RETURN TO SER AR INDEX

| EPA Draft Determination Condition Compliance Within Specifications (Highlighted in Yellow within Specification Section Noted) | Location Within Specifications Addressed |
|---|---|
| 1). Silt curtains must be used around blast areas, as well as non-explosive noise techniques to move fish from the immediate blast zone. | Section 02900 |
| 2). Appendix C Water Quality Standards, if exceeded, engineering controls that, at a minimum, will include use of silt curtains and absorbent booms will be implemented. If still exceeded, work will stop until the problem is addressed in a way to prevent further exceedances. | Section 01135 |
| 3). Best management practices, such as keeping exposed soil surfaces treated or wet, covering soil piles and unconsolidated materials when not in use, and providing enclosed areas for fine materials will be included for dust suppression. | Section 01135 |
| 4). Prior to the start of construction, paleosol areas will be marked and no equipment will be allowed within or floating above this area. No dredging or other work activities will take place within 100 feet of this area without temporary excavation support (sheet piling). | Section 02850 |
| 5). Decontamination area shall have a polyethylene liner and will be established near the construction entrance. Hay bales and silt fencing will be placed downgradient from the decontamination area. | Section 01355 |
| 6). Soil piles with slopes greater than 10% will be surrounded by a berm and swale system. | Section 01355 |
| 7). On behalf of MassDEP, the contractor shall employ an "Environmental Monitor" , who shall verify the placement and performance of erosion/sediment/turbidity control measures and shall have the authority to halt construction for erosion control purposes or for other threats to public health, safety or the environment. The EM will submit bi-weekly reports to MassDEP. The EM is designated to prepare and submit a baseline condition report, and annual condition reports for a period of five years associated with the salt marsh area construction. EPA will also include conditions related to the use of an Environmental Monitor for the duration of the construction. | Section 01355 |
| 8). Stationary emergency or standby engine installed at the site shall comply with the requirements of 310 CMR 7.02(8)(i) and 310 CMR 7.26(40) and (44) as applicable. Any engine that is mobile in nature shall comply with federal standards with regard to limitation on the sulfur content of fuel.<br><br>Need to include requirements for the contractor to use diesel oxidation catalyst retro-fitted vehicles and equipment. MassDEP should be referred to for retrofitting guidance. Federal off-road diesel emission standards, including the use of ultra low sulfur diesel fuel (15 ppm sulfur content) in all diesel diesel engine powered equipment. All equipment shall meet the Tier 1-3 emission standards for off-road diesel equipment and to the extent practicable; all diesel powered equipment | Section 01355 |



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| EPA Draft Determination Condition Compliance Within Specifications (Highlighted in Yellow within Specification Section Noted) | Location Within Specifications Addressed |
|---|---|
| shall meet the Tier 4 emission standards (the final deadline for which is 2015), per 40 CFR Part 89.<br><br>Diesel powered equipment shall be fitted with after-engine emissions controls such as oxidation catalysts or particulate filters. | |
| 9.) Blasting/dredging/disposal requirements:<br>a). All blasting shall be conducted using inserted delays of a fraction of a second per hole, and<br>b). stemming, in which rock is placed into the top of the borehole to damp the shock wave reaching the water column, thereby reducing fish mortalities from blasting.<br>c). All blasting operations are contingent upon using sonar, and with a fisheries observer present who is approved by the Massachusetts Division of Marine Fisheries (and National Marine Fisheries).<br>d). There shall be no blasting during passage of schools of fish or when a marine mammal is present as determined by the fisheries observer.<br>e). Blasting activities shall be conducted with fish startle systems.<br>f). Blasting shall only be conducted in the time period from November to February.<br>g). Monitoring of potential fish mortality is required for each blast. If excessive mortalities (hundreds of fish/event) occur, then additional technologies, such as fish startle systems or bubble curtains, may also be considered for use. | Section 02900 |
| 10. Dredging will be done using an environmental bucket and appropriate containment devices, such as silt curtains. | Section 01135 |
| 11. The selected contractor for the upland area PCB remediation work shall submit a contractor work plan describing the containment and air monitoring that will be employed during PCB remedial activities, including but not limited to site control, excavation, handling, storage, and disposal activities. At a minimum, the air monitoring plan and action levels for the project shall include the procedures and performance standards contained in Attachment 6 of this TSCA determination. (Attachment 6 may also be found at Appendix A to EPA's Draft Determination.) This work plan should also include information on how and where all PCB-contaminated wastes (both < 25 ppm and > 25 ppm) will be stored, how stormwater controls and runoff will be managed, and on how field equipment will be decontaminated. | Section 02111 |
| 12. Identified PCB-contaminated soils with > 25 ppm shall be excavated and disposed off-site at a TSCA-approved facility or a RCRA-hazardous waste landfill as required under § 761.61(b). Confirmatory sampling shall be conducted in accordance With 40 CFR Part 761, Subpart O to document that all PCBs with > 25 ppm have been removed. The locations of these PCB-contaminated soil areas are identified in Attachment 7. | Section 02111 |
| 13. In the event it is determined that soils that are deemed to be "upland geotechnically unsuitable" must be removed and | Section 02111 |

| EPA Draft Determination Condition Compliance Within Specifications (Highlighted in Yellow within Specification Section Noted) | Location Within Specifications Addressed |
|---|---|
| disposed off-site, the contractor shall submit a sampling and analysis plan for characterization of these soils to EPA for review and approval, unless characterization data exists which documents the PCB concentrations in the soils. If PCB concentrations in these soils are determined to be greater than (>) 1 ppm but less than (<) 50 parts per million (ppm), EPA approval will be required for disposal of these soils. If PCB concentrations are determined to be greater than or equal to (>) 50 ppm, the soils shall be disposed of in accordance with 40 CFR § 761.61(b). | |
| 14. Compliance with the PCB regulations at 40 CFR Part 761 is maintained during all phases of work involving PCB-contaminated soils and/or sediments, including but not limited to:<br>a. 40 CFR § 761 Subpart C - Marking of PCBs and PCB Items<br>b. 40 CFR §761.65-Storage for Disposal<br>c. 40 CFR § 761.79 - Decontamination Standards and Procedures<br>d. 40 CFR §761.180-Records and Monitoring<br>e. 40 CFR § 761 Subpart K, PCB Waste Disposal Records and Reports | Section 02111 |

# SECTION 01135

# WATER QUALITY MONITORING AND CONTROL

## PART 1 GENERAL

### 1.1 APPLICABLE REGULATORY STANDARDS

As part of the State Enhanced Remedy (SER), Performance Standards were established which follow the guidelines of the Massachusetts Department of Environmental Protection (MADEP) Water Quality Program Standards. The Performance Standards are included in the Attachments to Section 00800 SUPPLEMENTARY CONDITIONS. In addition, the Contractor shall comply with the Final Determination issued by USEPA in conjunction with this project. Although the Final Determination has not yet been issued by EPA, a Draft Determination titled, “Draft Determination for the Proposed South Terminal Project, USEPA, 7-16-12” is attached to Section 00800 SUPPLEMENTARY CONDITIONS. Available information associated with the permitting application with USEPA, the USEPA Draft Determination, and USEPA Final Determination process may be located at the following website:

http://www.mass.gov/eea/ocean-coastal-management/serth/

### 1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01300 SUBMITTAL PROCEDURES:

Enclosed Bucket Performance Data:

Submit demonstrated capability of the enclosed bucket to meet the specified water quality performance standards.

Contingency Plan:

The Contractor shall submit for review and approval a Contingency Plan as specified in this section and which meets the requirements of the Performance Standards, the USEPA Final Determination, and Contract Documents. The Plan shall address mitigation measures to be taken if water quality performance standards are exceeded during either upland filling, rock removal operations (including blasting, if selected as an alternate bid item by the Owner), cofferdam installation, capping, dredging or disposal operations, and related activities. The Contingency Plan shall detail specific actions to be taken by the Contractor, and the order in which they shall be employed in the event of a water quality exceedance. Such actions shall be in addition to the controls required by the Contract Documents. Contingency measures may consist of additional operational controls,

events, or combinations thereof, as necessary to achieve water quality criteria. At a minimum, the Contractor’s Contingency Plan shall include the utilization of silt curtains to encircle each filling area (including the bulkhead if filling is to take place before an area behind the bulkhead is

capping area, or disposal area, should operations in any or all of these

locations result in an exceedances in the Performance Standards or in the conditions within the USEPA Final Determination and shall also include the total halt of work as a final measure after all other contingency measures have been attempted. The submittal shall include a written description of each contingency measure as well as a proposed layout plan, if appropriate. The submittal shall include details of materials, equipment, and operational controls required for each contingency measure. The Contingency Plan will be submitted to the Owner's Representative for review and approval prior to initiation of dredging activity. The Contractor shall amend his/her contingency plan to take account of any recommended modifications.

## 1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Additional requirements relative to water quality monitoring and control including submittal of a Dredge Plan are specified in Section 02482 DREDGING.

B. Additional requirements relative to water quality monitoring and control are specified in Section 01355 ENVIRONMENTAL PROTECTION.

C. Additional requirements relative to water quality monitoring and control are specified in State Enhanced Remedy – Performance Standards in Attachments to Section 00800 SUPPLEMENTARY CONDITIONS.

D. Additional requirements relative to water quality monitoring and control are specified in the USEPA Final Determination. Although the Final Determination has not yet been issued by EPA, a Draft Determination titled, “Draft Determination for the Proposed South Terminal Project, USEPA, 7-16-12” is attached to Section 00800 SUPPLEMENTARY CONDITIONS.

## 1.4 GENERAL

The Performance Standards established under the SER are set forth in this and other sections of these specifications. The referenced documents shall not be relied in concert with the specifications and plans for contract requirements. In the event a discrepancy is discovered between the SER Performance Standards and these specifications or the contract drawings, the Contractor shall notify the Owner's Representative for clarification.

The Final Determination issued by USEPA are set forth in this and other sections of these specifications. The referenced documents shall not be relied in concert with the specifications and plans for contract requirements. In the event a discrepancy is discovered between the Final Determination issued by USEPA and these specifications or the contract drawings, the Contractor shall notify the Owner's Representative for clarification.

## 1.5 SCOPE OF WORK

### 1.5.1 General Requirements

The Contractor shall perform all activities related to dredging and disposal required by this contract in such a manner as to minimize adverse impacts to water quality. The Contractor shall plan dredging and disposal activities, select and operate equipment in such a manner as to minimize the re-

suspension of silt, clay, oil, grease, and other fine particulate matter and floatable materials. This may include changes in dredging and disposal operations such as delaying disposal activities until certain tide conditions occur.

1.5.2 Division of Responsibilities

1.5.2.1 General

The Contractor is solely responsible for maintenance of water quality criteria established in this specification while prosecuting the work required by the Contract.

1.5.2.2 Water Quality Monitoring

The Owner’s Representative will be responsible for water quality sampling and testing required for monitoring the Contractor's dredging activities. The Contractor shall fully cooperate in every way with these activities. The Contractor shall provide access to the work and prior notification of the schedule for all dredge and disposal activities potentially subject to water quality monitoring. The Owner’s Representative will independently tabulate, plot and interpret the monitoring data and laboratory test results. The data acquired by the Owner’s Representative will be made available to the Contractor upon request in a timely manner for his/her independent assessment. At no cost to the Owner, the Contractor may observe the Owner's Representative's sampling activities, and may take supplementary samples and perform independent testing. The Contractor shall obtain additional data as the Contractor may consider necessary to monitor construction performance and safety aspects of the work, at no cost to the Owner.

1.5.2.3 Contract Administration Actions

Except as otherwise specified in this section, the Owner’s Representative, in concert with the Massachusetts Department of Environmental Protection (MADEP) SER Project Manager, will be responsible for contract administration actions relative to water quality monitoring. The Owner’s Representative will require the initiation of the mitigation measures by the Contractor found in the Contingency Plan if water quality criteria are exceeded. The Contractor is required to have all materials, equipment and labor necessary for implementation of mitigation measures as detailed in the approved Contingency Plan, available at the job site in advance of commencement of dredging activities. Contractor failure to implement the Contingency Plan when directed by the Owner's Representative and/or the MADEP SER Project Manager shall result in issuance of a stop work order, which will continue in effect until such time as mitigation measures are employed. Issuance of a stop work order shall not relieve the Contractor of his/her obligations to achieve Mandatory Schedule Milestones and associated liquidated damages related to the same.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 DREDGING REQUIREMENTS

### 3.1.1 Enclosed Bucket

Dredging of Maintenance Material (as defined in Section 02482 DREDGING) shall be done using a closed, environmental, clamshell bucket. At a minimum, an enclosed bucket shall be utilized for material removed as shown on the following plans: “P-2.1 TOP OF DREDGE FOOTPRINT PLAN 1”, “P-2.2 TOP OF DREDGE FOOTPRINT PLAN 2”, “P-3.1 TOP OF CAD #3”, “P-2.7 GIFFORD STREET CHANNEL DREDGE”, and “P-2.8 MOORING MITIGATION AREA PLAN”. The dredge bucket shall be designed to completely enclose the dredged sediment and water captured. The dredge bucket shall demonstrate the capability of meeting the water quality performance standards specified in this section. A conventional bucket may be used to dredge maintenance material if it can be demonstrated that water quality performance standards are not exceeded when using a conventional bucket. Hydraulic dredging methods may not be used for dredging of Maintenance Material, or material removed as shown on the Top of Dredge Footprint Plans or the Top of CAD Cell #3 Plan, if the dredged material is to be placed within CAD Cell #2 or CAD Cell #3. An enclosed bucket must be maintained at the site in the event of water quality exceedances.

### 3.1.2 Bucket Control

The Contractor shall demonstrate that the dredge operator has sufficient control over bucket depth in the water and bucket closure so that sediment re-suspension from bucket contact with the bottom and due to bucket over-filling can be minimized at the same time minimizing the amount of free water contained in the bucket.

### 3.1.3 Hydraulic Dredge Performance

Hydraulic Dredging may be utilized by the Contractor for capping purposes, for transporting sediment to upland locations. Hydraulic dredging shall not be utilized by the Contractor to transport any material that is ultimately intended to be disposed of within CAD Cell #2 or CAD Cell #3. The Contractor shall demonstrate that the hydraulic dredge operator has sufficient control of the dredgehead in the depth in the water and the ability to reduce sediment re-suspension and material loss. Hydraulic dredging methods may not be used for dredging of Maintenance Material, or material removed as shown on the Top of Dredge Footprint Plans or the Top of CAD Cell #3 Plan, if the dredged material is to be placed within CAD Cell #2 or CAD Cell #3.

### 3.1.4 Silt Curtains

Silt-curtains and absorbent booms shall be deployed to enclose the bulkhead, dredging and disposal areas in order to minimize adverse impacts to water quality as outlined within the specifications, and shall be included within the Contractor’s Contingency Plan as an item to be implemented should the Performance Standards be exceeded. If the Contractor plans to begin filling behind the bulkhead prior to completing the construction of the cofferdam, the Contractor shall utilize silt curtains between the completed bulkhead sections and the shoreline or other enclosed bulkhead sections to minimize impacts from turbidity generated during filling operations and various weather conditions. The Contractor shall use silt curtains around any area planned for rock removal operations of any type.

The Contractor shall further note that all in-water operations including, but not limited to: bulkhead installation, filling, dredging, rock removal, capping and disposal operations (except as noted within offshore disposal permits to RISDS and/or CCDS) shall all be conducted utilizing silt curtains surrounding any of the previously listed operations for the bulkhead installation, filling, capping, rock removal, dredging and disposal

Plans and a written description indicating layout and details of equipment and procedures for deployment of silt curtains and oil absorbent booms shall be submitted as part of the work plan as specified in Section 02482 DREDGING.

3.1.5 Debris Management Plan

The Contractor shall follow an approved Debris Management Plan as specified in Section 02482 DREDGING. Where pilings or other debris is found to interfere with the enclosed bucket closure or equipment operation, a conventional bucket may be used to extract pilings or debris. Abandoned piles shall be cut or broken off rather than extracted, where applicable. Sediment removal during such activity shall be minimized to the greatest extent practicable.

3.1.6 Release of Oily Material

All and every reasonable attempt must be made by the Contractor to minimize the release of oily material from the sediment during dredging. All oily material released during dredging or other project activity shall be promptly collected and disposed at a licensed facility.

3.1.7 Discharge of Sediment

All barges or scows used shall be in good operating condition and shall completely contain the sediment and water placed in them to prevent discharge of sediment or water. Deck barges shall not be used to contain dredged sediments unless approval to do so has been granted by the Owner’s Representative. The Owner’s Representative will consider the use of deck barges for capping operations if proposed by the Contractor. If the Contractor has obtained approval to use deck barges, the barge must be modified to provide for complete containment of the sediments and associated free water.

3.2 WATER COLUMN MONITORING - REFERENCE DATA

Reference water column data will be collected by the Owner’s Representative prior to initiation of dredging, capping, construction, or rock removal activities. Samples will be collected from the reference locations and analyzed for the following parameters: dissolved metals (arsenic, cadmium, copper, chromium, lead, mercury, nickel, zinc) and PCBs, as well as total suspended solids (TSS), turbidity and dissolved oxygen (DO). Upon request, results will be made available to the Contractor for his/her independent assessment. The Contractor may obtain supplementary samples and laboratory analyses at the Contractor's discretion, at no additional cost to the Owner.

3.3 WATER COLUMN MONITORING - IN-WATER CONTRACTOR OPERATIONS

### 3.3.1 Turbidity Monitoring

Turbidity will be measured utilizing an optical backscatter sensor at three depths within the water column at each location: near the surface, mid-depth, and near the bottom. The three measurements will be averaged together to obtain a single representative value for comparison purposes. Turbidity measured at the down-current location which exceeds the up-current reference by the following values in two consecutive monitoring events shall be considered an exceedance:

When silt curtains are deployed:

| Reference Site Turbidity (NTUs) | Permissible Turbidity Increase |
|---|---|
| <10 | Reference plus 20 NTUs |
| 11-20 | Reference plus 15 NTUs |
| >21 | Reference plus 30% of reference |

When silt curtains are not deployed:

| Reference Site Turbidity (NTUs) | Permissible Turbidity Increase |
|---|---|
| <10 | Reference plus 20 NTUs |
| 11-20 | Reference plus 15 NTUs |
| 21-30 | Reference plus 10 NTUs |
| >31 | Reference plus 30% of reference |

An exceedance will trigger collection of water column samples for analyses, as described below in Subpart 3.3.3.

### 3.3.2 Sample Locations and Depths

Two locations will be selected for turbidity monitoring: a reference location will be selected approximately 200 ft up current from the dredging, capping, construction, or rock removal activity, and a monitoring location shall be established 200 feet down-current from the dredging, capping, construction, or rock removal operation (if silt curtains are deployed, a monitoring location shall be established outside of and within fifteen (15) feet of the silt curtain). If results of turbidity monitoring indicate an exceedance of the permissible turbidity increase, sampling will be performed by the Owner's Representative for water column monitoring of the dredging, capping, construction, or rock removal operation. Water samples, composited over the entire water column, will be collected from both the monitoring and reference sites and submitted for analysis, as described below in Subpart 3.3.3.

### 3.3.3 Sample Frequency and Analytical Parameters

On the first day of dredging, capping, construction, or rock removal, turbidity monitoring will be performed by the Owner's Representative prior to the start of dredging and every two (2) hours during the initiation of dredging operations. Turbidity monitoring will be performed in the same manner for the first three (3) of dredging, capping, construction, or rock removal and at least two (2) days per week thereafter until the conclusion of the project. This monitoring schedule may be less frequent if in-water dredging, capping, construction, or rock removal activities do not occur on a daily basis or are otherwise suspended during the course of the project.

The exact schedule of monitoring activities will be determined by the Owner's Representative in consideration of the Contractor's proposed daily schedule of operations, progress of work, and if any changes in dredging, capping, construction, or rock removal procedures and/or equipment occurs. Frequency of subsequent monitoring will be established by the Owner's representative based on review of monitoring and sampling data and relative compliance with the SER Performance Standards. The Contractor will not be consulted in the scheduling process or notified prior to a monitoring event.

If a turbidity exceedance occurs, water column samples, composited over the entire water column, will be collected from both the monitoring and reference sites by the Owner's representative and submitted for analysis at a certified laboratory for the following analyses: TSS, DO, TPH, pH, PCBs and selected dissolved and/or total metals.

## 3.4 DREDGE MATERIAL FREE LIQUID DISCHARGE MONITORING

Standing water or free liquid removed from scows before disposal shall be pumped through a sand media filter or equivalent approved by the Owner’s Representative prior to discharge into the harbor. The discharge effluent from the filter will be monitored for turbidity periodically by the Owner’s Representative. It is the Contractor’s responsibility to assure that the discharge has a turbidity of less than 50 NTUs and that the pH for such liquid is no less than 6.5 and no greater than 8.5. The Owner’s Representative will perform turbidity monitoring on effluent discharge during the first discharge event and subsequently as determined by the Owner’s Representative. Contractor must provide a sampling port or other suitable sampling mechanism to facilitate Owner’s Representative sampling of the discharge. Monitoring of the discharge will also occur if any changes to the discharge procedures and/or equipment are implemented. If the turbidity monitoring of the discharge liquid exceeds 50 NTUs, the Contractor will stop discharging filtrate effluent until the Contractor demonstrates that turbidity of the discharge can be controlled within required limits.

## 3.5 BULKHEAD OR UPLAND DEWATERING LIQUIDS DISCHARGE MONITORING

Standing water, stormwater, or dewatering fluids removed from either within the cofferdams or from the upland area of the site, or from the dredge spoils dewatering areas shall be pumped through a treatment system approved by the Owner’s Representative prior to discharge into the harbor. The discharge effluent from the system will be monitored for turbidity periodically by the Owner’s Representative. It is the Contractor’s responsibility to assure that the discharge has a turbidity of less than 50 NTUs. The Owner’s Representative will perform turbidity monitoring on effluent discharge during the first discharge event and subsequently as determined by the Owner’s Representative. Contractor must provide a sampling port or other suitable sampling mechanism to facilitate Owner’s Representative sampling of the discharge. Monitoring of the discharge will also occur if any changes to the discharge procedures and/or equipment are implemented. If the turbidity monitoring of the discharge liquid exceeds 50 NTUs, the Contractor will stop discharging filtrate effluent until the Contractor demonstrates that turbidity of the discharge can be controlled within required limits.

For treatment of liquids recovered when dewatering contaminated soil or contaminated sediment on land, the treatment system utilized by the

Contractor shall be capable of removing all dissolved or suspended contaminants prior to discharge, and meeting NPDES or septic system acceptance criteria, as necessary. The Contractor shall be responsible for obtaining any necessary discharge permits associated with discharge of treated dewatering liquids.

## 3.6 EXCEEDANCES OF WATER QUALITY PROGRAM STANDARDS

### 3.6.1 Water Quality Program Standards

In consideration of the elevated levels of contaminants of concern present in the sediment within the project site, the SER has established site-specific water quality criteria as a dredging performance standard. Dredging performance relative to water quality will be evaluated by comparing laboratory analytical data for the individual parameters of concern from the down current samples with the reference, or up current sample data for each sampling round.

An exceedance of project water quality standards shall be attributed to project activities when turbidity measured at the down-current location which exceeds the up-current reference in two consecutive monitoring events according to the values stated above in Subpart 3.3.1.

### 3.6.2 Confirmatory Samples

If water samples, composited over the entire water column, collected as described above in response to an exceedance fail to meet water quality standards and can be attributed to project activities as specified above, confirmatory samples shall be obtained by the Owner's Representative under similar conditions within 24 hours after the laboratory provides the results of the first set of samples. The confirmatory samples shall be analyzed for the parameter(s) of concern.

### 3.6.3 Implementation of Contingency Plan

If confirmatory water samples collected in accordance with Subpart 3.6.2 - Confirmatory Samples above fails to meet water quality performance standards as specified above in Subpart 3.6.1 - Water Quality Program Standards, the Contractor shall immediately implement the mitigation measures included in the Contingency Plan as appropriate and as pre-approved by the Owner's Representative. If the Contractor does not follow the instruction of the Owner’s Representative to immediately implement the Contingency Plan, all dredging and/or disposal, construction, rock removal, or capping activities in the affected work area shall cease. Affected activities shall not resume until the Contractor has implemented the mitigation measures included in the Contingency Plan as appropriate and as pre-approved by the Owner’s Representative, or presents an alternative proposal that is provided to and approved by the Owner’s Representative, which shall then be immediately implemented. (Refer to Subpart 1.5.2.3 – Contract Administration Actions as stated above.)

If, after the Contractor has implemented some of the mitigation measures included in the Contingency Plan, and additional water samples collected in accordance with Subpart 3.6.2 - Confirmatory Samples above fails to meet water quality performance standards as specified above in Subpart 3.6.1 -

additional mitigation measures included in the Contingency Plan, as

If, after the Contractor has implemented all possible mitigation measures included in the Contingency Plan, and additional water samples collected in accordance with Subpart 3.6.2 - Confirmatory Samples above again fails to meet water quality performance standards as specified above in Subpart 3.6.1 - Water Quality Program Standards, all dredging and/or disposal, construction, rock removal, or capping activities in the affected work area shall cease. Affected activities shall not resume until the Contractor presented an additional proposal that is provided to and approved by the Owner's Representative, which shall then be immediately implemented.

-- End of Section --

# SECTION 01355

# ENVIRONMENTAL PROTECTION

## PART 1 GENERAL

### 1.1 REFERENCES

The publications listed below are incorporated into these Technical Specifications by reference. The publications are referred to in the text by basic designation only.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

| | |
|---|---|
| 33 CFR 328 | Definitions |
| 40 CFR 68 | Chemical Accident Prevention Provisions |
| 40 CFR 129 | Toxic Pollutant Effluent Standards |
| 40 CFR 260 | Hazardous Waste Management System: General |
| 40 CFR 261 | Identification and Listing of Hazardous Waste |
| 40 CFR 302 | Designation, Reportable Quantities, and Notification |
| 40 CFR 355 | Emergency Planning and Notification |
| 49 CFR 171 - 178 | Hazardous Materials Regulations |

### 1.2 DEFINITIONS

#### 1.2.1 Environmental Pollution

Environmental pollution 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.

#### 1.2.2 Environmental Protection

Environmental protection is the prevention/control of environmental pollution and habitat disruption that may occur to the environment during the Work. The control of environmental pollution 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.

#### 1.2.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of Hazardous Wastes as defined by MassDEP regulation 310 CMR 30. These waste streams could 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 sediment admixtures. Reasonable efforts should be made to re-use these materials for other applications on other projects if possible, before the Contractor determines that partially consumed materials are waste and must be disposed of as hazardous waste. Materials determined to be hazardous waste must be managed in accordance with MADEP regulations at 310 CMR 30.0000; including requirements for storage, transport, disposal, and obtaining a Generator Identification Number.

### 1.2.4 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

### 1.2.5 Wetlands

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Refer to the definition of Wetlands in MADEP regulations at 310 CMR 10.

## 1.3 ENVIRONMENTAL PROTECTION REQUIREMENTS

### 1.3.1 General

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. The Contractor shall comply with all applicable environmental Federal, State, and local laws and regulations. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations.

### 1.3.2 Performance Standards

This section supplements the Contractor's responsibility to the extent that the Owner has already obtained approval under the State Enhanced Remedy (SER) through the New Bedford Harbor Superfund remedy. The Contractor shall comply with the terms and conditions of the Performance Standards and the included Performance Standards that are applicable to the work. Such applicable terms and conditions and are specified in the various sections of these specifications and on the contract drawings. The above referenced documents shall not be relied on for contract requirements. In the event that a discrepancy is discovered between the reference documents and these specifications or the contract drawings, the contractor shall notify the Owner's Representative for clarification. The Owner's Representative will rely on requirements and conditions of the Performance Standards to resolve perceived conflicts.

### 1.3.3 USEPA Final Determination

This section supplements the Contractor's responsibility to the extent that the Owner has already obtained approval under the State Enhanced Remedy (SER) through the New Bedford Harbor Superfund remedy. The Contractor shall comply with the terms and conditions of the USEPA Final Determination associated with this project. Although the Final Determination has not yet been issued by EPA, a Draft Determination titled, “Draft Determination for the Proposed South Terminal Project, USEPA, 7-16-12” is attached to Section 00800 SUPPLEMENTARY CONDITIONS, for the Contractor’s review. Available information associated with the permitting application with USEPA, the USEPA Draft Determination, and USEPA Final Determination process may be located at the following website:

http://www.mass.gov/eea/ocean-coastal-management/serth/

In the event that a discrepancy is discovered between the Final Determination and these specifications or the contract drawings, the contractor shall notify the Owner's Representative for clarification. The Owner's Representative will rely on requirements and conditions of the Final Determination to resolve perceived conflicts.

1.3.4 Environmental Monitor

The Contractor shall employ an “Environmental Monitor” (EM). An assistant to the EM shall be hired if needed. The EM shall have a minimum of five (5) years experience in wetlands protection, erosion and sedimentation control, water quality monitoring, site maintenance, site drainage, dredging operation management and general site construction. The EM shall verify the placement and performance of erosion/sediment/turbidity control measures and shall have the authority to halt construction for erosion control purposes or for other threats to public health, safety, or the environment. The name and phone number(s) of the EM and his or her assistant, if needed, and back-up shall be provided to the SER Project Manager and other governmental agencies charged with oversight of the project so that s/he may be contacted on a 24-hour basis, seven days a week to address any emergency situation. The EM shall be authorized to contact the SER Project Manager directly for any matter involving wetland protection. the EM shall submit bi-weekly reports to the SER Project Manager, following commencement of construction and continuing until completion of work in resource areas. The bi-weekly reports shall summarize, by station location, the status of construction, the condition of the site, the weather conditions and shall report any erosion, sedimentation, discharge or pollution problems and how they were corrected, along with recommendations on how to prevent similar problems in the future. The EM shall immediately report any erosion, sedimentation or pollution problems to the Engineer and the Contractor. The Contractor shall take immediate steps to correct these problems. The EM shall immediately report any unauthorized discharges of sediments to the Contractor, SER Project Manager, and the Engineer. The Contractor shall take immediate steps to halt those unauthorized discharges.

1.4 SUBCONTRACTORS

The Contractor shall ensure compliance with this section by subcontractors.

1.5 SUBMITTALS

The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

Preconstruction Submittals:

Environmental Protection Plan:

The Environmental Protection Plan shall include the following plans as further described herein:

Spill Control Plan
Contaminant Prevention Plan

## 1.6 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing construction activities or delivery of materials to the site, the Contractor shall submit an Environmental Protection Plan for review and approval by the Owner's Representative. 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 the Work. Issues of concern shall be defined within the Environmental Protection Plan as outlined in this section. 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. Prior to submittal of the Environmental Protection Plan, the Contractor shall meet with the Owner's Representative for the purpose of discussing the implementation of the initial Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The Environmental Protection Plan shall be current and maintained onsite by the Contractor.

### 1.6.1 Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection 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.

### 1.6.2 Contents

The Environmental Protection Plan shall include, but shall not be limited to, the following:

A. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.

B. Name(s) and qualifications of person(s) responsible for managing waste to be removed from the site, if applicable.

C. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.

D. Description of the Contractor's environmental protection personnel training program.

E. Work area plan showing the proposed activity in each portion of the site 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.

F. The Spill Control Plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations (such as 310 CMR 40.0000, The Massachusetts Contingency Plan). Any spill above a reportable quantity should be reported to MassDEP at (888) 304-1133. The proper notifications need to comply with 310 CMR 40. This plan shall include as a minimum:

1. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Owner's Representative in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.

2. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

3. A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.

4. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.

5. The methods and procedures to be used for expeditious contaminant cleanup.

K. A Contaminant Prevention 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 Material Safety Data Sheets (MSDS) 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. The Contaminant Prevention Plan should be coordinated with the Dredge Material Management Work Plan included in Section 02482 DREDGING.

## 1.7 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the drawings, plans and specifications which may have an environmental impact will be subject to approval by the Owner's Representative and may require an extended review, processing, and approval time. The Owner's Representative reserves the right to disapprove alternate methods, even if they are more cost effective, if the Owner's Representative determines that the proposed alternate method will have an adverse environmental impact.

## 1.8 NOTIFICATION

The Owner's Representative will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, project Performance Standards, EPA Final Determination, and other elements of the Contractor's Environmental Protection plan. The Contractor shall, after receipt of such notice, inform the Owner's Representative of the proposed corrective action and take such action when approved by the Owner's Representative. The Owner'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 Owner's Representative may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

# PART 2 PRODUCTS (NOT USED)

# PART 3 EXECUTION

## 3.1 GENERAL

The Contractor shall be responsible for complying with all environmental regulations required by Federal, State, Regional, and local environmental laws and regulations.

## 3.2 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, the Contractor shall identify any land resources to be preserved within the work area.

### 3.2.1 Work Area Limits

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 operations commence. Where construction operations are to be conducted during darkness, any markers shall be visible in the dark. The Contractor's

personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

### 3.2.2 Erosion and Sediment Controls

The Contractor shall be responsible for providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. 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 the Contractor's construction activities. The Contractor shall install sufficient erosion control measures to protect existing resource areas, including those above and beyond those listed on the Plans or described in the specifications at no additional cost to the Owner. The Contractor will be responsible for any necessary sediment controls within the proposed laydown area. No sediment or discharge waters will be allowed outside of the proposed laydown area to prevent sediment from entering nearby waters or municipal systems. The National Pollutant Discharge Elimination System (NPDES) permit program is administered in Massachusetts by the US EPA and MADEP. As authorized by the Clean Water Act, the NPDES permit program controls water pollution from construction that disturbs one (1) or more acres of land by regulating point sources discharging pollutants into surface waters. Point sources are discrete conveyances such as pipes or man-made ditches. Refer to the federal NPDES regulations at 40 CFR 122.

The Contractor shall install temporary stormwater detention basins as necessary to collect stormwater for settling and infiltration, while the site is exposed and prior to final grading and stabilization. Diversionary stormwater detention trenches shall be utilized between the construction areas and surface water as needed to intercept stormwater prior to discharge to New Bedford Harbor.

Dredged material shall be transferred to enclosed basins while dewatering is occurring. Runoff from such basins shall be routed to detention basins for additional treatment and infiltration. The discharge point from dewatering operations shall be protected. Water from dewatering activities

discharge.

The following additional specific erosion control measures (in addition to those measures shown on the Contract Drawings) shall be performed as needed by the Contractor to control erosion and sedimentation from exposed areas and from

- Stockpiles and areas covered with Bottom of Dredge Material or Offsite Fill to be left bare for more than 14 days shall be treated with air dried wood chips, mulch consisting of certified weed free straw or seeded with perennial fescue-grass at a rate as depicted on sheet “P-1.1 EROSION AND SEDIMENTATION CONTROLS PLAN” of the contract documents.

- Stockpiles of “Upper Existing Material” or cleared and uncapped site areas to be left bare for more than 7 days shall be treated with air dried wood chips, mulch consisting of certified weed free straw or

seeded with perennial fescue-grass at a rate as depicted on sheet “P-1.1 EROSION AND SEDIMENTATION CONTROLS PLAN” of the contract documents.

In addition, areas identified by the Owner’s Representative as requiring treatment to control erosion and sedimentation controls shall be treated with air dried wood chips, mulch consisting of certified weed free straw or seeded with perennial fescue-grass at a rate as depicted on sheet “P-1.1 EROSION AND SEDIMENTATION CONTROLS PLAN” of the contract documents.

The Contractor shall install and maintain siltation sacks as identified within the Contract Drawings and as identified by the Owner’s Representative, within catch basins adjacent to the site and as identified by the Owner’s Representative.

All soil or sediment piles with slopes greater than 10% shall be surrounded by a berm and swale system. All supply and storage areas shall be covered when not in use.

A decontamination area with a temporary polyethylene liner shall be

place downgradient of the decontamination area. The Contractor shall inspect this area daily and clean the area as necessary.

The Contractor shall immediately comply with any order from the Engineer for the installation of additional erosion/sediment/turbidity controls to protect resource areas beyond what is shown on the plans if field conditions or the Engineer’s judgment dictate that additional protection is necessary.

### 3.2.3 Contractor Facilities and Work Areas

The Contractor shall propose locations for field offices, staging areas, stockpile storage, and temporary buildings for approval by the Owner/Owner’s Representative. Temporary movement or relocation of Contractor facilities shall be made only when approved by the Owner’s Representative.

## 3.3 WATER RESOURCES

The Contractor shall monitor construction activities to prevent pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation. All water areas affected by construction activities shall be monitored by the Contractor. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water as required by the Clean Water Act.

### 3.3.1 Wetlands

The Contractor shall not enter, disturb, destroy, or allow discharge of contaminants into any wetlands. The Contractor shall be responsible for the protection of wetlands in accordance with applicable regulations. Authorization to enter specific wetlands identified shall not relieve the Contractor from any obligation to protect other wetlands within, adjacent to, or in the vicinity of the construction site and associated boundaries.

## 3.4 AIR RESOURCES

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.

### 3.4.1 Particulates

Dust particles; aerosols and gaseous by-products from construction

and hours when work is not in progress. The Contractor shall maintain the work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. The Contractor must have sufficient, competent equipment available to accomplish these tasks. The Contractor shall implement particulate control measures whenever a particulate nuisance or hazard occurs. The Contractor shall comply with all State and local visibility regulations. Refer to MADEP regulations at 310 CMR 7.00.

### 3.4.2 Odors

Odors from construction activities shall be controlled at all times. The odors shall not cause a nuisance or health hazard and shall be in compliance with State regulations at 310 CMR 7.02 and/or more stringent local ordinances.

### 3.4.3 Sound Intrusions

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 Commonwealth of Massachusetts rules and policy DAQC 90-01 “Allowable Sound Emissions.” The Contractor shall also comply with City of New Bedford noise regulations and requirements. Sound measurements at the property line shall not exceed 90 dBA. The Contractor

exceeds this standard.

### 3.4.4 Additional Dust, Odor and Noise Control

If, in the opinion of the Owner's Representative, the dust, odor and noise control measures are inadequate or insufficient to meet the intent of the specification, the Contractor shall be requested to implement additional measures to control dust, odor and noise at no additional cost to the Owner. Refer to MADEP regulations at 310 CMR 7.09. Action levels for airborne particulates, airborne PCBs, airborne asbestos and lead are listed in the table below, the Contractor shall implement best management practices onsite to minimize the potential for exceedances of air quality standards onsite. Should air quality standards be exceeded, the Contractor shall immediately halt work and implement whatever control measures are necessary to abate the condition. Actions to control impacts to air shall not be cause for additional compensation to the Contractor. The air quality standards are as follows:

| **Constituent** | **Air Quality Standard** |
|---|---|
| Airborne Particulates ($PM_{10}$) – 10 Hour Time Weighted Average | Not to Exceed 100 ug/m3 |
| Airborne PCBs | Not to Exceed Background or 0.10 ug/m3, whichever is higher |
| Airborne Asbestos | Not to Exceed 0.1 fiber/cubic centimeter |
| Lead | Not to Exceed 50 ug/m3 |

### 3.4.5 Diesel Exhaust

Any stationary emergency or standby engine installed at the site shall comply with the requirements of 310 CMR 7.02(8)(i) and 310 CMR 7.26(40) and (44) as applicable. Any engine that is mobile in nature shall comply with

Construction equipment used for this project shall comply with federal off road diesel emission standards including the use of ultra low sulfur diesel fuel (15 ppm sulfur content) in all diesel engine powered equipment. All equipment shall meet the Tier 1-3 emission standards for off-road diesel equipment and to the extent practicable; all diesel powered equipment shall meet the Tier 4 emission standards (the final deadline for which is 2015), per 40 CFR Part 89.

Contractors are encouraged to use diesel oxidation catalyst retro-fitted vehicles and equipment, and project are directed to MassDEP for retrofitting guidance. Diesel-powered equipment shall be fitted with after-engine emissions controls such as oxidation catalysts or particulate filters.

The Contractor shall not cause, suffer, allow or permit visible emissions including smoke from any marine vessel, spark-ignited internal combustion engine or non-stationary diesel engine as per 310 CMR 7.06.

To the extent any activities may include Groundwater/ Soil venting systems, Conveyors and dry material storage silos, and rock crushing/processing as

with the requirements of 310 CMR 7.03.

## 3.5 MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes shall be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

### 3.5.1 Solid Waste

Solid waste shall be managed in accordance with applicable regulations. Debris generated during dredging operations shall be handled in accordance with the Contractor’s debris management plan described in Section 02482 DREDGING.

### 3.5.2 Contractor Management of Hazardous Waste/Excess Hazardous Materials and Spill Response

#### 3.5.2.1 Contractor Management of Hazardous Waste/Excess Hazardous Materials

Hazardous wastes are defined by applicable MADEP regulations at 310 CMR 30.0000 and more stringent local regulations, if any. Hazardous materials are defined in M.G.L. Chapter 21E and 49 CFR 171 - 178. The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during performance of the work. The Contractor shall segregate hazardous waste from other materials and wastes, shall protect it from the weather by placing it in a safe covered location, and shall take appropriate precautionary measures to prevent accidental spillage. The Contractor shall be responsible for storing, describing, packaging, labeling, marking, and placarding hazardous waste and hazardous material in accordance with all appropriate, relevant and applicable Federal, State, and local laws and regulations. The Contractor shall transport Contractor generated hazardous waste off Government property within thirty days in accordance with MADEP regulations at 310 CMR 30.0000 and Department of Transportation laws and regulations.

#### 3.5.2.2 Contractor Response to a Spill or Release of Hazardous Materials

A spill or release of hazardous or toxic materials resulting from Contractor activities shall be immediately reported to the Owner's Representative. Appropriate regulatory authorities shall be notified in a timely fashion in accordance with MADEP regulations at 310 CMR 40.0000. All associated cleanup activities and cleanup costs due to such spills shall be the Contractor's responsibility. The Contractor shall coordinate the disposition of hazardous materials unearthed as a result of the dredging activity that can be attributed to prior disposal activities by a third party(ies) with the Owner's Representative. The Contractor shall provide to the Owner's Representative three quotes for the disposal of such hazardous materials for consideration of payment as a changed condition. All cleanup activities shall be conducted in conformance with the Massachusetts Contingency Plan regulations at 310 CMR 40.0000 as administered by MADEP.

### 3.5.3 Fuel and Lubricants

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.

## 3.6 RECYCLING AND WASTE MINIMIZATION

The Contractor shall participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project.

## 3.7 BIOLOGICAL RESOURCES

The Contractor shall make every reasonable effort to minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall be responsible for the protection of threatened and endangered animal and plant species including their habitat in accordance with Federal, State, Regional, and local laws and regulations as per Section 01135 WATER QUALITY MONITORING AND CONTROL.

### 3.7.1 Essential Fish Habitats

In order to protect Essential Fish Habitats (EFH) in New Bedford Harbor protective measures will be taken between between January 15$^{th}$ and June 15$^{th}$. Additional details are provided within SECTION 02482 DREDGING.

## 3.8 PREVIOUSLY USED EQUIPMENT

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 or sediment residuals, egg deposits from plant pests, noxious weeds, and plant seeds.

## 3.9 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control, and in accordance with the provisions contained in Section 00700 General Conditions and in Section 00800 Supplementary Conditions. 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: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

## 3.10 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for Construction (“Construction Areas” shall be defined as any area used by the Contractor) to their pre-construction condition. The Contractor shall, unless otherwise instructed in writing by the Owner's Representative, obliterate all signs of temporary construction facilities such as work areas, structures, construction trailers, staging areas, stockpiles of excess or waste materials, and all other vestiges of construction prior to final acceptance of the work.

-- End Of Section --

# SECTION 02111

# EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL

## PART 1 GENERAL

### 1.1 SCOPE

A. This section details proper handling, stockpiling, excavation, grading and disposal procedures to be undertaken upon generation of contaminated material in upland areas. Locations of “hot-spots” of existing soil contamination to be excavated and disposed offsite are noted on the Contract Drawings. As non-“hot-spot” soil contamination (including, but not limited to, concentrations of lead and PCBs in soil) exist onsite within the “upper existing material” that the Contractor will be excavating, staging onsite, and backfilling, the Contractor shall assume that any “upper existing material” (see Section 02200 and Part 1.1C of this Section) is contaminated, and shall handle such “upper existing material” accordingly. Additional areas that may or may not contain contaminated materials include: “upper existing material” from the Former Dartmouth Finishing Site.

B. “Hot-spot” contaminated upland material identified for excavation on the Contract Drawing “P-1.2 REMEDIAL EXCAVATION PLAN” shall be disposed of offsite under Base Bid Item No. 0011. The Owner’s Representative may also direct the Contractor to segregate contaminated materials during the course of the Work, including soils deemed to be geotechnically unsuitable for reuse but may also be contaminated, and dispose of those materials offsite under Optional Bid Item Number 0001.

C. The Contractor is directed within Section 02200 EARTHWORK to remove the “upper existing material” in the upland area above Mean High Water for possible reuse as compacted backfill on-site. Contractor shall note that, due to potential long-term human health risks, “upper existing material” at the New Bedford Marine Commerce Terminal and at the Former Dartmouth Finishing Site may not be reused within three feet of final grade; thus, regardless of its suitability for reuse as compacted backfill onsite, the Contractor shall not place “upper existing material” within two feet of the elevations shown on Contract Drawing P-1.6 FORMER DARTMOUTH FINISHING SITE SUB-GRADE GRADING PLAN. Soil and rubble piles shown on the existing conditions plans for the Former Dartmouth Finishing Site are included within the definition of “upper existing materials”.

### 1.2 RELATED SECTIONS

A. Requirements relative to disposal of contaminated dredge material in designated CAD cell are specified Section 02482 – DREDGING.

B. Additional requirements relative to the transportation and disposal of upland material are specified in Section 02223 – TRANSPORTATION AND DISPOSAL.

C. Additional requirements relative to sediment dewatering and stockpiling are specified in Section 02600 – UPLAND RE-USE.

D. Additional requirements relative excavation, backfilling and fill materials are specified in Section 02200 – EARTHWORK.

E. The results of previous environmental analyses to characterize contaminated upland soils are provided in the Data Report – New Bedford Marine Commerce Terminal attached to Section 00800 – SUPPLEMENTARY CONDITIONS.

1.3 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 the basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

| | |
|---|---|
| ASTM D 5434 | (2009) Standard Guide for Field Logging of Subsurface Explorations of Soil and Rocks |

CODE OF FEDERAL REGULATIONS (CFR)

| | |
|---|---|
| 40 CFR 302 | Designation, Reportable Quantities, and Notification |
| 40 CFR 761 | POLYCHLORINATED BIPHENYLS (PCBs) MANUFACTURING, PROCESSING, DISTRIBUTION IN COMMERCE, AND USE PROHIBITIONS |
| 29 CFR 1910.120 | Occupational Safety and Health Standards, Hazardous Waste Operations and Emergency Response |

CODE OF MASSACHUSETTS REGULATIONS (CMR)

| | |
|---|---|
| 310 CMR 40.0000 | Massachusetts Contingency Plan |

B. Compliance with PCB regulations at 40 CFR Part 761 shall be required during all phases of work involving PCB-contaminated soils and/or sediments, including, but not limited to:

1. 40 CFR 761, Subpart C – Marking of PCBs and PCB Items
2. 40 CFR 761.65 – Storage for Disposal
3. 40 CFR 761.79 – Decontamination Standards and Procedures
4. 40 CFR 761.180 – Records and Monitoring
5. 40 CFR 761, Subpart K – PCB Waste Disposal Records and Reports

1.4 SUBMITTALS

A. Excavation and Handling Work Plan – The Contractor shall submit to the Owner’s Representative an Excavation and Handling

1. Documentation that the Contractor will utilize appropriately trained staff to excavate potentially contaminated materials if encountered on site and that the staff is informed of procedures to be followed to protect the Health and Safety of all on-site workers as it relates to possible contaminated materials to be removed. Documentation must show that workers involved in these activities have completed Health and Safety Training per Occupational Safety and Health Administration (OSHA) Regulation 29 CFR 1910.120, as appropriate. The Contractor is entirely responsible for the Health and Safety of his own employees and subcontractors.
2. Locations and methods, including drainage, for on-site stockpiling of excavated potentially contaminated soils or dredge materials as specified in this Section. Describe methods to keep different classification of material segregated during processing operations.
3. Procedure for decontamination of tools and equipment.
4. Methodology for on-site soil tracking, including methodology to ensure cross contamination does not occur.
5. Identify proposed locations for offsite disposal of excavated contaminated material. Identify any subcontractors responsible for transportation and disposal of contaminated material. Licenses or permits shall be submitted for disposal sites that are not commercial operating facilities. Evidence of the disposal facilities acceptance of the contaminated material shall be attached to this plan during the construction.

## 1.5 RESPONSIBILITY OF THE CONTRACTOR

A. The Contractor is responsible for adhering to regulations, Specifications, and recognized standard practices related to the management of contaminated and potentially contaminated material during excavation and removal activities. The Owner and Owner’s Representative will not be responsible at any time for the Contractor's violation of pertinent State or Federal regulations or endangerment of laborers, passers-by or any others.

B. The Owner will not be held negligent or liable for any inadequacies or deficiencies in the Contractor's site-specific worker health and safety plan or for any oversight or inadequacies in the Contractor's implementation of the safety plan.

C. Provide labor, materials and equipment necessary to complete the work including:

1. Excavation, backfilling, on-site transportation, stockpiling, and maintenance of excavated material.

2. The Contractor is responsible for all construction, protection and maintenance of soil stockpiles from excavation through chemical testing and on-site re-use or off-site disposal (if required). Contractor shall stockpile material only in areas designated by the Owner.

3. The Contractor is responsible for providing all documentation to track potentially contaminated material from the time of excavation until it is accepted by and disposed of at the disposal facility.

4. Contractor shall utilize information provided by the Owner as necessary to characterize contaminated soils prior to transportation and disposal at an Owner-approved disposal facility. The results of previous environmental analyses to characterize contaminated upland soils are provided in the Data Report – New Bedford Marine Commerce Terminal attached to Section 00800 – SUPPLEMENTARY CONDITIONS. The Contractor shall also obtain additional samples and/or analyses beyond those provided by the Owner as necessary, to comply with the requirements of any in-state or out-of-state permitted landfill facility or in-state or out-of-state recycling facility receiving material or any other disposal/reuse sites at no additional cost to the Owner.

5. The Contractor shall backfill excavations with suitable materials in accordance with Section 02200 – EARTHWORK to the limits and elevations shown in the Contract Drawings.

D. The Contractor is responsible for all disposal costs at the disposal facility.

1.6 REGULATORY REQUIREMENTS

A. Permits and Licenses

The Contractor shall obtain required federal, state, and local permits for excavation, storage and disposal of contaminated material. Permits shall be obtained at no additional cost to the Owner.

B. Sampling Plan Submission and Implementation for Characterization of Geotechnically Unsuitable or Excess Material

During removal and reuse of “Upper Existing Material”, the Owner’s Representative may identify material that is unsuitable for reuse due to geotechnical reasons (i.e. “geotechnically unsui, or because the material is excess and cannot be reused at the site. That material shall be separated from other stockpiled material (but shall not be removed physically from the site), and be assumed by the Contractor to be hazardous, until and unless analytical results indicate otherwise. The Owner’s Representative shall prepare and submit a Sampling and Analysis Plan to EPA for their approval, and then shall collect sufficient samples (as approved by EPA) to fully characterize this material, before the Owner’s Representative shall allow the Contractor to remove this material and dispose of it offsite. If PCB

(1) mg/kg, but less than fifty (50) mg/kg, EPA approval shall be required prior to disposal of these soils offsite. The

time as the material has been fully characterized in compliance

with EPA regulations and EPA approval has been received;

Contractor shall comply with 40 CFR 761.65(a)(9) and shall not allow PCB containing soil stockpiled onsite to remain onsite for longer than 180 days. If the concentration of PCBs in these soils is greater than or equal to fifty (50) mg/kg, the soils shall be disposed of in accordance with 40 CFR 761.61(c). The Contractor shall take into account the possible length of time associated with the Owner's Representative completing this task when situating the stockpile associated with the geotechnically unsuitable or excess material. Delays in the Contractor's operations associated with time needed to complete these tasks shall not be a basis of any change in the cost of the work. Costs for characterization and preparation of the Sampling and Analysis plan will be borne by the Owner.

1.7 SCHEDULING

A. The Contractor shall notify the Owner's Representative prior to the start of excavation of contaminated material.

PART 2 PRODUCTS

2.1 BACKFILL MATERIAL

A. Approved backfill materials are specified in Section 02200 – EARTHWORK and shall be placed to the limits and elevations as shown in the Contract Drawings.

2.2 SPILL RESPONSE MATERIALS

A. The Contractor shall provide spill response materials including, but not limited to the following: containers, adsorbents, shovels, and personal protective equipment. Spill response materials shall be available at all times in which hazardous materials/wastes are being handled or transported. Appropriate spill response materials shall be available at all times to respond to a leak of fuel or other hazardous material from Contractor's vehicles or other mechanical devices. Spill response materials shall be compatible with the type of materials and contaminants being handled.

2.3 POLYETHYLENE BARRIER

A. Polyethylene barrier for use in protecting stockpiles from spreading contamination or for protecting truck bodies shall be minimum 6-mil (0.006 inches) thick. At least two (2) layers of polyethylene shall be used beneath stockpiles of impacted materials to protect the ground surface. At least one (1) layer of black, 6-mil polyethylene will be used to cover stockpiles of impacted material at all times except when modifying stockpiles. Notwithstanding these stockpile requirements (as well as the requirements of Part 3.5 of this Section), the Contractor shall ensure compliance with storage requirements for PCB impacted soil as outlined within 40 CFR 761.65(c)(9).

## PART 3 EXECUTION

### 3.1 EXISTING STRUCTURES AND UTILITIES

A. No excavation shall be performed until site utilities have been field located. The Contractor shall take the necessary precautions to ensure no damage occurs to existing structures and utilities. Damage to existing structures and utilities resulting from the Contractor's operations shall be repaired at no additional cost to the Owner. Utilities encountered that were not previously shown or otherwise located shall not be disturbed without written approval from the Owner's Representative.

### 3.2 CONTAMINATED MATERIAL REMOVAL

A. Excavation

Areas of contamination shall be excavated to the limits and elevations shown on the Contract Drawings. Excavation shall be performed in a manner that will limit the potential for contaminated material to be mixed with uncontaminated material. A log of the materials and any visible signs of contamination encountered during excavation shall be maintained for each area of excavation. Excavation logs shall be prepared in accordance with ASTM D 5434.

B. Dewatering and Discharge of Dewatering Effluent

Contractor shall reference Section 02600 – UPLAND RE-USE for required dewatering techniques, upland storage, and treatment of dewatering liquids.

### 3.3 BACKFILLING

A. Prior to backfilling the Contractor shall provide access to the bottom and side walls of excavations for pre-backfilling environmental confirmatory sampling of the exposed subgrade and side walls. Results shall be made available to the Contractor 14-days after sample collection. Backfilling may not commence prior to written approval of the Owner's Representative based on confirmatory sample test data.

B. It is the Contractor's Responsibility to protect the subgrade prior to backfilling. Additional excavation and backfilling requirements are specified in Section 02200 – EARTHWORK.

### 3.4 SOIL TRACKING

A. For upland soils identified for remedial excavation within the Contract Documents as well as soils exhibiting olfactory or visual evidence of potential contamination, provide soil tracking system to track all excavated soils between excavation and final disposition.

1. Soil tracking system shall include identification of the source of material (area, depth, date of excavation, etc.). The system shall be designed by the Contractor and shall be submitted to the Owner's Representative for review and acceptance. The system should include daily log sheets for tracking all soils from excavation through final transport and disposal.

2. Provide to the Owner's Representative on a daily basis, copies of field records documenting the location of stockpiled material, and stockpile identification data. This documentation shall be provided on a daily basis when stockpiles are present on-site.

3. If requested by the Owner, obtain a written receipt signed by the Owner of the receiving facility or disposal site, even if such documentation is not required by law.

## 3.5 CONTAMINATED MATERIAL STORAGE

A. The Contractor is responsible for the construction, protection and maintenance of temporary stockpiles and through the final disposal or re-use of those stockpiles by the Contractor.

1. Stockpile areas will be graded such that storm water runoff is diverted from stockpiled soils; berms (i.e., hay bales, silt fencing, gravel) as specified in the Contract Drawings will be placed around the perimeter of the area to prevent contact of runoff with contaminated soils.

2. The area will be blocked off to minimize worker and passersby contact with stockpiled soils. The area will be visibly marked with appropriate warning signs of potential hazards.

3. For soils or dredge materials identified by the Owner as contaminated, or for potentially contaminated soils or dredge materials, the first lift of stockpiled soil or dredge materails will be placed on a minimum of two layers of six-mil-thick (0.006") or one layer of 20-mil-thick (0.020") polyethylene barrier over existing pavement.

4. The size of the individual stockpiles will be limited such that no individual stockpile is larger than 500 cubic yards. Total dimensions and locations of the stockpile areas will be at the discretion and approval of the Owner's Representative.

B. The transfer of soil materials from the excavation to the stockpile areas will be conducted by the Contractor in such a manner as to prevent the spread of contaminated or potentially contaminated

C. The Contractor will place stockpiled soils within a designated stockpile area, graded to shed water, and shall cover the

stockpiled soils prior to inclement weather and at the end of each work day with a minimum six-mil-thick (0.006") black polyethylene cover overlapped and weighted to form a continuous waterproof barrier over the soil. The cover will be maintained by the Contractor throughout the stockpile period to prevent water from entering the soils and to prevent blowing dust. The cover will be suitably weighted to prevent the soil from being exposed by wind.

D. Excavation and soil handling will be performed in a manner which limits mixing of soils with different levels and types of contamination to the highest degree possible. Disposal of soil which is contaminated as a result of the Contractor's careless or unauthorized procedures for excavation or soil handling and stockpiling will be at his own expense. All stockpiles will be located within the Project limits.

E. Water-tight roll-off units may be used to temporarily store contaminated material. An impermeable cover shall be placed over the units to prevent precipitation from contacting the stored material.

F. For soil to be disposed of by others, the soil may not be

regulations.

G. The Contractor is responsible for the construction, protection and maintenance of temporary stockpiles. After completion of classification, materials shall be removed from the Site by the Contractor. Stockpiles shall not contain solid waste material. In no case shall contaminated stockpiled soil that ultimately must be disposed of offsite remain onsite longer than 90 days from the date of excavation.

## 3.6 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.), or a Release of oil or hazardous material as defined under 310 CMR 40.0000 (The Massachusetts Contingency Plan, or MCP) the Contractor shall notify the Owner’s Representative immediately. If the spill exceeds the reporting threshold, the Contractor shall follow the pre-established procedures for immediate reporting and containment. Immediate containment actions shall be taken 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 Owner’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 Owner or the Owner’s Representative.

## 3.7 DISPOSAL REQUIREMENTS

A. Offsite disposal of contaminated material shall be in accordance

with State, Federal and local regulations at a facility approved by the Owner's Representative. Disposal costs are the responsibility of the Contractor.

B. Prior to offsite disposal of any soil or sediment offsite, the Contractor shall collect samples at a rate of a minimum of one sample per 1000 cubic yards and shall analyze those samples for: RCRA 8 Metals, Total PCBs, VOCs, SVOCs, and Conductivity and shall submit a copy of the results of those analyses to the Owner's Representative. Additional analysis or additional frequency of analyses required in order to dispose of the soil shall be the responsibility of the Contractor.

C. Contractor shall also note the requirements of Section 02223 TRANSPORTATION AND DISPOSAL.

D. Contractor shall manage hazardous waste manifests, bills of lading, and other waste tracking documentation in accordance with Section 02223 TRANSPORTATION AND DISPOSAL. Documentation of offsite disposal of soil or sediment impacted with PCBs shall be managed in accordance with 40 CFR 761.180 and 40 CFR 761, Subpart K.

-- END OF SECTION --

# SECTION 02850

# CULTURAL RESOURCES

## PART 1 GENERAL

### 1.1 SCOPE

A. This section details the existing cultural resources located within the work areas and the mitigation efforts to be undertaken by the Contractor to protect the cultural resources during construction related activities.

### 1.2 RELATED SECTIONS

A. Section 01355 – ENVIRONMENTAL PROTECTION

### 1.3 DEFINITIONS

A. Massachusetts Board of Underwater Archaeological Resources (MBUAR) is the state agency charged with the identification and protection of the Commonwealth's underwater archaeological resources.

B. Massachusetts Historical Commission (MHC) is the state agency charged with the identification and protection of the Commonwealth's historic resources.

C. Cultural Resource Area – Areas identified and shown on Contract Drawings as a cultural resource both on land or underwater. The following terms are interchangeable with "Cultural Resource Area": "Paleosol Area", "Subtidal Paleosol Area", "Intertidal Paleosol Area", "Sub-Tidal Paleosol Area" or "Inter-Tidal Paleosol Area"; additionally, any areas within which unanticipated finds may be located during the completion of the work may be designated as a "Cultural Resource Area" by the Owner's Representative.

### 1.4 SUBMITTALS

A. Cultural Resources Protection Plan – Contractor shall provide to the Owner's Representative a plan for protecting Cultural Resource Areas identified on the Contract Drawings. The Cultural Resources Protection Plan shall include the following:

1. Personnel of the Contractor responsible for implementing Cultural Resources Protection Plan.
2. Procedures for accurately locating Cultural Resource Areas identified on the Contract Drawings in the field.
3. Procedures for accurately demarcating the location of Cultural Resource Areas physically, such that their location will be visible to Contractor's personnel during the course of the Work.
4. Procedures for completing the work in such a manner as to keep Contractor equipment outside of any area defined as a Cultural Resource Areas.
5. Procedures for completing the Work and arranging the sequence of the Work to prevent Work completed outside of a

Cultural Resource Area from impacting a Cultural Resource Area.

6. Procedures that the Contractor will follow upon the location of unanticipated Cultural Resource Areas or unanticipated finds.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall be responsible for complying with all regulations related to cultural resources required by Federal, State, Regional and local laws and regulations. This includes following the policies of the MBUAR related to unanticipated archaeological resources and human remains discoveries during all construction activities at the site. These policies are attached to the Contract Documents and the Contractor and associated personnel will be briefed on them and the protocol in the event of an unanticipated find, prior to commencement of any construction activities.

3.2 CULTURAL RESOURCES

The Contractor shall confine all construction related activities to areas defined by the drawing to be outside of any defined Cultural Resource Area.

A. Work Area Limits

No work activities shall occur within 100 feet of the area defined as a Cultural Resource without notification of the Owner’s Representative. If work is to occur within 100 feet of the Cultural Resource areas, the Owner’s Representative shall be notified and a Tribal Observer shall be present when work activities are occurring within 100 feet of the Cultural Resource Area, unless written authorization is presented by the Tribal Observer that his/her presence is not necessary at that time and that work may proceed without an observer. Time associated with mobilization of the Tribal Observer to the site shall not be cause for a change in the cost of the work. No equipment shall be allowed within or floating over a Cultural Resource Area.

B. Cultural Resource Areas Demarcation

Prior to commencing construction activities, the Contractor shall mark Cultural Resource Areas as shown on the Contract Drawings. Cultural Resource Areas shall not be disturbed by the Contractor. Isolated areas, including all water areas, within the general work area which are not to be disturbed shall be marked, fenced, or otherwise visibly demarcated to prevent any disturbance of the area. The Contractor shall develop avoidance measures to eliminate the potential effects to the Cultural Resources Areas. The proposed avoidance measures shall be submitted to the Owner’s Representative for review and approval. The Contractor is responsible for providing, installing and maintaining all monuments,

darkness, any markers shall be visible in the dark. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

C. Dredging

Prior to any work or dredging within 100 feet of a Cultural Resource Area, the Contractor shall submit to the Owner's Representative a Temporary Excavation Support Plan for approval. The Temporary Excavation Support Plan shall ensure that that the Cultural Resource shall not be disturbed during dredging or other work activities. Temporary excavation support, if deemed necessary by either the Contractor or the Owner's Representative, shall be designed by a Structural Engineer licensed in the Commonwealth of Massachusetts. Time associated with the review of the Temporary Excavation Support Plan for adequacy by Tribal Representatives shall not be cause for a change in cost for the work.

D. Unanticipated Finds

Should the Contractor locate unanticipated underwater archeological resources or unanticipated human remains during the course of the Work in any location, the Contractor shall immediately notify the Owner's Representative. The Contractor shall follow the following procedures: "Policy Guidance on the Discovery of Unanticipated Human Remains" and/or "Policy Guidance for the Discovery of Unanticipated Underwater Archaeological Resources", promulgated by the Commonwealth of Massachusetts Board of Underwater Archaeological Resources, Office of Coastal Zone Management, as applicable, which are included as attachments to Section 00800 SUPPLEMENTARY CONDITIONS.

E. Top of Dredge Footprint Obstruction Removal

One obstruction within the Top of Dredge Footprint (indicated on the Contract Drawings) has previously been identified as a submerged shipwreck. This shipwreck has been evaluated for potential historic value within an investigation overseen by the Massachusetts Board of Underwater Archeological Resources and the Massachusetts Historic Commission. This shipwreck may be removed and disposed of offsite as debris. Unanticipated finds located during removal of this shipwreck shall be reported immediately in accordance with Paragraph D, Unanticipated Finds, above.

-- END OF SECTION --

# SECTION 02900

# BLASTING

## PART 1 GENERAL

### 1.1 BLASTING REGULATIONS, CONTROLS AND RESPONSIBILITIES

#### 1.1.1 General

In general, the Contractor shall assume that no blasting is allowed in association with the New Bedford Marine Commerce Terminal project, that rock removal in association with the Work must take place utilizing non-blasting methods, and shall bid the Work accordingly; however, should Optional Bid Item No. 0002 be approved by the Owner, blasting will be allowed in association with the Work, subject to the conditions of Section 02900 BLASTING, the USEPA Final Determination, the Performance Standards, as well as other conditions of the Plans and Specifications including, but not limited to, conditions within Section 02482 DREDGING, Section 02470 DRILLED ROCK SOCKETS, Section 02458 CONCRETE FILLED STEEL PIPE PILES, Section 02488 STEEL SHEET PILING, and Section 01135 WATER QUALITY MONITORING AND CONTROL.

When the nature of the material to be dredged requires blasting, the Contractor's blasting progress and methods shall be those necessary to accomplish the excavation shown on the Contract Drawings in accordance with the procedures specified herein. The Contractor shall note that an Operational Blasting Plan shall be submitted for review by the Owner, Owner’s Representative, as well as regulatory oversight authorities as noted in Part 3.9 of this Section. The Contractor will be required to make necessary plans, examinations, surveys, and test blasts to determine the quantity of explosives that can be fired without damaging property, and to thereafter control the quantity of explosives fired in any one blast to prevent injuries to persons or damage to structures, homes, utilities, vehicles, vessels moored or underway, or any property. The Contractor's blasting program shall abide by all Federal, State and Local laws and regulations, which include, but are not limited to, the following applicable codes and regulations:

- Title 29 Code of Federal Regulations Part 1926, Safety and Health Regulations for Construction.
- Federal Occupation Safety and Health Act of 1970.
- Army Corps of Engineers EM-385-1-1, Safety and Health Requirements Manual.
- Institute of Makers of Explosives (IME); Safety Publications.
- Board of Fire Prevention Regulations, Code of Massachusetts Regulations, Title 527, Section 13

#### 1.1.2 Liabilities

The Contractor's attention is called to Article 5 of Section 00700 of the General Conditions entitled “Laws to be Observed”, which defines the Contractor's responsibilities relative to the references listed in paragraph 1.1.1. The Contractor shall assume all liability and hold and save the Owner, its representatives, officers, agents, and employees harmless for any and all claims for personal injuries, property damages, or other claims arising out of, or in connection with, the transportation, storage, and use of explosives under the contract.

1.1.3 The Contractor shall, in addition, process any and all claims of private citizens arising out of said use of explosives promptly in an acceptable time period set by the Owner’s Representative; in particular, all property damage claims shall be acknowledged by the Contractor, or his representative, and be submitted immediately as directed by the Owner’s Representative providing name of claimant, location, time and description of alleged damage, and estimated value. The claimed damage shall be inspected by the Blasting Vibration Consultant (see paragraph 3.7.3) within 48 hours following initial notification, and processed to a conclusion (honored, denied, or compromised) within 90 days after cessation of all blasting on the contract; but, in no case shall the claims remain unresolved for a period exceeding 6 months (180 calendar days). The Contractor shall submit inspection results and actions taken to the Owner’s Representative on a weekly basis.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 TRANSPORTATION, STORAGE, AND USE OF EXPLOSIVES

The Contractor will be held responsible to perform the work in compliance with all applicable Federal, State, and local codes and regulations, including, but not limited to, those cited above in paragraph 1.1.1. The Contractor shall have available the documents for inspection at all times, which will pertain to the blasting operation. In case of conflict between codes and regulations, the more stringent will apply.

3.1.1 Daily Summary

The Contractor shall keep a daily record of transactions, to be maintained at each storage magazine. The inventory records shall be updated at close of business each day and furnished to the Owner’s Representative on a weekly basis. Records shall show class and quantities received and issued, and total remaining on hand at end of each day. The remaining stock shall be checked each day, and any discrepancies that would indicate a theft or loss of explosive materials shall be reported immediately. The daily summary shall be done in accordance with the applicable regulations cited in paragraph 1.1.1. Copies of the daily inventory records shall be furnished to the Owner’s Representative.

3.1.2 Report of Loss

Should a loss or theft of explosives occur, all circumstances and details of the loss/theft will be immediately reported to the nearest office of the

Alcohol, Tobacco, Firearms and Explosives (ATF), as well as to the local and State law enforcement authorities and the Owner’s Representative.

ATF Boston Field Office
10 Causeway Street, Room 791
Boston, Massachusetts 02222
Telephone: 617-557-1200

The New Bedford Fire Department should be contacted at the following address:

New Bedford Fire Department
868 Pleasant Street
New Bedford, Massachusetts 02740
Telephone: 508-991-6105, 508-991-6124.

3.2 RESPONSIBILITY

The Contractor shall be responsible for obtaining all licenses, permits, any and all fees, and the keeping of accounts and records, as well as arranging the transportation and protection of all explosives on the contract, and notifying the relevant local, state and federal authorities of its work. Should the Contractor fail to comply with above requirements, the Owner’s Representative may order a suspension of that part of work involved until the deficiencies are corrected. The Contractor's attention is also directed to subparagraph 1.1.2 "Liabilities" for additional specific liability to be assumed by the Contractor. The Contractor must supply to the Owner’s Representative all permits, licenses and approvals which are necessary for this contract as required by the regulations cited in paragraph 1.1.1.

3.3 PREBLAST PUBLIC INFORMATION MEETINGS

3.3.1 The Contractor shall schedule, publicize, coordinate, secure adequate facilities for, and conduct two Preblast Public Information Meetings prior to finalizing his Operational Blasting Plan. The meeting shall be held in New Bedford, Massachusetts. As a minimum, the meetings shall be publicized in advertisements in local newspapers, including the Standard Times, not less than two weeks prior to the scheduled meeting for a period of not less than one week. State and local agencies likely to express an interest in the project shall be contacted in writing directly, including law enforcement, fire prevention, and environmental authorities. The Owner’s Representative will solicit interest from appropriate Federal agencies. In addition, all property owners whose properties border a portion of the contract limits shall be contacted in writing directly. A post test blast public information meeting shall be conducted at the above location, if requested by the Owner’s Representative.

3.3.2 The contents of the advertisements shall be approved by the Owner’s Representative prior to advertisement. Copies of all correspondence publicizing the meetings shall be furnished to the Owner’s Representative.

3.3.3 The purpose of the meetings is to disseminate basic project information to interested members of the public, to solicit comments from the public and evaluate proposed blasting methods in light of any valid concerns, and to identify key representatives of the Contractor and Owner’s Representative who may be contacted for current project information or to report complaints. The Contractor, in conjunction with the Owner’s Representative, shall prepare an agenda for each meeting to address these purposes. A public question-and-answer period shall be held at the conclusion of the public presentation if required by the Owner’s Representative.

3.3.4 The Owner’s Representative will participate in each meeting, and will provide reasonable assistance in planning, scheduling, and coordination with the public.

3.3.5 The proceedings of each meeting shall be recorded verbatim by the Contractor, and transcripts thereof shall be provided to the Owner’s Representative. The Owner’s Representative will review the transcripts, as well as any written comments that may be received, with the Contractor, and may require the Contractor to address specific comments in his Operational Blasting Plan prior to submission.

3.4 PROTECTION FOR ADMINISTRATION OF DRILLING AND BLASTING COMPLAINTS

3.5 PREBLAST SURVEY

The Contractor shall provide one person from his organization and his specialist on vibration control (Seismic specialist, see paragraph 3.7.3) to work as a team with a representative of the Owner’s Representative in making a preblast structural survey. A preblast survey of the interior and exterior of all structures shall be made within a one thousand five hundred (1500) foot radius from the production blasting areas. The Contractor must notify the property owners near the blasting areas of the preblast survey as defined below. All structures that may be affected by the blasting, as well as those enumerated in paragraph 3.7.3, will be inspected and their condition documented. Any existing outstanding architectural defects such as broken or fallen plaster or broken windows shall be photographically documented by digital video and with a minimum 7 mega-pixel digital camera with zoom capabilities. The Contractor shall provide methodology to be used in conducting the preblast survey and listing of structures, determined from the survey to be sensitive, with reasons for these structures being sensitive, within 1500 feet from the blasting areas. Photographs will be taken of all the surveyed structures. The Contractor will determine the elevation of all piers and record with photographs all floating vessels that are in the vicinity and that are vulnerable to wave propagation.

The Contractor shall certify that the survey was prepared prior to the start of any blasting under this contract. A copy of the Preblast survey shall be submitted for the Owner's Representative’s approval in conjunction with the Operational Blasting Plan.

3.5.1 Prior to test blast program and Blasting activities, the following actions regarding property owners located within 1,500 feet of proposed blasting locations are required:

A. Newspaper Advertisements-Advertisements in the local newspapers informing the public about the location, date and time of the Public Information Meetings.

B. Public Information Meetings

C. Door hangers providing information about the blasting and the request for pre-blast property inspection surveys to the property owners residing within 1,500 ft from the blast site.

D. Requests by first class mail to all property owners for pre-blast property inspections within the 1,500 foot radius of blasting

E. Where there has been no response to first requests, second requests by certified letter for pre-blast property inspections.

F. Where there has been no response to second requests, the Contractor shall inform the property owner by certified mail that he has not responded to both requests for inspections and will provide the date and time that blasting will be commencing .

3.5.2 During blasting activities, the process for addressing citizens complaints will be as follows:

A. Citizen complaints will be received through the Contractor.

B. The caller's name, address, phone number, and pertinent information will be recorded in a master complaint log to be maintained by the Contractor.

C. Contractor shall schedule and perform an inspection of the complainant's property within five calendar days of the date of the complaint.

D. The Contractor shall issue an acknowledgement letter not later than seven days from the inspection date as a follow up to the inspection and update the complainant as to the status of the final determination of the inspection results.

E. The Contractor shall provide to the complainant a final determination letter honoring, denying the claim within 90 days after cessation of all blasting on the contract. In no case shall the claims remain unresolved for a period exceeding 180 calendar days.

F. Inspection results, actions taken and all correspondence regarding the complaints shall be furnished to the Owner’s Representative.

3.6 SAFETY

3.6.1 Drill Boat or Barge Safety

3.6.1.1 All onboard magazines shall be permanently secured to the deck as required by the Coast Guard.

3.6.1.2 No high explosives shall be stored on the boat or barge deck in the open except for the one case that is to be loaded immediately into the bore holes. Any explosives remaining on deck shall be returned to the day magazine prior to the firing of any blast.

3.6.1.3 The firing line reel or spool shall be mounted on the rig in a manner that it cannot be lost overboard. An approved blasting machine shall be used for detonation regardless of the number of caps used. An electric blasting system shall not be used.

3.6.1.4 The amount of explosives permitted aboard the drill boat at any one time will be subject to the approval of the ’Owner's Representative, but in no case shall such amount exceed the amount permitted by appropriate codes and regulations.

3.6.1.5 The Contractor shall make necessary arrangements to prevent damage to any vessel, moored or underway, building or structure and preserve the crew or occupants thereon from exposure to injury as a result of the Contractor's operations. The Owner’s Representative may require additional arrangements.

3.6.1.6 The Contractor shall have a certified marine survey of all floating plant proposed for underwater blasting work on this contract performed prior to starting any work, and shall provide the results to the Owner’s Representative.

3.6.1.7 Automatic fire extinguishers of an appropriate type shall be installed on air compressors and in all engine compartments aboard vessels (drill boats, barges) where explosives are stored, handled, and used.

3.6.1.8 Remote fuel shut-offs and fire signaling devices shall be provided aboard the drill boats.

3.6.1.9 Loading of tubes and casings of dissimilar metals shall not be used because of possible transient electric currents from galvanic action of the metals and water.

3.6.1.10 Only water resistant blasting caps and detonating cords shall be used for all marine blasting. Loading shall be done through a non-sparking metal loading tube when a tube is necessary.

3.6.1.11 No blast shall be fired while any vessel under way is closer than 1,500 feet from the blast area. Those on board vessels or craft moored or anchored within 1,500 feet shall be notified before a blast is fired.

3.6.1.12 No blast shall be fired while any swimming or diving operations are in progress in the vicinity of the blasting area. If such operations are in progress, signals and arrangements shall be agreed upon to assure that no blast shall be fired while any person is in the water.

3.6.1.13 A red blasting flag, 18 inches by 30 inches with the word “EXPLOSIVES” thereon in white letters, at least six inches in height, shall be readily visible in all directions.

3.6.1.14 The storage of explosive material shall be in accordance with 527 CMR 13.05(4).

3.6.1.15 When more than one charge is placed in under water, a float device shall be attached to an element of each charge in such a manner that it will b released by firing. Misfires shall be handled in accordance with 527 CMR 13.09(5).

3.6.2 Lightning

The Contractor shall furnish, maintain, and operate lightning-detection equipment during the entire period of blasting operations and during the periods that explosives are stored at the site. The equipment shall be installed where approved by the Owner’s Representative. A lightning detector shall be operated at all times to detect lightning within a 50 mile radius. When the lightning-detection device indicates a blasting hazard potential, the Contractor shall perform the following:

A. Notify the Coast Guard and the Owner’s Representative of the potential hazard.

B. Clear the buoyed area of all vessels and personnel.

C. Terminate all loading of holes and return unused explosives to the day storage area/day magazine.

D. Monitor the blast area to prevent any boat or vessels from inadvertently entering the blasting area during the lightning hazard.

E. Remove the lightning detector from the drill barge with the last evacuation vessel and continuously monitor the potential hazard until the danger has passed.

F. After sounding the All Clear Signal, notify the Coast guard and the Owner’s Representative that the potential hazard has passed.

G. Resume operations only after all potential of hazard has passed.

3.6.3 All other applicable safety requirements shall be implemented in addition to that required above.

3.6.4 Navigation Control during Drilling, Loading, and Blasting Operations

3.6.4.1 The Contractor shall buoy the area with warning signs. The warning signs shall be legible from a distance of 200 feet and shall contain the message "DANGER - EXPLOSIVES IN USE" visible on either side of the sign. The Contractor shall operate two or more patrol boats during blasting operations equipped with a visible yellow flashing light, audible horn, and radio with a hailer, whose sole function shall be to monitor and maintain security in the blast area. Patrol boats shall be stationed at the drill barge and remain in the blasting area during all blasting operations. Land oriented access control and visual observation locations should be determined and approved by the Owner’s Representative. The Contractor shall inspect and ensure there is no boat traffic within the buoyed work area prior to the firing of the blasting caps and until such time as the

Contractor has sounded the "All Clear Signal". The Contractor shall establish and maintain a warning system as required by the Corps of Engineers Safety Manual. The Contractor shall equip and maintain his floating plant with radio equipment capable of communications with the Coast Guard. The Contractor, after each blast, upon inspecting the area, shall immediately notify the Coast Guard and the Owner’s Representative if all clear or misfire is noted.

3.6.4.2 Coordination with the U.S. Coast Guard.

The Contractor shall notify the Coast Guard 24 hours prior to a scheduled shot and 2 hours prior to the actual shot. The channel must be kept open to vessel traffic at all times except as permitted by the Coast Guard and the Owner’s Representative. Contact should be made with:

US Coast Guard New Bedford Marine Safety Unit
New Bedford, Massachusetts
Telephone: 508-999-0072

3.6.5 Contingency Plan in Case of Misfire, Inadvertent Initiator Extraction, or Accidental Loss of Down Lines

All loading of blasting holes shall be done early enough each day to allow time, in case of a misfire, inadvertent initiator extraction, or accidental loss of down lines, to implement a contingency plan for removing or detonating the explosives before dark. The Contractor shall submit a contingency plan to the Coast Guard and Owner’s Representative prior to initiation of any blasting and shall notify both parties in the event of a misfire, inadvertent initiator extraction, or accidental loss of down lines. All undetonated explosives due to misfire, inadvertent initiator extraction, or accidental loss of down lines must be detonated. The Contractor shall immediately notify the Coast Guard upon giving the "All Clear Signal" after correcting the misfire, inadvertent initiator extraction, or accidental loss of down lines.

3.6.6 The Contractor shall notify the public at least 24 hours prior to any scheduled blast, and at least 2 hours prior to an actual blast. As a minimum, the following shall be notified:

New Bedford Police Department
871 Rockdale Avenue
New Bedford, Massachusetts 02740
Tel. (508) 991-6300

New Bedford Fire Department
868 Pleasant Street
New Bedford, Massachusetts 02740
Tel. (508) 991-6124

Fairhaven Police Department
1 Bryant Lane
Fairhaven, Massachusetts 02719
Tel. (508) 997-7421

Fairhaven Fire Department
146 Washington Street
Fairhaven, Massachusttes 02719

Tel: (508) 994-1428

3.6.7 Bulk Product Specifications

A. Bulk blasting agents or explosives delivered to the work area shall be weighed by a certified weigh master at the transfer location nearest the work area to determine the actual quantity of explosives delivered each day.

B. Bulk storage tanks or vessels on barges shall be permanently attached to the barge and electrically grounded. A containment dike shall be erected to contain the maximum rated capacity of the storage vessel and all associated pumps and hoses for transfer operations. Pumps, hoses and valves containing bulk product after transfer operations shall be stored in a locked magazine.

C. All access ports, valves, vents and drains shall be secured to prevent vandalism or theft of the explosive product.

A flow metering device capable of measuring the quantity of explosives to within 0.5% of the actual quantity in pounds shall be utilized for all bulk transfer to or from the bulk storage vessel.

D. The delivery system to load holes on each drill frame shall be designed to load each hole to within 0.5% of the design quantity required for each drill hole.

E. Each drill frame shall measure the quantity of explosives loaded in all holes with weigh scales or flow metering devices to within 0.5% of the design quantity for each hole. The total of all loaded holes shall be checked with the total quantity delivered prior to subsequent bulk deliveries. Should the bulk quantity delivered vary from the recorded quantity loaded and detonated, all measuring devices and or meters shall be recalibrated to within the specified accuracy.

F. Each hole loaded with emulsions or slurry shall be initiated with two separate downlines, caps, boosters and starters. At least one booster shall be secured in the hole with a mechanical lock-in system or spider to prevent extraction of the booster or priming charge.

G. As a minimum the top elevation of the emulsion or slurry product shall be measured to check for voids and actual quantity loaded.

H. The blast plan shall include manufacturer's catalog cuts, data sheets and detailed plans and specifications for the bulk storage vessel and transfer system, drill frame delivery system associated loading tubes and reel systems and measuring devices.

I. All loading tubes or hoses shall be equipped to be retracted from the bottom of the hole to the top of the product as the emulsion or slurry is loaded in the hole. The system shall in effect place the product in each hole in a tremie method.

### 3.6.8 Surface Blasting

Doby, or Surface Blasting, will not be allowed for the fragmentation of bedrock. Doby blasting is an allowable option for fragmenting boulders or large blast rubble when water depths are at least 30 feet.

## 3.7 BLASTING CONTROL

### 3.7.1 General

The blasting program and methods shall be those developed by the test blasting program and procedure to accomplish the excavation shown on the contract drawings in accordance with the procedures specified herein.

### 3.7.2 Blasting

**Blasting shall be confined to daylight hours during the period from 2 hours after sunrise to 1 hour before sunset, but shall not be conducted before 9:00 A.M. or after 4:00 P.M. on the day of blasting**. Blasting shall not be conducted when temperature inversions or heavy, low-level cloud cover exists. **Blasting will be prohibited on Saturdays, Sundays and Federal holidays.**

### 3.7.3 Vibration Control

Where blasting is necessary, the Contractor shall employ a specialist qualified in vibration control methods capable of analyzing results obtained from seismograph readings. A minimum of 30 days prior to commencement of blasting operations, the Contractor shall provide the Owner’s Representative such bona fides of the seismic specialist to include, but not limited to, past experience, training, and education, and have working a knowledge of State and local laws and regulations which pertain to blasting. The acceptability of the specialist is subject to the approval of the Owner’s Representative. The Contractor's seismic specialist shall place vibration monitors on any identified historic structures and shall determine the placement of at least 8 additional vibration monitoring machines per blast area (minimum 4 per shore) with approval of the Owner’s Representative and shall be retained for loss control should contract blasting operations result in claims or complaints. The vibration monitoring plan shall identify the type of anchoring devices to be employed at various monitoring sites. Structures that should have monitoring machines include, at least, bulkheads, hazardous materials storage areas and buried utilities. At least one vibration monitoring machine must be placed between the blast and the nearest structure on a natural ground surface. This may require utilizing underwater locations. The other machines must be secured in the ground near identified sensitive structures. Blasting shall be controlled in such a manner that the maximum vibration level at any vessel or structure which is vulnerable to damage should not exceed the peak particle velocity of the appropriate municipality and geographical jurisdictions, or be subject to an unacceptable vibration frequency. A written and a telephone report on vibration intensity shall be submitted within 24 hours when specifically requested by the Owner’s Representative or, without request, when such intensity exceeds a peak particle velocity of 2.0 inches per second for any one of the 3 perpendicular planes of motion. Peak Particle Velocity of 2.0 inches per second should not become the basis of design. Refer to 527 CMR

13.09 chart (a)for assistance. The Contractor will perform a test blast (paragraph 4) which will determine a safe peak particle velocity (PPV) for all structures within the blast area. If historic structures are to be monitored, they shall be evaluated for sensitivity to vibration and monitored during blasting operations. The Contractor shall follow the following vibration limits for the structures listed below:

Historic Structures PPV<0.5 in/sec
Residential Structures in Massachusetts PPV<0.8 in/sec
Other Structures PPV<2.0 in/sec

The Contractor shall submit a copy of the record in tabular form for each blast to the Owner’s Representative no later than 24 hours after each blast, with a written report on velocity and vibration effects. This should also include location of blast, size, spacing, number, top and bottom elevations of holes, type of explosives, amount of explosives and stemming per hole and delay, type of delays, sequence and pattern, distance from the blast to the vibration monitoring machine, and any other pertinent information.

3.7.3.1 The Contractor is advised to evaluate the vibration and airblast factors affecting structures and vessels in the vicinity of the blast area as determined in the preblast survey. It is recommended that the Contractor use a blast design that produces the maximum amount of relief practicable. The amount of explosives to be used will be determined during the test blast operation to meet all proper safety and environmental requirements. The Contractor is responsible that the fragmentation resulting from the blasting operation is of suitable size to allow for easy excavation by the Contractor's equipment. The Contractor shall also check water wave propagation to insure that shoreline structures and moored vessels within the blasting area will not be affected during blasting.

3.7.4 All blasting shall be monitored by the Contractor to determine air blast effects using an instrument approved by the Owner’s Representative, operated by an experienced person with a minimum of 3 years of related experience with the type of equipment to be used throughout the project construction and all data furnished to the Owner’s Representative. The instrumentation will be located at seismic station locations as determined in paragraph 3.7.3 and other locations as directed by the Owner’s Representative with at least three (3) monitors located in the area closest to the blast site. Airblast equipment shall record waveform data. Recorded airblast data shall be submitted in conjunction with vibration intensity data as specified in paragraph 3.7.3, within 24 hours of each blast. The maximum allowable airblast shall not exceed 129 decibels.

3.7.5 If the Government decides to have a supplemental blasting monitoring program, under no circumstances will this relieve the Contractor of monitoring and controlling the blasting as specified in this Section or any other requirements.

3.8 TEST BLAST PROGRAM

3.8.1 Purpose

The purpose of the test program is to allow the Contractor to establish safe limits of vibration and airblast overpressure, demonstrate the satisfactory performance of the drill boats and develop an operational blasting plan. The type of explosives and firing systems shall adhere to all applicable codes and regulations including, but not limited to, those cited in paragraph 1.1.1.

3.8.2 Test Blast Plan

3.8.2.1 The Contractor shall submit fifteen (15) copies of the Test Blast Plan for review. The Owner’s Representative shall have 35 days for review after receipt. The Contractor may be required to revise and resubmit the plan. The ’Owner's Representative shall have 21 days review of the revised plan. Concurrence with the revised plan will not relieve the Contractor of his responsibility to produce safe and satisfactory results as set forth by these specifications. The test plan shall include as a minimum all pertinent information listed in paragraphs 3.8.4, 3.9.2 and 3.9.4.

3.8.2.2 Test blast programs shall be conducted by the Contractor for each area of rock such as discontinuity of rock contours and areas and as directed by the Owner’s Representative. An optional test blast program for the glacial till shall be planned if determined by the Owner’s Representative to be necessary. Each blast program shall involve all drill boats that will be used for any portion of the contract. No drill boat shall be used for the contract that has not participated in a test blast program.

3.8.2.3 The Contractor shall notify the Owner’s Representative sufficiently in advance of each test blast in order for the Owner’s Representative to be present during the test blasts. The Contractor shall also invite representatives of the Fire Departments from New Bedford and Fairhaven to the test blasts. The test blasts shall begin with a small number of charges and extend upward to the maximum yield to be used. The final test event shall simulate as close as practicable the explosives charge type, size, overlying water depth, charge configuration, charge separation, initiation methods, and emplacement conditions anticipated for the operational blasting program. During each blast the Contractor will analyze the effect of wave propagation on structures, vessels, etc., and take the appropriate actions to prevent damages.

3.8.3 Post Blast Evaluation

3.8.3.1 After each test blast, the Contractor shall examine the structures of the preblast survey that were inspected and documented, to establish whether damage was caused to the structures. All damage resulting from the test blasting shall be reported in detail to the Owner’s Representative, including photographs.

3.8.3.2 After each test shot the Contractor will excavate the fractured material to evaluate breakage, toe and top of cut. This information will be documented and provided to the Owner’s Representative.

3.8.4 Data Recording and Evaluation

The test blast program shall be conducted and reported in strict accordance with procedures outlined in the sections of these specifications covering vibration control and air blast control. The Contractor shall submit the blasting plans showing the location(s) and extent of the blasted areas. The blasting plans shall include the blasting patterns and the locations of patterns shall be drawn on plan sheet(s)(maps) in scale by providing coordinates of at least four (4) corners of the blasted area. Include information as to the number of holes, bottom and top elevations of holes, coordinates of each hole, amount of explosives and stemming per hole, type of delay in holes, sequence and pattern of delays, maximum peak particle velocity from each instrument, and peak overpressure reading in pounds per square inch and decibels from each airblast sensor. Information provided should also include a written analysis of each blast, including the maximum particle velocity in each plane, associated frequency in each plane and peak true vector sum of particle motion. In addition to the submission of an initial test blast plan, the Contractor is required to submit a documentation of each blast prior to proceeding forward the next blast test. The documentation shall include, but not limited to a written analysis of each blast, all observed test blasting data, examination of structures of the preblast surveys that were inspected, and information about excavation of fractured materials. Four copies of the record of each blast performed shall be submitted no later than 24 hours after completion of each test blast until the test blast program is completed. It is expected that the initial test blast will be used to develop knowledge of ground conditions, propagation characteristics, etc. At the conclusion of the test blast program, the Contractor shall examine all reports, surveys, test data, and other pertinent information. Conclusions reached shall be the basis for developing a completely engineered procedure for blasting. Five copies of the Test Blast Plan and results shall be provided to the Owner’s Representative. In no event shall the operational blasting proceed until the review of the developed procedure for blasting has been completed and the procedures approved.

3.9 OPERATIONAL BLASTING PLAN

3.9.1 The Contractor shall submit to the Owner’s Representative ten (10) copies of the Proposed Operational Blasting Plan for review. The Owner’s Representative shall have 35 days for review after receipt. The Contractor may be required to revise and resubmit the plan. The Owner’s Representative shall have 21 days review of the revised plan. Concurrence with the revised plan will not relieve the Contractor of his responsibility to produce safe and satisfactory results as set forth by these specifications.

3.9.2 Environmental Impact of Blasting

3.9.2.1 The Contractor shall follow the following guidelines and incorporate the following measures when preparing its Operational Blasting Plan and shall use the following measures to minimize its impact to the aquatic environment to the extent possible. These measures include:

1. Evaluate the need to use explosives. If practical alternatives are available and not excessively expensive to remove rock without blasting, the Contractor shall utilize those methods.
2. Plan the blasting program to minimize the total weight of explosive charges per shot and the number of shots for the project.

3. Use angular stemming material of sufficient length in drill holes to reduce energy dispersal to the aquatic environment.
4. Subdivide the charge, using detonating caps with delays or delay connectors with detonating cord, to reduce total pressure. The Contractor shall not use submerged detonation cord unless the Contractor can show that no other method is practicable.
5. The Contractor shall use decking when possible in lengthy drill holes to reduce total pressure.
6. For seismic exploration use non-explosive sources when possible or use linear charges for open water shots or buried charges.
7. Use shaped charges to focus the blast energy when submerged surface charges are necessary, reducing energy released to the aquatic environment during demolition.
8. Contractor shall, to the degree practical, enclose blast areas with silt curtains to keep fish species away from the blast area
9. Contractor shall use non-explosive noise techniques to move fish and marine mammals from the immediate blast zone.
10. All blasting shall be conducted using inserted delays of a fraction of a second per hole.
11. Stemming, in which rock is placed into the top of the borehole to damp the shock wave reaching the water column, thereby reducing fish mortalities from blasting, shall be utilized.
12. All blasting operations shall take place utilizing sonar to identify fish schools and with a fisheries observer (hired by the Contractor) who is approved by the Massachusetts Division of Marine Fisheries (and National Marine Fisheries Services) in attendance. The fisheries observer shall observe for fish mortality. If excessive mortalities (hundreds of fish/event) occur, then additional technologies, bubble curtains shall be considered for use.
13. There shall be no blasting during the passage of schools of fish or when a marine mammal is present as determined by the fisheries observer (as required in item 12 above).
14. Blasting shall be conducted with a fish startle system.
15. Blasting shall only be conducted in the time period from the first of November to the final day of February in any calendar year.

3.9.3 No drilling shall be started before the Owner’s Representative reviews and concurs with the final blasting plan or any revisions to that plan.

3.9.3.1 Any changes to the Contractor's blasting or monitoring procedures, equipment, plant, products or personnel must be reflected in a revised Operational Blasting Plan or supplement and must be approved by the Owner’s Representative prior to implementation.

3.9.4 The Blasting Plan shall include as minimum requirements the following:

1. Proposed method of transportation, storage, and handling of explosives.

2. Plan showing layout of drill hole pattern, timing and sequence, anticipated burden dimensions and depth of subdrilling.

3. Plan for the fragmentation of large boulders and blast rubble.

4. Type of explosives and method of loading and detonating.

5. Type of blasting machine to be used and when last tested.

6. Specific gravity of explosives and manufacturer's technical literature.

7. Initiation system to be used and explosive loading in pounds of explosive per delay.

8. Indication as to whether decking or boosters will be used and the depths of required stemming.

9. Type and number of drilling rigs, including drill hole diameter, and expected production rates/day.

10. Type of instrumentation to be used, manufacturer, and when last calibrated and certified.

11. Procedure for monitoring the blast operations.

12. List of permits and clearances required, when applied for, and date of approval or anticipated approval.

13. A format for maintaining a record of individual blasts throughout the life of the job designed to record pertinent data before, during, and after the blasting operation. Pertinent information shall include, but not limited to, number of holes, bottom and top elevations of holes, coordinates of each hole, amount of explosives and stemming per hole, type of delay in holes, and sequence and pattern of delays.

14. Names and qualifications of specialists for vibration control analysis and airblast over- pressure measurements (refer to paragraph 3.7.3 for exacting requirements).

15. Location plan, manufacturer's literature, and parameters to be used in site selection for seismic instrumentation.

16. Plan showing location of warning signs and signals and the Contractor's land and marine spotters.

17. Name and address of Contractor's representative to which any claims for damage due to blasting should be addressed.

18. The plan, signed off by the Contractor's jobsite authorized representative.

19. The location of monitoring equipment, based on information from the preblast survey.

20. Contingency Plan for Lightning Hazard

21. The 527 CMR 13.00 Uniform Blasting Site Detail Check List – (Attached at the end of this Section).

22. Complete Project Team Organization with duties, responsibilities and authorities clearly defined. This organizational outline shall also include a listing of all personnel authorized to sign for, receive and use explosives on this contract.

23. Complete list of floating plant involved in production blasting operations.

24. Provide analysis and control of potential hazard due to possibility of undetonated Pourvex remaining from previous deepening.

The Contractor shall submit the blasting plans showing the location(s) and extent of the blasted areas. The blasting plans shall include the blasting patterns and the locations of patterns shall be drawn on the maps in scale by providing coordinates of at least four (4) corners of blasted areas.

3.9.4 If drilling and blasting is required outside the buoyed areas, the Contractor shall submit a plan to maintain **the previous authorized depth**, as part of the Operational Blast Plan. This plan shall include areas where the buoy cannot be removed.

3.10 DRILL LOG AND BLAST REPORT

The Contractor shall prepare and complete drill logs and report for each blast is completed. Information provided on the logs shall include, at a minimum:

1. Name, signature, and Certificate of Competencey Number of the blaster in charge.
2. Blast location, address, city description.
3. Drill rig type, construction of rig, name of driller in charge, location of borehole in Massachusetts State Plane coordinates.
4. Depth of boring in MLLW. Position within borehole of explosives at time of detonation.
5. Date and time of blast.
6. Type of material blasted.
7. Distance in feet, to the nearest inhabited building or structure, neither owned or leased by holder or holder client of the Explosives User Certificate issued by State Fire Marshall.
8. Scaled distance or alternative option used to determine blast design.
9. Type of matting or cover over blast, if applicable.
10. Weather conditions, including temperature, cloud cover, wind direction.

11. Blast plan and sketch showing blast hole diameter, delay, delay patter, and types of detonators, spacing, depth of blast hole, hole pattern and number of holes.
12. Explosive material type, size, total weights of each explosive by hole.
13. Type of initiation system (Methods of firing and type of circuit).
14. Feet of overburden, depth and type of stemming.
15. Maximum weight of explosives detonated within any eight millisecond period.
16. The seismograph(s) location(s) including distance and direction from the seismograph to the closest borehole and from the seismograph to the closest structure.
17. Seismograph readings including peak particle velocity, frequency and airblast.
18. Type of seismograph, instrument make, model serial number, calibration date and sensitivity settings.
19. Name of person taking the seismograph reading. The name and firm analyzing the seismograph record, if applicable.
20. Complaints or comments following blast.

- End of Section -

**527 CMR 13.00 Uniform Blasting Site Detail Check List**

Location: _____ Date: ___/___/____

Blaster's Name: _____ Cert. #: _____

Company Name: _____ Time of Blast: __:__

| Check List | Ref. # | Violations? | YES | NO |
|---|---|---|---|---|
| Two Way Radio/Warning Signs (“Blasting Zone” “Turn off 2-way Radio”) | CMR 13.09(1)(p) | | ☐ | ☐ |
| Transport Vehicle(s) (Placards, Fire Marshal Magazine Permit, Attended) | CMR 13.06(2), 13.04(3) | | ☐ | ☐ |
| Site Storage (Day Box) (Fire Marshal Magazine Permit, Attended) | CMR 13.04(3) | | ☐ | ☐ |
| NO smoking or open flames (within 50ft of explosives) | CMR 13.09(1)(d) 2., 3. | | ☐ | ☐ |
| NO unnecessary personnel on the blast site (while boreholes are being loaded or are loaded with explosives) | CMR 13.09(2)(a) | | ☐ | ☐ |
| Prior to blasting, excess explosives returned to proper storage | CMR 13.09(2)(f) | | ☐ | ☐ |
| Seismograph must be placed between 5&10 ft of nearest inhabited structure | CMR 13.09 (9)(f) | | ☐ | ☐ |
| Explosives, persons & equipment must be at a safe distance prior to blast | CMR 13.09(3)(a), (h) | | ☐ | ☐ |
| Warning signal (3 long blasts 5 min before blast) Blast Signal (2 blasts 1 min before blast) All Clear Signal (1 prolonged blast) | CMR 13.09(1)(m), (3)(h)(2) | | ☐ | ☐ |
| Post Blast Inspection (blaster must inspect site prior to personnel returning) | CMR 13.09(4) | | ☐ | ☐ |
| Trash (boxes, bags, non-electric) (shall be picked up and/or destroyed) | CMR 13.09(6) | | ☐ | ☐ |

**Seismograph Readings:**

PPV: H_____ V_____ R_____ (2.0 in/sec max)
HZ: H_____ V_____ R_____ Airblast: _____Db (133max)

***Report any incident involving flyrock, whether or not was an injury or damage, to the Office of the State Fire Marshal at 978-567-3375.***
FP-55 (Rev. May '10)