 COMMON BACKFILL AND BEACH SAND FILL PLACEMENT

- A. Common backfill and beach sand fill shall be placed in the designated areas and to the specified lines, grades, sections, and elevations shown on the Design Drawings, making

due allowance for settlement of the material. Over-excavated, non-impacted on-site material from the revetment construction may be used as common backfill provided it meets the NJDEP clean fill requirements. Sampling frequency will be determined by the NJDEP's Fill Material Guidance for SRP Sites (Version 4) Section 6.2.2. Backfilling shall proceed according to this Specification and the applicable referenced sections of the NJDOTSS.

- B. All intertidal/subtidal areas, excluding the tidal wetland areas, shall be filled with clean beach sand using the material specified in Paragraph 2.3 and as depicted in the Design Drawings. Alternatively, the intertidal/subtidal areas, excluding the tidal wetland areas, shall be filled to a minimum depth of six inches below the final grade with beach sand fill followed by common backfill, considering the availability of beach sand fill. The surface shall be free of materials that would hinder the placement of beach sand fill. Beach sand fill shall then be uniformly spread, graded, and compacted to the thickness, elevations, and slopes shown, and left free of surface irregularities. Beach sand fill shall be compacted by one pass of a cultipacker, roller, or equivalent. Beach sand fill shall not be placed when the subgrade is excessively wet.
- C. Wetland areas shall be backfilled in accordance with SECTION 02955 – TRANSITION AND WETLAND AREA RESTORATION.
- D. The upland transition and forested transition areas shown on the Design Drawings and to be seeded /planted shall be backfilled with common backfill or non-impacted on-site material to approximately 12 inches below final grade.
- E. The upland area shown on the Design Drawings and designated for turf seeding shall be backfilled with common fill or non-impacted on-site material to approximately 6 inches below final grade.
- F. Common backfill and beach sand fill shall not be placed on snow, ice, standing water, or frozen ground surfaces. Common backfill and beach sand fill shall not be placed over contaminated material. Common backfill and beach sand fill shall not be placed when the material is too wet either from rain or from excess application of water. At such times, work shall be suspended until the previously placed and new materials have thawed and/or dried to permit proper compaction.
- G. Each lift of common backfill and beach sand fill shall be placed in horizontal layers not exceeding 12 inches (+ or – 0.5 inches) in loose thickness.
- H. Upon completion of the backfill operations, the surface of the fill shall be sloped to facilitate surface drainage. This grade shall be maintained throughout backfilling operations except where controlled by other specified grade and elevations. The final finish grade shall be as specified in Paragraph 3.9. Grading shall be performed to promote surface drainage towards the Raritan Bay.
- I. Settlement or washing that occurs in graded, topsoiled, or backfilled areas prior to acceptance of the work shall be repaired and grades reestablished to the required elevations and slopes. The Contractor shall notify the EPA's Representative of unexpected subsurface conditions and discontinue work in the affected area until notified to resume work.

3.5 COMPACTION

- A. The Contractor shall compact each lift of common backfill as specified herein. Compaction in soil areas shall be accomplished by sheepsfoot rollers, pneumatic tired rollers, steel wheeled rollers, or other approved equipment well suited to the soil being

compacted. Material shall be moistened or aerated as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used.

- B. The Contractor shall be responsible for providing appropriate compaction effort to achieve the Minimum Percent of Laboratory Maximum Density (Modified Proctor) as outlined in this Specification. Area within the footprint of the revetment shall be compacted as specified in SECTION 03530 – REVETMENT CONSTRUCTION. For the remainder of the site, backfill shall be compacted to 90 percent of the Laboratory Maximum Density (Modified Proctor). No compaction testing in intertidal/subtidal areas shall be performed.
- C. If any common backfill is used for backfilling the intertidal/subtidal excavation areas then, it shall be placed and spread with low-ground pressure equipment. Compaction shall be accomplished by tracking the equipment over the fill surface of the intertidal excavation areas.
- D. If the EPA's Representative determines that added moisture is required, water shall be applied by sprinkler tanks or other sprinkler systems, which shall ensure uniform distribution of the water over the area to be treated and give complete and accurate control of the amount of water to be used. If too much water is added, the area shall be permitted to dry before compaction is continued.
- E. The Contractor shall supply all hose, piping, valves, sprinklers, pumps, sprinkler tanks, hauling equipment, and all other materials and equipment necessary to place the water in the fill in the manner specified. Water shall be provided and obtained at the Contractor's expense.
- F. Approved compacted subgrades that are disturbed by the Contractor's operations or adverse weather shall be scarified and recompact to the required density, prior to further construction.

3.6 SOIL TESTING

- A. Initial conformance testing shall be performed to show that all backfill materials meet the Specification requirements and to identify the compaction properties of the appropriate backfill materials. Testing shall be performed by an approved commercial testing laboratory or may be performed by the Contractor subject to approval by the EPA's Representative. The Contractor shall submit to the EPA's Representative for approval licenses or certifications of qualification for the performance of field and laboratory testing. At a minimum, the tests listed below shall be conducted for each material and submitted as initial conformance test results. In addition, periodic conformance testing shall be conducted by the Contractor's Quality Control Laboratory on common fill soils prior to their use on the project. The EPA's Representative reserves the right to reject material based on the results of these conformance tests and/or independent quality assurance testing conducted by the EPA's Representative. Rejected materials shall be removed from the site at no additional cost.
 - 1. Chemical Testing
 - a. Prior to the use of any backfill on site, the Contractor shall be responsible for performing chemical testing, by an off-site laboratory, of the proposed borrow material, in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.
 - 2. Sieve Analysis

- a. Sieve analysis shall be performed in accordance with ASTM D 421-85(2007) and ASTM D 422-63(2007) e2. A retest for classification shall be performed at a minimum of every 5,000 cubic yards.
3. Density Testing
 - a. Field in-place density tests shall be performed in accordance with ASTM D 6938-17a. A minimum of one test shall be performed per 500 cubic yards of material placed, with no less than one test per lift. Calibration curves shall be checked and adjusted, if necessary, by the procedure described in ASTM D 7013M-15 and D 7759M-14. The calibration checks of both the density and moisture gauges shall be made at the beginning of each working day and for each different type of material encountered. Calibration for in-place density testing shall consist of determining in-place density in accordance with D 1556M-15e1.
4. Moisture-Density Test
 - a. A moisture-density relationship for the soil shall be determined in accordance with ASTM D 1557-12e1 (Modified Proctor). A minimum of one test per 5,000 cubic yards shall be performed, but no less than one test per borrow area. The EPA's Representative may direct additional tests should soil materials change during the course of work.
5. Imported Material Acceptance
 - a. If tests indicate that the material does not meet Specification requirements, material placement shall be terminated until corrective actions are taken. Material that does not conform to the Specification requirements and is placed in the work shall be removed and replaced at the Contractor's sole expense. The presence of any compound above the requirements of Paragraph 1.5.A herein shall be reason to reject the source, regardless of other test results.

3.7 SPREADING TOPSOIL

- A. Upland area designated for turf seeding where common backfill material has been placed:
 1. Shall be covered with a minimum topsoil thickness of 6 inches using the material specified in Paragraph 2.2. Upland transition and forested transition areas shall be covered with a minimum topsoil thickness of 12 inches using the material specified in Paragraph 2.2.
 2. The surface shall be free of materials that would hinder planting or maintenance operations. The subgrade shall be pulverized to a depth of 2 inches by disking or plowing for the bonding of topsoil with the subsoil. Topsoil shall then be uniformly spread, graded, and compacted to the thickness, elevations, and slopes shown, and left free of surface irregularities. Topsoil shall be compacted by one pass of a cultipacker, roller, or equivalent. Topsoil shall not be placed when the subgrade is frozen, excessively wet, extremely dry, or in a condition otherwise detrimental to seeding, planting, or proper grading.
- B. Requirements for spreading topsoil within transition and wetland areas are provided in SECTION 02955 – TRANSITION AND WETLAND AREA RESTORATION.

3.8 RIPRAP

1. Riprap shall be placed as specified in SECTION 03530 – REVETMENT CONSTRUCTION.

3.9 GRADING

- A. The Contractor shall uniformly smooth, and grade all filled areas to provide a finished surface that is reasonably smooth, compacted to the specified project requirements, free from irregular surface changes, and sloped to drain properly. Grading shall not create swales or areas where ponding of water will occur. The finished surface shall be essentially as indicated on Restoration Plan depicted on the Design Drawings, as confirmed by surveying operations. Grading tolerances shall be plus or minus 0.1 feet for all exposed surfaces of backfill unless otherwise indicated on the Design Drawings.
- B. During the process of grading, the area to be graded shall be maintained in such condition that it shall be well drained at all times. When directed, temporary drains and drainage ditches shall be installed to intercept or divert surface water that may affect the execution or condition of the work.
- C. If at the time of grading it is not possible to place any material in its final location, it shall be stockpiled in approved areas for later use. No extra payment will be made for the stockpiling or double handling of excavated material.
- D. The right is reserved to make minor adjustments or revisions in lines or grades if found necessary as the work progresses, in order to obtain satisfactory construction. After grading is completed and accepted by the EPA's Representative, no further filling or grading shall be permitted except with the approval of and inspection by the EPA's Representative.

3.10 QUALITY CONTROL PROGRAM

- A. An independent soil testing laboratory shall be retained by the Contractor and approved by the EPA's Representative to provide fill materials conformance and compaction testing as indicated herein.

3.11 SOIL EROSION AND SEDIMENT CONTROLS

- A. Newly-graded areas shall be protected from erosion by installing soil erosion and sediment controls, as specified in SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT and Soil Erosion and Sediment Control Plan certified by the Freehold Soil Conservation District.

3.12 SOIL TREATMENT

- A. Insecticide and herbicide treatment of backfill materials is prohibited.

END OF SECTION

SECTION 02230

CLEARING AND GRUBBING

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all labor, equipment, materials, and incidentals required clearing within the area of source materials removal and soil/sediment excavation, which shall include all items described herein, and include clearing the area, chipping and satisfactory disposing the trees and other vegetation etc. All cleared vegetation will be transported off-site for disposal. All other areas, beyond the limits of Exclusion Zone, shall be protected against damage by the Contractor, unless otherwise approved by the EPA's Representative.

1.2 REFERENCES

- A. References
 - 1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.
 - a. New Jersey Department of Transportation Standard Specifications
 - 1) NJDOTSS Division 200 – Earthwork and Division 800 – Landscaping
 - b. New Jersey Administrative Code (N.J.A.C.)
 - 1) N.J.A.C. 7:26 – Solid and Hazardous Waste Management Regulations

1.3 SUBMITTALS

- A. Not used.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. The Contractor, in consultation with the EPA and the state, will determine if there are any trees or shrubs that would require saving for future park development, where appropriate.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 PREPARATION

- A. All clearing shall be performed in accordance with the requirements of Sections 201, 801, and 802 of the NJDOTSS, unless otherwise indicated herein. Protect existing trees and other vegetation to remain against damage.
 - 1. The Contractor shall not smother trees by stockpiling construction materials or excavated materials within drip line.
 - 2. The Contractor shall avoid foot or vehicular traffic or parking of vehicles within drip line.
 - 3. The Contractor shall provide temporary protection as required.

- B. If herbicide application is required in the work area prior to site clearing, the Contractor shall follow the approved Herbicide Application Plan as per SECTION 02100 – SITE PREPARATION.
- C. The Contractor shall repair or replace trees and vegetation that located within the Support Zone and damaged by construction operations as per SECTION 02900 – SITE RESTORATION, SECTION 02921 – UPLAND SEEDING, and shown on Design Drawings.
 - 1. Repair shall be performed by a qualified tree surgeon/licensed arborist.
 - 2. Trees which cannot be repaired and restored to full-growth status shall be replaced.
 - 3. New trees shall be replaced with minimum 4-inch caliper or as required by local tree ordinance.

3.2 SITE CLEARING

- A. Clearing
 - 1. Clearing shall consist of the felling, trimming, cutting into sections, and chipping of trees. Trees, stumps, roots, brush, and other vegetation to be cleared shall be cut 6 inches above ground surface. Any limbs and branches to be trimmed nearby the excavation or staging area shall be neatly cut close to the bole of the tree or main branches. Trees and vegetation designated to remain shall be protected from damage incident to clearing, grubbing, and construction operations, in accordance with the requirements of Paragraph 3.2.C.
 - a. Clear from within limits of construction all trees not marked to remain.
 - b. Include the removal of shrubs, brush, downed timber, rotten wood, heavy growth of grass and weeds, vines, and rubbish.
 - c. Trees shall be felled in such a manner as to avoid damage to trees left standing, and with due regard for the safety of employees and others.
 - d. Clearing shall be performed prior to any remedial excavation.
- B. Grubbing
 - 1. All stumps from trees removed during site clearing operations within the excavation area shall be grubbed out since the trees are only being removed to facilitate construction activities.
 - 2. Grubbing shall be done in phases incidental to the remedial excavation phase to reduce the potential for soil erosion.
 - 3. All grubbed material is assumed to be contaminated and shall be disposed of off-site.
 - 4. Grubbing shall consist of the removal and disposal of stumps, roots, buried logs, and all tap roots, lateral roots, or other projections over 1.5 inches in diameter within the area of excavation. Material to be grubbed shall not be removed below the depth of excavation indicated on the Design Drawings, or as otherwise directed by the EPA's Representative.
- C. Protection
 - 1. Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction using barriers or other means as the circumstances require.
 - 2. The Contractor shall repair all damage to trees, shrubs, and plants scheduled to remain, by properly dressing, cutting, and painting with an acceptable tree wound paint, or replacing items that cannot be repaired.

3. The Contractor shall, at no additional expense, seed all grassed areas, beyond the limits of construction shown on the Design Drawings, which have been damaged as a result of the Contractor's operation.
4. The Contractor shall not destroy or damage trees and shrubs outside the limits of construction without the authorization of the EPA's Representative.

D. Disposal of Materials:

1. *Phragmites* and any other cleared material which is determined not be used on site shall be handled as contaminated material and disposed of at an approved Subtitle D landfill facility pursuant to N.J.A.C. 7:26-1 et seq. Chipped material shall be transported in such a manner as to contain the spread of *Phragmites* seeds during off-site transportation and disposal, such as covering chipped material with non-hazardous material during transport.
2. Grubbed material shall be assumed to be contaminated and shall be chipped to a maximum size of 2 inches by 2 inches. The chippings shall be consolidated and containerized with other contaminated material, or otherwise handled as required by the receiving disposal facility.
3. The Contractor shall not reuse any mulch generated from materials removed from areas within the excavation and adjacent to the seawall.
4. The Contractor shall not burn combustible materials on site.
5. The Contractor shall remove all waste materials from site.
6. The Contractor shall not bury organic matter on site.

END OF SECTION

SECTION 02370
EROSION CONTROL AND STORMWATER MANAGEMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all labor, materials, equipment, and incidentals necessary to perform erosion control for the duration of the project. Work shall be performed as shown on the Design Drawings, specified herein and identified in the Soil Erosion and Sediment Control (SESC) Plan certified by the Freehold Soil Conservation District.
- B. EPA will prepare and submit the SESC Plan to the Freehold Soil Conservation District. A copy of the certified SESC Plan will be provided to the Contractor. The Contractor shall comply with all requirements specified in the certified SESC Plan.

1.2 REFERENCES

- A. References
 - 1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.
 - a. New Jersey Administrative Code (N.J.A.C.)
 - 1) N.J.A.C. 2:90-1 Soil Erosion and Sediment Control on Land Disturbance Activities
 - b. New Jersey State Soil Conservation Committee (SSCC)
 - 1) SSCC Standards for Soil Erosion and Sediment Control
 - c. New Jersey Department of Environmental Protection (NJDEP)
 - 1) NJDEP New Jersey Stormwater Best Management Practices Manual
- B. Definitions
 - 1. Non-contact water
 - a. Any water on the site that does not come into direct contact with the contaminated soil/sediment and contains dissolved phase contaminant concentrations comparable to underlying groundwater is identified as “non-contact water.” Water collected from the non-contact dewatering system such as collection trench with sump or well point dewatering system outside of the excavations is identified as non-contact water.
 - b. Groundwater at the site does not exceed the Groundwater Quality Standards (GWQS) and non-contact water does not require treatment prior to discharge.
 - 2. Contact water
 - a. Any water on the site that has come into contact with the contaminated soil/sediment and has potential for contaminant concentrations greater than the GWQS is identified as “contact water.” Water in contact with contaminated material that collects in excavations shall be designated as contact water. Any water collected in decontamination pad sumps shall also be designated as contact water. Contact water shall be managed assuming it contains contaminated suspended solids and dissolved phase contaminant concentrations greater than the GWQS.

- b. Contact water shall be collected, containerized, and tested to determine if and the type of treatment that is required prior to discharge. Treatment and discharge shall meet the requirements of the NJPDES DSW permit equivalent.
- 3. Severe Storm
 - a. In general, a severe or large storm event is Category 1 or higher hurricane, tropical storm, or a nor'easter, resulting in more than 1.0 inches of rainfall in 1-hour period and 3.0 inches of rainfall in 24-hour period.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals with an "FIO" designation is for information only. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES
 - 1. Samples; Samples; EA
 - a. Samples of all materials shall be submitted for inspection and approval upon request from the EPA's Representative.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Not used.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Sheet Pile Wall
 - 1. Temporary sheet pile wall shall be installed in accordance with SECTION 02140 – DEWATERING AND DRAINAGE and SECTION 03150 – METAL SHEET PILE to control tidal water from entering excavations.
- B. Temporary Seeding and Mulching
 - 1. Temporary seeding, mulching, fertilizing, and erosion control matting shall be used as needed to reduce erosion as specified in SECTION 02921 – UPLAND SEEDING.
- C. Baled Hay or Straw checks
 - 1. Baled hay or straw erosion checks are temporary measures to control erosion and prevent siltation. Bales shall be either hay or straw containing 5 cubic feet or more of material. The bales shall be free from noxious weeds.
- D. Temporary Diversion Fences
 - 1. Diversion fence material shall be a black, multi-ply, high-density polyethylene, impermeable geomembrane. The membrane shall be reinforced with a non-woven grid of high strength fiber cord having a uniform tear resistance in all directions. Reinforcing shall be a heavy-duty nylon cord in a diamond pattern.
 - 2. The material shall be attached to the upstream side of the fence to retain the suspended silt particles found in the runoff water and divert the water away from areas of excavation.
- E. Temporary Silt Fences
 - 1. The siltation fence fabric shall be a geotextile material suitable for siltation control use with a minimum tensile strength of 100 pounds, meeting ASTM D 4632. The equivalent opening size shall be between the no. 50 and no. 70 sieve size. A 12-gauge metal fence with 4-inch by 4-inch openings shall be provided as support for the fence fabric.

- F. Geomembrane Liner
 - 1. The geomembrane liner shall be as specified in SECTION 02100 – SITE PREPARATION.
- G. Non-woven geotextile fabric
 - 1. The non-woven geotextile fabric shall be as specified in SECTION 02100 – SITE PREPARATION.
- H. Erosion control blanket
 - 1. Erosion control blanket shall be in accordance with SECTION 02921 – UPLAND SEEDING.
- I. Turbidity Barriers
 - 1. Exterior turbidity barriers shall be at minimum Type II Turbidity Barriers with filter cloth skirt, reefing system and dual anchor system or approved equal.

PART 3 - EXECUTION

3.1 SEDIMENT AND EROSION CONTROL

- A. Sediment and erosion control practices shall be consistent with procedures outlined in NJAC 2:90-1 and New Jersey Standards for Soil Erosion and Sediment Control.
- B. If the Contractor desires to stockpile construction materials such as stone, earth, etc., the location of these materials and the protection measures required shall be in accordance with the approved Soil Erosion and Sediment Control Plan prepared by the EPA.
- C. The Contractor shall not be permitted to divert stormwater onto adjacent properties. Stormwater shall be diverted around open excavation areas using diversion fencing.
- D. All stormwater that comes in contact with contaminated soils shall be collected, treated on-site (if required), and discharged to surface water. All other site run-off water shall be diverted towards the non-contact water dewatering system via the control measures (e.g., diversion dikes with baled hay or straw check/silt fence filtration) as approved by the EPA's Representative.

3.2 CONSTRUCTION REQUIREMENTS

- A. The EPA's Representative has the authority to limit the surface area of erodible earth material exposed by excavation and fill operations, and to direct the Contractor to provide immediate, permanent, and/or temporary pollution control measures to prevent contamination of adjacent properties or to the bay. Such work may involve the use of temporary mulches, mats, seeding, or other control devices or methods as necessary to control erosion. Cut and fill slopes shall be seeded and mulched in the upland areas and stabilized in the beach and seawall area as the excavation proceeds, to the extent directed by the EPA's Representative.
- B. The Contractor shall be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in its accepted schedule. Temporary pollution control measures shall be used to correct conditions that develop during construction, prior to installation of permanent pollution control features, or temporarily to control erosion that develops during normal construction practices.
- C. The EPA's Representative has the authority to limit the area of excavation and fill operations in progress commensurate with the Contractor's capability and progress in keeping the finished grading, mulching, seeding and other such temporary or permanent

pollution control measures current, in accordance with the accepted schedule. Should seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified.

- D. In the event of conflict between these requirements and pollution control laws, rules, or regulations, or other Federal, State, or local agencies, the more restrictive laws, rules, or regulations shall apply.

3.3 CONSTRUCTION OF CONTROL MEASURES

- A. Temporary sheet pile wall shall be installed in accordance with SECTION 02140 – DEWATERING AND DRAINAGE and SECTION 03150 – METAL SHEET PILE to control tidal water from entering excavations.
- B. Diversion Dikes
1. Build diversion dikes with a maximum channel slope of 2 percent and adequately compacted to prevent failure. The minimum height measured from the top of the dike to the bottom of the channel shall be 18 inches. The minimum base width shall be 6 feet and the minimum top width shall be 2 feet. Ensure that the diversion dikes are not damaged by construction operations or traffic. Build diversion dikes where needed.
 2. The Contractor shall inspect diversion dikes on a daily basis and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site. The Contractor shall pay close attention to the repair of damaged diversion dikes and accomplish necessary repairs promptly. When diversion dikes are no longer required, the Contractor shall shape to an acceptable grade, and seed the areas disturbed by this shaping in accordance with SECTION 02921 – UPLAND SEEDING or SECTION 02900 – SITE RESTORATION.
- C. Baled Hay or Straw Erosion Checks
1. Baled hay or straw checks shall be used where the existing ground slopes toward or away from an embankment, along the toe of slopes, in ditches, or other areas where the Contractor deems necessary to prevent siltation, erosion or water runoff problems.
 2. Hay or straw erosion checks shall be embedded in the ground 6 inches to prevent water from flowing under them. The bales shall also be anchored securely to the ground, as shown on the Design Drawings. Bales and anchoring shall be removed after they have served their purpose, as determined by the EPA's Representative. The Contractor shall keep the checks in good condition by replacing broken or damaged bales immediately after damage occurs. Normal debris cleanout shall be considered routine maintenance.
 3. The Contractor shall inspect baled hay or straw erosion checks on a daily basis and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site. The Contractor shall pay close attention to the repair of damaged bales, end runs and undercutting beneath bales. Accomplish necessary repairs to barriers or replacement of bales in a promptly manner. The Contractor shall remove sediment deposits when deposits reach one-half of the height of the barrier. At each end of each row turn bales uphill when used to retain sediment.
 4. The Contractor shall remove a straw bale barrier when it is no longer required. The immediate area occupied by the bales and any sediment deposits shall be shaped to an acceptable grade. The Contractor shall seed the areas disturbed by this shaping in accordance with SECTION 02921 – UPLAND SEEDING or SECTION 02900 – SITE RESTORATION.

D. Temporary Diversion Fences and Silt Fences

1. Temporary silt fences shall be placed on the natural ground, at the bottom of fill slopes, in ditches, or at other areas where siltation is a problem. Silt fences are constructed of material designed for that application or some other approved material on the up-grade side of the fence and anchored into the soil.
2. Temporary diversion fences shall be embedded in the ground 6 inches to prevent water from flowing under them. Diversion fences shall be placed upstream of excavations to divert water away from excavations and adjacent properties and into the existing stormwater system.
3. The fence shall be fastened to the fence posts with metal clips 12 inches on center or an approved equal compatible with the fence material. The filter material shall be fastened to the fence at the top, center, and bottom with metal fasteners (nails or staples) and a high-strength reinforcement material (nylon webbing, grommets, washers, etc.) placed between the fastener and the geotextile fabric.
4. Silt fence at locations meeting the sheet pile wall shall meet the requirements of the Design Drawings.
5. The Contractor shall be required to maintain diversion fence and silt fence in a satisfactory condition for the duration of the project or until removal is approved by the EPA's Representative.
 - a. The Contractor shall pay close attention to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the Contractor shall replace the fabric promptly.
 - b. The Contractor shall remove sediment deposits when deposits reach one-third of the height of the barrier and properly disposed of as directed by the EPA's Representative.
6. The Contractor shall remove a silt fence and diversion fence when they are no longer required. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded in accordance with SECTION 02921 – UPLAND SEEDING or SECTION 02900 – SITE RESTORATION. The diversion fence and silt fence become the property of the Contractor whenever the fence is removed.
7. The Contractor shall inspect the temporary diversion fences and silt fences on a daily basis and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site. Any erosion control features observed to be damaged or in need of repair shall be repaired immediately.

E. Erosion Control Blanket

1. The erosion control blanket shall be installed in diversion drainage channels as directed by the EPA's Representative. The Contractor shall follow the manufacturer's installation instructions for high flow applications.

F. Turbidity Barriers

1. Exterior turbidity barriers shall be installed along the sheet pile wall on the bay side as excavation work progresses.
2. The Contractor shall install and repair turbidity barriers per the manufacturer's instructions.
3. The Contractor shall be required to maintain turbidity barriers in a satisfactory condition for the duration of the project or until removal is approved by the EPA's Representative.
4. The Contractor shall inspect the turbidity barriers at minimum once a week and or within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at

the site. Turbidity barriers observed to be damaged or in need of repair shall be repaired immediately.

G. Construction Entrance

1. The access road from the site shall be maintained in a condition that will prevent tracking or flowing of sediment onto the Route 35 and the Laurence Parkway. This may require periodic top dressing with additional stone as required in order to maintain previously established stabilized construction access conditions. All construction vehicles shall be decontaminated, and wheels washed out prior to leaving the Exclusion Zone at the temporary decontamination facility. No soil or sediment shall be spilled, dropped, washed, or tracked onto the New Jersey Route 35 or the Laurence Parkway.
2. The Contractor shall , inspect surrounding roads, including but not limited to New Jersey Route 35, Laurence Parkway, Bayview Drive, Wilson Avenue, Roosevelt Avenue, Harding Road, and Shoreland Circle for dust track out on a daily basis and shall sweep surrounding roads immediately if any sediment is observed on roadways.

H. Storm Drains

1. The Contractor shall install filter fabric in all storm drains surrounding the active site as directed by the EPA's Representative.

3.4 MAINTENANCE

- A.** The temporary erosion control features installed by the Contractor shall be acceptably maintained by the Contractor until no longer needed or until permanent erosion control methods are installed. The erosion and stormwater control features shall be inspected as per Paragraph 3.4.C. Required repairs shall be performed in a timely manner. Any related materials removed shall become the property of the Contractor.

B. Inspections

1. Inspect disturbed areas of the construction site, areas that have not been finally stabilized used for storage of materials exposed to precipitation, stabilization practices, structural practices, and other controls daily and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site. Conduct inspections at least once every month where areas have been finally stabilized.
2. Inspect disturbed areas and areas used for material storage that are exposed to precipitation for evidence of, or the potential for, pollutants entering the drainage system. Observe erosion and sediment control measures identified in the SESC Plan to ensure that they are operating correctly. Inspect discharge locations or points to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters daily and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site.
3. Inspection Reports - For each inspection conducted, prepare a report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the erosion control methods, maintenance performed, and actions taken. Furnish the report to EPA's Representative within 24 hours of the inspection as a part of the Contractor's daily quality control report. A copy of the inspection report shall be maintained on the job site.

END OF SECTION

SECTION 02900

SITE RESTORATION

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all labor, equipment, material, and incidentals necessary to restore the site as specified herein and/or as directed by the EPA's Representative.

1.2 REFERENCES

- A. Not used.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES:
 - 1. Site Restoration Plan; EA
 - a. The Contractor shall submit a general Site Restoration Plan at least 90 calendar days prior to the start of site restoration activities. No restoration work shall be performed until the Site Restoration Plan is approved. The Contractor shall allow 30 calendar days in the schedule for review by the EPA's Representative. No adjustment for time or money will be made if resubmittals of the plan are required due to deficiencies in the plan.
 - b. At a minimum, the Site Restoration Plan shall include all elements listed below.
 - 1) A comprehensive plan outlining all general site restoration activities.
 - 2) Detailed timeline indicating the sequence of restoration activities, their estimated duration, seasonal restrictions, and the overall schedule for completing the restoration work.
 - 3) Identification of the resources needed for the site restoration, including personnel, equipment, and materials.
 - 4) Monitoring and reporting including a strategy for ongoing monitoring and evaluation of the restoration progress. This may involve regular site inspections and reporting.
 - 5) Contingency plans to address unforeseen circumstances, such as unexpected environmental conditions or technical challenges that may arise during the restoration process.
 - 2. Material Samples; Samples; EA
 - a. Samples of all materials to be used in the restoration shall be submitted for inspection and approval upon the EPA's Representative's request.
 - 3. Inspection Reports; Operation and Maintenance Data; EA
 - a. Inspection reports of the restored site conditions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Not used.

PART 2 - PRODUCTS (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor shall remove all equipment and materials used during project operation including, but not limited to, sheet pile wall, dewatering and temporary water treatment systems, trailers, silt fence, construction fence, stormwater diversion structures, electrical wiring, staging area, decontamination pad, stream diversion etc., prior to demobilization from the site.
- B. The restoration of the site excluding tidal wetlands and transition areas are to be completed within one month of the completion of remedial activities and in accordance with the Contractor's approved RA Schedule SECTION 01320 – PROJECT SCHEDULES.
- C. Prior to demobilization, all equipment shall be decontaminated in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE.
- D. All materials removed during site restoration activities shall be disposed of at an approved off-site disposal facility by the Contractor.
- E. The Contractor shall restore stormwater pipe outfalls extension in accordance with SECTION 03530 – REVETMENT CONSTRUCTION while constructing the revetment.
- F. The Contractor shall restore the site as shown on the Design Drawings. The restoration activities shall include, but not be limited to
 - 1. Restoration of Old Bridge Waterfront Park facilities including the playground, gazebo, and select light poles and benches that were removed prior to construction.
 - 2. Removal of stormwater diversion structures from park area stormwater sewers.
 - 3. In-kind restoration of park area stormwater sewer systems not included in SECTION 03530 – REVETMENT CONSTRUCTION.
 - 4. Removal of temporary Margaret's Creek's crossing and restoration of the area.
 - 5. Removal and/or restoration of the access road along the bay through the Margaret's Creek area.
 - 6. Restoration of the OBMUA fire access road from New Jersey Route 35 back to its original condition, if damaged during construction.
 - 7. Restoration of the wooden boardwalk and sidewalk with concrete paving if removed during the remedial action.
- G. Materials determined to be unusable shall be replaced in kind to restore each to its existing condition.
- H. The Contractor shall replace the asphalt parking areas and asphalt park pathways in accordance with Design Drawings and as specified in SECTION 03212 – HOT MIX BITUMINOUS PAVEMENT.
- I. The Contractor shall inspect the park grassy areas located within the park not addressed by site restoration, and disturbed areas shall be restored as specified in SECTION 02921 – UPLAND SEEDING.
- J. The impacted tidal wetland areas and transition areas shall be restored as shown on the Design Drawings and in accordance with SECTION 02955 – TRANSITION AND WETLAND AREA RESTORATION and SECTION 02921 – UPLAND SEEDING. Wetland tidal areas shall be restored to areas equal to, areas disturbed during the remedial action.

- K. All construction materials shall be removed from the site in accordance with SECTION 01780 – PROJECT CLOSEOUT.
- L. The site will be determined restored when all punch list items have been completed to the satisfaction of the EPA's Representative.

END OF SECTION

SECTION 02921

UPLAND SEEDING

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all labor, materials, equipment, and incidentals necessary to provide seeding in upland areas as required by the Contract Documents. Upland areas are defined as areas outside of the wetland and intertidal/subtidal restoration limits.

1.2 REFERENCES

- A. References
1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.
 - a. Code of Federal Regulations (CFR)
 - 1) 7 CFR 201 Federal Seed Act Regulations
 - b. New Jersey Department of Transportation Standard Specifications (NJDOTSS)
 - 1) NJDOTSS Division 800 – Landscaping
 - 2) NJDOTSS Division 900 – Materials
 - c. New Jersey State Soil Conservation Committee (SSCC)
 - 1) SSCC Standards for Soil Erosion and Sediment Control

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
1. Seeding Schedule; Product Data; FIO
 - a. The Contractor shall submit the schedule for the seed establishment and any modification to the schedule.
 2. Seed Certification; Certificates; EA
 - a. Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following: classification, botanical name, common name, percent pure live seed, minimum percent germination and hard seed, maximum percent weed seed content, and date tested.
 3. Maintenance Record; Closeout Submittals; FIO
 - a. A record of each site visit shall be furnished as specified in this section.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Not used.

PART 2 - PRODUCTS

2.1 SEED

A. Seed Classification

1. State-certified seed of the latest season's crop shall be provided in original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Labels shall be in conformance with 7 CFR 201 and applicable state seed laws.

B. Temporary Seed Species

1. Temporary seeding(s) may be necessary to provide cover when permanent seedings are likely to fail due to mid-summer heat or drought. Temporary seed species shall be as specified by New Jersey State Soil Conservation Committee (SSCC) publication Standards for Soil Erosion and Sediment Control in New Jersey January 2014, revised July 2017(the Standards) Table 7.2. according to season of installation.

C. Permanent Seed Species and Mixtures

1. Seed species and mixtures and application rates shall be as follows or as recommended by the manufacturer. Seed must be sourced from within 150 miles of the project site, if practicable.

Table 02921-1 Seed Mix #1: For Upland Transition Areas (40 lbs/acre)

% Pure Live Seed	Scientific Name	Common Name	Wetland Indicator Status*
15	<i>Tridens Flavus</i>	Purpletop	FACU
10	<i>Andropogon ternarius</i>	Split-beard bluestem	FACU
10	<i>Eragrostis spectabilis</i>	Purple lovegrass	FACU
10	<i>Panicum virgatum</i>	Switchgrass	FAC
10	<i>Sorghastrum nutans</i>	Indiangrass	FACU
10	<i>Schizachyrium scoparium</i>	Little false bluestem	FACU
5	<i>Solidago nemoralis</i>	Gray goldenrod	--
5	<i>Solidago canadensis</i>	Canada goldenrod	FACU
5	<i>Lespedeza virginica</i>	Slender lespedeza	--
5	<i>Lespedeza frutescens</i>	Shrubby bushclover	--
5	<i>Asclepias syriaca</i>	Common milkweed	UPL
4	<i>Monarda fistulosa</i>	Wild bergamot	FACU
3	<i>Chamaecrista fasciculata</i>	Partridge pea	FACU
3	<i>Rudbeckia triloba</i>	Brown-eyed Susan	FACU

Table 02921-2 Seed Mix #2: For Forested Transition Areas (40 lbs/acre)

% Pure Live Seed	Scientific Name	Common Name	Wetland Indicator Status*
15	<i>Panicum virgatum</i>	Switchgrass	FAC
15	<i>Andropogon gerardii</i>	Big bluestem	FAC
10	<i>Andropogon virginicus</i>	Broomsedge	FAC
10	<i>Elymus canadensis</i>	Canada wild rye	FAC
5	<i>Panicum amarum</i>	Bitter panic grass	FAC
5	<i>Tridens flavus</i>	Purpletop	FACU
10	<i>Solidago rugosa</i>	Wrinkleleaf goldenrod	FAC
10	<i>Quercus alba</i>	White oak	FAC
10	<i>Quercus rubra</i>	Red oak	FAC
5	<i>Prunus serotina</i>	Black cherry	FACU
5	<i>Ceanothus americanus</i>	New Jersey tea	--

National Wetland Plant Indicator Definitions:

- OBL (Obligate Wetland Plants)—Almost always occur in wetlands.
- FACW (Facultative Wetland Plants)—Usually occur in wetlands but may occur in non-wetlands.
- FAC (Facultative Wetland Plants)—Occur in wetlands and non-wetlands.
- FACU (Facultative Upland Plants)—Usually occur in non-wetlands but may occur in wetlands.
- UPL (Upland Plants)—Almost never occur in wetlands.

Table 02921-3 Turf Seed Mix: Upland (Park) Area (30 lbs / acre)

% Pure Live Seed	Scientific Name	Common Name
10	<i>Agrostis tenuis</i>	Colonial Bentgrass
30	<i>Festuca arundinacea</i> , 'Firecracker SLS'	Firecracker SLS Tall Fescue
30	<i>Festuca arundinacea</i> , 'Titanium 2LS'	Titanium 2LS Tall Fescue
30	<i>Festuca arundinacea</i> , 'Turismo'	Turismo Tall Fescue

D. Temporary Seed Species and Mixtures

1. Temporary seed species and mixtures and application rates shall be as follows or as recommended by manufacturer.

Table 02921-4 Temporary Seed Mix - As needed (30 lbs per acre)

Scientific Name	Common Name	Percent Seed
Lolium multiflorum	Annual ryegrass	55
Agrostis perennans	Albany Pine Bush NY – Ecotype Autumn Bentgrass	15
Secale cereale	Winter or cereal rye	30
* All exposed soil shall be seeded with Temporary Seed Mix.		

E. Seed Quality

1. Weed seed shall be a maximum 1 percent by weight of the total mixture.

F. Seed Mixing

1. The mixing of seed may be done by the seed supplier prior to delivery, or on site as directed by the EPA's Representative.

G. Seed Substitutions

1. Substitutions will not be allowed without written request and approval from the EPA's Representative.

2.2 WATER

- A. Water shall be the responsibility of the Contractor, unless otherwise noted. Water shall not contain elements toxic to plant life or the environment. Surface water or water generated from site operations shall not be used for watering seed.

2.3 SOIL AMENDMENTS

- A. Soil amendments, including pH adjusters such as lime, fertilizers, and soil conditioners, shall not be utilized, without written approval of EPA's Representative. Vermiculite shall not be used.

2.4 HAY MULCH

- A. Hay mulch shall consist of cured hay. When air dried in the loose state, the contents of a representative bale shall lose not more than 15 percent of the resulting air-dry weight of the bale. It shall be free from primary noxious weed seeds and rough or woody materials.

2.5 STRAW MULCH

- A. Straw mulches shall be stalks from oats, wheat, rye, barley, or rice and shall be furnished in air-dry condition and with a consistency for placing with commercial mulch blowing equipment. Mulches shall be free from weeds, mold, and other deleterious materials, in addition to meeting the requirements of the NJDOTSS, Sections 809 and 917.

2.6 FIBER MULCH

- A. Fiber mulch shall be a specially processed cellulose fiber containing no growth or germination- inhibiting factors. It shall be manufactured in such a manner that after addition and agitation in slurry tanks with water, the fibers in the material become uniformly suspended to form a homogeneous slurry. When sprayed on the ground, the material shall allow absorption and percolation of moisture. Each package of the cellulose fiber shall be marked by the manufacturer to show the air-dry weight content. Fiber mulch shall meet the requirements of the NJDOTSS, Sections 809 and 917.

2.7 EROSION CONTROL MATERIALS

- A. Soil erosion control shall conform to the following subparagraphs.
 - 1. Soil Erosion Control Blanket
 - a. Seventy percent agricultural straw and 30 percent coconut fiber matrix stitched with degradable nettings, designed to degrade within 12 months.
 - 2. Soil Erosion Control Fabric
 - a. Knitted construction of polypropylene yarn with uniform mesh openings 0.75-inch to 1-inch square with strips of biodegradable paper. Filler paper strips should last 6 to 8 months. Polypropylene yarn shall be removed by the Contractor upon completion of work and prior to final inspection.
 - b. Biodegradable yarn, if utilized, does not require removal upon completion of construction.
 - 3. Erosion Control Net
 - a. Net shall be heavy, twisted jute mesh, weighing approximately 1.22 pounds per linear yard and 4 feet wide with mesh openings of approximately 1-inch square.

PART 3 - EXECUTION

3.1 INSPECTION, STORAGE, AND HANDLING

- A. Inspection
 - 1. Seed shall be inspected upon arrival at the job site for conformance to species and quality. Seed that is wet, moldy, or bears a test date 5 months or older, shall be rejected. Other materials shall be inspected for compliance with specified requirements. Unacceptable materials shall be removed from the job site.
- B. Storage
 - 1. Materials shall be stored in designated areas. Seed shall be stored in cool, dry locations away from contaminants.
- C. Handling
 - 1. Materials shall not be dropped or dumped from vehicles.
- D. Time Limitation
 - 1. Hydroseeding time limitation for holding seed in the slurry shall be a maximum of 24 hours.

3.2 SEEDING TIME AND CONDITIONS

- A. Seeding Time
 - 1. Prior to any construction, the Contractor shall mark the areas that will not be disturbed under this contract. Isolated areas within the general work area that are to be saved and protected shall also be marked or fenced. The Contractor and his/her subcontractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.
 - 2. Seeding, mulching, and conditioning shall be performed at times established by common practice for the necessary establishment period. Seeding for the permanent seed mixes shall be between March 15th and May 15th or September 1st to October 15th, unless otherwise approved by the EPA's Representative.
 - 3. In areas where trees and/or shrubs will be installed as well as seeding; seeding shall occur following installation of trees and shrubs, unless approved by EPA's Representative.

B. Seeding Conditions

1. Seeding operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the seeding operations, proposed alternate times shall be submitted for approval.

C. Equipment Calibration

1. Immediately prior to the commencement of seeding operations, calibration tests shall be conducted on the equipment to be used. These tests shall confirm that the equipment is operating within the manufacturer's Specifications and will meet the specified criteria. The equipment shall be calibrated a minimum of once every day during the operation.

D. Soil Test

1. Delivered topsoil, existing soil in smooth graded areas, and stockpiled topsoil shall be tested and meet the requirements of SECTION 01450 – CHEMICAL DATA QUALITY CONTROL and SECTION 02201 – BACKFILL, COMPACTION AND GRADING. Sample collection on site shall be evenly distributed the entire site. Sample collection for stockpiled topsoil shall be at different levels in the stockpile and shall be done once prior to use. A separate set of soil tests shall be performed for each area of a given soil condition and type of seeding. The Contractor shall not use fertilizer, lime, and other soil amendments.

3.3 SITE PREPARATION

A. Finished Grade and Topsoil

1. The Contractor shall verify that finished grades are as indicated on the Design Drawings, and the placing of topsoil, smooth grading, and compaction requirements have been completed in SECTION 02201 – BACKFILL, COMPACTION AND GRADING prior to the commencement of the seeding operation.
2. Topsoil, per SECTION 02955 – TRANSITION AND WETLAND AREA RESTORATION, shall be placed to a minimum compacted depth of 6 inches in all disturbed areas that will receive turf seeding or Seed Mix #1. Areas that will receive Seed Mix #2 shall receive topsoil to a minimum compacted depth of 12 inches.

B. Tillage

1. The EPA's Representative shall review the area to be permanently seeded with the Contractor within four weeks of permanent seeding installation. If invasive species are present the EPA's Representative may direct the Contractor to provide up to two herbicide treatments prior to tilling and subsequent seeding.
2. The Contractor shall till to a minimum 4-inch depth areas that were temporarily seeded for erosion control a maximum of two times. The first tilling shall occur six to eight weeks prior to permanent seeding. If weeds and or temporary grass is resprouting to 20% or more coverage and a second tilling shall occur one to two weeks prior to permanent seeding, or as directed by the EPA's Representative.
3. Soil on slopes up to maximum 3-horizontal-to-1-vertical shall be tilled to a minimum 4-inch depth. Rototillers shall be used where soil conditions and length of slope permit. Drainage patterns shall be maintained as indicated on the Design Drawings. Areas compacted by construction operations shall be completely pulverized by tillage. Soil used for repair of surface erosion or grade deficiencies shall conform to topsoil requirements.

- C. Prepared Surface
 - 1. Preparation
 - a. The prepared surface shall be a maximum of 1 inch below the adjoining grade of any surfaced area. New surface shall be blended to existing areas. The prepared surface shall be completed with a light raking to remove debris.
 - 2. Lawn Area Debris
 - a. Debris and stones over a minimum 5/8-inch in any dimension shall be removed from the surface.
 - 3. Protection
 - a. Areas with the prepared surface shall be protected from compaction or damage by vehicular or pedestrian traffic and surface erosion.

3.4 INSTALLATION OF SEED

- A. Prior to installing seed, any previously prepared surface compacted or damaged shall be reworked to meet the requirements of Paragraph 3.5 herein. Seeding operations shall not take place when the wind velocity will prevent uniform seed distribution.
- B. Installing pH Adjuster and Fertilizer
 - 1. Limestone and/or fertilizer shall not be utilized.
- C. Installing Seed
 - 1. Upland Seed Mix may be applied by hand broadcast, if even coverage can be ensured, hydroseeding, centrifugal seeder, cultipacker, or approved equal. Seeding procedure shall ensure even coverage. Gravity feed applicators, which drop seed directly from a hopper onto the prepared soil, shall not be used because of the difficulty in achieving even coverage, unless otherwise approved. Absorbent polymer powder shall be mixed with the dry seed at the rate recommended by the manufacturer. Do not broadcast seed, or hydroseed, when the wind velocity is such as to prevent uniform seed distribution.
 - 2. Planting depth of seed shall be 1/4" to 1/2" depth.
- D. Broadcast Seeding and Rolling
 - 1. Seed shall be uniformly broadcast using broadcast seeders. Half the total rate of seed application shall be broadcast in one (1) direction, with the remainder of the seed rate broadcast at 90 degrees from the first direction.
 - 2. After all seed mixes for an area are applied, the entire area shall be firmed with a roller not exceeding 90 pounds per foot of roller width. Steep slopes (over a maximum 3- horizontal to 1-vertical) shall not be rolled.
- E. Hydroseeding
 - 1. Seed shall be added to water and thoroughly mixed. The time period for the seed to be held in the slurry shall be a maximum 24 hours. Slurry shall be uniformly applied under pressure over the entire area. Mulch shall not be included in the tank with the seed. The hydroseeded area shall not be rolled.
- F. Mulch
 - 1. Mulch Application

Hay or straw mulch shall be spread uniformly at a rate of 2 to 2.5 tons per acre, or between 90 and 115 pounds per 1,000 square feet. Fiber mulch shall be spread uniformly at a rate of 1 ton per acre, or 45 pounds per 1,000 square feet. Mulch shall be spread by hand, hydraulically, using a blower-type mulch spreader, or by another approved method. Mulching shall be started on the windward side of relatively flat areas or on the upper part of steep slopes and

continued uniformly until the area is covered. The mulch shall not be bunched or clumped. Sunlight shall not be completely excluded from penetrating to the ground surface. All areas installed with seed shall be mulched on the same day as the seeding to minimize the loss by wind or water. Mulch shall be bound in place with one of the binders described below or as specified by the ds for Soil Erosion and Sediment Control.

2. Mechanical Anchor
 - a. Mechanical anchor shall be a V-type-wheel land packer; a scalloped-disk land packer designed to force mulch into the soil surface; or other suitable equipment.
3. Non-Asphaltic Adhesive Tackifier
 - a. Hydrophilic colloid shall be applied at the rate recommended by the manufacturer, using hydraulic equipment suitable for thoroughly mixing with water. A uniform mixture shall be applied over the area.
4. Watering Seed
 - a. Watering shall be started immediately after completing the seeding of an area. Water shall be applied to supplement rainfall at a rate sufficient to ensure moist soil conditions to a minimum depth of 1 inch. Run-off and puddling shall be prevented. Watering trucks shall not be driven over turf areas, unless otherwise directed by the EPA's Representative. Watering of other adjacent areas or plant material shall be prevented.

3.5 SURFACE EROSION CONTROL

- A. Where necessary, surface erosion control material shall be installed in accordance with the manufacturer's instructions. Placement of the material shall be accomplished without damage to installed material or without deviation to finished grade. Non-biodegradable erosion control materials may only be used temporarily and must be removed prior to permanent seeding and planting.
- B. Temporary Seeding
 1. When there are contract or weather delays in the seeding operation, areas designated for permanent seeding that that will remain exposed for more than 30 days shall be straw mulched with a temporary seed mixture and non-asphaltic tackifier to prevent erosion, as directed by the EPA's Representative. Areas shall be permanently seeded as soon as possible once conditions permit. Areas to receive temporary seeding shall be protected against erosion and washout as follows:
 - a. Apply temporary seed mixture as specified in Paragraph 2.1.D.
 - b. Apply fiber mulch at a rate of 45 pounds per 1,000 square feet.
 - c. Temporary Stabilization with Mulch Only
 - 1) Areas that will be exposed for less than 30 days may be stabilized against erosion using only straw mulch or equivalent, as directed by the EPA's Representative. Mulch shall be spread uniformly at a rate of 2 to 2.5 tons per acre and in accordance with the NJDOTSS.

3.6 QUANTITY CHECK

- A. For materials provided in bags, the empty bags shall be retained for recording the amount used. For materials provided in bulk, the weight certificates shall be retained as a record of the amount used. The amount of material used shall be compared with the total area covered to determine the rate of application used. Differences between the quantity applied and the quantity specified shall be adjusted as directed by the EPA's Representative.

3.7 RESTORATION AND CLEAN UP

A. Restoration

1. Existing turf areas, pavements, and facilities that have been damaged from the seeding operation shall be restored to original conditions.

B. Clean Up

1. Excess and waste material shall be removed from the seeded areas and shall be disposed of off-site. Adjacent paved areas shall be cleaned.

3.8 PROTECTION OF INSTALLED AREAS

- #### **A.**
1. Immediately upon completion of the seeding operation in an area, the area shall be protected from traffic or other use.

3.9 SEED ESTABLISHMENT PERIOD

A. Commencement

1. The seed establishment period to obtain a healthy stand of plants shall end 3 months after the last day of the seeding operation, when seeding occurs between March 15th to September 15th. If seeding occurs after September 15th or before March 15th, the establishment period will end 3 months after the start of the next growing season on March 15th.
2. Written calendar time period shall be furnished for the seed establishment period. When there is more than one seed establishment period, the boundaries of the seeded area covered for each period shall be described. The seed establishment period shall be modified for inclement weather, shut down periods, or for separate completion dates of areas.

B. Satisfactory Stand of Plants

1. Plants shall be evaluated for species and health when the plants are a minimum of 8 inches high. A satisfactory stand of plants shall meet or exceed NJ erosion control requirements of 80% coverage.
2. Bare spots of 4 inches square or greater shall be reseeded. The total bare spots shall be a maximum 2 percent of the total seeded area. If 2% is exceeded the Contractor shall reseed the entire area, regardless of the location or size of the bare spots.

C. Maintenance During Establishment Period

1. Maintenance of the seeded areas shall include eradicating weeds, insects, and diseases; protecting embankments and ditches from surface erosion; maintaining erosion control materials and mulch; protecting installed areas from traffic; mowing; watering; and post-fertilization.
 - a. Herbivory Control
 - 1) Measures shall be taken during the establishment period to prevent excessive herbivory of the seed and establishing plants.
 - b. Repair or Reinstall
 - 1) Unsatisfactory stand of plants and mulch shall be repaired, or reinstalled, and eroded areas shall be repaired in accordance with Paragraph 3.2 herein.
 - c. Maintenance Record
 - 1) A record of each site visit shall be furnished, describing the maintenance work performed; areas repaired or reinstalled, and diagnosis for unsatisfactory stand of grass plants.

3.10 FINAL ACCEPTANCE

- A. At the end of the Seed Establishment Period, a final inspection will be made. Final acceptance of the turf will be based upon a satisfactory stand of turf as defined in Paragraph 3.9.
- B. Rejected areas shall be replanted or repaired as directed by the EPA's Representative, at the Contractor's expense. Rejected areas shall be subject to the requirements herein, including the initiation of a new establishment and maintenance period per Paragraph 3.9.

END OF SECTION

SECTION 02955
TRANSITION AND WETLAND AREA RESTORATION

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all labor, materials, equipment, and incidentals required to install erosion control measures, riprap, place wetland backfill and/or topsoil, finish grade, install plant stock, apply seed, construct waterfowl exclusion fence, and maintain and monitor the restoration areas as specified herein and depicted on the Design Drawings and/or as directed by the EPA's Representative.
- B. Tidal Wetland Restoration refers to the tidal wetland restoration areas depicted on the Design Drawings. These areas shall be referred to herein as "tidal wetland." Tidal wetland restoration is required for alterations of existing herbaceous marsh as indicated in the Design Drawings and if the Contractor infringes upon such areas beyond the identified limit of work. Plants specified are intended to provide a native tidal wetland habitat ranging from 10 to 20 parts per thousand salinities under normal circumstances, and to be resilient to temporary higher salinities during extreme high tides and storms.
- C. Freshwater Wetland Restoration refers to the freshwater wetland restoration areas depicted on the Design Drawings. These areas shall be referred to herein as "freshwater wetland."
- D. Wetland Restoration infers both Tidal and Freshwater Wetland Restoration Areas, where specific reference to Tidal or Freshwater is not stated.
- E. Transition Area Restoration refers to vegetated areas outside of freshwater wetland boundaries that are regulated by the State of New Jersey, as depicted on the Design Drawings. Transition areas may be 'reforested' with containerized trees and shrubs and seeded or 'upland' areas that are seeded.
- F. Upland (Park) Area refers to vegetated areas that are outside of transition or wetland boundaries regulated by the State of New Jersey. These areas consist generally of mown turf grass and trees.
- G. Restoration of all vegetated areas, unless otherwise indicated in the Contract Documents, is required for alterations of existing herbaceous areas and/or if the Contractor infringes upon such areas beyond the identified limit of work. The Contractor shall restore all areas that are indicated to be restored or are temporarily altered by construction activities including clearing, excavation, and trenching during the course of construction to equal or better than that condition which existed previous to construction.
- H. At a minimum, tidal wetland restoration areas shall be restored at a 1:1 ratio, one square foot of disturbance shall be restored to provide one square foot of the same habitat. Restoration shall achieve 75% cover by native wetland plant species five years after construction.
- I. At a minimum, freshwater wetland restoration areas be restored at a 1:1 ratio, one square foot of disturbance shall be restored to provide one square foot of the same

habitat. Restoration shall achieve 85% cover by native wetland plant species five years after construction.

- J. At a minimum, transition restoration and upland (Park) areas shall be restored at a 1:1 ratio, one square foot of disturbance shall be restored to provide one square foot of the same habitat. Restoration shall achieve 80% cover by native plant species one year after construction.
- K. Restoration areas receiving seeding only shall meet the establishment requirements of SECTION 02921 – UPLAND SEEDING.
- L. All restoration work shall be as indicated.

1.2 REFERENCES

A. References

- 1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.
 - a. American National Standards Institute (ANSI)
 - 1) ANSI Z60.1 American Standard for Nursery Stock
 - b. United States Composting Council (USCC)
 - 1) TMECC Test Method for the Examination of Composting and Compost
 - c. United States Department of Agriculture (USDA) Plants Database
 - 1) USDA PLANTS Database (<http://plants.usda.gov>). National Plant Data Team, Greensboro, NC 27401-4901 USA.
 - d. United States Army Corps of Engineers Technical Reports (TR)
 - 1) TR-Y-87-1 Corps of Engineers Wetlands Delineation Manual
 - e. U.S. Army Engineer Research and Development Center Environmental Laboratory (ERDC/EL) Technical Reports (TR)
 - 1) ERDC/EL TR-10-20 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coast Plain Region (Version 2.0)
 - f. New Jersey Department of Environmental Protection (NJDEP)
 - 1) NJDEP CHECKLIST NJDEP Mitigation Project Monitoring Reports Checklist for Completeness (dated January 2018), or more recent NJDEP checklists as appropriate and as approved by NJDEP for use on this project.

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES:
 - 1. Upland (Park) Area Tree Restoration Plan; Pre-Construction Submittals; EA
 - a. The Contractor shall submit an Upland Area (Park) Tree Restoration Plan at least 90 calendar days prior to the start of planting. No restoration work shall be performed until the Upland Tree Restoration Plan is approved. At a minimum, the Plan shall include all elements listed below:
 - 1) Documentation of pre-construction tree inventory, which will include all trees 4-inch caliper or larger, within the limit of disturbance.

- 2) Planting schedule tied into the overall construction schedule.
 - 3) Planting stock (type, size, quantity) as per Paragraph 2.4 and 2.5, along with the name, address and contact phone number of the nursery/nurseries supplying the plant materials.
 - 4) Figure showing planting locations of individual trees.
 - 5) Turf Seed mix: sources.
 - 6) Maintenance plan and schedule for the maintenance period.
 - 7) Delivery schedule of plants and seed for the restoration.
 - 8) Calendar time period for the plant and seed establishment periods.
2. Transition and Wetland Area Restoration Plan; Pre-Construction Submittals; EA
 - a. The Contractor shall submit a Restoration Plan at least 90 calendar days prior to the start of planting. No restoration work shall be performed until the Wetland Restoration Plan is approved. At a minimum, the Plan shall include all elements listed below:
 - 1) Documentation of pre-construction plant inventory, including wetland delineation and measurement of percent vegetative cover within wetland areas. Documentation of plant inventory and wetland delineation to be paid under SECTION 01550 - SURVEYING.
 - 2) Planting schedule tied into the overall construction schedule.
 - 3) Personnel requirements.
 - 4) Planting stock (type, size, quantity) as per Paragraph 2.4 and 2.5, along with the name, address and contact phone number of the nursery/nurseries supplying the plant materials.
 - 5) Figure showing planting locations of individual trees, shrubs, and ground cover plantings.
 - 6) Seed mixtures: sources and specifications.
 - 7) Waterfowl exclusion fence manufacturer and proposed installation layout and procedures will be maintained for the first two growing seasons.
 - 8) Maintenance plan and schedule for the maintenance period, including herbicide application plan if required.
 - 9) Wetland and Transition Area Monitoring Plan, as specified herein.
 - 10) Delivery schedule of plants and seed for the restoration.
 - 11) Calendar time period for the plant and seed establishment periods. When there is more than one establishment period, the boundaries of the planted areas covered for each period shall be described.
 3. Material Samples; Samples; EA
 - a. Samples of all materials to be used in the restoration shall be submitted for inspection and approval upon the EPA's Representative's request.
 4. Wetland Backfill and Topsoil Testing
 - a. Testing shall follow Paragraph 3.6 of SECTION 02201 – BACKFILL, COMPACTION AND GRADING.
 - b. Wetland Backfill and Topsoil shall be tested for determining the particle size, pH, organic matter content, textural class, chemical analysis, soluble salts analysis, nutrient analysis, and mechanical analysis. Certificates of compliance for the above parameters shall be provided from the source facility and submitted to the EPA's Representative. If certificates are not available for any parameter, the Contractor shall be responsible for providing soil testing by an off-site laboratory to determine the material in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.
 5. State Nursery Inspection Certificates and Samples; Certificates; EA

- a. State Nursery Inspection Certificates and samples of material for all plantings shall be submitted for inspection and approval.
- 6. Plant Stock Certifications; Certificates; FIO
 - a. Certification by the landscaping contractor that all plant stock obtained for this work is the plant indicated and of quality as specified.
- 7. Wetland Restoration Specialist; Certificates; EA
 - a. Documentation showing the certification of the proposed Restoration Specialist assigned to the project has at least 5 years of experience designing and monitoring successful tidal wetland restoration projects.
- 8. Maintenance Instructions; Operation and Maintenance Data; EA
 - a. Complete written instructions to maintain the plants, seeded areas, and restoration materials, for EPA's Representative use after the Contractor's one-year maintenance period expires.
- 9. Restoration Inspection Reports; Operation and Maintenance Data; EA
 - a. A certified Restoration Specialist will complete and submit Restoration Inspection Reports, as specified herein.
- 10. Restoration Monitoring Reports; Operation and Maintenance Data; EA
 - a. Complete and submit Restoration Monitoring Reports during the 5-year monitoring period, as specified in herein.
 - b. Wetland Restoration Monitoring Reports shall be submitted by the Contractor to the EPA by November 1st of each year, upon review and revision, submit to the state (NJDEP) by December 15th of each year.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Restoration Specialist

- 1. The Contractor shall provide the services of a Restoration Specialist to supervise all restoration work.
 - a. BA/BS degree and at least 5 years of experience designing and monitoring successful tidal wetland restoration projects.
 - b. At least 5 projects demonstrating experience working with coastal restoration, wetland restorations, bank stabilization and/or natural channel design concepts.
 - c. Experience with water quality sampling, monitoring plant or animal species to complete project management activities.
 - d. At least 5 years of experience supervising or managing staff, volunteers, or contractors to complete a conservation project.

1.5 REGULATORY REQUIREMENTS

A. Permits

- 1. The Contractor shall be responsible for complying with all requirements of permits from NJDEP Division of Land Use Regulation (DLUR), including, but not limited to, the Transition areas General Permit 4 and Coastal General Permit 11 (equivalency) and any others applicable permit equivalencies. The Contractor will obtain freshwater and coastal wetlands permit equivalencies and will provide them to EPA.

PART 2 - PRODUCTS

2.1 TOPSOIL – ORGANIC RICH LOAM

- A. Organic rich loam and any amendments used therein shall be tested to ensure they are free from chemical and radiological contamination as specified in SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.
- B. Organic rich loam shall be used as topsoil to achieve final contours in the upland (Park) area and transition area restoration zones. Organic rich loam shall be friable and capable of promoting and supporting healthy plant growth.
- C. Organic rich loam shall be manufactured by mixing loam and organic amendments for loam, as specified, to raise the organic content to between 10 percent and 14 percent. If manufactured topsoil is used, it must meet the requirements specified by the NJDEP Mitigation Project Monitoring Reports Checklist for Completeness (dated January 2018), or more recent NJDEP checklists as appropriate and as approved by EPA's Representative for use on this project.
- D. Loam shall be imported material free of the following: slag, stones 1-inch or greater in largest dimension, plants or their roots, sticks, clay clods, toxic substances, acid producing soils, or any material harmful to animals or plant growth.
- E. Organic rich loam for use as topsoil shall be loam or sandy clay loam using the following USDA textural classification system based on the percentage of clay (<0.002 mm), silt (0.05 to 0.002 mm) and sand (2 mm-0.05 mm) in the fine earth fraction. Mineral soil content above 2 mm shall be less than 10 percent.

Texture	% Sand	% Silt	% Clay
Loam	23-52	28-50	7-27
Sandy Clay Loam	45-80	0-28	20-35

- F. Topsoil shall meet the requirements of NJDOTSS 909.10. The soil shall be free from debris, noxious weeds, toxic substances, or other materials harmful to plant growth.
- G. The organic matter content for organic rich loam shall be by weight as determined by loss on ignition of moisture free test samples oven dried to a constant weight at a temperature of 100 degrees Centigrade. To adjust organic matter content, the loam may be amended with organic amendments.
- H. Organic rich loam shall have a pH between 5.5 and 7.5.
- I. Soluble salts shall not be greater than 160 ppm.
- J. Organic amendments for loam
 - 1. Compost material may be used as an organic amendment. The compost shall be a stable, humus-like material produced from the aerobic decomposition of organic residues. The residues may include biosolids as well as yard wastes and agricultural wastes. The compost shall be of a dark brown to black color and be capable of supporting plant growth. The composted material shall have been stabilized so as not to have an unpleasant odor. An organic amendment not stabilized as specified herein and having an objectionable odor will be rejected.
 - 2. The compost moisture content shall be such that no visible free water or dust is produced when handling it and the carbon: nitrogen ratio shall be in the range of 11:1 to 15:1.
 - 3. Stability must be assessed by a respirometry test or Solvita test. Protocols for the respirometry test are specified in USCC TMECC 05.08-B. For the respirometry test, the compost respiration shall be no more than 2 milligrams CO₂-C/gram

organic matter/day. For the Solvita test, compost must have a minimum Solvita maturity index of 7. Compost that does not meet one of these criteria shall not be used.

4. The compost shall contain at least 40 percent organic matter (dry weight) and 100 percent of the material should pass a 3/8-inch (or smaller) sieve. Debris, such as metal, glass, plastic, wood (other than residual chips), asphalt or masonry, is not acceptable and compost containing such material will be rejected.

2.2 WETLAND BACKFILL

- A. Wetland backfill and any amendments used therein shall be tested to ensure they are free from chemical and radiological contamination as specified in SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.
- B. Wetland backfill shall be medium sand, D50 (0.25 mm), with no more than 10% silts and clays and no more than 5% pebble or cobble.
- C. Wetland backfill shall have a pH between 5.5 and 7.5.
- D. Organic content shall be 0-5%.
- E. Soluble salts shall not be greater than 160 ppm.
- F. Imported material shall be free of slag, stones 1-inch or greater in largest dimension, plants or their roots, sticks, clay clods, toxic substances, or any material harmful to animals or plant growth.
- G. Tidal Wetland Areas
 1. Wetland backfill shall be sourced from clean materials off-site.
 2. Clean coarse sand generated onsite during construction activities, or sourced off-site, that is a pH range of 5.5 to 7.5, and is free from slag, stones 1-inch or greater in largest dimension, plants or their roots, sticks, clay clods, toxic substances or any material harmful to animals or plant growth, may be used partially or fully within tidal wetland areas as wetland backfill, upon review and approval by EPA's representative.
- H. Freshwater Wetland Areas
 1. Wetland Backfill, mixed with Topsoil, shall be used to achieve final contours in the Freshwater Wetland restoration areas.
 2. Wetland Backfill and Topsoil shall be blended either on-site or off-site, at a ratio of 1 part wetland backfill to 1 part topsoil, for use in freshwater wetland areas only.

2.3 SPREADING OF TOPSOIL AND WETLAND BACKFILL

- A. Areas to be restored with turf seeding or Seed Mix #1 shall be backfilled with topsoil approximately six inches below final grade.
- B. The transition restoration areas to be seeded with Seed Mix #2 and planted with trees/shrubs shall have a minimum of 12 inches of topsoil within the transition restoration area.
- C. Wetland Backfill and Wetland backfill with Topsoil, shall be placed to a minimum depth of 12 inches below finished grade within tidal and freshwater wetland areas.
- D. Containerized and balled and burlapped trees shall be planted in the Upland refollowing the Design Drawings, with topsoil provided to the depth and width specified in the Design Drawings.

- E. The surface shall be free of materials that would hinder planting or maintenance operations. The subgrade shall be pulverized to a depth of 2 inches by disking or plowing for the bonding of topsoil with the subsoil. Topsoil shall then be uniformly spread, graded, and compacted to the thickness, elevations, and slopes shown, and left free of surface irregularities. Topsoil shall be compacted by one pass of a cultipacker, roller, or equivalent. Topsoil shall not be placed when the subgrade is frozen, excessively wet, extremely dry, or in a condition otherwise detrimental to seeding, planting, or proper grading.
- F. The Contractor shall uniformly smooth, and grade all filled areas to provide a finished surface that is reasonably smooth, compacted to the specified project requirements, free from irregular surface changes, and sloped to drain properly. Grading shall not create swales or areas where ponding of water will occur. The finished surface shall be essentially as indicated on the Design Drawing Restoration Plan, as confirmed by surveying operations. Grading tolerances shall be plus or minus 0.1 feet for all exposed surfaces of backfill unless otherwise indicated on the Design Drawings.
- G. During the process of grading, the area to be graded shall be maintained in such condition that it shall be well drained at all times. When directed, temporary drains and drainage ditches shall be installed to intercept or divert surface water that may affect the execution or condition of the work.

2.4 PLANT MATERIALS

- A. Trees, shrubs, and herbaceous plants shall be as indicated on the plant schedule provided as follows:

Table 02955 – 1 Upland (Park) Area Planting

Plant Type	Common Name	Scientific Name	Size	Qty	Spacing
Tree	Hackberry	<i>Celtis occidentalis</i>	4-4.5" Cal	30	15 ft. O.C.
	Sweet gum	<i>Liquidambar styraciflua</i>	4-4.5" Cal.	30	15 ft. O.C.
	Pin oak	<i>Quercus rubra</i>	4-4.5" Cal	30	15 ft. O.C.
	Tulip Tree	<i>Liriodendron tulipifera</i>	4-4.5" Cal	30	15 ft. O.C.
	Red Maple	<i>Acer rubrum</i>	4-4.5" Cal	30	15 ft. O.C.

Table 02955 – 2 Forested Transition Area Planting

Plant Type	Common Name	Scientific Name	Size	Approximate Quantity	Spacing
Tree	Hackberry	<i>Celtis occidentalis</i>	5-6 ft height	40	10 ft. O.C.
	Eastern red cedar	<i>Juniperus virginiana</i>	5-6 ft height	40	10 ft. O.C.
	Sweet gum	<i>Liquidambar styraciflua</i>	5-6 ft height	40	10 ft. O.C.
	Pin oak	<i>Quercus rubra</i>	5-6 ft height	40	10 ft. O.C.
	Black gum	<i>Nyssa sylvatica</i>	5-6 ft height	40	10 ft. O.C.
	Black cherry	<i>Prunus serotina</i>	5-6 ft height	40	10 ft. O.C.
Shrub	Bayberry	<i>Morella pennsylvanica</i>	3-4 ft height	50	7 ft. O.C.

	Virginia rose	Rosa virginiana	3-4 ft height	50	7 ft. O.C.
	Southern arrowwood	Viburnum dentatum	3-4 ft height	50	7 ft. O.C.
	Beach plum	Prunus maritima	3-4 ft height	50	7 ft. O.C.
	Staghorn sumac	Rhus typhina	3-4 ft height	50	7 ft. O.C.
	Winged sumac	Rhus copallinum	3-4 ft height	50	7 ft. O.C.

Table 02955 – 3 Tidal Wetland Area Planting

Plant Type	Common Name	Scientific Name	Size	Qty	Spacing
Herbaceous plug	Saltwater Cord Grass	Spartina alterniflora	Plug -Min. 2" root mass diameter	22,460	12-inch O.C.

Table 02955 – 4 Freshwater Wetland Area Planting

Plant Type	Common Name	Scientific Name	Size	Qty	Spacing
Herbaceous plug	Big Bluestem	Andropogon gerardii	Plug -Min. 2" root mass diameter	500	12-inch O.C.
	Canada Rush	Juncus canadensis	Plug -Min. 2" root mass diameter	1000	12-inch O.C.
	Bitter Panic Grass	Panicum amarum	Plug -Min. 2" root mass diameter	500	12-inch O.C.
Shrub	High-Tide Bush	Iva frutescens	Tubeling	500	2 ft. O.C.
	Beach Plum	Prunus maritima	#1 Pot – 2-3' height	50	7 ft. O.C.
	Southern arrowwood	Viburnum dentatum	#1 Pot– 2-3' height	25	7 ft. O.C.
	Winged sumac	Rhus copallinum	#1 Pot– 2-3' height	50	7 ft. O.C.
Tree	Black gum	Nyssa sylvatica	5-6 ft height	15	10 ft. O.C.

- B. Trees and shrubs, if required to be replaced, will be randomized and irregularly spaced mimicking a natural forest landscape. Spacing provided in the above tables is for reference only to illustrate species densities and shall not limit layout in the field. Layout will be approved in the field by the EPA's Representative prior to planting.
- C. Purple Loosestrife, reed canary grass, *Phragmites*, or any other invasive species listed in the NJDEP Checklist shall not be planted in any of the restoration areas. Any proposed substitutions, if needed due to lack of availability, must be native to the region of the site. If practicable, plant material shall be sourced from within a 150-mile radius of the planting site and grown within the 6A to 7B (inclusive) USDA Hardiness Zones. If practicable, plant material shall also be sourced from US EPA Ecoregion 84C (Barrier Islands – Coastal Marshes) or Ecoregion 84D (Inner Coastal Plain) as mapped at <https://www.epa.gov/eco-research/ecoregiondownload-files-state-region-2#pane-28>. If material cannot be sourced from these areas, then it shall be sourced from as close to the site as practicable. Plants shall be nursery grown under climatic conditions similar to those in the locality of the site and shall conform to the variety and sizes indicated.

Plants shall conform also to the indicated botanical names and standards of size, culture and quality for the highest grades and standards as adopted in ANSI Z60.1.

- D. All plants shall be container grown or ball and burlap. Plants shall be dug with firm natural balls of earth, of sufficient diameter and depth to include most of the fibrous roots and conforming to the standards of ANSI Z60.1. No heeled in plants or plants from cold storage shall be used. Plants shall be healthy and vigorous, well branched, and densely foliated when in leaf; shall be free of disease, insect pests, eggs or larvae and shall have healthy, well developed root systems. All parts of the plant shall be moist and shall show active green cambium when cut to demonstrate plants are healthy and vigorous.
- E. The height or caliper of trees shall be nursery stock. The trunk of each tree shall be a single trunk growing from a single un-mutilated crown of roots. No part of the trunk shall be conspicuously crooked as compared with normal trees of the same variety. The trunk shall be free from sun scald, frost cracks, or wounds resulting from abrasions, fire, or other causes. No pruning wounds shall be present having a diameter of more than 2 inches and such wounds must show vigorous bark on all edges.
- F. Removed trees from the transition areas will be replaced in kind or with a native species listed in Paragraph 2.4. The Contractor shall not replace invasive species in kind. If non-native trees are removed from the transition area, the Contractor shall provide substitutions with native coastal species with approval from EPA's Representative and concurrence from the property owners. If in kind trees are not commercially available, the Contractor will provide substitutions with native coastal species with approval from EPA's Representative and concurrence from the property owner(s). Trees and shrubs should be dug, transported, and planted in the shortest timespan possible.
- G. Container-Grown Stock shall have been grown in a container long enough for the root system to have developed sufficiently to hold its soil together, firm, and whole. No plants shall be loose in the container.
- H. Balled and burlapped stock shall be dug with a firm natural ball of earth in which the stock is grown and then wrapped and tied according to ANSI Z60.1. Balls shall be drum laced for sizes 30-inch or greater. Ball size shall be in accordance with ANSI Z60.1 for the tree type and size.
- I. If larger plants are used, the spread of roots or ball of earth shall be increased in proportion to the size of the plant.
- J. All plant stock shall be labeled by common name and botanical name and certified as the correct species by the plant supplier and conform with the stock indicated in the Contract Documents and the Contractor's approved Restoration Plan.
- K. Inspection of plant materials
 - 1. Plants shall be inspected by the Restoration Specialist before delivery to the site; field grown ball and burlap material shall be inspected in-place prior to digging.
 - 2. Plants shall also be inspected and approved by the EPA's Representative upon delivery for conformance to specified requirements as to quality, size, and variety. Such approval shall not impair the right of inspection and rejection during the progress of the work.
 - 3. Plants shall be accompanied by State Nursery inspection certificates.
 - 4. No plants will be accepted with plastic wrap or if the ball is cracked or broken.

2.5 SEED

- A. Seed shall be received in the manufacturer's original unopened container bearing the date of the last germination test, which date shall be within a period of six months prior to commencement of seeding operations. Seed shall be from same or previous year's crop; each variety of seed shall have a purity of not less than 85 percent, a percentage of germination not less than 90 percent, shall have a weed content of not more than 1 percent and contain no noxious weeds. The seed mixture for transition area restoration areas shall follow SECTION 02921 – UPLAND SEEDING.
- B. Any proposed substitutions, if needed due to lack of availability, must be native to the region of the site, with the exception of turf seed mix and temporary seed mix. If practicable, seed shall be sourced from within a 150-mile radius of the planting site and grown within the 6A to 7B (inclusive) USDA Hardiness Zones. If practicable, seed shall also be sourced from US EPA Ecoregion 84C (Barrier Islands – Coastal Marshes) or Ecoregion 84D (Inner Coastal Plain) as mapped at <https://www.epa.gov/ecoresearch/ecoregion-download-files-state-region-2#pane-28>. If seed cannot be sourced from these areas, then it shall be sourced from as close to the site as practicable.
- C. The seed mix shall not contain:
 - 1. Reed Canary grass (*Phalaris arundinacea*)
 - 2. Common Reed (*Phragmites australis*)
 - 3. Purple Loosestrife (*Lythrum salicaria*)
 - 4. Any invasive species listed in the NJDEP Checklist
- D. The seed shall be furnished and delivered premixed. A manufacturer's certificate of compliance to the specified mixes shall be submitted by the manufacturer for each seed type. These certificates shall include the guaranteed percentages of purity, weed content and germination of the seed and also the net weight and date of shipment. No seed may be sown until the certificates have been submitted and approved.

2.6 WATERFOWL EXCLUSION FENCE

- A. Waterfowl exclusion fence shall consist of a combination of exclusion fence and an exclusion grid system.
- B. Waterfowl exclusion fence shall consist of 48-inch-tall heavy duty polypropylene mesh with an aperture size that will allow the free flow of air and water. Waterfowl exclusion fence shall be installed with untreated oak stakes designed for at least 5 years of water contact and secured with ties that will last a minimum of 5 years. Stakes shall be spaced at a maximum of 10 feet. Pressure treated posts shall not be utilized.
- C. The exclusion grid system shall consist of 80lb nylon monofilament aerial wire stretched between stakes to achieve a protective grid to prevent geese from landing per Design Drawings. The twine shall be marked with Mylar tape spaced at a maximum distance of 10 feet. Aerial wire, stakes, and Mylar tape shall be of materials that will last for a minimum of 5 years in this application.

PART 3 - EXECUTION

3.1 INSPECTION, STORAGE, AND HANDLING

- A. Inspection
 - 1. All materials shall be inspected upon arrival at the job site for conformance to species and quality. Seed that is wet, moldy, or bears a test date 5 months or older,

shall be rejected. Other materials shall be inspected for compliance with specified requirements. Unacceptable materials shall be removed from the job site.

B. Storage

1. Materials shall be stored in designated areas. Seed and plant materials shall be stored in cool, dry locations away from contaminants.

C. Handling

1. Materials shall not be dropped or dumped from vehicles.

3.2 GENERAL

A. The Contractor shall:

1. Supply organic-rich loam as specified in Paragraph 2.1 for all transition areas and disturbed areas that will be seeded. Supply wetland backfill for tidal wetland restoration areas and wetland backfill with topsoil for freshwater wetland restoration areas as specified in Paragraph 2.2.
2. Grade all transition areas and tidal wetland areas to match pre-construction grades or as depicted on the Design Drawings.
3. In transition areas
 - a. Excavate planting pits in the transition areas.
 - b. Furnish and plant trees, shrubs, and ground cover.
 - c. Prune plant materials as specified.
 - d. Furnish and sow area seed mix.
 - e. Install and maintain goose exclusion fencing around wetland restoration areas to ensure survival of plants and seedlings. Exclusion fencing shall be maintained until the end of 5-year Monitoring Period.
 - f. Provide maintenance of all plantings for the duration of the 5-year monitoring period to achieve permit conditions.
4. In tidal wetland areas:
 - a. Install rock berm
 - b. Furnish and install plant plugs.
 - c. Install and maintain waterfowl exclusion fence around and within the tidal wetland restoration area to ensure the survival of plants. Waterfowl exclusion fence shall be maintained until the end of the 5-year Monitoring Period, at which time it shall be removed.
 - d. Provide maintenance of all plantings for the duration of the 5-year monitoring period to achieve permit conditions.
 - e. Remove tidal debris and rack as needed to provide adequate growing conditions for plantings.
5. Final cleanup and all other work required to complete the requirements of this section.

3.3 TRANSITION AREAS

- A.** The Contractor shall restore all disturbed transition areas. Transition area restoration shall include restoring disturbed transition areas to pre-construction contours or as indicated on the Design Drawings, placement of organic rich loam topsoil to restore final grades to pre-construction condition; the planting of trees and shrubs as shown on the Design Drawings, the application of seed mix throughout the disturbed transition areas, maintenance of the restoration for one year, and monitoring and maintenance for the 5- year monitoring period as required by NJDEP permit-equivalency.

- B. After contaminated soil/sediment removal is completed, the subgrade will be restored with topsoil per Paragraph 2.3. The clean backfill subgrade shall be covered by temporary erosion cover netting if it will remain exposed for 7 or more consecutive days to prevent subgrade erosion prior to topsoil placement and the finished grade establishment, in accordance with SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT.
- C. All restored transition area areas altered during construction shall be temporarily stabilized as specified in SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT.
- D. The Contractor shall not utilize equipment in the transition area that will damage any final restored surfaces.

3.4 WETLAND AREAS

- A. The Contractor shall restore all wetland areas. Wetland restoration shall include restoring disturbed tidal and freshwater wetland areas to the grades shown in the design drawings, placement of the rock berm in accordance with the plan, placement of wetland backfill, and wetland backfill with topsoil to restore final grades in accordance with plan; the planting of herbaceous plants as shown on the Design Drawings, and maintenance of the wetland areas for five years or agency approval of the project.
- B. Grades in areas that are to be left as open water (as indicated on the Design Drawings) shall be established such that they will support the restoration of stable pre-construction grades in all tidal wetland restoration areas. If open water excavation depths extend beyond 1 foot below ground surface, these areas shall be backfilled to original, pre- construction grade.
- C. After contaminated soil/sediment removal is completed, the subgrade will be restored with per paragraph 2.3. The clean backfill subgrade shall be covered by temporary erosion cover netting if it will remain exposed for 7 or more consecutive days to prevent subgrade erosion prior to wetland backfill placement and the finished grade establishment, in accordance with SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT.
- D. All restored wetland areas altered during construction shall be temporarily stabilized as specified in SECTION 02370 – EROSION CONTROL AND STORMWATER MANAGEMENT.
- E. The Contractor shall not utilize equipment in the tidal or freshwater wetland area that will damage any final restored surfaces.

3.5 TOPSOIL PLACEMENT

- A. The finished grade shall be established using organic rich loam as specified in Paragraph 2.3 above.
- B. Prior to placing organic rich loam, biodegradable temporary erosion cover netting and any other biodegradable erosion control materials shall be thoroughly incorporated into the subgrade by discing. Non-biodegradable erosion control materials, including photodegradable materials, shall be removed from all restoration areas.
- C. Finished areas shall be rolled with a hand roller weighing not more than 100 pounds per foot of width and then raked smooth. The finish grades shall match pre-construction contours except as shown on the Design Drawings and transition smoothly to the

surrounding undisturbed wetland and/or upland contours with a maximum vertical: horizontal slope of 1:3. The loam shall be placed over prepared areas so that after natural settlement and light rolling, the completed work shall conform to said pre-construction contours.

- D. No organic rich loam shall be spread in water or while frozen or muddy.
- E. After organic rich loam has been spread, it shall be prepared by scarifying or harrowing and hand raking. Remove and dispose of all stiff clods, lumps, roots, litter, and other foreign material. The area shall also be free of stones 1-inch or greater in largest dimension.
- F. Previously established grades (such as in areas where work has been completed) shall be maintained in a true and even condition throughout the restoration process.

3.6 TRANSITION AREA PLANTING AND SEEDING

- A. Transition Area Planting and Seeding Schedule
 1. Final planting or seeding shall be done within ten days following topsoil placement, within the planting window, unless otherwise approved by the EPA's Representative.
 2. Submit schedules to the EPA's Representative for approval 30 days prior to transition area planting and seeding. The restoration areas will be planted and seeded as follows unless otherwise approved by the EPA's Representative: Transition areas shall be planted between April 15 and May 30 or September 15 to November 30 and shall be seeded between March 15th and May 15th or September 1st to October 15th, unless otherwise approved by the EPA's Representative. Planting or seeding of any area during the dry season between June 15 and September 15 will require EPA's Representative approval and additional watering and irrigation, as necessary. In all cases, herbaceous material must be planted at least 30 days before the average first frost date of October 15. Hydroseed and straw mulch shall not be applied when weather conditions prevent installation at specified coverages.
 3. Planting and seeding operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the planting and seeding operations, proposed alternate times shall be submitted for approval.
- B. Transition Area Planting
 1. After final grades are established, the Contractor shall plant trees, shrubs, and ground cover, throughout the restoration areas as indicated on the Design Drawings.
 2. Stake out locations as indicated and secure the EPA's Representative's approval before excavating tree and shrub pits.
 3. Plants which cannot be planted immediately upon delivery shall be set on the ground and be protected with soil, bark mulch, or other acceptable material. Roots or balls of plants shall be protected at all times from sun and from drying winds.
 4. No plant shall be bound with wire or rope at any time so as to damage the bark or break branches. All bounding materials (burlap, twine, etc.) shall be removed from the plants prior to planting and disposed of off-site. Remove and dispose of any containers prior to planting.
 5. All plant pits shall be excavated with sloped sides. Plant pits shall be at least twice as wide as the rootball with sloped sides and sufficiently deep to allow for the

rootball to sit directly upon undisturbed soil. Backfill material for all pits shall consist of the existing material (loam) as excavated from the pit.

6. To encourage immediate root development, the outer one-half inch of the root ball shall be gently loosened.
7. Plants shall be set in center of pits plumb and straight and at such a level that after settlement, the crown of the plant ball will be at the surrounding finished grade.
8. When balled and burlapped plants are set, loam shall be tamped lightly. Loam shall not be packed so firmly as to drive out all the fine air spaces needed for a well aerated soil. All burlap, ropes or wires shall be removed from root balls.
9. Loam shall be backfilled within planting pits in layers of not more than 9-inches and each layer shall be watered sufficiently to settle before the next layer is put in place.
10. To complete backfilling, ensure that trunk flare is completely exposed and that the top of the rootball is not covered with loam. Immediately after the plant pit is backfilled, a saucer or shallow basin slightly larger than pit shall be formed with a ridge of soil to facilitate and contain watering.
11. When shrubs are set, loam shall be tamped lightly. Loam shall not be packed so firmly as to drive out all the fine air spaces needed for a well aerated soil.
12. Plantings shall be flooded with water twice within the first 24 hours of the time of planting.

C. Transition Area Seeding

1. After planting is completed, the areas shall be stabilized with the Transition Area Seed Mix as indicated in Paragraph 2.4. The seed shall meet all standards of purity and packaging requirements as specified above. Seed shall be spread at the rate indicated in Paragraph 2.4.
2. Prior to seeding, the seeded areas shall be prepared by scarifying or harrowing the topsoil surface by hand raking.
3. Seed application may be accomplished by broadcast seeding or hydroseeding. Seeding procedure shall ensure even coverage. Gravity feed applicators, which drop seed directly from a hopper onto the prepared soil, shall not be used because of the difficulty in achieving even coverage, unless otherwise approved. Tar tack shall not be used.
4. If broadcast seeding is used, seed shall be uniformly spread by broadcasting half the total rate of seed application in one (1) direction, and then broadcasting the remainder of the seed at 90 degrees from the first direction. The entire area shall then be firmed with a roller not exceeding 90 pounds per foot of roller width. Steep slopes shall not be rolled.
5. If hydroseeding is used, then the seed and fertilizer shall be added to water and thoroughly mixed. The time period for the seed to be held in the slurry shall be a maximum 24 hours. Slurry shall be uniformly applied under pressure over the entire area. The hydroseeded area shall not be rolled. Wood cellulose fiber, paper fiber, or recycled paper shall be applied as part of the hydroseeding operation, in accordance with the manufacturer's recommendations.
6. Any washouts which occur shall be regraded and reseeded until a stabilized slope is established.

D. Pruning

1. Each plant shall be pruned at the time of planting in accordance with ISA Standards.
2. Pruning shall be done with clean, sharp tools.

E. Watering

1. The Contractor shall water the transition area plantings and seed as necessary for establishment during the maintenance period, in accordance with their approved Transition and Wetland Area Restoration Plan.
2. Watering shall be started immediately after completing the planting/seeding of an area. Water shall be applied to supplement rainfall at a rate sufficient to ensure moist soil conditions to a minimum depth of 1 inch. Run-off shall be prevented. Watering trucks shall not be driven in the wetland restoration areas, unless otherwise directed by the EPA's Representative.
3. Irrigation water for planting and maintenance shall be provided by the Contractor and shall be free from contaminants or any ingredients harmful to plant life. The Contractor shall furnish his/her own equipment, hoses, connections, or other watering equipment. Water from the surrounding wetlands or open water areas may not be used for irrigation.

3.7 TIDAL WETLAND AREA PLANTING

A. Tidal Wetland Area Planting Schedule

1. Planting shall be completed following a minimum of two lunar cycles once wetland backfill is installed and following the removal of sheet piling, unless otherwise approved by EPA's Representative.
2. Submit schedules to the EPA's Representative for approval 30 days prior to tidal wetland planting. The tidal wetland planting season shall be between May 15th and July 15th, unless otherwise approved by EPA's Representative.
3. Planting operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the planting operations, proposed alternate times shall be submitted for approval.

B. Tidal Wetland Planting

1. After final grades are established, the Contractor shall plant herbaceous plants throughout the tidal wetland areas as indicated on the Design Drawings.
2. Plants which cannot be planted immediately upon delivery shall be set on the ground and be protected with soil, bark mulch, or other acceptable material and kept moist with water of similar salinity to growing conditions. Roots or balls of plants shall be protected at all times from sun, animals/insects, and from drying winds.
3. While wetland plugs are being distributed in planting beds or are awaiting planting after distribution, the Contractor shall protect the roots from drying out; the means employed shall be satisfactory to the EPA's Representative. Planting of plugs shall be performed using a hand trowel or dibble bars. Care shall be taken to firm the soil around the plugs' roots so as to anchor the plants well, while not compressing the root systems. Care shall be exercised in setting the plants plumb.
4. Following establishment of the planting hole, 1 oz of slow-release fertilizer such as 14-14-14 Osmocote or approved equal, shall be placed in the bottom of the hole prior to installation of the plug.
5. After the installation of plant plugs is completed in the tidal wetland restoration area, install waterfowl exclusion fence around and within the area per the Wetland Restoration Plan. Fencing shall enclose installed plantings at the end of each

workday. Material not enclosed by fencing, which is subsequently damaged by herbivory, shall be replaced by the Contractor at no additional cost.

3.8 FRESHWATER WETLAND PLANTING

A. Freshwater Wetland Area Planting Schedule

1. Planting shall be completed following a minimum of 30 days, following the establishment of final grades. Freshwater wetland planting season shall be between March 30 and June 15 or September 15 to November 30, unless otherwise approved by EPA's Representative.
2. Submit schedules to the EPA's Representative for approval 30 days prior to freshwater wetland planting.
3. Planting operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the planting operations, proposed alternate times shall be submitted for approval.

B. Freshwater Wetland Planting

1. After final grades are established, the Contractor shall plant herbaceous plants throughout the freshwater wetland areas as indicated on the Design Drawings.
2. Plants which cannot be planted immediately upon delivery shall be set on the ground and be protected with soil, bark mulch, or other acceptable material. Roots or balls of plants shall be protected at all times from sun and from drying winds.
3. While wetland plugs are being distributed in planting beds or are awaiting planting after distribution, the Contractor shall protect the roots from drying out; the means employed shall be satisfactory to the EPA's Representative. Planting of plugs shall be performed using a hand trowel or dibble bars. The Contractor shall excavate planting holes to a depth which will allow the top of the plug soil to be planted even with the surrounding ground surface. Care shall be taken to firm the soil around the plugs' roots so as to anchor the plants well, while not compressing the root systems. Care shall be exercised in setting the plants plumb.
4. After the installation of plant plugs is completed in the freshwater wetland restoration area, install waterfowl exclusion fence around and within the area per the Wetland Restoration Plan. Fencing shall enclose installed plantings at the end of each workday. Material not enclosed by fencing, which is subsequently damaged by herbivory, shall be replaced by the Contractor at no additional cost.

C. Watering

1. The Contractor shall water the freshwater wetland restoration plantings as necessary for establishment during the maintenance period.
2. Watering shall be started immediately after completing the planting of an area. Water shall be applied to supplement rainfall at a rate sufficient to ensure moist soil conditions to a minimum depth of 1 inch. Run-off shall be prevented. Watering trucks shall not be driven in the marsh, unless otherwise directed by the EPA's Representative.
3. Irrigation water for planting and maintenance shall be provided by the Contractor and shall be free from contaminants or any ingredients harmful to plant life. The Contractor shall furnish his/her own equipment, hoses, connections, or other watering equipment. Water from the surrounding wetlands or open water areas may not be used for irrigation.

3.9 MAINTENANCE PERIOD

- A. The Contractor shall perform maintenance of the restored areas, including exclusion fencing and other herbivory control devices (if installed) beginning immediately after areas are planted and seeded, through the initial maintenance period of one year, and continuing for a period of five growing seasons following the end of the initial one-year maintenance period. Maintenance shall be at no additional cost. Replanting of failed areas shall be performed as specified herein.
- B. The Contractor shall provide the minimum percent cover listed in Paragraph 1.1 of all disturbed wetland areas (evenly distributed cover throughout the disturbed areas) with indigenous plant species within the initial five-year maintenance and monitoring period. Bare spots may not be larger than 10 square feet. Areas not achieving the above requirement within the maintenance period shall be renovated at no additional cost.
- C. The Contractor shall ensure that the restored areas shall continue to develop such that they will achieve at least the minimum percent cover (when all strata are combined) by the end of the 5-year monitoring period or as required by NJDEP, with bare spots no larger than 10 square feet. The Contractor shall ensure a survival rate of 85 percent for trees and shrubs at the end of the 5-year monitoring period.
- D. The maintenance period shall encompass at least five complete growing seasons.
- E. Maintenance shall be monitored and measured by the inspections specified below. If required, corrective measures shall include reseeding, additional plantings, removal of any dead plants and replacement with new plants, additional watering, additional controls for herbivory, or other measures as deemed necessary by the EPA's Representative.
- F. Waterfowl exclusion fencing shall be maintained for 5 years or as long as the NJDEP monitoring requirement. Maintenance within the maintenance period shall be at no additional cost.
- G. Plants damaged by wildlife, insects, disease, or natural events shall be replaced as needed during the five-year monitoring period. Any replacement during the maintenance period shall be at no additional cost.
- H. The Contractor shall provide a long-term maintenance plan for maintenance beyond the maintenance period, at no additional cost.

3.10 TRANSITION AND WETLAND AREA MONITORING

- A. Transition and Wetland Area Monitoring Plan
 - 1. The Contractor's Restoration Specialist shall develop a Monitoring Plan that will be part of the Contractor's Restoration Plan submittal. The Monitoring Plan shall be implemented by the Contractor for both the initial maintenance period and the 5-year monitoring period and shall be utilized during the site inspections specified below. The plan shall include all requirements of the NJDEP Mitigation Project Monitoring Reports Checklist for Completeness (dated January 2018), or more recent NJDEP checklists as appropriate and as approved by NJDEP for use on this project. The plan shall include specific success criteria for each of the five monitoring years in order to meet requirements specified herein.

2. The Monitoring Plan shall focus on obtaining both qualitative and quantitative data on the plant community and documenting the establishment of wetland hydrology during the growing season, development of hydric soil characteristics, and a plant community. Reporting requirements shall be included to keep project personnel and regulatory agencies informed of progress and/or problems. The plan shall also include provisions for implementing remedial actions, if necessary, and any long-term site management recommendations.
- B. As part of the Monitoring Plan, monitoring stations will be established within the restoration area. Additional monitoring stations shall be added if directed by the EPA's Representative.
 - C. The monitoring stations shall be permanently marked and photographed facing the cardinal compass directions from the fixed point shall be taken prior to commencement of site preparation. Following completion of grading and planting, and for each of the three inspection events specified in herein during the monitoring period, photographs shall be taken facing the cardinal compass points from the fixed monitoring point and for each photo the inspector shall note the date, time, weather, and relevant observations.

3.11 INSPECTIONS

- A. During each of the inspections specified below, the Contractor's Restoration Specialist and EPA's Representative shall inspect the permanent monitoring stations in detail, as well as perform a more general inspection of the entire restoration area. Within the monitoring stations, the concentric plant sampling protocol established by USACE and described in the wetland manual TR-Y-87-1 shall be followed to document: the species present and their occurrence within the restoration area; field indicators of hydric soil development or lack thereof; and hydrology. Qualitative assessments shall include visual inspections of the condition of the planting efforts and natural re-colonization, hydrologic conditions, document any colonization by non-native invasive species including but not limited to *Phragmites australis*, and observations of wildlife use for each monitoring station.
- B. During each of the inspections specified below, the condition of the waterfowl exclusion fence shall be examined and recommendations for maintenance or adjustments made as needed.
- C. Initial Inspection
 1. After areas are planted and seeded, the Contractor and Contractor's Restoration Specialist shall request an "Initial Inspection" of the restored areas by the EPA's Representative. The Contractor shall notify all parties of the inspection date with written request at least 10 days prior to the anticipated inspection date. The EPA's Representative and Contractor's Restoration Specialist will inspect the restoration areas, including the permanent monitoring stations, for compliance with the plans and Specifications, with regard to the number and quality of plants, plant sizes, species, and location.
 2. At the Initial Inspection, areas will be defined by the EPA's Representative as "approved," or "not approved." Areas noted as "approved" shall have sufficient planting coverage and quality of live, native plants. Areas noted as "not approved" are subject to immediate correction by the Contractor. Any and all corrective work identified during the inspection shall be performed until acceptance by the EPA's Representative, at no additional cost.

D. Interim Inspection

1. Approximately 3 months following the Initial Inspection, the EPA's Representative and the Contractor's Restoration Specialist will perform an "Interim Inspection" of the overall restoration area and the permanent monitoring stations. The Contractor shall notify all parties of the inspection date with written request at least 10 days prior to the anticipated inspection date. The EPA's Representative and Contractor's Restoration Specialist will inspect said Work for vitality and compliance with the percent coverage requirements and the requirements herein. If it is evident in the opinion of the EPA's Representative that it is unlikely that the percent cover and/or survival re-establishment requirements will be achieved, the Contractor shall immediately supplement the plantings as necessary to achieve the required coverage. If appropriate, a delay in planting may occur with the approval of the EPA's Representative in order to plant during favorable planting times as indicated herein. Any and all corrective Work identified during the inspection shall be performed until acceptance by the EPA's Representative, at no additional cost.

E. Final Inspection

1. At the conclusion of the Contractor's initial maintenance period, the EPA's Representative and the Contractor's Restoration Specialist will perform a "Final Inspection" of the restoration areas and the permanent monitoring stations. The Contractor shall notify all parties of the inspection date with written request at least 10 days prior to the anticipated inspection date. The EPA's Representative and Contractor's Restoration Specialist will inspect said Work for vitality and compliance with the percent coverage requirements, by restoration area, described herein.

- F. If one year after planting, 65 percent re-establishment has not been achieved in transition and wetland areas, the Contractor shall provide and plant additional trees, shrubs, and ground cover as directed by the EPA's Representative, at no additional cost. Planting of such materials shall take place during the times as indicated in Paragraph 3.6 and 3.7. The maintenance and inspection period for these replanted areas shall continue for five years following planting.

3.12 RESTORATION INSPECTION REPORTS

- A. Complete and submit three inspection reports no later than 30 days following the Initial, Interim, and Final inspections, summarizing the findings of the inspections, any deficiencies noted by the EPA's Representative, and the corrective actions taken to address the issue. The monitoring reports shall follow the requirements of the NJDEP Mitigation Project Monitoring Reports Checklist for Completeness (dated January 2, 2013), or more recent NJDEP checklists as appropriate and as approved by NJDEP for use on this project. Items to be included in the monitoring report include, but are not limited to, documentation forms, photographs of the monitoring stations facing the cardinal compass points, additional photographs as necessary to document site conditions, a narrative summary of the inspection findings, and records for each maintenance visit performed.

3.13 FIVE-YEAR MONITORING AND REPORTING

- A. After the initial maintenance period of 1 year, monitoring shall continue for the entire 5-year monitoring period as required by NJDEP. Monitoring shall be performed in accordance with the approved Monitoring Plan as described in Paragraph 3.10. Monitoring shall occur twice yearly, in the early spring and fall. Monitoring reports

shall be prepared in accordance with the Monitoring Plan and the NJDEP Mitigation Project Monitoring Reports Checklist for Completeness (dated January 2018), or more recent NJDEP checklists as appropriate and as approved by NJDEP for use on this project. Monitoring reports shall include a description of areas that require maintenance including but not limited to failed plant material, herbivory, erosion, establishment of invasive species, and damaged deer fencing as well as recommendations for remedying such areas. The monitoring report shall also include a discussion of the likelihood that the restored areas will meet the 5-year coverage requirements as outlined in Paragraph 1.1.

3.14 ADAPTIVE MANAGEMENT

- A. During the inspection and monitoring periods, the wetland scientist shall include adaptive management activities in reports, as well as when activities should occur, that are necessary to reach the required vegetative cover percentages.
- B. Adaptive management activities may include, but not be limited to:
 - 1. Overseeding / reseeding areas with insufficient cover.
 - 2. Replanting of dead or dying plants with the same or alternative species.
 - 3. Repair, replacement, or installation of wildlife fencing, including tree trunk protections.
 - 4. Modifications to the watering schedule or methods.
 - 5. Herbicide or mechanical removal of undesirable plants including mowing and hand pulling.
 - 6. Regrading of areas to support desired hydrology, such as hand excavation to support drainage or placement of additional fill.
 - 7. Removal of trash and debris.

3.15 WARRANTY

- A. All plantings used on the site, including trees, shrubs, and ground cover, shall come furnished with a minimum one-year material warranty from the date of purchase, such that the plantings are free of disease, sickness, defects, or deficiencies that would prevent establishment. Plant and seed installation shall be warranted by the Contractor as specified in herein, and the plant establishment and survival shall be warranted by the Contractor as specified in Paragraph 3.9.

END OF SECTION

SECTION 02957
DECOMMISSION GROUNDWATER MONITORING WELL

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the labor, materials, and equipment necessary to decommission and remove the groundwater monitoring wells located within the excavation limits shown on the Design Drawings.
- B. Eight monitoring wells as listed below are located within or near the proposed excavation areas and identified as needing to be decommissioned:
 - 1. Area 1: MW-05S, MW-05D, MW-06S, MW-06D, MW-10S, MW-10D
 - 2. Area 4: MW-09S
 - 3. Area 9: MW-12S
- C. Five monitoring wells as listed below are located within or near the support zone that shall be protected to the extent practicable with a contingency for removal:
 - 1. Area 4: MW-04S, MW-04D, MW-08S, MW-08D, MW-07S
- D. Three monitoring wells as listed below are located near the Margaret's Creek access road that shall be protected during the construction:
 - 1. Area 9: OBMUA-MW-1, OBMUA-MW-2, MW-15S
- E. These wells are single stem risers with diameters less than 3 inches and depths ranging from 6 to 24 feet for shallow wells (designated as "S") and from 25 to 40 feet for deep wells (designated as "D"). It is the Contractor's responsibility to verify all information on the existing wells to be removed.
- F. Well bottoms for shallow wells appear to be located 12 to 24 feet below ground surface. The Contractor may excavate out the shallow wells in lieu of decommissioning them as described in this section.
- G. Contractor shall be responsible for verifying all site conditions and the location of all existing utilities and protecting those to remain during well decommissioning procedures. Inactive or abandoned utilities shall be capped in accordance with local requirements.

1.2 REFERENCES

- A. References
 - 1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of the standards below, the revision in effect at the time of contract award shall apply. If conflicts exist between these standards, regulations, or requirements, the most stringent of the documents shall apply.
 - a. The New Jersey Administrative Code (N.J.A.C.)
 - 1) N.J.A.C. 7:9D - Well Construction and Maintenance; Sealing of Abandoned Wells

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. The

Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES:

1. Decommissioning Procedures; Pre-construction Submittal; EA
 - a. Contractor shall include procedures to be used for decommissioning the wells in the Excavation and Handling Plan. The plan shall provide a discussion on the equipment to be used, the means, and methods for decommissioning the monitoring wells.
2. Product Data; Product Data; FIO
 - a. Monitoring Well Field Inspection Logs
 - b. Well Decommissioning Report (see Paragraph 1.3)
 - c. Daily Field Report with photographs
 - d. Grout Specification

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Monitoring well decommissioning shall be conducted by a New Jersey licensed driller. The New Jersey licensed driller shall also submit the required monitoring well decommissioning reports to the Contractor and the state.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 DECOMMISSIONING PROCEDURES

- A. Wells in the Exclusion Zone and/or Support Zone will be completely removed by casing pulling or excavating to prepare the site for excavation. Casing pulling includes the following:
 1. Puncturing the bottom of the well or use of a casing cutter to cut away the screen
 2. Grouting
 3. Using jacks to free the casing from the hole
 4. Lifting the casing out using a drill rig, backhoe, crane, or other suitable equipment
- B. Prior to commencing the casing pulling, the Contractor shall verify the depth and construction of each monitoring well. The information shall be provided in a field notebook that will be submitted to the EPA with all other required documentation.
- C. The Contractor shall maintain a record of the decommissioning process for each well.
 1. Casing Pulling:
 - a. Method employed
 - b. Casing retrieved (feet)
 - c. Casing type and diameter (inches)
 2. Grouting
 - a. Interval grouted
 - b. Number of batches prepared
 - c. For each batch record (as applicable):
 - d. Quantity of water used
 - e. Quantity of cement used
 - f. Cement type
 - g. Quantity of bentonite used
 - h. Quantity of calcium chloride used
 - i. Volume of grout prepared
 - j. Volume of grout used.

- 3. Schematic showing relevant decommissioning data
- D. A daily field report shall be prepared that will make note of the progress for removing the wells, any problems that arise during the removal, and measures used to correct those problems.
- E. The Contractor may use an alternative decommissioning procedure with prior approval by EPA's Representative.

3.2 DISPOSAL

- A. All materials removed shall be properly disposed of off-site in accordance with all local, state, and federal regulations.

END OF SECTION

SECTION 03150

METAL SHEET PILE

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall provide all labor, materials, and equipment necessary to design and install sheet piling as shown on the Design Drawings to control tidal water and subsurface water from entering excavations. Following completion of seawall reconstruction, all sheet piling shall be extracted and removed from the site.
- B. The Contractor shall install metal sheet piling along the perimeter of the excavation area at the approximate alignments shown on the Design Drawings. It is estimated that sheet pile wall will be approximately 3,700 linear feet.

1.2 REFERENCES

- A. References
 - 1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. Where reference is made to one of the standards below, the revision in effect at the time of contract award shall apply.
 - a. American Welding Society (AWS)
 - 1) AWS D1.1/D1.1M (2015; Errata 1 2015; Errata 2 2016) Structural Welding Code - Steel
 - b. ASTM International (ASTM)
 - 1) ASTM A572/A572M (2018) Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
 - 2) ASTM A6/A6M (2017a) Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
 - c. United States Steel (USS) – U.S. Department of Transportation
 - 1) Steel Sheet Piling Design Manual (July 1984)
 - d. U. S. Army Corps of Engineers (USACE)
 - 1) EM 1110-2-2504 (March 1994) Engineering and Design – Design of Sheet Pile Walls

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES:
 - 1. Metal Sheet Piling Installation Work Plan; Pre-Construction Submittals; EA
 - a. The Contractor shall submit the Metal Sheet Piling Installation Work Plan with the Contractor-designed sheet pile wall system to the EPA's Representative for review and approval at least 28 days prior to first Pre-Work Conference. Submittals shall include information outlined in Paragraph 3.2.
 - b. The Contractor shall also submit Metal Sheet Piling Monitoring Plan as part of the Metal Sheet Piling Installation Work Plan. Submittals shall include but not limited to:

- 1) Inspection and monitoring of sheet pile wall for deflections in excess of 12-inches
- 2) Vibration monitoring for the aquatic life and mitigation plan, if required based on the assessment
2. Metal Sheet Piling; Pre-Construction Submittals; EA
3. Waterproofing; Product Data; FIO
4. Driving; Product Data; FIO
5. Pile Driving Equipment; Product Data; FIO
6. Pulling and Redriving; Product Data; FIO
7. Installer Qualifications; Product Data; FIO
8. Interlocked Joint Strength in Tension Test Procedures; Product Data; FIO
9. Materials Tests; Interlocked Joint Strength in Tension Test; Test Reports; FIO
10. Pile Driving Record; Closeout Submittals; FIO

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Not used.

1.5 QUALITY ASSURANCE

- A. Material Certificates
 1. For each shipment, submit certificates identified with specific lots prior to installing piling. Include in the identification data piling type, dimensions, chemical composition, mechanical properties, section properties, heat number, and mill identification mark.
- B. Interlocked Joint Tension Test
 1. Submit, for approval, the procedure for testing the tension strength of piling interlocks prior to testing sheet piling.
- C. Qualifications
 1. Sheeting installer must have, as a minimum, three successful past installations of sheet piling of comparable overall heights and sections and comparable penetration into soils similar to soils found on the project site.

PART 2 - PRODUCTS

2.1 METAL SHEET PILING

- A. Submit detail drawings (certified by New Jersey Professional Engineer) for sheet piling, including fabricated sections, showing complete piling dimensions and details, driving sequence and location of installed piling.
 1. Include in the drawing's details of top protection, special reinforcing tips, tip protection, lagging, splices, fabricated additions to plain piles, cut-off method, and dimensions of templates and other temporary guide structures for installing piling. Provide details of the method for handling piling to prevent permanent deflection, distortion, or damage to piling interlocks.
 2. Metal sheet piling shall be hot-rolled steel sections conforming to ASTM A572/A572M, Grade 60.
- B. Interlocks
 1. The interlocks of sheet piling shall be free sliding, provide a swing angle suitable for the intended installation but not less than 5 degrees when interlocked, and maintain continuous interlocking when installed.

C. General Requirements

1. Sheet piling shall be full-length sections of the dimensions shown. Provide sheet piling with standard pulling holes.

2.2 APPURTENANT METAL MATERIALS

- A. Provide metal plates, shapes, bolts, nuts, rivets and other appurtenant fabrication and installation materials conforming to manufacturer's standards.

2.3 TESTS, INSPECTIONS, AND VERIFICATIONS

A. Materials Tests

1. Submit certified materials tests reports showing that sheet piling, and appurtenant metal materials meet the specified requirements, for each shipment and identified with specific lots prior to installing materials. Material test reports shall meet the requirements of ASTM A6/A6M. Perform materials tests conforming to the following requirements. Sheet piling and appurtenant materials shall be tested and certified by the manufacturer to meet the specified chemical, mechanical and section property requirements prior to delivery to the site. Testing of sheet piling for mechanical properties shall be performed after the completion of all rolling and forming operations. Testing of sheet piling shall meet the requirements of ASTM A6/A6M.

B. Interlocked Joint Strength in Tension Test

1. Submit the procedure for testing sheet piling interlocked joint strength in tension, prior to testing piling. The interlocked joint strength in tension test shall conform to the piling manufacturer's standard test, include testing at least two 3-inch-long coupons taken randomly from different as-produced pilings of each heat and shall be approved. Submit a certified report showing results based on approved testing procedures.

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE, AND HANDLING

- A. Materials delivered to the site shall be new and undamaged and shall be accompanied by certified test reports. Provide the manufacturer's logo and mill identification mark on the sheet piling as required by the referenced Specifications. Store and handle sheet piling in the manner recommended by the manufacturer to prevent permanent deflection, distortion, or damage to the interlocks; as a minimum, support on level blocks or racks spaced not more than 10 feet apart and not more than 2 feet from the ends. Storage of sheet piling should also facilitate required inspection activities and prevent damage. Handle sheet piling over 80 feet in length using a minimum of two pickup points.

3.2 METAL SHEET PILING INSTALLATION WORK PLAN

- A. The Contractor shall submit a Work Plan along with shop drawings, design calculations for the Contractor-designed sheet pile wall system to the EPA's Representative for review and approval. The Work Plan shall include the following minimum information:
1. Proposed construction method(s)
 2. Plan layout of the system
 3. Method and sequence of installation and removal of the sheet pile wall system
 4. Soft-start technique for installation to allow marine animals an opportunity to leave the project vicinity before sound pressure levels increase.

5. Estimated noise levels anticipated during pile driving and required noise-mitigating measures to be implemented.
6. Proved details, arrangement, and equipment requirements
7. Engineering calculations and design for sheet pile wall installation certified by a New Jersey licensed professional engineer
8. Vibration monitoring plans (including format for reporting the vibration readings)
9. Qualifications and resume for vibration specialist
10. Details for establishing and employing an alarm system to announce immediate shut down of vibration causing activities, and
11. Corrective action measures and procedures to be implemented if vibrations exceed acceptable levels.
12. Environment and aquatic receptors protection and monitoring plan to be implemented during the period of installation and removal.

3.3 SHEET PILING DESIGN

- A. The planned location of the sheet pile wall is dictated by the extent of contamination in the intertidal areas and seaward side of the seawall to prevent tidal water from entering the excavation area.
- B. The lateral wall alignment shall be positioned at minimum 30 feet towards the bay beyond the lateral extent of the contamination and approximately align with the -3 feet AMSL contour as shown in the Design Drawings. The alignment shall allow for a “clean buffer” of soil between the contaminated zone and the wall.
- C. The portion of sheet pile wall parallel to the bay (i.e., not including tie-ins angling back to the bank), the top of wall elevation shall be set at minimum +10 feet AMSL.
- D. At minimum, the sheet pile wall system shall meet the properties of a Sheet Pile AZ32-750 or NZ38 or equivalent with a minimum section modulus of 59.5 cubic inch per foot, length of sheet system greater than 50 feet long, and tip to elevation at minimum -43.9 feet mean high tide (MHT).
- E. The sheet pile wall system shall meet the strength of a Sheet Pile AZ32-750 or NZ38 or equivalent with maximum deflection of 12-inches.
- F. The sheet pile wall system shall include waterproofing if required to prevent water seepage through the wall into the excavation area.
- G. The Contractor shall have a New Jersey Professional Engineer design and certify the sheet piling and bracing system to adequately support all loads. The calculations and design will be submitted for information purposes only and will not be checked.

3.4 POST CONSTRUCTION SURVEY

- A. The Contractor shall provide the EPA’s Representative with a copy of all post construction survey reports, daily summary logs for vibration monitors, and analysis documents comparing pre and post structural condition.

3.5 EARTHWORK

- A. Perform in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS. Pre-excavation will not be permitted. Contractor shall take caution with work so that piles are not damaged.

3.6 INSTALLATION

- A. The Contractor shall perform all work with a water rig from the bay side to prevent working from the contaminated side and to prevent decontamination of the equipment used for sheet pile wall installation and extraction.
- B. The sheet pile wall shall be forming a relatively straight wall which will be used temporary to control tidal water from entering the excavations and extracted after the seawall, beach and intertidal zone reconstruction is completed.
- C. The Contractor shall submit complete descriptions of sheet piling driving equipment including hammers, extractors, protection caps and other installation appurtenances, before starting work. Descriptive information includes manufacturer's name, model numbers, capacity, rated energy, hammer details, and templates. Provide pile driving equipment conforming to the following requirements.
 - 1. Driving Hammers
 - a. Hammers shall be vibratory type. The driving energy of the hammers shall be as recommended by the manufacturer for the piling weights and subsurface materials to be encountered. Repair damage to piling caused by use of a pile hammer with excess delivered force or energy.
 - 2. Jetting Equipment
 - a. Jetting will not be permitted.
 - b. Spudding is not permitted. The Contractor may pre-auger, or pre-drill to penetrate through obstacles.
- D. The Contractor must use soft start techniques as follows when pile driving.
 - 1. Soft start must be implemented at the start of each day's pile driving and at any time following cessation of pile driving for a period of 30 minutes or longer:
 - 2. For vibratory pile installation, the Contractor shall initiate pile driving for 15 seconds at reduced energy followed by a one (1) minute waiting period. The Contractor shall repeat this sequence two additional times, followed immediately by pile driving at full rate and energy.
- E. Placing and Driving
 - 1. Placing
 - a. Any excavation required within the area where sheet pilings are to be installed shall not be completed without notifying the EPA's Representative. Pilings properly placed and driven shall be interlocked throughout their length with adjacent pilings to form a continuous diaphragm throughout the length or run of piling wall.
 - 1) Pilings shall be carefully located as indicated. Pilings shall be placed plumb with out-of-plumbness not exceeding 1/8 inch per foot of length and true to line. Place the pile so the face will not be more than 6 inches from vertical alignment at any point. Top of pile at elevation of cut-off shall be within 1/2 inch horizontally and 2 inches vertically of the location indicated. Manipulation of piles to force them into position will not be permitted. Check all piles for heave. Redrive all heaved piles to the required tip elevation.
 - 2) Provide temporary wales, templates, or guide structures to ensure that the pilings are placed and driven to the correct alignment. Use a system of structural framing sufficiently rigid to resist lateral and driving forces and to adequately support the sheet piling until design tip elevation is achieved. Use two templates, at least, when placing each piling not less than 20 feet

apart. Templates shall not move when supporting sheet piling. Fit templates with wood blocking to bear against the web of each alternate sheet pile and hold the sheet pile at the design location alignment. Provide outer template straps or other restraints as necessary to prevent the sheets from warping or wandering from the alignment. Mark template for the location of the leading edge of each alternate sheet pile. If in view, also mark the second level to assure that the piles are vertical and in position. If two guide marks cannot be seen, other means shall be used to keep the sheet pile vertical along its leading edge.

2. Driving

- a. Submit records of the completed sheet piling driving operations, including a system of identification which shows the disposition of approved piling in the work, driving equipment performance data, piling penetration rate data, piling dimensions and top and bottom elevations of installed piling. Drive pilings with the proper size hammer and by approved methods so as not to subject the pilings to damage and to ensure proper interlocking throughout their lengths.
- b. Maintain driving hammers in proper alignment during driving operations by use of leads or guides attached to the hammer. Caution shall be taken in the sustained use of vibratory hammers when a hard driving condition is encountered to avoid interlock-melt or damages. Discontinue the use of vibratory hammers employed when the penetration rate due to vibratory loading is one foot or less per minute.
- c. Remove and replace pilings damaged during driving or driven out of interlock at the Contractor's expense.
- d. Drive pilings without the aid of a water jet.
- e. Take adequate precautions to ensure that pilings are driven plumb. Where possible, drive Z-pile with the ball end leading. If an open socket is leading, a bolt or similar object placed in the bottom of the interlock will minimize packing material into it and ease driving for the next sheet. If at any time the forward or leading edge of the piling wall is found to be out-of-plumb in the plane of the wall the piling being driven shall be driven to the required depth and tapered pilings shall be provided and driven to interlock with the out-of-plumb leading edge or other approved corrective measures shall be taken to insure the plumbness of succeeding pilings. The maximum permissible taper for any tapered piling shall be 1/8 inch per foot of length.
- f. Pilings in each run or continuous length of piling wall shall be driven alternately in increments of depth to the required depth or elevation. No piling shall be driven to a lower elevation than those behind it in the same run except when the pilings behind it cannot be driven deeper. Incrementally sequence driving of individual piles such that the tip of any sheet pile shall not be more than 4 feet below that of any adjacent sheet pile. When the penetration resistance exceeds five blows per inch, the tip of any sheet pile shall not be more than 2 feet below any adjacent sheet pile. This criterion for determining the refusal shall be adjusted based on the driving energy of the hammers as recommended by the manufacturer for the piling weights and subsurface materials to be encountered. If the piling next to the one being driven tends to follow below final elevation it may be pinned to the next adjacent piling.
- g. If obstructions restrict driving a piling to the specified penetration, the obstructions shall be removed or penetrated by use of pre-augering or pre-drilling. If the Contractor demonstrates that removal or penetration is impractical, make changes in the design alignment of the piling structure as

directed to ensure the adequacy and stability of the structure. Pilings shall be driven to depths shown and shall extend up to the elevation indicated for the top of pilings. A tolerance of two inches above the indicated top elevation will be permitted. Pilings shall not be driven within 100 feet of concrete less than 7 days old.

- h. Spudding of piles is not permitted. Pre-augering and pre-drilling may be used to penetrate through obstacles.

F. Cutting-Off and Splicing

1. Contractor shall notify the Government if pilings are driven to refusal or to the point where additional penetration cannot be attained. Pilings driven below the required top elevation and pilings damaged by driving and cut off to permit further driving shall be extended per wall designer requirements to reach the top elevation by splicing when directed at no additional cost to the EPA.
 - a. Pilings adjoining spliced pilings shall be full length unless otherwise approved. Splicing of pilings shall provide full sectional equivalent capacity. Ends of pilings to be spliced shall be squared before splicing to eliminate dips or camber. Pilings shall be spliced together with concentric alignment of the interlocks so that there are no discontinuities, dips, or camber at the abutting interlocks. Spliced pilings shall be free sliding and able to obtain the maximum swing with contiguous pilings. Welding shall be in accordance with the current standards of the American Welding Society. Shop and field welding, qualification of welding procedures, welders, and welding operators shall be in accordance with AWS D1.1/D1.1M.
 - b. The tops of pilings excessively battered during driving shall be trimmed when directed, at no cost to the Government. Piling cut-offs shall become the property of the Contractor and shall be removed from the site.
 - c. Cut holes in pilings in a neat and workmanlike manner, as shown or as directed. Use a straight edge in cuts made by burning to avoid abrupt nicks. Do not use explosives for cutting.

G. Inspection of Driven Piling

1. Perform continuous inspection during pile driving. Inspect all piles for compliance with tolerance requirements. Bring any unusual problems which may occur to the attention of the EPA's Representative. Inspect the interlocked joints of driven pilings extending above ground. Pilings found to be out of interlock shall be removed and replaced at the Contractor's expense.

H. Pulling and Redriving

1. Submit the proposed method of pulling sheet piling, prior to pulling any piling. Pull, as directed, selected pilings after driving to determine the condition of the underground portions of pilings. Any piling so pulled and found to be damaged, to the extent that its usefulness in the structure is impaired, shall be removed and replaced at the Contractor's expense. Pilings pulled and found to be in satisfactory condition shall be re-driven when directed.

3.7 REMOVAL

- A. The removal of sheet pilings shall consist of pulling, sorting, cleaning the interlocks, inventorying, and storing previously installed sheet pilings as shown and directed.
- B. Pulling
 1. The method of pulling piling shall be approved. Provide pulling holes in pilings, as required. Extractors shall be of suitable type and size. Care shall be exercised

during pulling of pilings to avoid damaging piling interlocks and adjacent construction. If the Contracting Officer determines that adjacent permanent construction has been damaged during pulling, the Contractor will be required to repair this construction at no cost to the Government. Pull pilings one sheet at a time. Pilings fused together shall be separated prior to pulling, unless the Contractor demonstrates, to the satisfaction of the EPA's Representative, that the pilings cannot be separated. The Contractor will not be paid for the removal of pilings damaged beyond structural use due to proper care not being exercised during pulling.

- C. Sorting, Cleaning, Inventorying and Storing
 - 1. Pulled pilings shall be sorted, cleaned, inventoried, and stored by type into groups as:
 - a. Piling usable without reconditioning.
 - b. Piling requiring reconditioning.
 - c. Piling damaged beyond structural use.
- D. Cleaning of sheet piling shall be in accordance with equipment decontamination requirements provided in SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE

3.8 INSTALLATION RECORDS

- A. Maintain a pile driving record for each sheet pile driven. Indicate on the installation record: installation dates and times, type and size of hammer, rate of operation, total driving time, dimensions of driving helmet and cap used, blows required per foot for each foot of penetration, final driving resistance in blows for final 6 inches, pile locations, tip elevations, ground elevations, cut-off elevations, and any reheading or cutting of piles. Record any unusual pile driving problems during driving. Submit complete records to the EPA's Representative.

END OF SECTION

SECTION 03212
HOT MIX BITUMINOUS PAVEMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Contractor shall provide all labor, materials, tools, and equipment to install all paving to restore paved parking areas and park pathways as shown on the Design Drawings and/or as directed by the EPA's Representative.

1.2 REFERENCES

- A. References
1. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.
 - a. New Jersey Department of Transportation (NJDOT)
 - 1) NJDOT STANDARD SPECIFICATIONS (2001) New Jersey Department of Transportation Standard Specifications for Road and Bridge Construction
 - b. American Society for Testing and Materials (ASTM)
 - 1) ASTM C 117 (2003) Materials Finer Than 75 micrometer (No. 200) Sieve in Mineral Aggregates by Washing
 - 2) ASTM C 136 (2001) Sieve Analysis of Fine and Coarse Aggregates
 - 3) ASTM D 1559 (1989) Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus
 - 4) ASTM D 2172 (2001e1) Quantitative Extraction of Bitumen from Bituminous Paving Mixtures
 - 5) ASTM D 4867/D 4867M (1996) Effect of Moisture on Asphalt Concrete Paving Mixtures
 - 6) ASTM D 979 (2001) Sampling Bituminous Paving Mixtures ASTM D 3666 (2004) Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
1. Asphalt Cement Binder; Design Data; EA
 2. Job-Mix Designs; Design Data; EA
 3. Bituminous Mix Tests; Test Reports; EA
 4. Commercial Laboratory Certification; Certificates; EA

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Not used.

1.5 QUALITY ASSURANCE

A. Required Data

1. Job-Mix formula shall show the following:
 - a. Source and proportions, percent by weight, of each ingredient of the mixture
 - b. Correct gradation, the percentages passing each size sieve listed in the Specifications for the mixture to be used, for the aggregate and mineral filler from each separate source and from each different size to be used in the mixture and for the composite mixture
 - c. Amount of material passing the No. 200 sieve determined by dry sieving
 - d. Number of blows of hammer compaction per side of molded specimen
 - e. Temperature viscosity relationship of the asphalt cement
 - f. Stability, flow, percent voids in mineral aggregate, percent air voids, unit weight
 - g. Asphalt absorption by the aggregate
 - h. Effective asphalt content as percent by weight of total mix
 - i. Temperature of the mixture immediately upon completion of mixing
 - j. Asphalt performance grade
 - k. Curves for the leveling, binder, and wearing courses

B. Charts

1. Plot and submit, on a grain size chart, the specified aggregate gradation band, the job-mix gradation, and the job-mix tolerance band.

C. Selection of Optimum Asphalt Content

1. Base selection on percent of total mix and the average of values at the following points on the curves for each mix:
 - a. Stability: Peak
 - b. Unit Weight: Peak
 - c. Percent Air Voids: Median

D. Construction Equipment

1. Calibrated equipment, such as scales, batching equipment, spreaders, and similar equipment, shall have been recalibrated by a calibration laboratory approved by the EPA's Representative within 12 months of commencing work.

E. Source Quality Control

1. The Contractor shall employ a commercial laboratory approved by the EPA's Representative to perform testing. The laboratory used to perform all sampling and testing shall meet the requirements of ASTM D 3666 and NJDOT.
2. A certification signed by the manager of the laboratory stating that it meets these requirements or clearly listing all deficiencies shall be submitted to the EPA's Representative prior to the start of construction. The certification shall contain as a minimum:
 - a. Qualifications of personnel; laboratory manager, supervising technician, and testing technicians.
 - b. A listing of equipment to be used in developing the job mix.
 - c. A copy of the laboratory's quality control system.
 - d. Evidence of participation in the AASHTO Materials Reference Laboratory (AMRL) program.

3. Tests
 - a. The Contractor shall perform testing in accordance with the NJDOT STANDARD SPECIFICATIONS Sections 301, 305, 404, and 903.

PART 2 - PRODUCTS

2.1 PAVEMENT DETAILS

- A. Surface course shall be a minimum of 1.5 inches of compacted thickness of HMA Mix 9.5M64 per NJDOT standard specifications.
- B. Base course shall be a minimum compacted thickness of 3" of HMA mix 12.5M64, 19M64 per NJDOT standard specifications.
- C. Subbase shall be a minimum of 4" compacted thickness DGABC per NJDOT standard specifications.
- D. Prime and Tack coat as per Section 404.13 of NJDOT STANDARD SPECIFICATIONS. The prime coat will be required if it will be at least seven [7] days before the surfacing (Asphalt cement hot mix concrete) layer is constructed on the underlying (base course, etc.) compacted material. Contractor shall receive approval prior to paving, to waive prime coat requirement.
- E. Asphalt Cement Binder as per NJDOT STANDARD SPECIFICATIONS.

2.2 TRAFFIC MARKINGS

- A. The Contractor shall provide traffic marking paint with chlorinated rubber base.
- B. The Contractor shall provide factory-mixed, quick-drying, and non-bleeding; FS TT-P-115, Type III.

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE, AND HANDLING

- A. The Contractor shall inspect materials delivered to the site for damage and store with a minimum of handling. The Contractor shall store aggregates in such a manner as to prevent segregation, contamination, or intermixing of the different aggregate sizes.

3.2 ENVIRONMENTAL CONDITIONS

- A. The Contractor shall place bituminous mixture only during dry weather and on dry surfaces. The Contractor shall place courses only when the surface temperature of the underlying course is greater than 45 degrees F for course thicknesses greater than one inch and 55 degrees F for course thicknesses one inch or less.

3.3 PREPARATION

- A. Subgrades
 1. Placed subgrades shall be prepared in accordance with SECTION 02201 – BACKFILL, COMPACTION AND GRADING. Existing Subgrades shall be proof-rolled and prepared in accordance with NJDOT STANDARD SPECIFICATIONS Section 301.
- B. Surface Preparation of Underlying Course

1. Prior to the laying of the asphalt concrete, clean underlying course of foreign or objectionable matter with power blowers or power brooms, supplemented by hand brooms and other cleaning methods where necessary. During the placement of multiple lifts of bituminous concrete, each succeeding lift of bituminous concrete shall have its underlying lift cleaned and provided with a bituminous tack coat if the time period between the placement of each lift of bituminous concrete exceeds 14 days, or the underlying bituminous concrete has become dirty. Remove grass and other vegetative growth from existing cracks and surfaces.

C. Spraying of Contact Surfaces

1. The Contractor shall spray contact surfaces of previously constructed pavement with a thin coat of bituminous materials to act as an anti-stripping agent. Paint contact surfaces of structures with a thin coat of emulsion or other approved bituminous material prior to placing the bituminous mixture. Tack coat the previously placed primed coats on base courses when surface has become excessively dirty and cannot be cleaned or when primed surface has cured to the extent that it has lost all bonding effect.

3.4 PLACEMENT

A. Machine Spreading

Table 03212-1 Minimum Spreading Temperatures

Base Temp. in Degrees C (*)	Wearing, Binder, or Leveling Course Thickness, (mm)							
	13	19	25	38	50	75	88	100
-7 - 0 (**)	---	---	---	---	---	---	135 (**)	127 (**)
0 - 4 (**)	---	---	---	---	146	138	132	127
4 - 10	---	---	---	149	141	135	129	124
10 - 16	---	---	149	146	138	132	127	124
16 - 21	---	149	143	141	135	129	124	121
21 - 27	149	143	141	138	132	129	124	121
27 - 32	143	138	135	132	129	127	121	121
32	138	135	132	129	129	124	121	121

* Note: Base on which mix is placed.

** Note: Increase by 8 degrees when placement is on base or subbase containing frozen moisture. Normally, hot mix paving is not allowed on base temperatures below 7 degrees C.

- B. The range of temperatures of the mixtures at the time of spreading shall be between 250 degrees F and 300 degrees F. Bituminous concrete having temperatures less than minimum spreading temperature when dumped into the spreader will be rejected. Adjust spreader and regulate speed so that the surface of the course is smooth and continuous without tears and pulling, and of such depth that, when compacted, the surface conforms with the cross section, grade, and contour indicated. Unless otherwise directed, begin the placing along the centerline of areas to be paved on a crowned section or on the high side of areas with a one-way slope. Place mixture in consecutive adjacent strips having a minimum width of 10 feet, except where the edge lanes require strips less than 10 feet to complete the area. Construct longitudinal joints and edges to true line markings. Establish lines parallel to the centerline of the area to be paved, and place string lines coinciding with the established lines for the spreading machine to

follow. Provide the number and location of the lines needed to accomplish proper grade control. When specified grade and smoothness requirements can be met for initial lane construction by use of an approved long ski-type device of not less than 30 feet in length and for subsequent lane construction by use of a short ski or shoe, in-place string lines for grade control may be omitted. Place mixture as nearly continuous as possible and adjust the speed of placing as needed to permit proper rolling.

C. Shoveling, Raking, and Tamping After Machine-Spreading

1. Shovelers and rakers shall follow the spreading machine. Add or remove hot mixture and rake the mixture as required to obtain a course that when completed will conform to requirements specified herein. Broadcasting or fanning of mixture over areas being compacted is prohibited. When segregation occurs in the mixture during placing, suspend spreading operation until the cause is determined and corrected. Correct irregularities in alignment left by the spreader by trimming directly behind the machine. Immediately after trimming, compact edges of the course by tamping laterally with a metal lute or by other approved methods. Distortion of the course during tamping is prohibited.

D. Hand-Spreading in Lieu of Machine-Spreading

1. In areas where the use of machine spreading is impractical, spread mixture by hand. The range of temperatures of the mixtures when dumped onto the area to be paved shall be between 250- and 300-degrees F. Mixtures having temperatures less than minimum spreading temperature when dumped onto the area to be paved will be rejected. Spread hot mixture with rakes in a uniformly loose layer of a thickness that, when compacted, will conform to the required grade, thickness, and smoothness. During hand spreading, place each shovelful of mixture by turning the shovel over in a manner that will prevent segregation. Do not place mixture by throwing or broadcasting from a shovel. Do not dump loads any faster than can be properly handled by the shovelers and rakers.

3.5 COMPACTION OF MIXTURE

- A. Compact mixture by rolling. Begin rolling as soon as placement of mixture will bear rollers. Delays in rolling freshly spread mixture shall not be permitted. Start rolling longitudinally at the extreme sides of the lanes and proceed toward center of pavement, or toward high side of pavement with a one-way slope. Operate rollers so that each trip overlaps the previous adjacent strip by at least one foot. Alternate trips of the roller shall be of slightly different lengths. Conduct tests for conformity with the specified crown, grade, and smoothness immediately after initial rolling. Before continuing rolling, correct variations by removing or adding materials, as necessary. If required, subject course to diagonal rolling with the steel wheeled roller crossing the lines of the previous rolling while mixture is hot and in a compactible condition. Speed of the rollers shall be slow enough to avoid displacement of hot mixture. Correct displacement of mixture immediately by use of rakes and fresh mixture or remove and replace mixture as directed. Continue rolling until roller marks are eliminated and course has a density of at least 90 percent but not more than 100 percent of that attained in a laboratory specimen of the same mixture prepared in accordance with ASTM D6927. During rolling, moisten wheels of the rollers enough to prevent adhesion of mixture to wheels, but excessive water is prohibited. Operation of rollers shall be by competent and experienced operators. Provide sufficient rollers for each spreading machine in operation on the job and to handle plant output. In places not accessible to the rollers, compact mixture thoroughly with hot hand tampers.

- B. Skin patching of an area after compaction is prohibited. Remove mixture that becomes mixed with foreign materials or is defective and replace with fresh mixture compacted to the density specified herein. Roller shall pass over unprotected edge of the course only when laying of course is to be discontinued for such length of time as to permit mixture to become cold.

3.6 JOINTS

- A. Joints shall present the same texture and smoothness as other portions of the course, except permissible density at the joint may be up to 2 percent less than the specified course density. Carefully make joints between old and new pavement or within new pavements in a manner to ensure a thorough and continuous bond between old and new sections of the course. Vertical contact surfaces of previously constructed sections that are coated with dust, sand, or other objectionable material shall be painted with a thin uniform coat of emulsion or other approved bituminous material just before placing fresh mixture.
- B. Transverse
 - 1. Roller shall pass over unprotected end of freshly laid mixture only when laying of course is to be discontinued. Except when an approved bulkhead is used, cut back the edge of previously laid course to expose an even, vertical surface for the full thickness of the course. When required, rake fresh mixture against joints, thoroughly tamp with hot tampers, smooth with hot smoothers, and roll. Transverse joints in adjacent lanes shall be offset a minimum of 2 feet.
- C. Longitudinal Joints
 - 1. Space 6 inches apart. Do not allow joints to coincide with joints of existing pavement or previously placed courses. Spreader screed shall overlap previously placed lanes 2 to 3 inches and be of such height to permit compaction to produce a smooth dense joint. With a lute, push back mixture placed on the surface of previous lanes to the joint edge. Do not scatter mix. Remove and waste excess material. When edges of longitudinal joints are irregular, honeycombed, or poorly compacted, cut back unsatisfactory sections of joint and expose an even vertical surface for the full thickness of the course. When required, rake fresh mixture against joint, thoroughly tamp with hot tampers, smooth with hot smoothers, and roll while hot.

3.7 FIELD QUALITY CONTROL

- A. Sampling
 - 1. Pavement and Mixture
 - a. Take plant samples for the determination of mix properties and field samples for thickness and density of the completed pavements. Furnish tools, labor and material for samples, and satisfactory replacement of pavement. Take samples and tests at not less than frequency specified hereinafter and at the beginning of plant operations; for each day's work as a minimum; each change in the mix or equipment; and as often as directed. Accomplish sampling in accordance with ASTM D 979.
- B. Testing
 - 1. Bituminous Mix Tests
 - a. Test one sample for each 500 tons, or fraction thereof, of the uncompacted mix for extraction in accordance with ASTM D2172/D2172M; perform a sieve

analysis on each extraction sample in accordance with ASTM C136/C136M and ASTM C117. Test one sample for each 500 tons or fraction thereof for stability and flow in accordance with ASTM D6927. Test one sample for each material blend for Tensile Strength Ratio in accordance with ASTM D4867/D4867M.

C. Pavement Courses

1. Perform the following tests:

- a. Density: For each 1000 tons of bituminous mixture placed, determine the representative laboratory density by averaging the density of four laboratory specimens prepared in accordance with ASTM D6927. Samples for laboratory specimens shall be taken from trucks delivering mixture to the site; record in a manner approved by the EPA's Representative the project areas represented by the laboratory densities. Determine density of laboratory prepared specimens and cored samples in accordance with ASTM D1188 or ASTM D2726/D2726M, as applicable. Separate pavement layers by sawing or other approved means. Maximum allowable deficiency at any point, excluding joints, shall not be more than 2 percent less than the specified density for any course. The average density of each course, excluding joints, shall be not less than the specified density. Joint densities shall not be more than 2 percent less than specified course densities and are not included when calculating average course densities. When the deficiency exceeds the specified tolerances, correct each such representative area or areas by removing the deficient pavement and replacing with new pavement.
- b. Thickness: Determine thickness of binder and wearing courses from samples taken for the field density test. The maximum allowable deficiency at any point shall not be more than 1/4 inch less than the thickness for the indicated course. Average thickness of course or of combined courses shall be not less than the indicated thickness. Where a deficiency exceeds the specified tolerances, correct each such representative area or areas by removing the deficient pavement and replacing with new pavement.
- c. Smoothness: Straightedge test the compacted surface of binder and wearing course[s] as work progresses. Apply straightedge parallel with and at right angles to the centerline after final rolling. Unevenness of binder courses shall not vary more than 1/4 inch in 10 feet; variations in the wearing course shall not vary more than 1/8 inch in 10 feet. Correct each portion of the pavement showing irregularities greater than that specified.
- d. Finish Surface Texture of Wearing Course: Visually check final surface texture for uniformity and reasonable compactness and tightness. Final wearing course with a surface texture having undesirable irregularities such as segregation, cavities, pulls or tears, checking, excessive exposure of coarse aggregates, sand streaks, indentations, ripples, or lack of uniformity shall be removed and replaced with new materials.

3.8 PROTECTION

- A. Do not permit vehicular traffic, including heavy equipment, on pavement until surface temperature has cooled to at least 120 degrees F. Measure surface temperature by approved surface thermometers or other satisfactory methods.

3.9 PATCHING

- A. As directed by EPA's Representative, in writing, remove and replace all defective areas. Cut out such areas and fill with fresh bituminous concrete. Compact to the required density.

3.10 MARKINGS

- A. New pavement shall be marked to replace the pavement markings that existed prior to construction.
- B. Sweep surface with power broom supplemented by hand brooms to remove loose material and dirt; prepare surface in accordance with paint manufacturer's instructions.
- C. Do not begin marking bituminous concrete pavement until approved by EPA's Representative.
- D. Application: Using mechanical equipment, provide uniform straight edges in two separate coats. Apply in accordance with paint manufacturer's recommended rates.

3.11 CLEANING

- A. After completion of paving operations, clean surfaces of excess or spilled bituminous materials and all foreign matter.

END OF SECTION

SECTION 03530

REVETMENT CONSTRUCTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes requirements for reconstruction of the seawall, herein referenced as construction of new revetment consisting of filter fabric, bedding stone and armored stone. It also includes the requirements for work including preparing the regraded surface (upon which the revetment shall be constructed), stormwater pipe outfall extension, and restoration.
- B. The Contractor shall furnish all labor, materials, equipment, and incidentals necessary to perform all regraded surface preparation, backfilling, compaction, grading, filter fabric installation, bedding stone and armored stone installation, stormwater pipe extensions, fertilizing, seeding, mulching, and topographic and hydrographic surveying of works items as presented on the Design Drawings and specified herein.

1.2 REFERENCES

- A. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of the standards below, the revision in effect at the time of contract award shall apply.
 - 1. American Association of State Highway and Transportation Officials (AASHTO)
 - a. AASHTO M-288 Standard Specification for Geosynthetic Specification for Highway Applications
 - 2. American Concrete Institute (ACI)
 - a. ACI 301 Specifications for Structural Concrete
 - 3. American Society for Testing and Materials (ASTM)
 - a. ASTM C 33 Standard Specification for Concrete Aggregates
 - b. ASTM C 76 Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe
 - c. ASTM C 117 Standard Test Method for Materials Finer than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing
 - d. ASTM C 127 Standard Test Method for Relative Density (Specific Gravity) and Absorption of Coarse Aggregate
 - e. ASTM C 136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
 - f. ASTM C 535 Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
 - g. ASTM D 75 Standard Practice for Sampling Aggregates
 - h. ASTM D 1140 Standard Test Method for Amount of Material in Soils Finer than the No. 200 (75- μ m) Sieve
 - i. ASTM D 1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³))
 - j. ASTM D 3740 Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

- k. ASTM 4992 Standard Practice for Evaluation of Rock to be Used for Erosion Control
- l. ASTM 5240 Standard Test Method for Evaluation of Durability of Rock for Erosion Control Using Sodium Sulfate or Magnesium Sulfate
- m. ASTM 5312 Standard Test Method for Evaluation of Durability of Rock for Erosion Control Under Freezing and Thawing Conditions
- n. ASTM D 5519 Standard Test Method for Particle Size Analysis of Natural and Man-Made Riprap Materials
- o. ASTM D 6092 Standard Practice for Specifying Standard Sizes for Erosion Control
- p. ASTM D 6473 Standard Test Method for Specific Gravity and Absorption of Rock for Erosion Control
- q. ASTM E 329 Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction
- 4. Federal Geographic Data Committee (FGDC)
 - a. FGDC-STD-007.3-1998 Geospatial Positioning Accuracy Standards, Part 3: National Standard for Spatial Data Accuracy
 - b. FGDC-STD-008-1999 Content Standards for Digital Orthoimagery
- 5. U.S. Army Corps of Engineers Publications (USACE)
 - a. EM 1110-2-1003 Hydrographic Surveying
- 6. New Jersey Department of Transportation (NJDOT)
 - a. NJDOTSS Standard Specification for Road and Bridge Construction

1.3 SUBMITTALS

- A. Approval from the EPA's Representative is required for submittals with an "EA" designation; submittals having an "FIO" designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA's Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES:
 - 1. Material sources and gradation reports for armored stone and bedding stone; Test Reports; EA
 - 2. Manufacturer's material certifications and catalog cuts for Filter Fabric; Certificates; EA
 - 3. Manufacturer's material certifications and catalog cuts for Concrete Pipe; Certificates; EA
 - 4. Shop drawings for concrete pipe outfall extensions; Shop Drawings; EA
 - 5. Concrete mix design; Design Data; EA
 - 6. Certification reports, samples, gradation curves and ASTM D1557 compaction test results for all imported Common Fill and Topsoil as specified in SECTION 02201 – BACKFILL, COMPACTION, AND GRADING; Certificates; EA
 - 7. Samples, gradation curves and ASTM D1557 compaction test results for on-site Satisfactory Material which the Contractor proposes to use as backfill as specified in SECTION 02201 – BACKFILL, COMPACTION and GRADING; Test Reports; EA
 - 8. Name, Location, and Historical Quality Reports from proposed stone source(s); Product Data; FIO
 - 9. Qualifications/Certifications for Sampling/Testing Agency; Certificates; EA
 - 10. Stone Quality and Test Report Schedule and Stone Delivery Schedule; Product Data; EA
 - 11. Stone Quality Test Reports; Test Reports; EA
 - 12. Stone Gradation Test Reports; Test Reports; EA

13. Stone Gradation Test Methodology Description; Product data; EA
14. Daily Activities Reports; Test Reports; FIO
15. Name and Affiliation of Registered Professional Land Surveyor; Product Data; FIO
16. Surveying Plan; Shop Drawings; EA
17. Survey Notification; Product Data; FIO
18. Survey Submittal Log; Product Data; EA
19. Initial Survey Drawings; Shop Drawings; EA
20. Interim Survey Drawings; Shop Drawings; EA
21. Final Survey Drawings; Shop Drawings; EA
22. Acceptance Aerial Photograph; Product Data; EA

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Not used.

1.5 QUALITY CONTROL REQUIREMENTS

A. Materials Testing

1. Contractor shall provide all equipment and facilities for testing construction materials.
2. All imported common fill and topsoil materials shall be tested to ensure they are free from chemical contamination as specified in SECTION 01450 - CHEMICAL DATA QUALITY CONTROL. Results shall be certified in writing. Analysis of stone for chemical contamination is not required to be performed by an off-site laboratory.
3. Acceptable stone shall meet the quality acceptance criteria in paragraph 2.1.A when tested in accordance with the procedures listed below:
 - a. Sampling of the stone shall be performed in accordance with ASTM D 75.
 - b. The absorption of stone shall be determined in accordance with ASTM D 6473.
 - c. The unit weight of stone shall be provided based on the apparent specific gravity determined in accordance with ASTM D 6473.
 - d. The loss by abrasion of stone shall be determined in accordance with ASTM C 535, processed and tested for No. 1 grading.
 - e. The gradation of armored stone shall be determined in accordance with ASTM D 5519, Test Method C.
 - f. The gradation of bedding stone shall be determined in accordance with ASTM C 136 and ASTM C 117.
4. Throughout the duration of the work, the Contractor shall inspect, sample, and test construction materials for compliance with the specified requirements and record the inspection of all operations. All sampling and testing shall be performed by a qualified testing laboratory meeting the requirements of ASTM D 3740 and ASTM E 329, or a commercial testing facility qualified by U.S. Army Corps of Engineers (USACE) Materials Testing Center (MTC). A copy of the records of inspection, as well as the records of corrective action taken, shall be provided to EPA's Representative. As a minimum, Contractor shall perform quality control inspection and testing in accordance with the following requirements and Table 03530-1.
 - a. Gradation: armored stone sample sizes shall consist of at least 50 stones per test and weigh at least 20 tons per test. Bedding stone sample sizes shall consist of at least 50 stones per test and weigh at least 10 tons per test. Refer to paragraph 2.2 for gradation requirements.
 - b. Quality: Refer to paragraph 2.1 for quality requirements.

- c. Placement: Continuous inspection of placement to ensure proper thickness and that material is not segregated. Refer to Part 3 of this Specification for placement requirements.
5. Prior to performing quality or gradation testing of stone, Contractor shall provide at least 3 days advance notice, in writing, so that EPA's Representative may have the opportunity to attend and observe the testing. Contractor shall conduct gradation tests at the quarry, not at the project site.
6. Table 03530-1 provides required submittals associated with stone quality for bedding stone and armored stone. Detailed descriptions of submittals are below.

Table 03530-1 Stone Submittal Schedule.

Stone Submittal Number	Submittal Description	Required Submission Timeframe
1	Name, Location, and Historical Quality Reports from Quarry	Prior to Pre-Construction Conference.
2	Testing Laboratory Qualifications	Prior to Pre-Construction Conference.
3	Stone Delivery, Staging, and Testing Schedule	Prior to transport or delivery of any stone from quarry.
4	Stone Quality and Gradation Test Report 1	With or after stone delivery, staging, and testing schedule but prior to transport or delivery of any stone from quarry.
5	Stone Quality and Gradation Test Report 2	After approximately 1/3 rd of total stone quantity has been shipped from quarry, but prior to any subsequent shipment.
6	Stone Quality and Gradation Test Report 3	After approximately 2/3 rd of total stone quantity has been shipped from quarry, but prior to any subsequent shipment.

7. Stone Submittal 1: Contractor shall provide the name and location of the quarry that will be the source of the stone for the project. Contractor shall also provide historical quality reports from the selected quarry to determine the acceptability of the stone from the proposed source. Historical quality reports are not considered suitable alternatives to the quality and gradation reports required during construction. Quality and gradation reports during construction shall be from new tests performed on actual stone to be used on the project.
8. Stone Submittal 2: Qualifications of proposed stone testing laboratory shall be submitted.
9. Stone Submittal 3: Prior to commencing stone delivery to project site, Contractor shall submit a stone delivery, staging, and testing schedule, and a description of the planned gradation test procedure. The schedule shall describe when stone quality and gradation testing will be performed to ensure that test results are available for EPA's Representative's review prior to stone being shipped from the quarry. A minimum of 3 quality and 3 gradation tests are required for each stone type (bedding stone and armored stone) and shall be provided at specified intervals to ensure compliance with quality and gradation requirements. For each stone type, the first quality and gradation test reports shall be performed, submitted, and

reviewed by EPA's Representative prior to delivery of any stone. The remaining quality and gradation tests shall be performed, submitted, and reviewed by EPA's Representative at approximately 1/3rd and 2/3rd of total stone quantity shipment (of each stone type) from quarry.

10. Stone Submittals 4-6: Contractor shall obtain EPA's Representative's review and confirmation of compliance of gradation and quality tests prior to shipment of stone in the increments stated in Table 03530-1. If a single shipment of stone is planned to encompass multiple increments, Contractor shall submit the required number of test submittals and receive review and confirmation of compliance prior to shipment of stone from quarry. Contractor may request variations to timeframes in Table 03530-1 in stone delivery, staging, and testing schedule.
11. Daily Activities Reports: Contractor shall provide a daily record of activities. Daily reports shall include approximate quantity (including tonnage or volume of stone transported from quarry) and locations of stone placement, and percent project completion.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Materials delivered to the site prior to placement shall be stored/stockpiled on-site and handled in a manner to minimize surface water impact and prevent mixing with on-site soils and to protect the fabric from UV radiation and animal destruction.

PART 2 - PRODUCTS

2.1 STONE MATERIAL

- A. All stone shall be a durable natural stone. It shall be free from visible fractures, shale partings, cracks, overburden soil, clay pockets, cavities (vugs or "honeycombs"), laminations, and other defects that would tend to increase unduly its deterioration from natural causes. Stone shall not include objectionable quantities of dirt, sand, clay, and/or rock fines. Stone shall comply with quality parameters in Table 03530-2.

Table 03530-2 Stone Quality Parameters

Quality Characteristic	Test Method	Requirement
Apparent Specific Gravity	ASTM D6473	2.65 (min)*
Absorption	ASTM D6473	2% (max)
Soundness, (Sodium Sulfate)	ASTM D5240	5% loss (max)
LA Abrasion, 1000 Revolutions, Grading No. 1	ASTM C535	25% loss (max)
Freeze Thaw, 45 Cycles (min), 5 samples (min)	ASTM D5312	1% loss (max)
Field Evaluation	ASTM D4992	No deleterious materials allowed
*Stone shall have a minimum unit weight of 165 pounds per cubic foot (PCF) per ASTM C 127. Stone unit weight shall be calculated as the apparent specific gravity multiplied times the unit weight of water (62.4 PCF).		

- B. The stone shall be reasonably well graded and shall include essentially all stone sizes between the two extremes specified which will result in a dense, fairly well-graded material not having noticeable voids or a lack of the larger sizes. Bi-modal or gap

graded stone gradation test results may result in rejection of the stone material. Armored stone and bedding stone size ranges (gradations) shall conform to the requirements specified below in accordance with ASTM 6092. Gradation test results that begin on the coarse side of the curve and end up on the fine side of the curve shall be considered “skip-graded” and will not be accepted.

- C. Stone Shape: The greatest dimension of each stone shall not be more than three times its least dimension. The faces of individual stones shall be roughly angular, not rounded, in shape.

2.2 BEDDING STONE

- A. Bedding stone shall conform to the gradation listed in Table 03530-3.

Table 03530-3 Bedding Stone Gradation Requirements

Stone Size, lbs	% Smaller by Weight
1,500	100
700	50-100
300	15-50
60	0-15

2.3 ARMORED STONE

- A. Armored stone shall conform to the gradation listed in Table 03530-4.
- B. Decontaminated post-Sandy and/or weathered riprap can be reused as the armored stone if it meets the gradation criteria listed in Table 03530-4.

Table 03530-4 Armored stone Gradation Requirements

Weight, lbs	Nominal Diameter, in	% Smaller by Stone Count
13,700	49	100
7,900	41	70-100
4,000	32	15-50
500	17	0-15
Note: up to 5% smaller fragments will be allowed incidental to handling and placement.		

2.4 FILTER FABRIC

- A. US Fabrics 205NW nonwoven needle punched geotextile meeting the requirements of AASHTO M-288-06 or approved equal.

2.5 CONCRETE

- A. Concrete shall be NJDOT Class B in accordance with NJDOTSS Table 903.03.06-3 Mix Design Requirements (3,700 psi 28-day Class Design Strength).

2.6 PIPE BEDDING

- A. Pipe bedding shall be clean sand that meets the requirements of ASTM C33 Fine Aggregate.

2.7 CONCRETE PIPE

- A. Concrete pipe shall match the diameter, wall thickness and joint configuration of the existing concrete pipe to be extended. The Contractor shall uncover and measure the existing pipe prior to ordering new pipe. For bid purposes, the Contractor should assume ASTM C76 Class IV reinforced concrete pipe.

PART 3 - EXECUTION

3.1 GENERAL

- A. Revetment shall not be installed until the environmental remediation work is completed and the existing ground surface has been inspected and approved by the EPA's Representative.
- B. The Contractor shall perform work in stages so that disturbed areas are relatively small and stabilized quickly, preferably in one day. The Contractor shall not leave large areas of the shoreline (greater than approximately 180-feet long) disturbed and unprotected from waves and weather.
- C. The Contractor shall be responsible for scheduling the delivery of all materials with the overall project schedule such that no delays in construction occur.
- D. The Contractor shall be responsible for maintaining surface water controls in place prior to and during revetment installation operations.
- E. Existing stone may be reused subject to the requirements of this Specification.

3.2 COORDINATION WITH QUARRY

- A. The Contractor shall be knowledgeable of the methods used at the quarry to produce the stone gradations specified, especially the effects of repeated handling. The Contractor shall coordinate with the quarry and use loading and unloading methods that ensure that required gradations are maintained and provided for placement.

3.3 REGRADED SURFACE PREPARATION

- A. Clear and grub all areas of vegetation which are located within the revetment area, if not already completed during site preparation and dredging/excavation activities.
- B. Above Mean High Water, grade the existing surface to the lines and levels shown on the drawings. Cut high areas and fill low areas. Fill shall be either be Satisfactory Material or Common Fill. Place fill in 8-inch maximum thick loose lifts and compact each lift to 90% of maximum dry density per ASTM D1557.
- C. Below Mean High Water, excavate to design regraded surface that the toe filter fabric, bedding stone and armored stone will be placed. If, as a result of remediation work, the ground level is lower than the design regraded surface, backfill to design regraded surface elevation using bedding stone.
- D. All Unsatisfactory Materials encountered during regraded surface preparations shall be removed from the site and replaced with Satisfactory Materials or Common Fill, as necessary.

3.4 FILTER FABRIC INSTALLATION

- A. After the regraded surface has been prepared and inspected and approved by the EPA's Representative, place Filter Fabric over the entire area where bedding stone and armored stone are to be placed. Extend Filter Fabric at least 12-inches beyond the bedding stone and armored stone area in all directions.
- B. Joints in Filter Fabric shall be overlapped a minimum of 36-inches underwater.
- C. At the outshore edge of the Revetment toe, turn the Filter Fabric back two feet over the toe of the armored stone.
- D. At the inshore edge of the Revetment crest, cut off the filter fabric 6-inches below the top of the Armored stone.

3.5 BEDDING STONE INSTALLATION

- A. After the Filter Fabric has been placed, cover it with bedding stone as shown on the Design Drawings. Do not damage or dislodge the Filter Fabric during bedding stone placement operations.
- B. The surface of the bedding stone shall have a uniform finish free of mounds, dips, and windrows. Compaction of bedding stone is not required.
- C. The finished thickness of the bedding stone layer shall be within a tolerance of -0.2 feet to +0.3 feet from the thickness specified on the Design Drawings.

3.6 ARMORED STONE INSTALLATION

- A. Firmly bed the armored stone into the bedding stone. Armored stone shall not be dumped on a slope or dropped from height exceeding 1-foot.
- B. Armored stone shall be placed to the full course thickness in such a manner as to avoid significant displacement of the underlying material.
- C. Armored stone shall be delivered and placed in a manner that ensures the armored stone in place is reasonably homogeneous with the larger stones uniformly distributed and firmly in contact with one to another, with the smaller stones and spalls filling the voids between the larger stones. Some hand placing of the smaller stones will be required to achieve this.
- D. The finished surface of the armored stone shall be within a tolerance of -0.2 feet to +1.0 feet from the finish slope lines shown on the Design Drawings, except that the extreme of such tolerance shall not be continuous over a distance greater than 100 feet.

3.7 REUSE OF EXISTING POST-SANDY AND WEATHERED RIPRAP

- A. Reuse of existing stone is subject to the following requirements:
 - 1. Existing post-Sandy and weathered riprap from the site shall be decontaminated by the Contractor and approved by the EPA's Representative prior to reuse.
 - 2. Existing post-Sandy and weathered riprap shall comply with the quality and gradation requirements of this Specifications prior to reuse.
 - 3. Existing post-Sandy and weathered riprap from the site shall not be used for bedding stone.
 - 4. The Contractor is responsible for all cleaning, sorting, mixing, quality testing, and gradation testing of existing post-Sandy and weathered riprap prior to reuse.

3.8 MISPLACED MATERIALS

- A. If any stone is deposited elsewhere than in places designated or approved, the Contractor may be required to remove such misplaced material and redeposit it where directed at no additional cost to the EPA.

3.9 STORMWATER PIPE OUTFALLS EXTENSION

- A. Locate the existing concrete pipe outfall flare end sections using soft dig exploratory excavations. Field measure and record size of existing pipe and type of joints.
- B. Use these measurements to determine and procure the correct size, length and joint type of new pipe sections required to match the existing pipes and to extend outfalls to the face of new armored stone.
- C. Prepare shop drawing plans and sections for the pipe extensions. Submit shop drawing to the EPA's Representative and local authorities having jurisdiction over the stormwater outfalls for their review and approval.
- D. Perform the work of extending each outfall during a period of dry weather when no rain is forecasted.
- E. Remove existing outfall flare end concrete pipe section. Save for reinstallation.
- F. Clean existing pipe of all debris, silt, and other material back to nearest upland manhole or catch basin. Dispose of material removed from existing pipe shall be disposed off-site as debris as specified in SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.
- G. Excavate, form, and pour the plain concrete mat located under the end of the outfall as shown on the drawings. Concrete shall be placed in accordance with ACI 301, Specification for Structural Concrete. Concrete testing is not required.
- H. Backfill the excavation and prepare the regraded surface for pipe extension as described in Paragraph 3.3 above. Compact backfill and top 12-inches of regraded surface to 90% of maximum dry density per ASTM D1557.
- I. Place 4-inches of pipe bedding.
- J. Install new pipe and relocated flare end section in accordance with NJDOTSS Division 600. Install the concrete collar.
- K. Inshore of Revetment, backfill sides and top of pipe with Common Fill. Place fill in 8 inches maximum thick loose lifts and compact each lift to 90% of maximum dry density per ASTM D1557.
- L. In the Revetment, cover sides and top of pipe with armored stone as specified in Paragraph 3.6 above.

3.10 SURVEYING AND ACCEPTANCE

- A. General: Contractor shall provide initial, interim, and final surveys for measurement and acceptance of bedding stone and armored stone placement. Surveys shall meet the following requirements:
 - 1. All surveys performed by Contractor shall be performed under the direct charge of a professional land surveyor licensed in New Jersey. Prior to commencing surveying activities, Contractor shall provide name of professional surveyor to be used on the project. Contractor shall notify EPA's Representative in writing at least 3 days prior to the commencement of surveying activities so that EPA's

Representative may have the opportunity to accompany the survey crew and witness the work.

2. **Surveying Plan:** Contractor shall provide written description of methods and equipment to be applied for required surveys as well as quality control and quality assurance (QA/QC) procedures to be applied. In particular, the plan shall provide planned transects (in PDF or CAD format) of all areas planned for revetment, as well as document an approach that is appropriate for accurate bathymetric surveying in soft soils. Refer to EM 1110-2-1003 for QA/QC guidelines.
3. At a minimum, survey shots shall be taken along each 100 ft station (i.e., 1+00, 2+00, etc.) within the limits of construction shown on the drawings. Survey shots along transects shall be taken at all significant grade breaks and at maximum horizontal spacing of 5 ft on center. At a minimum, transects shall extend 50 feet beyond the work limits and extend across areas of transitional grading adjacent to the revetment crest and revetment toe.
4. Surveys shall be performed to document the following stages of construction:

Table 03530-5 Summary of Required Surveys

Survey	Intended Purpose	Submittal(s) Schedule
Initial	To verify existing conditions.	Prior to removal of existing stone
Interim	To document removal of existing stone.	After preparation of revetment regraded surface and placement of any backfill and prior to placement of bedding stone.
Interim	To document placement of bedding stone.	After placement of bedding stone and prior to placement of armored stone.
Final	To document placement of armored stone.	After placement of armored stone.

5. All construction surveys submitted to EPA's Representative shall be in the form of plan-view and cross-section plots unless stated otherwise within these Specifications. Plots shall be prepared in the latest version of the AutoCAD. All survey data shall be referenced to the project datums shown on the drawings. Sealed plots shall be submitted as hard copies and transmitted electronically in PDF format. All plots shall legibly and clearly display the following information:
 - a. Project name
 - b. Owner's Name and Project Number
 - c. Professional Land Surveyor's seal, signature, and business affiliation
 - d. Date(s) surveys were performed
 - e. Locations and descriptions of survey control
 - f. Vertical and horizontal datums
 - g. Sheet names and numbers
 - h. Submittal Description
 - i. Name of Contractor
 - j. Drawing scale(s)
 - k. Transducer frequency (for fathometers/echo sounders)

6. All survey plots shall comprise a well-organized, stand-alone set of drawings that do not include any outdated or superseded information that may have been previously submitted. Plots shall include the following:
 - a. Plan sheets clearly documenting locations, limits, and dimensions of completed work and locations where cross sections were taken.
 - b. Cross-section sheets providing an overlay of initial, interim, and final survey transects superimposed with specified construction templates.
 7. In addition to plots, all survey submittals shall include the following:
 - a. A submittal log documenting surveys submitted to date with descriptors for survey dates and locations.
 - b. AutoCAD files
 - c. 3D ASCII files containing northing, easting, elevation, and descriptor for each survey point.
 8. Final Survey Drawings: Upon completion of work, a well-organized, stand-alone set of drawings that does not include any outdated, irrelevant, or superseded information shall be submitted to EPA's Representative. The stand-alone set of drawings shall clearly show final cross-sections superimposed over initial and interim cross-sections and construction templates with tolerances
- B. Acceptance Criteria: Acceptance of the bedding stone and armored stone shall be based on field observations and review of the interim and final surveys by EPA's Representative to verify that the bedding stone and armored stone meets the limits and tolerances specified in the drawings and the requirements of paragraphs 3.5 and 3.6.

3.11 SITE RESTORATION

- A. After completion of the work, restore disturbed areas of the site as specified in SECTION 02900 – SITE RESTORATION. In upland grass areas, place topsoil as specified in SECTION 02201 – BACKFILL, COMPACTION AND GRADING and seed as specified in SECTION 02921 – UPLAND SEEDING.

END OF SECTION

SECTION 13300

WATER TREATMENT SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all labor, supervision, engineering, design, construction, erection, equipment, tools, necessary fabrication, materials, installation, startup testing, and other services as specified for the completion and proper operation of a temporary water treatment system. The Contractor, in executing this work, shall ensure that the system effluent meets the treatment objectives specified herein. The Contractor shall discharge the treated water to surface water (to the Raritan Bay) in accordance with the New Jersey Pollutant Discharge Elimination System (NJPDES) permit.
- B. This section is written as a “performance-based” Specification. Basic and potential treatment equipment/systems, such as pumps, tanks, filtration systems, housing, and piping are specified. Minimal requirements such as treatment capacity and criteria for treated water are included. It shall be the Contractor’s responsibility to provide a system to consistently treat the influent water and produce the required effluent water quality based on NJPDES permit. All required equipment and incidentals, including electrical and instrumentation, shall be furnished, whether specified herein or not, to produce a fully operational system.
- C. The Contractor shall be responsible for the design, installation, operation, and maintenance (O&M) of a temporary water treatment system that consistently achieves the required treatment criteria and is in compliance with all Federal, State, and local laws. The Contractor shall also monitor system performance and maintain operating records of system performance that adequately document the required treatment.
- D. System operation is expected to be intermittent. Any maintenance shall be conducted during downtime. The system should be fully operable during dewatering or other generate water and will require treatment.

1.2 REFERENCES

- A. Not used.

1.3 SUBMITTALS

- A. Approval from the EPA’s Representative is required for submittals with an “EA” designation; submittals with an “FIO” designation are for information only. EPA will approve in consultation with the state, where appropriate. The Contractor shall submit the following to the EPA’s Representative in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
 - 1. Water Treatment Plan; Pre-Construction; EA
 - a. The Contractor shall submit a water treatment plan, which includes facility layout drawings and details, to install, maintain, and operate the temporary water treatment system. At a minimum, the plan shall include the following components:
 - 1) Water Treatment Equipment
 - a) The complete list of equipment and materials to be used in the temporary water treatment system shall include, but not be limited to, primary process equipment, pumps, tanks, filtration system, control

valves, flow monitoring instruments, level control instruments, chemicals, chemical feeding system and other similar equipment. Information for each piece of equipment shall include the following, as applicable:

- (1) Manufacturer literature and model number
 - (2) Equipment size and dimensions
 - (3) Design capacity
 - (4) Utility requirements
 - (5) Materials of construction and weight
 - (6) Manufacturer's certified rating curves showing characteristics of pumps and blowers, such as head, flow rate, brake horsepower, efficiency, etc.
 - (7) Installation and maintenance requirements
- 2) Process and Instrumentation Diagrams
 - a) A process and instrumentation diagram (P&ID) showing all major pieces of process equipment with controls. The P&ID shall contain complete piping, schematic diagrams and any other details required to demonstrate that the system has been coordinated and will properly function as a unit.
 - 3) Calculations
 - a) Provide calculations supporting the sizing for all equipment and piping, including, but not limited to those specified in PART 2 – PRODUCTS.
2. Treatment Plant Operator; Certificates; EA
 - a. Treatment Plant Operator qualifications including proof of at least one year experience in operation and maintenance of temporary treatment plant systems; proof of current Operator's License, at minimum Very Small Water System (VSWS License).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Permits

1. The Contractor shall be responsible for obtaining all necessary permits, including a Treatment Works Approval (TWA) permit, as required by NJAC 7:14A-22. The Contractor shall pay for all permits and comply with conditions and terms of the applicable permits unless directed by the EPA's Representative otherwise.
2. The NJPDES DSW permit equivalency will be obtained by the EPA and provided to the Contractor at the time of Notice to Proceed.
3. The use of any equipment (e.g., air stripper) for treatment of volatile organic compounds (VOCs) is not anticipated. However, if the Contractor determines that is necessary to treat VOCs, it is the Contractor's responsibility to obtain the necessary air emission permit in accordance with NJAC 7:27; Subchapter 8.

B. Temporary Electricity

1. The Contractor shall provide, maintain, and pay for temporary power service for operation of the temporary water treatment system. Electricians shall have a minimum of 4 years demonstrated experience providing a similar type of work to that required.

1.5 REGULATORY REQUIREMENTS

- A. The Contractor shall comply with all the laws, ordinances, codes, rules, and regulations of the federal, state, and local authorities having jurisdiction over any of the work specified herein.

1.6 QUALITY ASSURANCE

- A. The Contractor shall provide standard equipment modified as required and manufactured by companies whose products have commercially available replacement parts and have had similar units in service for not less than 5 years.

1.7 TREATMENT SYSTEM REQUIREMENTS

- A. The Contractor shall be responsible for all aspects of verifying design parameters designing, providing, installing, operating, maintaining, and removing collection, storage, and treatment facilities as required to discharge treated waters within the treatment limits required. The temporary water treatment system shall be designed by a New Jersey licensed Professional Engineer and design documents shall be certified by the New Jersey Professional Engineer. The treatment system shall:
 - 1. Be capable of removing site contaminants to below the discharge limits defined in the permit.
 - 2. Have sufficient storage capacity to meet testing requirements in the discharge permit.
 - 3. Include recycle capability for retreatment of effluent not meeting the discharge requirements of this Specification, as determined by on-site testing.
- B. The Contractor shall monitor, test, and adjust the treatment system in accordance with the work plan, or as otherwise modified by special regulatory requirements. If there is a conflict between requirements, the more stringent requirement shall prevail.

1.8 SYSTEM DESCRIPTION

- A. This section describes the functions, configuration, and operating parameters of the system. It is intended to provide basic information necessary for the Contractor's design, selection of equipment, installation, and operation of the system. A representative temporary water treatment system diagram is shown on the Design Drawings.
- B. The Contractor shall design the temporary water treatment system to operate on an intermittent basis as required by dewatering. The treatment system shall be designed to operate with an average flow rate up to 170 gpm with a peak flow rate of approximately 260 gpm, not exceeding 125,000 gallons per day (gpd).
- C. Estimated influent concentrations for the temporary water treatment system design are listed under Table 13300-1, based on groundwater (MW-6S/6D and MW-10S/D) and surface water (samples available for Area 1 and Area 2) quality data. If any, additional testing that may be necessary to characterize the influent water quality will be included in the NJPDES DSW permit equivalency .
- D. If available analytical results provided in this Specification are determined insufficient for designing the temporary water treatment system, then the Contractor may collect additional data. Additional sample collection, testing and analysis shall be included as part of the design of the temporary water treatment plant system.
- E. Effluent shall be discharged to surface water. The location of surface water discharge will be identified in NJPDES DSW permit equivalent. Treated water shall meet the effluent criteria specified in the NJPDES DSW permit. Treatment requirements for NJPDES DSW permit are provided in Table 13300-1.
- F. The Contractor shall provide means to clean out the sediment accumulated in the settling tanks and storage tanks, as necessary.

- G. The Contractor shall properly dispose of the waste generated by the temporary water treatment system. The potential wastes include but are not limited to sediment/sludge, used filter bags, and chemical containers.
- H. Instrumentation and controls shall be furnished to provide both automatic and manual operation of the system. The Contractor shall provide process parameters necessary to monitor system performance including flow, pressure, and tank levels. At a minimum, the low and high water levels in the tanks, the differential pressure in the bag filters, the pressure in the optional treatment vessels, the instant flow rate and the total volume of discharged water need to be monitored.
- I. Alarms shall be provided to alert or warn operators of abnormal conditions. Malfunction sensors shall be maintained at critical points in the treatment train to automatically provide a safe shutdown of the system in case of loss of power and during emergency conditions.

1.9 EQUIPMENT PROCESS LAYOUT

- A. All equipment shall be arranged to allow unobstructed access to components requiring operation and maintenance.
- B. The Contractor shall provide removable couplings on piping between each component.
- C. The equipment shall be located such that additional treatment units may be added if necessary to meet the required discharge criteria.
- D. All piping shall be labeled with arrows indicating the direction of the flow.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping:
 - 1. Do not ship materials until submittal is approved by the EPA's Representative.
 - 2. Package and deliver in a manner to exclude all dust, dirt, or deleterious material and to protect particles from physical damage and unsuitable environments.
- B. The Contractor shall arrange for the freight to the site and for on- and off-loading of all system equipment shipped to the site.
- C. To the extent possible, all component equipment of the system shall be delivered to the site on transportable structural steel skids, pre-piped and pre-wired, and ready for hookup.
- D. Delivery date of each system and subsystem shall be relayed to the EPA's Representative at least two working days prior to delivery. The equipment shall be shipped, delivered, handled, stored, and installed in ways that will prevent damage to the items. The equipment shall be shipped with suitable in-transit protection and shall be outfitted with lifting lugs, cleats, or other suitable means for unloading and erecting.
- E. Any damage to the treatment equipment and components during delivery, storage, erection, operation, and maintenance due to mishandling by personnel of the Contractor and/or its subcontractor shall be paid for by the Contractor, at no additional cost to the EPA.

PART 2 - PRODUCTS

2.1 GENERAL

- A. The Contractor shall furnish and install a complete mobile system ready for operation.
- B. Parts shall be amply portioned for stress, which may occur during fabrication, transportation, unloading, erection, and operation. All units and/or parts of the same size shall be identical and interchangeable. The Contractor shall be responsible for all mechanical, electrical design, as well as assembly and related work.
- C. The material of construction or surface coating and paint of all wetted parts of all equipment shall be suitable for the intended purpose and shall not cause loss of system integrity because of the constituents in the influent water.
- D. All units shall be suitable for outdoor use and shall be constructed of corrosion-resistant materials.
- E. Readings from pressure indicators shall be recorded at regular intervals throughout the system to aid in determining the limits of the system prior to failure of any system component due to system loading.

2.2 SUMP PUMPS

- A. The Contractor shall provide the required number of submersible sump pumps to convey the water from excavation sumps, decontamination stations and staging area to the settling tanks. The Contractor shall have at least 2 spare sump pumps per every 10 sump pumps on site to eliminate any downtime caused by pump malfunction.
- B. Each sump pump shall be capable of passing small solids without clogging and undue wear.
- C. Each sump pump shall be connected with flexible hose for easy placement in different areas within the excavation area.
- D. Each pump shall have properly designed mechanical seals for dry running and extra protection against leakage.
- E. Each motor shall be non-overloading at all points on the pump design curve. The motor shaft shall be connected to the pump shaft by a flexible coupling.

2.3 SETTLING/STORAGE TANKS

- A. A minimum of two settling/storage tank(s) per the decontamination stations and additional contingency settling/storage tanks for dewatering shall be provided for the collection, storage and treatment of contact water generated at the site. The settling tanks shall be used for flow equalization and reducing the number of suspended solids in order to protect the other process equipment. The Contractor shall submit the dimensions and overflow rates of the settling tank(s) for approval.
- B. At minimum, the contingency settling/storage tanks shall be able to store the daily volume of approximately 125,000 gallons.
- C. The settling tank(s) may be equipped with “V”-shaped floor and weirs to facilitate collection of the solids and to minimize solids in the tank effluent.
- D. The settling tank(s) shall be properly coated to prevent rust from contacting contaminated water, and exposure to rain and sun.
- E. The tank(s) shall have a manway for operator access.

- F. The tank(s) shall be equipped with a safe work platform on the top and a staircase or ladder.
- G. The side of the tank(s) shall be equipped with an appropriately sized flange and/or valve to facilitate pipe connections. The tank(s) shall have a cover, vacuum breaker, and vent.

2.4 TRANSFER PUMPS

- A. Centrifugal pumps shall be provided as required for transferring fluid within the temporary water treatment system as shown on the Design Drawings and described herein. The centrifugal pumps shall be able to pump up to 260 gpm. For each transferring function, multiple pumps may be used in parallel. The Contractor shall have a spare pump on site to eliminate any downtime caused by pump malfunction.
- B. Each centrifugal pump shall be a horizontal, American National Standards Institute (ANSI) type, single-stage, end-suction water pump coupled to an electric motor by means of a spacer-type coupling with coupling guard.
- C. Each pump casing shall be one piece with a side cover and shall be designed to permit replacement of wearing parts. A minimum of 1/2-inch plugged drains and vents on the pump casing shall be provided.
- D. Pumps shall be capable of pumping the required flow rate at the required head conditions and shall be capable of providing sufficient outlet pressure at the effluent flanges.
- E. The impeller shall be of the type designed for the specific application.
- F. Replaceable mechanical seals shall be rated for the temperature, pressure, and water quality to be pumped in the system. Seals shall prevent leakage of air into the pump, or leakage of water out of the pump.
- G. The motor shall be continuous-duty, electric, totally enclosed fan-cooled (TEFC), squirrel-cage induction type. The motor shall be sized so that when operating at rated speed, the motor cannot be overloaded despite variation in pumping head.
- H. The bearing shall be the manufacturer's standard ball or roller type suitable for the service intended. The bearing shall be oil- or grease-lubricated and provided with all necessary piping and fittings for lubrication and/or cooling.
- I. All wetted parts of the pump shall be constructed with materials suitable for the intended use at the site.

2.5 BAG FILTERS

- A. The bag filters shall be of sufficient capacity to prevent frequent replacements and shall have capacity to handle 100 percent of the peak flow rate (260 gpm). The bag filters shall be installed such that one may be taken off-line for maintenance while the other or others are in operation. Three bag filters will be utilized in series with the anticipated filter size for bag filters as 100 microns, 25 microns and 5 microns. The actual filter size shall be determined during the startup period.
- B. The units shall have a positive seal basket and compression assembly that allows for quick, efficient bag replacement and reduced operating and maintenance costs.
- C. Each bag filter shall be equipped with a differential pressure gauge to monitor the pressure drop across the system. The frequency of bag filter change-out shall be in accordance with the manufacturer's Specifications.

D. The system shall be skid mounted for easy transport and installation.

2.6 OPTIONAL TREATMENT EQUIPMENT

A. Cation Exchange Resin

1. A filtration system shall utilize cation exchange resin to provide inorganics (metals) removal. The Contractor shall propose a cation exchange resin to reduce concentrations to meet discharge criteria.
2. The system shall be skid mounted for easy transport and installation.
3. The sand filters shall be equipped with a differential pressure gauge to monitor the pressure drop across the system.

B. Sand Filters

1. Sand filtration shall be used to treat the water for metals, chemical oxygen demand (COD), biological oxygen demand (BOD) and TSS to meet discharge permit effluent limits. Multiple sand filtration units may be required.
2. Sand filtration systems shall be equipped with an automatic controller to initiate backwashing. The Contractor shall use the water from the settling tank for backwashing. Backwashing frequency shall be conducted in accordance with the manufacturer's Specifications.
3. The system shall be skid mounted for easy transport and installation.
4. The sand filters shall be equipped with a differential pressure gauge to monitor the pressure drop across the system.

C. Liquid Phase Granular Activated Carbon (LGAC)

1. The Contractor shall furnish at least two LGAC adsorption vessels in series to remove organic contaminants (VOCs and/or semi-volatile organic compounds) that may be detected at concentrations requiring treatment of contact water generated during excavation. The LGAC adsorption system shall be capable of removing contaminants to meet the effluent water quality criteria specified in the permit. NJPDES Effluent Standards for Site Remediation Projects are provided in Table 13300-1 for reference.
2. The activated carbon system shall consist of at least two pressure vessels in series. The connecting pipes shall be equipped with quick-connect hoses for change-out of the vessels. The LGAC shall be skid-mounted.
3. The Contractor shall provide the sizing calculations to the EPA's Representative for approval.
4. Each carbon vessel shall be an American Society of Mechanical Engineers (ASME) - coded vessel. All vessels and internal materials of construction shall be corrosion resistant.
5. The activated carbon system shall be furnished complete with vessels, internals, piping, valves, fittings and activated carbon media.
6. Water shall pass through the system influent valves and piping, enter the vessels at the top and flow downward through the LGAC bed. A screened collector system shall be provided to collect the treated water and retain the granular media in the bed. The treated water shall be discharged through the system effluent piping.

D. Filtration System for Inorganics (Metals) Treatment

1. Additional treatment equipment to treat inorganics (primarily metals) may be required based on the metals detected in the influent.

2.7 SLUDGE PUMP

- A. The sludge pump shall be constructed suitable for transferring sludge containing a high percentage of sand and silt and suitable for transferring iron sludge.
- B. The Contractor shall submit the sizing of the sludge pump to the EPA's Representative for approval.

2.8 TREATED WATER DISCHARGE

- A. The Contractor shall provide an effluent discharge line capable of discharging treated effluent from the temporary water treatment system to the dewatering system for final discharge to the bay as per NJPDES/DSW permit equivalent.
- B. The Contractor shall provide all necessary erosion control required for the effluent discharge outfall to the bay as per NJPDES/DSW permit equivalent.
- C. A flow meter and totalizer shall be installed in the effluent line. A sample port shall be provided on the effluent discharge line to obtain samples for compliance.

2.9 SYSTEM PIPING, VALVES AND FITTINGS

- A. The Contractor shall furnish all piping, valves, hoses, and fittings for a complete operational temporary water treatment system. All system piping shall be installed in place with proper supports and anchoring.
- B. Influent and effluent connections shall be terminated as ANSI flanges approximately 12 inches above grade. Generally, valves on lines 3 inches and smaller shall be ball valves; valves on lines greater than 3 inches shall be butterfly valves; and valves on sludge transfer lines shall be plug valves.

PART 3 - EXECUTION

3.1 INSTALLATION AND ERECTION

- A. Install products in accordance with manufacturer's instructions.
- B. All component equipment shall be skid-mounted, pre-piped and pre-wired ready for hookup when possible. The installation of the system equipment shall be in strict accordance with the manufacturer's technical data and printed instructions. Anchor bolts, guy wires, and supporting incidentals shall be furnished as required for proper installation of each component.
- C. The tanks shall be installed in accordance with the manufacturer's provided instructions. Tank mounting and tie-down devices shall be provided as recommended by the manufacturer.
- D. The temporary water treatment system shall be installed within an impermeable containment area with secondary containment of 110% capacity of the largest tank/vessel as shown on the Design Drawings.

3.2 START-UP TESTING

- A. The Contractor shall conduct hydraulic tests on the system once all relevant systems have been documented and accepted by the EPA's Representative as mechanically complete. The Contractor shall perform hydraulic testing at the maximum design flow rate for at least 2 continuous hours. Potable water shall be used for the test, unless otherwise approved by the EPA's Representative. During the testing, the Contractor shall inspect all temporary water treatment system components, including tanks, pumps,

pipings, valves, meters, level controls, and connections, to confirm that no system components leak and that all system components perform correctly. Any leaks or other deficiencies observed during the testing shall be repaired and the temporary water treatment system shall be retested after repairs. The hydraulic testing shall not be deemed complete until the entire temporary water treatment system has operated under normal operating conditions without any leaks or other deficiencies for at least 2 consecutive hours.

- B. Once the system has been determined to be operating to the satisfaction of the EPA's Representative, testing shall be performed with water from the excavation dewatering to confirm that the system is capable of consistently meeting the effluent discharge criteria included under Table 13300-1 under normal operations and as specified in the NJPDES DSW permit. This will be determined through the collection and analysis of effluent samples from a sample port on the effluent discharge line which will be analyzed in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL. System effluent shall be collected and discharged back into the storage/holding tank(s) until the Contractor has demonstrated that the system meets the effluent discharge criteria. System effluent shall not be discharged until approved by the EPA's Representative.

3.3 OPERATION AND MAINTENANCE

- A. The Contractor shall provide and maintain all personnel, equipment, and materials necessary for the operation and maintenance of the temporary water treatment system. The system shall be operated in strict accordance with the equipment manufacturers' Specifications and in accordance with the Contractor's approved plan.

3.4 SAMPLING AND ANALYSIS

- A. Sampling during startup testing shall be performed daily and during full operation sampling shall be performed as specified in the NJPDES DSW permit. All samples shall be analyzed in accordance with SECTION 01450 – CHEMICAL DATA QUALITY CONTROL.
- B. Compliance sampling shall be conducted as follows:
 - 1. The Contractor shall collect one effluent sample from each storage tank designated to collect contact water. The water from storage tanks will be directed to the dewatering system for discharge to the bay if the water meets the NJPDES DSW permit requirements for discharge based on the test results.
 - 2. The Contractor shall treat the water via filtration system to remove suspended solids if the water from storage tanks does not meet the NJPDES DSW permit requirements for discharge.
 - 3. The Contractor shall collect one effluent sample per every 21,000 gallons of water treated at the end of the bag filtration system and analyzed.
 - 4. The treated water from filtration system will be directed to the dewatering system for discharge to the bay if the water meets the NJPDES DSW permit requirements for discharge based on the test results.
 - 5. The Contractor shall further treat the water via ion exchange or liquid GAC system if the water from the filtration system does not meet the NJPDES DSW permit requirements for discharge.

3.5 DISPOSAL OF RESIDUES

- A. All process-derived wastes (e.g., settling tank sediments and bag filters) shall be mixed with the contaminated soil/sediment and disposed of at an approved off-site disposal

facility in accordance with SECTION 02120 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL. Spent GAC from the temporary water treatment system LGAC units that passes Toxicity Characteristic Leaching Procedure (TCLP) testing shall be considered non-hazardous and shall be recycled at an approved carbon generation facility. Spent GAC that fails TCLP testing shall be mixed with the contaminated soil and disposed of at an approved off-site disposal facility.

END OF SECTION

Table 13300-1
Influent Water Quality Estimates and Effluent Criteria

Parameter	Unit	Influent Concentration ³		NJPDES Monthly Average Limit ⁴	NJPDES Daily Max Limit ⁴
		Surface Water ¹	Groundwater ²		
VOCs					
Acrolein	µg/l	N/A	N/A	NC	100
Acrylonitrile	µg/l	N/A	N/A	NC	50
Benzene	µg/l	0.5	0.5	37	136
Bromoform	µg/l	0.5	0.5	29	58
Carbon Tetrachloride	µg/l	0.5	0.5	NC	8.8
Chlorobenzene	µg/l	0.5	0.5	15	28
Chlorodibromomethane	µg/l	N/A	NA	NC	14
Chloroethane	µg/l	0.5	0.5	104	268
Chloroform	µg/l	0.5	0.5	21	46
Dichlorobromomethane	µg/l	0.5	NA	NC	12
1,1-Dichloroethane	µg/l	0.5	0.5	22	59
1,2-Dichloroethane	µg/l	0.5	0.5	68	211
1,1-Dichloroethylene	µg/l	0.5	0.5	16	25
1,2-Dichloropropane	µg/l	0.5	0.5	153	230
1,3-Dichloropropylene	µg/l	N/A	N/A	29	44
Ethylbenzene	µg/l	0.55	0.5	32	108
Methyl Bromide	µg/l	N/A	N/A	20	40
Methyl Chloride	µg/l	N/A	N/A	86	190
Methylene Chloride	µg/l	0.5	0.5	40	89
1,1,2,2-Tetrachloroethane	µg/l	0.5	0.5	NC	10
Tetrachloroethylene	µg/l	0.5	3.8	22	56
Toluene	µg/l	2.4	0.5	26	80
1,2-Trans-Dichloroethylene	µg/l	N/A	N/A	21	54
1,1,1-Trichloroethane	µg/l	0.5	0.5	21	54
1,1,2-Trichloroethane	µg/l	0.5	0.5	21	54
Trichloroethylene	µg/l	0.5	0.5	21	54
Vinyl Chloride	µg/l	0.5	0.5	104	268
2-Chlorophenol	µg/l	5	5	31	98
2,4-Dichlorophenol	µg/l	5	5	39	112
2,4-Dimethylphenol	µg/l	5	5	18	36
4,6-Dinitro-O-Cresol	µg/l	N/A	N/A	78	277
2,4-Dinitrophenol	µg/l	10	10	71	123
2-Nitrophenol	µg/l	5	5	41	69

Parameter	Unit	Influent Concentration ³		NJPDES Monthly Average Limit ⁴	NJPDES Daily Max Limit ⁴
		Surface Water ¹	Groundwater ²		
4-Nitrophenol	µg/l	10	10	72	124
Pentachlorophenol	µg/l	10	10	NC	30
Phenol	µg/l	5	5	15	26
2,4,6-Trichlorophenol	µg/l	0.58	5	NC	20
SVOCs					
Anthracene	µg/l	5	5	22	59
Benidine	µg/l	N/A	NA	NC	50
Benzo (a) Anthracene	µg/l	5	5	NC	10
Benzo (a) Pyrene	µg/l	5	5	NC	20
Benzo(b)fluoranthene	µg/l	5	5	NC	10
Benzo (k) Fluoranthene	µg/l	5	5	NC	20
Bis (2-Chloroethyl) Ether	µg/l	5	5	NC	10
Bis (2-Chloroisopropyl) Ether	µg/l	5	5	301	757
Bis (2-Ethylhexyl) Phthalate	µg/l	5	5	59	118
Butyl Benzyl Phthalate	µg/l	N/A	5	NC	24
Chrysene	µg/l	5	5	NC	20
Dibenzo (a, h) Anthracene	µg/l	5	5	NC	20
1,2-Dichlorobenzene	µg/l	0.5	0.5	77	163
1,3-Dichlorobenzene	µg/l	0.5	0.5	31	44
1,4-Dichlorobenzene	µg/l	0.5	0.5	NC	28
3,3'-Dichlorobenzidine	µg/l	5	5	NC	60
Diethyl Phthalate	µg/l	5	5	81	203
Dimethyl Phthalate	µg/l	5	5	19	47
Di-N-Butyl Phthalate	µg/l	5	5	27	57
2,4-Dinitrotoluene	µg/l	5	0.5	NC	18.2
2,6-Dinitrotoluene	µg/l	5	5	255	641
Fluoranthene	µg/l	5	5	25	68
Fluorene	µg/l	5	5	22	59
Hexachlorobenzene	µg/l	5	5	NC	10
Hexachlorobutadiene	µg/l	5	0.5	20	49
Hexachlorocyclopentadiene	µg/l	5	5	NC	1800
Hexachloroethane	µg/l	5	5	21	54
Indeno (1,2,3-cd) Pyrene	µg/l	5	5	NC	20
Isophorone	µg/l	5	5	NC	20
Naphthalene	µg/l	5	5	22	59
Nitrobenzene	µg/l	5	5	27	68
N-Nitrosodimethylamine	µg/l	N/A	N/A	NC	20

Parameter	Unit	Influent Concentration ³		NJPDES Monthly Average Limit ⁴	NJPDES Daily Max Limit ⁴
		Surface Water ¹	Groundwater ²		
N-Nitrosodiphenylamine	µg/l	5	5	NC	20
Phenanthrene	µg/l	5	5	22	59
Pyrene	µg/l	5	5	25	67
1,2,4-Trichlorobenzene	µg/l	0.5	0.5	68	140
Inorganic Compounds (Metals)					
Aluminum	µg/l	5890	8360	NC	NC
Antimony	µg/l	60	5.4	NC	NC
Arsenic	µg/l	36.2	10	50	100
Barium	µg/l	200	421	NC	NC
Beryllium	µg/l	5	5.7	NC	NC
Cadmium	µg/l	5	3.2	50	100
Calcium	µg/l	230000	186000	NC	NC
Chromium	µg/l	25	162	50	100
Cobalt	µg/l	50	39.3	NC	NC
Copper	µg/l	82.6	41	50	100
Iron	µg/l	19300	84300	1000	2000
Lead	µg/l	1780	107	50	100
Magnesium	µg/l	714000	502000	NC	NC
Manganese	µg/l	382	2060	NC	NC
Mercury	µg/l	0.13	0.2	NC	1
Nickel	µg/l	50	214	72	144
Potassium	µg/l	367000	153000	NC	NC
Selenium	µg/l	35	35	50	100
Silver	µg/l	10	10	25	50
Sodium	µg/l	6050000	4420000	NC	NC
Thallium	µg/l	25	25	100	200
Vanadium	µg/l	53.8	50	NC	NC
Zinc	µg/l	278	107	100	200
Groundwater Wet Chemistry					
Alkalinity as CaCO ₃	mg/l	N/A	26	NC	NC
Total Organic Carbon	mg/l	N/A	N/A	30	45
Biochemical Oxygen Demand	mg/l	N/A	NA	30	45
Chemical Oxygen Demand	mg/l	N/A	NA	60	90
Total Dissolved Solids	mg/l	N/A	N/A	500 5	500 5
Total Suspended Solids	mg/l	55	N/A	30	45

Parameter	Unit	Influent Concentration ³		NJPDES	NJPDES
		Surface Water ¹	Groundwater ²	Monthly Average Limit ⁴	Daily Max Limit ⁴
Sulfate	mg/l	N/A	610	250 ⁵	250 ⁵
pH	SU	8.24	N/A	6-9	6-9

Notes:

1 - Maximum analyte concentration used for surface water samples collected from locations in Area 1 and 2.

2 - Maximum analyte concentration used for groundwater samples collected from monitoring wells MW-6S/6D and MW-10S/D - Influent concentrations are based on prior sampling performed at the site.

4 - NJPDES effluent standards for site remediation project for SC, SE Water per NJAC 7:14A:12: Appendix B

5 - Effluent standards for water quality parameters are listed from NJDEP standards for FW2 surface water per NJAC 7:9B because these parameters are not listed in NJAC 7:14A:12: Appendix B

µg/l – microgram per liter

mg/l – milligram per liter

NA – Analyte not analyzed or data not available due to rejected "R" flag for the analyte concentrations

NC – Analyte criteria not available

NJAC – New Jersey Administrative Code

NJDEP – New Jersey Department of Environmental Protection

NJPDES – New Jersey Pollutant Discharge Elimination System

SU – standard unit