

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. The Contractor shall establish, provide, and maintain lead controls for the duration of any work conducted during this contract. The Project to be completed under this contract is generally not considered a lead-abatement project; however, the Contractor may encounter lead coatings and lead-containing materials during general construction and demolition.
  
- B. The intent of this section is to require the Contractor to establish procedures and controls to prevent airborne lead emissions during general construction and demolition; comply with Washington Administrative Code (WAC) 296-155-176, Lead in Construction Standard; and manage debris waste in accordance with WAC 173-303, Dangerous Waste Regulations. The work may include:
  - 1. Limited demolition of concrete, steel, sheetrock, and other items that may consist of lead or contain lead coatings;
  - 2. Waste designation including samples collected in accordance with ASTM Standard E 1908 and subsequent Toxic Characteristic Leaching Procedure analysis (EPA Method 1311) conducted by a laboratory certified by the Washington State Department of Ecology;
  - 3. Disposal of lead debris waste in accordance with WAC 173-303, Dangerous Waste Regulations;
  - 4. Providing personnel that have received training as defined in WAC 296-155-17625.

**1.02 REFERENCES**

- A. The Contractor shall establish, provide, and maintain lead controls for the conditions that require conformance with specified regulatory requirements and standards. The following rules, requirements, and standards may apply to the Work:
  - 1. United States Occupational Safety and Health Administration (OSHA)
    - a) 29 CFR 1910 - Occupational Safety and Health Standards
    - b) 29 CFR 1910.134 - Respiratory Protection
    - c) 29 CFR 1910.1200 - Hazard Communication
    - d) 29 CFR 1926.55 - Gases, Vapors, Fumes, Dusts, and Mists

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- e) 29 CFR 1926.57 - Ventilation
- f) 29 CFR 1926.62 - Lead in Construction Standard
- 2. United States Environmental Protection Agency (EPA)
  - a) 40 CFR 260 - Hazardous Waste Management Systems: General
  - b) 40 CFR 261 - Identification and Listing of Hazardous Waste
  - c) 40 CFR 262 - Standards Applicable to Generators of Hazardous Waste
  - d) 40 CFR 263 - Standards Applicable to Transporters of Hazardous Waste
  - e) EPA Publication SW-846 - *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*
- 3. Department of Transportation (DOT)
  - a) 49 CFR Subchapter C; Hazardous Materials Regulations
- 4. National Institute for Occupational Safety and Health (NIOSH)
  - a) NIOSH OSHA Booklet 3142 Lead in Construction
- 5. American Society for Testing and Materials
  - a) Standard E 1908 – Standard Guide for Sample Selection of Debris Waste from a Building Renovation or Lead Abatement Project for Toxicity Characteristic Leaching Procedure (TCLP) Testing for Leachable Lead (Pb)
- 6. Washington State Regulations codified in the Washington Administrative Code governing lead work and lead waste management include but are not limited to:
  - a) WAC 296-62 - General Occupational Health Standards
  - b) WAC 296-24 - Safety Standards for Construction Work
  - c) WAC 296-155-176 - Occupational Health and Environmental Control; Lead
  - d) WAC 173-303 - Dangerous Waste Regulations

1.03 DEFINITIONS

- A. Action Level - Employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8-hour period. As used in this section, "30 micrograms per cubic meter of air" refers to the action level.
- B. Air Monitoring - The process of measuring the concentration of lead in a specific volume of air in a stated period of time. Air samples shall be collected and analyzed in accordance with the methods specified by the National Institute of Occupational Safety and Health (NIOSH Method 7082 or 7300) and as required by WAC 296-155-176.
- C. Area Monitoring - Sampling of lead concentrations within the lead control area, inside the physical boundaries, which are representative of the airborne lead concentrations that may reach the breathing zone of personnel potentially exposed to lead.
- D. ASTM- American Society for Testing and Materials
- E. Contractor - As defined in Document 00700 - General Conditions.
- F. Dangerous Waste - Solid wastes designated as dangerous wastes in WAC 173-303, Dangerous Waste Regulations. Dangerous Waste is the State of Washington's equivalent to Hazardous Waste under the Resource Conservation and Recovery Act (RCRA).
- G. DOT – Department of Transportation
- H. Ecology - Washington State Department of Ecology
- I. Eight-Hour Time Weighted Average (TWA) - Airborne concentration of lead averaged over an 8-hour workday to which an employee is exposed.
- J. EPA - United States Environmental Protection Agency
- K. Hazardous Waste – Solid Waste designated by 40 CFR Part 261 as hazardous and regulated as Hazardous Waste by the United States Environmental Protection Agency.
- L. L & I - Washington State Department of Labor & Industries
- M. Lead - Metallic lead, inorganic lead compounds, and organic lead compounds. Lead Permissible Exposure Limit (PEL) - Fifty (50) micrograms per cubic meter of air as an 8-hour time weighted average.

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- N. NIOSH - The National Institute for Occupational Safety and Health
- O. OSHA - The Occupational Safety and Health Administration
- P. Personal Monitoring - Sampling of lead concentrations within the breathing zone of an employee to determine the 8-hour time weighted average concentration in accordance with WAC 296-155-176. Samples shall be representative of the employee's work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of 6 to 9 inches and the center at the nose or mouth of an employee.
- Q. Industrial Hygienist: The Industrial Hygienist shall be subject to approval as specified under 1.06 Submittals of this specification section and shall have one of the following certifications:
  - a) Certified Industrial Hygienist certified by the American Board of Industrial Hygiene with prior experience in the health and safety aspects of a lead hazard control work project.
  - b) Professional Engineer or Certified Safety Professional with a minimum of three (3) years prior experience in industrial hygiene relating to lead hazard control work.
- R. WAC - Washington Administrative Code
- S. Waste Designation – The process of determining whether waste is regulated under WAC 173-303, Dangerous Waste Regulations.
- T. WISHA - Washington Industrial Safety and Health Act as enforced by the Washington State Department of Labor and Industries

**1.04 QUALITY ASSURANCE**

- A. The Contractor shall submit a Lead Controls Work Plan pursuant to 1.06 of this Section. The Work Plan shall establish procedures and controls to: prevent airborne lead emissions during general construction and demolition, comply with (WAC) 296-155-176, Lead in Construction Standard and manage debris waste in accordance with WAC 173-303, Dangerous Waste Regulations. The Work Plan will be submitted to the Port for review and approval prior to the start of any lead work.
- B. The Port will perform periodic observation of the site work to ensure that it is being performed in a manner consistent with the approved Work Plan and this specification. The Port's representative will have the authority to issue a "Stop Work" order for health and safety concerns or non-compliance with regulations or this specification.

1.05 SUBMITTALS

- A. Contractors shall provide complete submittals as per Sections 01330 Submittals and 01315 Regulated Materials Submittals for review by the Port. Review of submittals will be in accordance with Section 01330 Submittals.

PART 2 – PRODUCTS

2.01 EQUIPMENT AND SUPPLIES

- A. Containers
  - 1. All wastes that designate as hazardous waste shall be packaged in sealed containers with appropriate UN Performance Package Ratings.
  - 2. All drums and containers must be in shipping condition with gaskets intact.
- B. Labels
  - 1. All containers holding hazardous wastes will be labeled in accordance with WAC 173-303-190.

PART 3 – EXECUTION

3.01 WORK AREA PREPARATION

- A. Perform the following preliminary steps to prepare the Work Areas prior to demolition of lead coatings and lead-containing material.
  - 1. Establish a control area that includes a perimeter sufficient to perform the demolition work around each building or area that contains lead or lead-coated materials. The control area shall also consist of the pathway for transport of any lead-contaminated material to a stockpile or storage receptacle, if the demolition debris is not immediately transported from the site. Provide and display caution signs, in clearly visible areas, at entrances indicating that hazardous material work is being conducted, that state that unauthorized persons should not enter. Signs shall comply with WAC 296-155-176 regulations.
  - 2. Emergency Procedures: Establish and post written emergency procedures within each work area, including emergency contact names and contact phone numbers, plans for medical emergencies, temporary loss of electrical power or water, and procedures for an emergency. The Contractor is responsible for establishing and posting contingency procedures for all workers on site.

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3. Health and Safety Briefing: Conduct a health and safety briefing prior to the start of work and weekly to discuss the health and safety plan, hazardous materials, hazardous work and other related items per the specified Health and Safety Plan. More frequent briefings should be performed as required by project activities or changes in the work.
4. Utilities: Request and coordinate the use and shut down of all utilities. Request and coordinate the use of, including the shutdown of electric service to the work area and install temporary electric supply with ground fault interrupt protection.
5. Prepare all storm drains, floor and area drains, and drainage routes using the methods described in the approved work plan to prevent contaminated runoff.
6. Lead waste accumulation area: Prepare the lead-waste storage area as described in the approved Work Plan.
7. Decontamination Areas: Prepare the decontamination areas for use at all entrances and exits from the Work Area as described in the approved Work Plan.

#### 3.02 WORK PROCEDURE

- A. General Procedures: Perform all work and comply with the safety and health provisions in the site-specific Health and Safety Plan. The work includes all measures necessary to adequately protect workers, authorized personnel, Port staff and the public from lead exposures during the general demolition/renovation process and surface preparation activities.
- B. Coordination of work of all trades: Coordinate the work of all trades to assure that work is performed in accordance with the applicable regulations and that the control limits are maintained at all times both inside and outside the control area.
- C. Access to work Area: Access to work areas shall be through decontamination areas. Only the Contractor, subcontractors, authorized Port personnel, and project consultants shall have access to the Work Area.
- D. Means of Egress: Establish and maintain emergency and fire exits from the work area.
- E. Prevent dust generation at all times to the maximum extent practicable.
- F. The use of water shall be restricted to the smallest quantity necessary to minimize dust and to avoid the potential of contaminant migration through run-off or ponding. In no case shall liquids generated during building

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demolition/renovation come into contact with uncontaminated soils, drains, surfaces or conduits which may constitute a release to the environment.

- G. Demolition Procedures: Perform demolition in areas of lead-containing paints in accordance with approved Health & Safety Plans. Use procedures and equipment to limit occupational and environmental exposure to lead when lead-containing paint is impacted or when building components are demolished. The procedures employed by the Contractor shall not create the potential for contaminating surrounding areas or materials with lead-containing coatings or dust. Dust generation shall be kept to a minimum. Dry scraping, dry sanding, or dry grinding on lead-containing paints or lead contaminated surfaces will not be permitted without a full enclosure.
- H. Personnel and equipment decontamination shall occur whenever workers or equipment leave the work site as described in the approved work plan. Decontamination waste shall be packaged, stored, labeled and disposed according to all applicable requirements at the cost of the Contractor.
- I. The Port may inspect the Contractor's operations and work areas daily for job site cleanliness and conformance with the specifications.
- J. While performing the work, the Contractor may be subject to on-site inspection by L&I/DOSH, OSHA, EPA/Ecology inspectors and/or local building or health officials. If found to be in violation of pertinent regulations, the Contractor shall cease all work immediately and may not resume work until the violation is resolved. Standby time required to resolve the violation shall be at the Contractor's expense. Complete sets of equipment (such as respirators and disposable clothing) that may be required for entry to the control area shall be made available at all times by the Contractor to the Port and/or agency inspectors for inspection of the control area. Such requests will only be made during working hours.

### 3.03 LEAD CONTROLS AND AIR MONITORING

#### A. LEAD CONTROLS

- 1. Restrict the spread of dust and debris from being distributed over the work area.
- 2. Prevent dust generation at all times to the maximum extent practicable. The use of water shall be restricted to the smallest quantity necessary to minimize dust and to avoid potential run-off or ponding.

#### B. AIR MONITORING

- 1. Monitoring of airborne concentrations of lead shall be in accordance with

WAC 296-115-176, and as specified herein. Air monitoring, testing, and reporting shall be performed in accordance with an Air Monitoring Plan prepared and signed by the Contractor's Industrial Hygienist. The plan shall include personal monitoring in accordance with regulatory requirements and area monitoring outside the lead control area.

- a) Submit results of air monitoring samples, signed by the Contractor's Industrial Hygienist, within 24 hours after the air samples were taken.
- b) Notify the Engineer immediately of the corrective action taken if the exposure to lead is at or in excess of the action level of 30 micrograms per cubic meter of air outside of the lead control area.
- c) If the area air monitoring results are above the action level of 30 micrograms, the Engineer shall have the option of stopping all work until the work procedures and lead hazard controls are revised to the Engineer's satisfaction.

### 3.04 CLEAN UP, TESTING, AND DISPOSAL

#### A. CLEAN UP

1. Maintain surfaces of the lead control area free of accumulation of paint chips and dust. Restrict the spread of dust and debris; keep waste from being distributed over the work area. The use of compressed air to clean up the area is strictly prohibited. At the end of each shift, clean the area of visible lead paint contamination by vacuuming with a HEPA filtered vacuum cleaner, wet mopping the area, or cleanup by other appropriate means.
2. All abated lead waste shall be stored in sealed steel containers with appropriate UN Performance Package Ratings.
3. Demolition Debris that is found to designate as Dangerous Waste can be stored in closed top roll off containers. Tops must be closed when not adding waste to the container.

#### B. TESTING OF DEMOLITION DEBRIS

1. The Contractor is responsible for sampling and testing any abated lead waste or lead demolition debris.
2. Sampling of demolition debris shall be in accordance with the most current version of ASTM Standard E 1908 - Standard Guide for Sample Selection of Debris Waste from a Building Renovation or Lead Abatement



Project for Toxicity Characteristic Leaching Procedure (TCLP) Testing for Leachable Lead (Pb)

3. If any lead waste is found to designate as dangerous waste, the Contractor must immediately notify the Engineer.

**C. DISPOSAL OF LEAD DEMOLITION WASTE**

1. The following requirements shall be met for the disposal of any lead-containing Dangerous Waste:
  - a) The Contractor shall submit the name, address, and EPA Identification Number of the transporter and disposal facility to Port of Seattle prior to shipment of any hazardous waste.
  - b) A representative from Port of Seattle must be present for any Dangerous Waste shipment and will sign all hazardous waste manifests, waste material profiles, land disposal restriction forms and any other documents requiring generator signature.
  - c) Contractor shall give notice of any Dangerous Waste shipments to Port of Seattle at least 2 business days prior to shipment.
  - d) Any lead-containing Dangerous Waste for disposal must be packaged in appropriate UN performance packages or roll off containers according to all DOT specifications.

**PART 4 – MEASUREMENT AND PAYMENT**

No separate measurement or payment will be made for the work required by this section. The cost for this portion of the Work will be considered incidental to, and included in the payments made for "Site Demolition".

END OF SECTION
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**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. This section applies to all work related to removal, transportation, and disposal of Polychlorinated Biphenyls (PCB) containing light ballasts (PCB ballasts) and non-PCB ballasts.
- B. This project involves complete removal of light fixtures in buildings to be demolished.
- C. The work includes the following:
  - 1. Partial dismantling of light fixtures and separation of ballasts;
  - 2. Determining if ballasts are PCB ballasts or non-PCB ballasts;
  - 3. Identification and notification to Port regarding any leaking PCB Ballasts.
  - 4. Placement of all PCB or PCB-contaminated items generated as a result of work activities in approved disposal containers with proper labels;
  - 5. Marking and labeling of all PCB equipment and contaminated material;
  - 6. Collection and containerization of all non-PCB ballasts; and
  - 7. Coordinating transfer of PCB equipment and recycling of non-PCB equipment.

**1.02 SUBMITTALS**

- A. Contractors shall provide complete submittals per 01330 - Submittals and 01315 – Regulated Materials Submittals for review by the Port of Seattle. Review of submittals will be in accordance to section 01330 - Submittals.

**1.03 APPLICABLE REGULATIONS AND STANDARDS**

- A. The applicable sections, latest editions and addenda of the following government regulations, codes, industry standards and recommended practices, form a part of these specifications.
  - 1. EPA - Environmental Protection Agency, Toxic Substances Control Act Title 40 Code of Federal Regulations Part 761 (40 CFR 761)
  - 2. DOT - Department of Transportation, Title 49 Code of Federal Regulations

3. DOE - Washington State Department of Ecology, Dangerous Waste Regulations, Washington Administrative Code 173-303
4. WISHA - Washington State Industrial Safety & Health Act, Washington Administrative Code 296-800, Safety and Health Core Rules
5. All other applicable Federal, State, county and city standards codes

#### 1.04 COORDINATION

- A. Contractor shall coordinate ballast removal with the following Port of Seattle Departments:
  1. Port of Seattle Seaport Environmental Programs: The Contractor must coordinate with Seaport Environmental Programs to coordinate transfer of any PCB ballasts to Port of Seattle. This coordination shall be through the Engineer.

### PART 2 – PRODUCTS

#### 2.01 MATERIAL AND EQUIPMENT

- A. Containers
  1. All PCB Ballasts or PCB contaminated material or Non-PCB ballasts shall be packaged in sealed steel drums with appropriate UN Performance Package Ratings.
  2. All drums must be in shipping condition with gaskets intact.
- B. Labels
  1. All containers holding PCB ballasts or PCB Contaminated Material shall be labeled with the Large PCB Mark (M<sub>L</sub>) in accordance with 49 CFR 761.40 marking requirements.
  2. All containers holding non-PCB Ballasts shall be labeled with the words “non—PCB Ballasts”

### PART 3 – EXECUTION

#### 3.01 WASTE STREAM DETERMINATION, PACKAGING, AND MARKING

- A. Waste Stream Determination
  1. Before removing the ballast from the fixture, the Contractor shall distinguish PCB Ballasts from non-PCB ballasts by looking for the words

“No PCBs” on the ballast. If the words “No PCBs” do not appear on the ballast, the ballast must be considered PCB Equipment as defined in 40 CFR 761.3. If the words “No PCBs” do appear on the ballast, the ballasts shall be considered non-PCB. Contractor will also determine if the ballast is leaking.

2. The determinations made by the contractor will result in the following three possible waste streams that must be segregated:
  - a) Intact PCB Ballasts
  - b) Leaking PCB Ballasts
  - c) Non-PCB Ballasts (leaking non-PCB ballasts can be packaged with the non-leaking, non-PCB ballasts).
3. Any leaking PCB ballasts must be reported to Resident Engineer immediately.

**B. Containerization and Marking**

1. All non-leaking PCB Ballasts shall be packaged in steel drums marked or labeled with the Large M<sub>L</sub> PCB Mark. The “taken out of service” date shall be marked on the drum as the date the first ballast is removed and placed in the drum.
2. All leaking PCB ballasts shall be double bagged, packed in steel drums and marked or labeled with the Large M<sub>L</sub> PCB Mark. The “taken out of service” date and “Leaking PCB Ballasts” shall be marked on the drum. Upon notification to Port of Seattle Seaport Environmental Programs, Leaking PCB Ballasts will be removed from the site immediately by the Port.
3. Any PCB contaminated material generated as a result of the work shall be packaged in steel drums marked or labeled with the Large M<sub>L</sub> PCB Mark. The accumulation start date shall be indicated on the drum as the date the first piece of contaminated material is placed in the drum.
4. All non-PCB ballasts shall be packaged in steel drums and marked with the words “Non-PCB Ballasts for Recycling”.
5. All containers designated for disposal shall be marked with the project number.

### 3.02 LEAKING PCB BALLASTS AND SPILLS

- A. All leaking PCB ballasts shall be addressed immediately. Upon discovery of leaking PCB ballasts, the Contractor shall commence with cleanup as follows:
1. Clear the area and prohibit those not involved with cleanup from entering the area. Ventilate area if possible.
  2. Contact Engineer immediately.
  3. Don appropriate personal protection equipment for handling organic liquids as specified in the site specific safety plan.
  4. Ensure that the light fixture is turned off and disconnect electricity at the fuse or breaker box. Follow all lockout/tagout procedures.
  5. Remove the fluorescent lamp if it is still affixed and manage according to section 02082 – Removal and Disposal of Universal Waste Lamps.
  6. Remove the ballast and immediately double-bag in plastic.
  7. Place ballast in steel drum, seal the drum, and mark the drum as indicated in 3.01 B.
  8. Proceed to clean up any spilled liquids.
  9. If liquids have come in contact with an impervious surface, first absorb any free liquids with absorbent media (such as rags, oil pads, or towels) and place in the designated drum. The area impacted by the spilled PCB liquid must then be decontaminated with an appropriate solvent such as diesel or mineral spirits applied with a rag or towel. Dispose of all cleanup media in the designated drum.
  10. If liquids have come in contact with absorbent material such as carpet or drapes, the material must be cut away in a six inch radius from any contaminated point. Dispose of all cleanup media in the designated drum.
  11. Arrangements will be made by Port of Seattle Seaport Environmental Programs to remove the drums containing leaking PCB Ballasts from the site as soon as possible for storage in accordance with 49 CFR 761.65(b).

### 3.03 TEMPORARY STORAGE, TRANSPORTATION AND DISPSOAL

- A. Temporary Storage
1. The Contractor may temporarily store non-leaking PCB ballasts onsite for a maximum of 30 days. After 30 days the PCB ballasts are subject to the storage requirements of 40 CFR 761.65(b).

2. Leaking PCB ballasts cannot be temporarily stored onsite. If leaking PCB ballasts are discovered, immediately contact Port of Seattle Seaport Environmental Programs for removal following cleanup by the Contractor at (206) 465-2446.
3. Temporary onsite storage of drums of PCB Ballasts and non-PCB ballasts must be in accordance with directions given by Port of Seattle Seaport Environmental Programs. The requirements include secondary containment and covering of the waste materials if stored outside.

**B. Transportation and Disposal**

**1. PCB Containing Ballasts**

- a. The Port will take possession of and remove from the project site, all PCB containing ballasts at a minimum of every 30 days.
- b. The Contractor shall be responsible for scheduling transfer of drums to the Port. The Contractor must notify the Engineer at least 48 hrs. in advance to coordinate pickup of drums by the Port.

**2. Non-PCB Containing Ballasts**

- a. The Contractor shall be responsible for soliciting a waste service provider and any cost negotiations regarding disposal.
- b. The Port of Seattle requires that all non-PCB ballasts are recycled. Landfill of any light ballast is not allowed under this contract. The Contractor must ensure that the disposal/recycling facility will separate metal components from the ballast for recovery.

**PART 4 – MEASUREMENT AND PAYMENT**

No separate measurement or payment will be made for the work required by this section. The cost for this portion of the Work will be considered incidental to, and included in the payments made for "Site Demolition".

End of Section
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PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. The Contractor shall supply all labor, materials, vehicles, services, insurance and equipment necessary to remove and recycle universal waste lamps in accordance with all applicable federal and state regulations and these specifications.
- B. The intent of this section is to require the Contractor to establish procedures to remove and recycle universal waste lamps in accordance with Washington Administrative Code (WAC) 296-62, General Occupational Health Standards, and WAC 173-303, Dangerous Waste Regulations. The Work may include:
  - 1. Physical removal of universal waste lamps from fixtures;
  - 2. Packaging, labeling and temporarily storing universal waste lamps in accordance with WAC-173-303-573, Standards for Universal Waste Management;
  - 3. Transportation of universal waste lamps to the Port of Seattle approved off-site universal waste management facility;
  - 4. Clean-up of accidentally broken universal waste lamps.

1.02 REFERENCES

- A. The Contractor shall be responsible for monitoring work activities and determining conditions that require conformance with specified regulatory requirements and standards. The following rules, requirements, and standards may apply to the Work:
  - 1. United States Environmental Protection Agency (EPA)
    - a) Title 40 Code of Federal Regulations Part 273 – Standards for Universal Waste Management
  - 2. Washington State Department of Ecology (Ecology)
    - a) WAC 173-303-077 - Requirements for Universal Waste
  - 3. Washington State Department of Labor & Industries (L&I)
    - a) Chapter 296-24 Safety Standards

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- b) Chapter 296-62 Occupational Health and Safety Regulations, including:
    - 1) WAC 296-62-054 - Hazard Communication Standard
    - 2) WAC 296-842 - Respiratory Protection.
  - c) Chapter 296-155 - Construction Standards.
- B. Other guidelines, codes or documents:
- 1. United States Department of Transportation (DOT) Hazardous Materials Regulations, Code of Federal Regulations Title 49.
  - 2. Washington State Department of Ecology Publication 00-04-020, *Focus Sheet: Universal Waste Rule for Dangerous Waste Lamps WAC 173-303-573*

**1.03 DEFINITIONS**

- A. AIHA- American Industrial Hygiene Association
- B. ASTM- American Society for Testing and Materials
- C. Authorized Visitor - Designated representatives of the Contractor, tenant or the Port, and representatives of a regulatory or other agency having jurisdiction over the project.
- D. Certified Industrial Hygienist (CIH) - An industrial hygienist certified in the Comprehensive Practice of Industrial Hygiene by the American Board of Industrial Hygiene.
- E. Contractor - As defined in Document 00700 - General Conditions.
- F. Ecology - Washington State Department of Ecology
- G. EPA - United States Environmental Protection Agency
- H. HEPA Filter - A high efficiency particulate air filter capable of removing particles greater than 0.3 microns in diameter with 99.97% efficiency.
- I. L & I - Washington State Department of Labor & Industries
- J. NESHAP - The National Emission Standards for Hazardous Air Pollutants (40 CFR Part 61).



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- K. NIOSH - The National Institute for Occupational Safety and Health
- L. OSHA - The Occupational Safety and Health Administration
- M. PSCAA - Puget Sound Clean Air Agency
- N. Universal Waste – certain dangerous wastes such as batteries, electronic equipment and lamps that are excluded from full regulation under WAC-173-303 and can be managed under less stringent regulatory requirements. State requirements for universal waste are found in WAC 173-303-573.
- O. Universal Waste Lamp – certain lamps that contain constituents, such as mercury or lead that would otherwise cause them to designate as Dangerous Waste when discarded but can be managed as universal waste. The following lamps must be considered universal waste lamps and managed accordingly:
  - 1. Fluorescent tubes (including green-tip tubes)
  - 2. High intensity discharge lamps (including mercury vapor, metal halide, and high pressure sodium)
  - 3. Compact fluorescent lamps
  - 4. Incandescent bulbs
  - 5. Any other lamps that are dangerous waste
- P. WAC - Washington Administrative Code
- Q. WISHA - Washington Industrial Safety and Health Act as enforced by the Washington State Department of Labor and Industries

**1.04 SUBMITTALS**

- A. Contractors shall provide complete submittals as per Sections 01330 Submittals and 01315 - Regulated Materials Submittals for review by the Port. Review of submittals will be in accordance with Section 01330 - Submittals.

**PART 2 – PRODUCTS**

**2.01 EQUIPMENT AND SUPPLIES**

- A. Personnel Protective Equipment
  - 1. Respiratory Protection: All employees cleaning up broken universal waste lamps shall be provided with and be required to use adequate and appropriate respiratory protection in accordance with WAC 296-62-842.

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2. For workers cleaning up broken universal waste lamps, full body disposable protective clothing incorporating head, body and feet covering constructed of material that will not absorb chemicals shall be provided in sufficient quantities and adequate sizes to accommodate movement without tearing, to all workers and authorized visitors.
  3. Additional safety equipment (e.g., hard hats meeting the requirements of ANSI Standard Z89.1-1981, eye protection meeting the requirements of ANSI Standard Z87.1-1979, safety shoes meeting the requirements of ANSI Standard Z41.1-1967, and disposable gloves) shall be provided as necessary to all workers and authorized visitors and shall be sized to fit the wearer.
- B. Removal Equipment
1. A sufficient supply of scaffolds, ladders, lifts, and hand tools shall be provided, as needed.
  2. Additional support equipment, as needed.
- C. Packaging Equipment and Material
1. Cardboard boxes and/or fiberboard drums
  2. Fluorescent lamp shipping boxes
  3. Universal Waste labels

**PART 3 – EXECUTION**

**3.01 WASTE DESIGNATION**

- A. All lamps removed from the site shall be considered universal waste lamps as defined by WAC 173-303-040 provided the lamps are managed accordingly.
- B. Any onsite disposal of universal waste lamps (i.e. thrown in the garbage or waste dumpster) constitutes improper disposal of fully regulated dangerous waste and would be considered a violation of the Federal Resource Conservation and Recovery Act and the Washington State Dangerous Waste Regulations. Consequences for improper disposal could involve severe penalty or criminal charges.

**3.02 REMOVAL PROCEDURES**

- A. Removal and Packaging of Universal waste lamps

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1. Lamps shall be removed and containerized in a manner to prevent breakage. The Universal Waste lamps (that is, each lamp), or a container in which the lamps are accumulated, must be labeled or marked clearly with any one of the following phrases:
  - "Universal Waste Lamp(s),"
  - "Waste Lamp(s)"
  - "Used Lamp(s)"
2. If a lamp breaks, the Contractor shall immediately clean-up debris and place in a container specified for broken lamps. The container holding broken lamps must be marked: "Universal Waste - Accidentally Broken Lamps".
3. The accumulation start date is the date that any amount of universal waste was placed in the container. Broken lamps shall also be recycled but must be separated from unbroken lamps
4. All lamps shall be placed in boxes or fiberboard drums in a manner to prevent breakage. These boxes shall be shipped to an approved recycling facility. 5. Contractor must identify disposal facility and gain approval by the Port.

**B. Clean-up Procedures for Broken Universal waste lamps**

1. The Contractor shall have a cleanup kit on site prior to removing/dismantling universal waste lamps fixtures.
2. Broken lamps shall be cleaned-up immediately.
3. Use calcium polysulfide wetting solution on spilled lamp material to inhibit vaporization.
4. Following removal of broken glass, clean the floor with diluted trisodium phosphate (TSP) solution according to the manufacturer's recommendations.
5. Place all broken glass and TSP powder in sealed containers and label as specified in 3.02 (A.)(1.) of this section.

**3.03 TEMPORARY ONSITE STORAGE**

- A. Universal waste lamps that have been removed, properly packaged, and are awaiting disposal must be stored in a manner consistent with WAC-173-303-573

and Section - 01631, Hazardous Materials Management, Planning and Execution of the Project Manual.

- B. Under no circumstances shall universal waste be stored onsite for longer than one year.

**3.04 TRANSPORTATION TO OFF-SITE FACILITIES**

- A. The universal waste lamps shall be packaged, labeled and transported to the Port-approved recycling facility.
- B. The Port of Seattle shall be listed as the Generator of the universal waste lamps on all shipping papers.
- C. The Contractor shall provide a shipping record to the Port at the time of shipment.
- D. The Contractor shall arrange for all certificates of recycle to be mailed to the Port at the following address:

Port of Seattle AV/ENV  
PO Box 68727  
Seattle, WA 98168-0727

**PART 4 – MEASUREMENT AND PAYMENT**

- A. No separate measurement or payment will be made for the work required by this section. The cost for this portion of the Work will be considered incidental to, and included in the payments made for "Site Demolition"..

End of Section

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. The Contractor shall supply all labor, materials, services, insurance, special permits and equipment necessary to remove and dispose of asbestos containing materials (ACM) as assigned by the Port in specific work authorizations in accordance with all applicable federal, state, and local regulations and these specifications.

1.02 GENERAL REQUIREMENTS

- A. Contractor shall be responsible for notifying and providing all necessary communications to the responsible regulatory agencies for all required work.
- B. Contractor shall be responsible for taking appropriate measures ensuring that the project site shall be safeguarded from contamination during the asbestos abatement project period.
- C. Building materials in the project area shall be treated as ACM or asbestos-contaminated unless otherwise noted.
- D. All work shall be performed in accordance with applicable codes, standards, regulations, and accepted industry practices. This includes compliance with regulatory requirements applicable at the time the work is performed and is not limited to requirements at the time of bid. All work, including work practices, shall be craftsman-like and is subject to inspection by the Engineer and regulatory agency personnel.
- E. All required permits and notifications shall be kept valid for the duration of the contract. This includes any permit and/or notification revisions, such as changes of abatement dates, shift times, work locations, Contractor personnel, etc.
- F. The Contractor shall be responsible for restoring the work area and auxiliary areas utilized during the abatement to conditions equal to or better than original. Damages caused during the performance of abatement activities shall be repaired by the Contractor at no additional cost to the Port.
- G. All air and bulk sampling information shall be legibly entered on Port of Seattle forms. Copies of the applicable Port forms are available through the Engineer.
- H. All employees involved in asbestos abatement activities shall be the bearer of a current Certified Asbestos Worker card issued by the Washington State Department of Labor and Industries (L&I). Cards shall be available for inspection at the jobsite. The Contractor shall also provide, as a minimum, one (1) person certified by L&I as an Asbestos Abatement Supervisor and this person shall be responsible for overall abatement activities. This person shall be immediately available on-site when any project work is done. If abatement work is performed on multiple shifts, each shift shall have a certified Asbestos Abatement Supervisor.
- I. Use of the Site: Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to seaport rules and regulations affecting the work while engaged in the project.

- J. Keep public easements free of accumulation of waste, rubbish, and construction debris.
- K. Smoking or open fires shall not be permitted anywhere on the premises.
- L. Site Conditions: The removal area may have domestic water and sewer lines, electrical and communication conduit with active wiring, cable trays, light fixtures and HVAC equipment located in the project area. The Contractor shall verify location of all equipment and protect and maintain it as required.
- M. The Contractor shall follow all Port rules and regulations regarding access to and from the work site.
- N. Contractor shall be responsible for all air sampling for DOSH and other local, state and federal compliance. Refer to Article 1.07 of this Section for requirements for Contractor air monitoring.
- O. On-site Observation
  - 1. The safety and protection of the Contractor's employees, sub-contractor's employees, Port's employees, consultants, the facility, and the public shall be the sole responsibility of the Contractor.
  - 2. Representatives of the Port or local, State, or Federal agencies may make unannounced visits to the site during the work. The Contractor shall provide two complete sets of clean, protective clothing and respirators with the same protection factor as required in the regulated area available daily for such visitor use. It is the visitor's responsibility to insure all necessary medical qualification, training, and "fit test" certificates are current prior to using any respirator or protective clothing provided by the Contractor.
  - 3. If the Port or agency visitor determines that practices are in violation of applicable regulations, or are endangering workers, the general public or the facility, they will immediately notify the Contractor orally that operations must cease until corrective action is taken. Such notification from the Port will be followed by written confirmation within three (3) workdays.
  - 4. Contractor shall immediately stop work after receiving such notification verbally or written. The work shall not be restarted until the Contractor receives written authorization from the Engineer.
  - 5. All costs resulting from such stop work order and any necessary corrective actions shall be borne solely by the Contractor and shall not be a basis for an increase in the contract amount or an extension of time.

### 1.03 ASBESTOS ABATEMENT DEFINITION

- A. Port Asbestos Definitions
  - 1. *Engineer*: The Engineer is the Port on-site representative directly involved with project oversight, abatement inspections, and recordkeeping.
  - 2. *RM Project Designer*: The person or firm under contract with the Port of Seattle for project designs associated with the removal/abatement of Regulated Materials. The RM Project Designer reports directly to the Engineer.
- B. Definitions Relevant to Asbestos Abatement: (Some of these definitions may be found in

other sections of the contract documents.)

1. *Abatement*: Procedures to control fiber release from asbestos-containing materials. Includes removal, encapsulation, enclosure, repair, demolition and renovation activities.
2. *ACGIH*: American Conference of Governmental Industrial Hygienists.
3. *Aerosol*: A system consisting of particles, solid or liquid, suspended in air.
4. *AIHA*: American Industrial Hygiene Association.
5. *Air Cell*: Insulation normally used on pipes and ductwork that is comprised of a corrugated cardboard that frequently contains asbestos.
6. *Airlock*: A system for permitting ingress and egress with minimum air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways separated by a distance of at least 3 feet.
7. *Air Monitoring*: The process of measuring the fiber content of a known volume of air collected during a specific period of time. The procedure most commonly utilized in industry for asbestos follows the WISHA reference method outlined in WAC 296-62-07735, Appendix A, and WAC 296-62-07737, Appendix B. For clearance air monitoring, aggressive monitoring techniques are used and shall be conducted in accordance with EPA document #560/5-85-024 (June 1985). Electron microscopy methods may also be utilized for lower detectability as well as specific fiber identification.
8. *Air Sampling Firm (ASF)*: A professional firm providing specialized services by trained and certified or qualified personnel in the field of asbestos abatement and project management, contracted with or employed by the Contractor or tenant to supervise and/or conduct inspection, monitoring, and analysis services.
9. *Amended Water*: Water to which a surfactant has been added in order to accomplish more thorough penetration and saturation of the asbestos-containing material.
10. *ANSI*: American National Standards Institute.
11. *Asbestos*: The mineral varieties of serpentinite (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite (amosite), anthophyllite, actinolite and tremolite. For purposes of determining respiratory and worker protection, both the asbestiform and non-asbestiform varieties of the above minerals and these minerals that have been chemically treated and/or altered shall be considered as asbestos.
12. *Asbestos-Containing Material (ACM)*: Any material containing more than one percent (1%) asbestos as defined under NESHAPS CFR 40, Part 61, and OSHA 29 CFR Part 1926.1101, WAC 296-62-07703, and Regulation III of the Puget Sound Clean Air Agency.
13. *Asbestos-Containing Waste Material*: Any material, which is or is suspected of being or any material contaminated with an asbestos-containing material, which is to be removed from a work area for disposal.
14. *Asbestos-Containing Waste*: Asbestos containing or contaminated materials or

objects requiring disposal.

15. *ASF*: Air Sampling Firm.

16. *ASTM*: American Society for Testing and Materials.

17. *Authorized Visitor*: Designated representatives of the Contractor, or the Port and representatives of a regulatory or other agency having jurisdiction over the project.

18. *Breathing Zone*: A hemisphere forward of the shoulders with a radius of approximately 6 to 9 inches.

19. *Bridging Encapsulant*: The application of a sealant over the surface of asbestos-containing material to prevent the release of asbestos fibers.

20. *Category I; Non-friable Asbestos-Containing Material (ACM)*: Asbestos-containing packing, gaskets, resilient floor covering and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in appendix A, subpart F, 40 CFR part 763, section 1, Polarized Light Microscopy.

21. *Category II; Non-friable ACM*: Any material, excluding Category I Non-friable ACM, containing more than 1 percent asbestos as determined using the methods specified in appendix A, subpart F, 40 CFR part 763, section 1, Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized, or reduced to *powder by hand pressure*.

22. *Certified Industrial Hygienist (CIH)*: An industrial hygienist certified in the Comprehensive Practice or Chemical Aspects of Industrial Hygiene by the American Board of Industrial Hygiene.

23. *Class I Asbestos Work*: Activities involving the removal of thermal system insulation or surfacing ACM/PACM.

24. *Class II Asbestos Work*: Activities involving the removal of ACM, which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.

25. *Class III Asbestos Work*: Repair and maintenance operations where "ACM", including TSI and surfacing ACM and PACM, may be disturbed.

26. *Class IV Asbestos Work*: Maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II, and III activities.

27. *Clean Room*: An uncontaminated area or room, which is a part of the worker decontamination enclosure system with provisions for storage of worker's street clothes and clean protective equipment.

28. *Containment*: An enclosure system.

29. *Contractor*: As defined in Document 00700 - General Conditions.



30. *Competent Person*: The individual onsite (a representative of the contractor) who is capable of identifying existing asbestos, hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, and who has the authority to take prompt corrective measures to eliminate them as specified in WAC 296-62-07728. The competent person shall meet all requirements specified in WAC 296-62-07728. The competent person shall be certified as an asbestos supervisor in compliance with WAC 296-65-030(3) and 296-65-012.

31. *Curtained Doorway*: A device to allow ingress or egress from one room to another, typically constructed by placing three overlapping sheets of plastic over an existing or temporarily framed doorway.

32. *Cutting*: To penetrate with a sharp-edged instrument and includes sawing, but does not include shearing, slicing, or punching.

33. *Demolition*: The wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations or the intentional burning of any facility.

34. *Differential Pressure System*: A containment system utilizing HEPA machines in an airtight enclosure.

35. *Disposal Bag*: 6-mil thick leak-tight plastic bags used for transporting asbestos waste from the work site and to the disposal site. Each shall be labeled in accordance with WAC 296-62-07721 and 40 CFR 61.150 and PSCAA 4.05(b) 10.

36. *Encapsulant*: A material which is applied to asbestos-containing material to reduce or control the potential release of asbestos fibers from the material, either by creating a membrane over the surface (bridging encapsulant), or by penetrating into the material and binding its components together (penetrating encapsulant).

37. *Encapsulation*: The application of an encapsulant to asbestos-containing materials in accordance with the manufacturer's specifications.

38. *Enclosure*: A semi-air tight system used to segregate and isolate an asbestos abatement area, and which is continuously served by a negative pressure ventilation system once abatement activities start.

39. *EPA*: U.S. Environmental Protection Agency, Region X.

40. *Equipment Room*: An area or room, which is part of the worker decontamination enclosure system with provisions for storage of contaminated clothing and equipment.

41. *Excursion Limit*: The maximum personal exposure concentration of asbestos fibers in air for any 30-minute period (1.0 f/cc).

42. *Facility*: Any institutional, commercial, public, industrial, or residential structure, installation, or building (including any structure, installation, or building containing condominiums or individual dwelling units operated as a residential cooperative, but excluding residential dwellings having four or fewer dwelling units); any ship; and any active or inactive waste disposal site. For purposes of this definition, any building,

structure or installation that contains a loft used as a dwelling is not considered a residential structure, installation, or building.

43. *Facility Component*: Any part of a facility including equipment.

44. *Filter*: A media component used in respirators or equipment to remove solid or liquid particles from air or water.

45. *Fixed Object*: A piece of equipment or furniture in the work area, which cannot be removed from the work area.

46. *Friable Asbestos Material*: Any material containing more than 1 percent asbestos as determined using the method specified in appendix A, subpart F, 40 CFR part 763 section 1, Polarized Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

47. *Friable Upon Removal*: A non-friable material, which becomes friable when disturbed during removal.

48. *Fugitive Source*: Any source of emissions not controlled by an air pollution control device.

49. *Glovebag Technique*: A method for removing small amounts of friable asbestos-containing material from fireproof beams, HVAC ducts, short piping run, valves, joints, elbows and other non-planar surfaces in a non-contained (plasticized) work area. The glovebag assembly is a manufactured or fabricated device consisting of a bag (typically constructed of plastic), two inward projecting long sleeve gloves, an internal tool pouch and an attached or pre-printed label. All workers who are permitted to use the glovebag technique must be trained, experienced and skilled in this abatement method.

50. *Grinding*: To reduce to powder or small fragments and includes mechanical chipping or drilling.

51. *HEPA Filter*: A high efficiency particulate air filter capable of removing particles greater than 0.3 microns in diameter with 99.97% efficiency using Dop testing methodology.

52. *HEPA Vacuum*: A vacuum system equipped with HEPA filtration.

53. *HEPA Machine*: Negative air machine.

54. *HVAC*: Heating, Ventilation and Air Conditioning System.

55. *Installation*: Any building or structure or any group of buildings or structures at a single demolition or renovation site that are under the control of the same owner or operator (or owner or operator under common control).

56. *L&I*: Washington State Department of Labor and Industries.

57. *Leak-Tight*: Solids or liquids cannot escape or spill out. It also means dust-tight.

58. *Malfunction*: Any sudden and unavoidable failure of air pollution control equipment or

process equipment or of a process to operate in a normal or usual manner so that emissions of asbestos are increased. Failures of equipment shall not be considered malfunctions if they are caused in any way by poor maintenance, careless operation, or any other preventable upset conditions, equipment breakdown, or process failure.

59. *Material Decon Unit*: A decontamination system, which is utilized for transferring containerized waste from inside to outside of the work area.

60. *Movable Object*: A piece of equipment or furniture in the work area, which can be removed from the work area.

61. *MSDS*: Material Safety Data Sheet.

62. *Mudded Pipe Insulation Section*: A continuous section of pipe insulation less than 12" in length, which may contain one or more plumbing fitting(s) (i.e., elbows, tees, valves, "y's", unions, etc.).

63. *Negative Air Machine*: A specially designed fan mounted in a cabinet that draws air from the contaminated space into pre-filters and a HEPA filter.

64. *Negative Pressure Respirator*: A respirator in which the air pressure inside the respirator is negative during inhalation in relation to the air pressure outside the respirator.

65. *Negative Pressure Enclosure*: The negative pressure/local exhaust system, utilizing HEPA filtration capable of maintaining a negative pressure of 0.02 inches of water inside the work area and a minimum of four (4) air exchanges per hour from adjacent areas into the work area and exhausting clean, filtered air outside work area.

66. *Negative Pressure*: Air pressure lower than surrounding areas, generally caused by exhausting air from within the containment work area. A sufficient volume of air shall be exhausted to create a minimum pressure of -0.02 inches of water within the enclosure with respect to the area outside of the containment work area.

67. *NESHAP*: The National Emission Standards for Hazardous Air Pollutants (40 CFR Part 61).

68. *Non-Friable Asbestos-Containing Material*: Any material containing more than 1 percent asbestos as determined using the method specified in appendix A, subpart F, 40 CFR part 763, section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

69. *NIOSH*: The National Institute for Occupational Safety and Health.

70. *OSHA*: The Occupational Safety and Health Administration.

71. *Outside Air*: The air outside building, structure, negative air enclosure or containment.

72. *Owner or Operator of a Demolition or Renovation Activity*: Any person, who owns, leases, operates, controls, or supervises the facility being demolished or renovated or any person, who owns, leases, operates, controls, or supervises the demolition or renovation operation or both.

73. *PACM*: Presumed Asbestos-Containing Material, means thermal system insulation and surfacing material found in building, vessels, and vessel sections constructed no later than 1980.

74. *PAT Program*: Proficiency Analytical Testing Program to determine quality of laboratory performing PCM analysis, as administered by the AIHA.

75. *PCM*: Phase Contrast Microscopy.

76. *PLM*: Polarized Light Microscopy.

77. *Particulate Asbestos Material*: Finely divided particles of asbestos or material containing asbestos.

78. *Penetrating Encapsulant*: Liquid material applied to asbestos-containing material to control airborne fiber release by penetrating into the material and binding its components together.

79. *Personal Monitoring*: Sampling the asbestos fiber concentrations within the breathing zone of an employee during representative operations as required by applicable regulations.

80. *Protection Factor*: The ratio of the ambient concentration of an airborne substance to the concentration of the substance outside the respirator to the concentration inside the respirator at the breathing zone of the wearer.

81. *Prior Experience*: Experience required of the Contractor on asbestos projects of similar nature and scope to insure the capability of performing asbestos abatement in a satisfactory manner. Similarities shall be in areas related to material composition, project size, abatement methods required, number of employees and the engineering, work practice and personal protection controls required.

82. *Regulated Area*: An area established by the Contractor to demarcate areas where airborne concentrations of asbestos exceed, or can reasonably be expected to exceed the permissible exposure limits. The regulated area may take the form of (a) a temporary enclosure, as required by WAC 296-62-07711, or (b) an area demarcated in any manner that minimizes the number of employees exposed to asbestos.

83. *Regulated Asbestos-Containing Material (RACM)*: (a) Friable asbestos material, (b) Category I Non-friable ACM that has become friable, (c) Category I Non-friable ACM that will be or has been subjected to sanding, grinding, cutting or abrading, or (d) Category II Non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations regulated by this subpart.

84. *Removal*: To take off asbestos containing materials from surfaces or components of a facility.

85. *Renovation*: Altering a facility or one or more facility components in any way, including the stripping or removal of RACM from a facility component. Operations in which load-supporting structural members are wrecked or taken out are demolitions.

86. *Respirator*: A device designed to protect the wearer from the inhalation of harmful atmospheres.

87. *Shower Room*: A room between the clean room and the equipment room within the worker decontamination system supplied with hot and cold running water controllable at the tap and suitably arranged for complete showering.

88. *Staging Area*: Either the holding area or some areas near the waste transfer airlock where containerized asbestos waste has been placed prior to removal from the work area.

89. *Structural Member*: Any loaded-bearing member of a facility, such as beams and load-bearing walls or any non-load supporting member, such as ceilings and non-load supporting walls.

90. *Surfactant*: A chemical wetting agent added to water to improve penetration.

91. *"Tattle-Tale"*: A material or method providing a positive visual method of checking material leakage such as cardboard or chalk, which becomes noticeably darker when wet.

92. *Time Weighted Average (TWA)*: The average exposure to a contaminant in air measured during a specific time period, usually a shift, adjusted to eight hours.

93. *Visible Emissions*: An emission containing particulate asbestos material that is visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.

94. *Waste Generator*: Any owner or operator of a source covered by Department of Transportation regulations whose act or process produces asbestos-containing waste material. All demolition debris materials, including asbestos-containing materials, except those containing substances classified as hazardous or dangerous by controlling local, state or federal regulatory agencies, shall upon their demolition become the property of the Contractor.

95. *Waste Shipment Record*: The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste material.

96. *Wet Cleaning*: The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils which have been dampened with water and afterwards thoroughly decontaminated or disposed of as asbestos contaminated waste.

97. *Work Area*: Designated rooms, spaces, or areas of the project in which asbestos abatement actions are to be undertaken or which may become contaminated as a result of such abatement actions.

98. *Worker Decontamination System*: A series of connected rooms, consisting of a clean room, a shower room and an equipment room separated from each other and from the work area by curtained doorways. This system is used for all worker entries and exits from the work area.

99. *WSDOT*: Washington State Department of Transportation.

1.04 REFERENCE STANDARDS:

A. General Requirements:

1. All work under this contract shall be done in strict accordance with all applicable regulations, standards and codes governing asbestos abatement and in accordance with the "Standards of the Industry".
2. The Port will utilize and enforce the recommendations of various references as guides including:
  - a. Skoog, Robert F., and Twombly, Jr., Robert C. "The Asbestos Abatement Worker's Handbook", and
  - b. Levins, Hoag, "The Glove Bag Book and Asbestos Maintenance Safety Guide".
3. The most recent edition of any relevant regulation, standard, document or code shall be in effect during the work, regardless of the effective date of this Section's governing contract. Where conflict among the requirements or with these Section's exists, the most stringent requirements shall be utilized by the Contractor. **All regulatory revisions and requirements relating to this contract after the contract is signed shall be incorporated.**

B. Standards which govern asbestos abatement work or hauling and disposal of asbestos waste materials include the following:

1. American National Standards Institute (ANSI).
2. Fundamentals Governing the Design and Operation of the Local Exhaust Systems Publication Z 9.2-79.
3. Practices for Respiratory Protection Publication Z 88.2-80.
4. American Society for Testing and Materials (ASTM).
5. Specification for Encapsulant for Friable Asbestos Containing Building Materials Proposal P-18.
6. Safety and Health Requirements Relating to Occupational Exposure to Asbestos E 849-82.

C. EPA Guidance Documents: Which discuss asbestos abatement work or hauling and disposal of asbestos waste materials are listed below for the Contractor's information only. These documents do not describe the work and are not a part of the work of this contract. EPA maintains an information number (800) 334-8571.

1. Asbestos-Containing Materials in Buildings - A Guidance Document. Parts 1&2 (Orange Books) EPA C00090 (out of print).
2. Guidance for Controlling Asbestos-Containing Materials in Buildings (Purple Book)

EPA 560/5-85-024.

3. Friable Asbestos-Containing Materials in Schools: Identification and Notification Rule (40 CFR Part 763).
  4. Evaluation of the EPA Asbestos-in-Schools Identification and Notification Rule. EPA 560/5-84-005.
  5. Asbestos in Buildings: National Survey of Asbestos-Containing Friable Materials. EPA 560/5-84-006.
  6. Asbestos in Buildings: Guidance for Service and Maintenance Personnel. EPA 560/5-85-018.
  7. Asbestos Waste Management Guidance. EPA 530-SW-85-007.
  8. Asbestos Fact Book. EPA Office of Public Affairs.
  9. Asbestos in Buildings. Simplified Sampling Scheme for Friable Surfacing Materials.
  10. Commercial Laboratories with Polarized Light Microscopy Capabilities for Bulk Asbestos Identification.
  11. A Guide to Respiratory Protection for the Asbestos Abatement Industry. EPA-560-OPTS-86-001.
- CODES AND REGULATIONS:**
- D. General Applicability of Codes, Regulations and Standards: Except to the extent that more stringent requirements are written directly into the contract documents, all applicable codes, regulations and standards have the same force and effect and are incorporated into the contract documents by reference as if copied directly into the contract documents.
- E. Contractor Responsibility: The Contractor shall assume full responsibility and liability for compliance with all applicable federal state and local regulations pertaining to work practices, hauling, disposal and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor shall be responsible for providing medical examinations and maintaining medical records of his personnel as required by the applicable federal, state and local regulations. The Contractor shall hold the Port and Port's Representative harmless for failure to comply with applicable work, hauling, disposal, safety, health or other regulation on the part of himself, his employees or his subcontractors including without limitation: the costs of compliance, payment of all fines levied against the Port and Port's representative, and payment of all attorney's fees and costs incurred in defense of the Port or Port's representative for alleged regulatory violations.
- F. Federal Requirements: Which govern asbestos abatement work or hauling and disposal of asbestos waste materials including but not limited to the following:
1. U.S. Department of Labor, Occupational Safety and Health Administration, (OSHA), including but not limited to:
    - a. Occupational Exposure to Asbestos, Tremolite, Anthophyllite and

- Actinolite; Final Rules Title 29, Part 1910, Section 1001 and Part 1926, Section 58 of the Code of Federal Regulations.
  - b. Respiratory Protection Title 29, Part 1910, Section 134 of the Code of Federal Regulations.
  - c. Construction Industry Title 29, Part 1926, of the Code of Federal Regulations.
  - d. Access to Employee Exposure and Medical Records Title 29, Part 1910, Section 2 of the Code of Federal Regulations.
  - e. Hazard Communication Title 29, Part 1910, Section 1200 of the Code of Federal Regulations.
  - f. Specifications for Accident Prevention Signs and Tags Title 29, Part 1910, Section 145 of the Code of Federal Regulations.
2. U.S. Environmental Protection Agency (EPA), including but not limited to:
- a. Regulation for 40 A of the Code of Federal Regulations 763.
  - b. National Emission Standard for Hazardous Air Pollutants; Asbestos, NESHAP Revision; Final Rule, 40 CFR, Part 61, of the Federal Register.
  - c. Office of Solid Waste publication Asbestos: Waste Management Guidance (EPA/530-SW-85-007).
3. Department of Transportation (DOT) including, but not limited to the following:
- a. Hazard Material Regulations (HMR) 49 CFR parts 171-180.
  - b. 49 CFR part 107, et. seq., Performance-Oriented Packaging Standards; Changes of Classification, Hazard Communication, Packaging and Handling Requirements Based on UN Standards and Agency Initiative; Final Rule.
- G. Washington State Requirements: WISHA and DOSH rules which govern asbestos abatement work or hauling and disposal of asbestos waste material including but are not limited to the following:
- 1. General Occupational Health Standards Chapter WAC 296-62.
  - 2. Asbestos Removal and Encapsulation Chapter WAC 296-65.
  - 3. Safety Standards for Construction Work Chapter WAC 296-155.
  - 4. Parts – Demolition WAC 296.155.975.
  - 5. Respirators Standard Chapter WAC 296-842.
  - 6. WISHA Regional Directives 79-23 (Amended) regarding minimum airborne fiber concentration for initiation and continuing asbestos medical examinations, 80-16



(amended) regarding respirable air supplied by oil-lubricated compressors, 83-10 (Amended) regarding respirator requirements for removal, demolition, and spraying of asbestos, 87-2 Respiratory Protection Requirements for negative pressure enclosures, 23-10 Occupational Exposure to Asbestos.

- 7. Safety Standards Chapter WAC 296-24.
- H. Local Requirements which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:
  - 1. Puget Sound Clean Air Agency (PSCAA) Regulation III, Article 4- Asbestos Control Standard.

#### 1.05 ASBESTOS ABATEMENT SUBMITTALS

- A. Portions of this contract are very unique and are under strict control of several regulatory agencies. It is understood that this work is so designed and these contract requirements are so stated that the materials and equipment specified are required for the abatement project and the final function of the facility. Therefore, "approval by the Port" or similar phrases are not to be construed as a transfer of liability; only a statement that the information, material or equipment submitted appears to comply with the requirements of the contract and the regulatory agencies and that no objection has been raised upon the submittal information.
- B. Required submittals for this Section are listed in Section 01315 – Regulated Materials, and shall be submitted in accordance with Section 01330 Submittals.

#### 1.06 CONTRACTOR AND PORT RESPONSIBILITIES

- A. The Contractor shall coordinate with the Port to accomplish the following tasks, prior to Commencement of Work.
- B. The Contractor Shall notify the Engineer in writing utilizing the daily work log of work area, start and stop time of work, outline of work, and areas the will be effected by the work.
- C. Provide to the Port information concerning access, shut down and protection requirements of certain equipment and systems in the work area.

#### 1.07 AIR MONITORING

- A. The following describes air monitoring to verify that the outside environment remains uncontaminated. This Section also sets forth airborne fiber levels both inside and outside the work area as action levels and describes the action required by the Contractor if an action level is met or exceeded.
- B. The Port's RM Project Monitor may monitor inside and outside the work area, as well as collect personal samples used for quality control. Note: The purpose of the Port's RM Project Monitor's air monitoring and inspection activities is to provide quality assurance only, not to replace any air monitoring and/or inspections required of the Contractor by Federal, State, or local regulations or by this Section. The Contractor shall perform the monitoring required by DOSH Asbestos regulations for inside and outside areas of the

abatement work.

- C. In addition to the air monitoring requirements described elsewhere in this Section, the Contractor shall be responsible for all air monitoring as required by Washington State Department of Labor and Industries, including pre-abatement samples, personal time-weighted average and short-term excursion limit samples, negative pressure enclosure samples at the entrance to the decontamination chamber and the discharge from the HEPA exhaust, post- abatement clearance sampling, and “other” sampling as required by Federal, State, or local regulations. In addition, the Contractor shall be responsible for post-abatement final inspection to determine that all required asbestos has been removed and that the area is sufficiently clean for post-abatement clearance sampling. The Port and the Port’s RM Project Monitor shall be held harmless from any legal action taken as a result of such sampling. The Contractor shall also indemnify, hold harmless, and defend the Port, its agents, and employees for the use of any Port supplied air-monitoring data.
- D. The Contractor shall be required, at its own expense, to take its own employee air samples per the following regulations:
1. WAC 296-62-07709 - (Exposure Monitoring)
  2. WAC 296-62-07735 - (Appendix A)
- E. The air samples must be analyzed by a laboratory in accordance with the following:
1. Personnel conducting on site asbestos air sample analysis shall be listed on AIHA’s Registry of Proficiency and shall have successfully completed NIOSH 582 (or equivalent) training.
  2. The laboratory conducting bulk sample analysis shall be accredited by the United States Department of Commerce, National Institute of Standards and Technology’s NVLAP program.
  3. The laboratory conducting analysis of air samples shall be satisfactory participants in the NIOSH Proficiency Analytical Testing (PAT) program and AIHA Registry and shall produce their PAT number and results on request.
  4. All air monitoring information must be placed on Port of Seattle Air Monitoring Data Sheet – Asbestos or Port of Seattle approved equivalent.
- See 3.11 of this Section section for additional requirements relating to Clearance Requirements.
- G. Air Monitoring Requirements:
1. Baseline/Pre-abatement Air Monitoring: Prior to beginning asbestos abatement tasks, the Contractor shall conduct pre-abatement air monitoring.
  2. Outside Work Area Air Monitoring: The Contractor shall daily conduct air monitoring to document acceptable condition or detect faults in the work procedures and engineering controls. Samples shall be collected outside the work area at HEPA exhausts and at the decontamination entrance every shift.

3. Personal Samples: The Contractor shall conduct daily representative personal monitoring in each abatement work area on each representative work activity. This requirement is a Port requirement and is greater in frequency than the requirements stated in the Washington State Department of Labor and Industries regulations. In addition to those required to be collected by the Contractor, the Port's RM Project Monitor reserves the right to monitor airborne fiber levels produced by some workers to determine the effectiveness of work practices. This implies no agency relationship with the Contractor's employees.
4. Clearance: The regulated area shall remain in place until the Port certifies visual clearance and that Contractor's post-abatement air sampling results meet acceptable levels. Article 3.11 details the work area clearance process.
5. Where feasible, samples shall be collected according to the WISHA Reference Method (WAC 296-62-07735, Appendix A) and Detailed Procedure for Asbestos Sampling and Analysis (WAC 296-62-07737, Appendix B) and NIOSH Method 7400 (as revised). All samples shall be collected at a height of approximately 60 inches above the working floor for projects with 8-10 foot ceiling heights, unless otherwise directed.

H. Airborne Fiber Counts

1. Personnel Exposures on workers inside "regulated areas". Contractor shall notify the Engineer in writing regarding elevated levels above 0.1 f/cc. The Contractor and the Engineer will conduct an assessment of removal procedures. The Contractor shall identify corrective action and ensure that corrective action is taken to lower fiber counts at no additional cost or delay to the Port.
2. Outside Work Area: If any air sample taken outside of the work (outside enclosures) exceeds 0.01 f/cc, the Contractor shall:
  - a. The Contractor shall Notify Engineer immediately.
  - b. Investigate with the Engineer for possible causes of elevated fiber levels. The Contractor shall ensure that corrective action is taken to lower fiber counts at no additional cost or delay to the Port.
  - c. After corrective action is taken, the Contractor shall resample the area. If airborne level is below 0.01 f/cc, the work may recommence with appropriate changes in work practices authorized by the Engineer. If the airborne fiber levels remain above 0.01 f/cc, The Contractor and the Engineer will continue to conduct assessments of removal procedures until acceptable air counts (0.01 f/cc or less) are reached. The Contractor shall ensure that corrective action is taken to lower fiber counts at no additional cost or delay to the Port
  - d. If the analytical results of any outside area sample exceed 0.05 f/cc for any sample taken, the Contractor shall **stop all removal work**, leave negative air system in operation and re-clean the entire work area. The **Contractor shall notify the Engineer immediately**. The Contractor shall not recommence work until the cause of the elevated count is corrected and the Port authorizes start up. The Port shall not be charged for the cleanup

time, materials, and air monitoring costs or delay costs. Delays resulting from non-compliant analytical results shall not constitute an extension to the project time.

- e. If the Contractor stops work due to elevated airborne fiber counts, the Contractor shall secure air samples in the same area as the samples with elevated readings. These samples shall be analyzed by transmission electron microscopy in accordance with NIOSH 7402. The Contractor shall not resume work until the average of airborne asbestos fibers in all samples taken is at or below .01 fibers per cubic centimeter. The cost of such analysis and any delays shall be born solely by the Contractor.
  
- I. Analytical Methods: The following methods shall be used for analyzing filters used to collect air samples:
  - 1. Twenty five millimeter (25 mm) cellulose ester filters with 50 mm conductive cowl extensions shall be used for all sampling. Sampling and analysis for personal samples shall be conducted according to the OSHA/WISHA Reference Method. Area clearance samples shall be analyzed according to the NIOSH Method 7400 using airflow rates between 1 - 10 liters per minute. At least 1200 liters of air shall be sampled for area air samples. All inside and outside air sampling shall be continuous throughout work shift.
  - 2. TEM analysis shall be NIOSH Method 7402.
  
- J. Laboratory Testing
  - 1. The Contractor shall have a qualified laboratory perform analysis of the air samples required to monitor abatement procedures. The laboratory results, signed by the lab manager, shall be returned to the site prior to the start of abatement for the same work shift the following day. A complete record of inspections and all air monitoring tests and results shall be furnished to the Port and the Contractor daily.
  - 2. Written Reports: All air monitoring test results and daily inspection logs shall be posted at the job board on a daily basis.
  
- K. Conflicts in air monitoring analytical results: QA/QC discrepancies identified in any of the reported analytical results shall be resolved by TEM analysis (NIOSH 7402 method).
  - 1. The Contractor and the Engineer will conduct an assessment of air monitoring results.
  - 2. The Contractor shall resample the area. The Port's RM Project Monitor may resample the area.
  - 3. The Port shall not be charged for any and all costs associated with any additional sampling resulting from QA/QC air monitoring conflicts.

## 1.08 ASBESTOS ABATEMENT - SPECIAL REPORTS

- A. Except as otherwise indicated, the Contractor must submit special reports directly to the Engineer and others affected by occurrence within (24) hours of occurrence requiring special report.
- B. Reporting Unusual Events: When an event of unusual and significant nature occurs at site (examples: failure of negative pressure system, rupture of temporary enclosures), the Contractor must prepare and submit a special report listing chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects and similar pertinent information. When such events are known or predictable, the Contractor must advise the Port in advance at earliest possible date.
- C. Reporting Accidents: Accidents must be reported in accordance with Section 01860-Safety Management, 1.07 (B). The Contractor must prepare and submit reports of significant accidents, at site and anywhere else work in progress. Record and document data and actions; comply with industry standards. For this purpose, a significant accident is defined to include events where personal injury is sustained, or property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury.

## PART 2 PRODUCTS

### 2.01 MATERIALS

- A. GENERAL
  - 1. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name (where applicable).
  - 2. Store all materials subject to damage off the ground, away from wet or damp surfaces and under cover sufficient to prevent damage or contamination. Replacement materials shall be stored outside the work area until abatement is completed.
  - 3. Damaged, deteriorating or previously used materials shall not be used and shall be removed from the worksite and disposed of properly.
  - 4. Polyethylene sheeting for walls and stationary objects shall be a minimum of 6-mil thick. For floors and all other uses sheeting of at least 6-mil thickness shall be used in widths selected to minimize the frequency of joints. Polyethylene shall be fire retardant per UL Ratings and ASTM standards D-2898-81 and D-3201-79.
  - 5. Method of attaching polyethylene sheeting shall be agreed upon in advance by the Contractor and the Port and selected to minimize damage to equipment and surfaces. The Contractor shall be responsible for any damage to equipment and surfaces created by this attachment of polyethylene sheeting. If the Contractor uses foam, the foam shall be fire retardant as per UL ratings and the Contractor shall cut the foam back to within 1/4 inches of base surface if applied to an asbestos-containing material for all other materials it shall be completely removed.
  - 6. Polyethylene sheeting utilized for worker decontamination enclosure shall be opaque white or black in color.

7. Disposal bags shall be 6-mil polyethylene, pre-printed with labels as required by EPA regulation 40 CFR 61.150 (a) (i) (iv) (v) or WISHA Chapter 296-62-0072.
  8. Disposal drums shall be metal or fiberboard with locking ring tops; labeled in accordance with EPA regulation 40 CFR 61.150 (a) (i) (iv) (v).
  9. Warning signs as required by WISHA Chapter 296-62-07721.
  10. The wood framing shall adhere to Uniform Building Code 23-4 and 23-5.
  11. Tape: Tape shall be capable of sealing joints of adjacent sheets of plastic sheet and for attachment of plastic sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under dry wet conditions, including use of amended water. Minimum 2" wide tape must be used.
  12. Other materials: The Contractor shall provide all other materials such as lumber, nails, and hardware, which may be required to construct and dismantle the decontamination area and the barriers that isolate the work area, and as required to complete the work as specified.
- B. SURFACTANT (wetting agent): shall be a 50/50 mixture of Polyethylene ester and polyoxyethylene ester, or equivalent, mixed in a proportion of 1 fluid ounce to 5 gallons of water as specified by manufacturer. (An equivalent surfactant shall be understood to mean a material with surface tension of 29 dynes/cm as tested in its properly mixed concentration, using ASTM method D1331-56- "Surface and Interfacial Tension of Solutions of Surface Active Agents.")
- C. ENCAPSULATION PRODUCTS
1. Encapsulation materials shall be applied to asbestos containing material to control the release of asbestos fibers. Both "Bridging" and "Penetrating" encapsulation products shall be used under this contract.
  2. The contractor shall encapsulate the edges of ACM that remain throughout the project area with pink or other approved colored bridging encapsulant.
  3. Encapsulation materials shall conform with the following characteristics:
    - a) Encapsulants shall not be solvent-based or utilize a vehicle consisting of hydrocarbons. Tinting of the encapsulant may be required.
    - b) Encapsulants shall be non-flammable.
    - c) Contractor must provide certification that encapsulant is compatible with specified fireproofing replacement material.
- D. ENCLOSURE
1. Enclosure materials shall be fire-retardant and conform to the applicable local fire codes.
  2. The enclosures shall be constructed of materials such that when the enclosure is

completed there is limited potential for impact damage to the enclosure and no potential for fiber release.

3. Wood framing used for enclosure shall be pressure treated and fire retardant and shall conform to Uniform Building Code 23-4 and 23-5.

## 2.02 EQUIPMENT

### A. GENERAL

1. A sufficient quantity of negative pressure ventilation units equipped with HEPA filtration and operated in accordance with ANSI 29.2-79 (local exhaust ventilation requirements) and EPA guidance document EPA 560/5-83-002 Guidance for Controlling Friable Asbestos-Containing Materials in Buildings Appendix F: Recommended Specifications and operating procedures for the use of negative pressure systems for asbestos abatement shall be utilized so as to provide one work place air change every 15 minutes.

To calculate total air flow requirement:

$$\text{Total ft}^3/\text{min} = \frac{\text{Vol. of work area (in ft}^3\text{)}}{15 \text{ min}}$$

To calculate the number of units needed for the abatement:

$$\text{Number of units needed} = \frac{[\text{Total ft}^3/\text{min}]}{[\text{Capacity of unit in ft}^3/\text{min} \times 70\%]}$$

If air-supplied respirators are utilized, estimate the volume of supplied air and add to work place air volume when calculating ventilation requirements. For small enclosures and glove bags, a HEPA filtered vacuum system may be utilized to provide negative air pressure. A sufficient quantity of air shall be exhausted to create a minimum pressure of -0.02 inches of water at all times within the enclosure with respect to outside the enclosure.

2. Contractor shall install and maintain a continuous read strip chart, or similar digital recording differential pressure meter (manometer).
  - a. Adhere strictly to manufacturer's recommendations for calibration of manometer.
  - b. Location of manometer must be approved by the Engineer.
  - c. Manometer records must be submitted, on 8-1/2 X 11 paper, weekly to the Engineer along with current calibration data.
  - d. The manometer must be equipped with an audible system programmed to sound if pressure within the enclosure in respect to pressure outside the enclosure drops to -0.01 inches of water or lower.
3. Type "C" air supplied respirators operated in the pressure demand mode with full

face pieces and escape cylinders or HEPA filters are required by WISHA for negative pressure containment abatement work until the successful completion of final clearance air monitoring. Spectacle kits and eyeglasses must be provided for employees who wear glasses and who must wear full-face piece respirators. Respirators shall be provided that have been tested and approved by the National Institute of Occupational Safety and Health for use in asbestos contaminated atmospheres.

4. Compressed air systems shall be designed to provide air volumes and pressures to accommodate respirator manufacturer's specifications. The compressed air systems shall have a receiver of adequate capacity to allow escape of all respirator wearers from contaminated areas in the event of compressor failure. Compressors must meet the requirements of 29 CFR 1910.134(d). Compressors must have an in-line carbon monoxide monitor, and periodic inspection of the carbon monoxide monitor must be evidenced. Documentation of adequacy of compressed air systems/respiratory protection system must be retained on site at all times. This documentation shall include a list of compatible components with the maximum number and type of respirators that may be used with systems providing air of sufficient quality (Grade D breathing air as described in Compressed Gas Association Commodity Specifications G-7.1.)

At least two (2) dedicated airlines and respirators shall be available to the Port or Port's Consultants or regulatory agency personnel at all times. Contractor shall provide clean respirators in good repair for the Port's or regulatory agency personnel's use. The Contractor shall provide airlines for the Port's, RM Project Designer's, or regulatory agency personnel and Project Monitor's use upon demand.

5. Full body disposable protective clothing, including head, body, and foot coverings (unless using footwear as described in 2.02-A-6) consisting of material impenetrable by asbestos fibers shall be provided to all workers and authorized visitors in sizes adequate to accommodate movement without tearing.
6. Additional safety and fall protection equipment (e.g., hard hats meeting the requirements of ANSI Standard Z89.1-1981, eye protection meeting the requirements of ANSI Standard Z87.1-1979, safety shoes meeting the requirements of ANSI Standard Z41.1-1967, disposable PVC gloves) as necessary shall be provided to all workers and authorized visitors.
7. Non-skid footwear shall be provided to all abatement workers. Disposable clothing shall be adequately sealed to the footwear to prevent body contamination.
8. Only single-use, disposable towels and clothing shall be used.
9. A sufficient supply of disposable mops, rags and sponges for work area decontamination shall be available.
10. For mini-enclosures and glove bags, a HEPA filtered vacuum system shall be utilized to provide negative air.

**B. REMOVAL EQUIPMENT**



1. A sufficient supply of scaffolds, ladders, lifts and hand tools (e.g., scrapers, wire cutters, brushes, utility knives, wire saws, etc.) shall be provided by the Contractor.
2. Rubber dustpans and rubber squeegees shall be employed for cleanup.
3. Brushes utilized for removing loose asbestos containing material shall have nylon or fiber bristles, not metal.
4. A sufficient supply of HEPA filtered vacuum systems shall be available during cleanup.

**C. ENCAPSULATION EQUIPMENT**

1. Encapsulants shall be applied in accordance to manufacturer's specifications.
2. Tools, sprayers, and other additional support and fall protection equipment, as needed.
3. The nature of the encapsulant may affect the requirements for respiratory protection. Vapors that may be given off during encapsulant application must be taken into account when selecting respirators, if types other than air supplied are used.

**D. ENCLOSURE EQUIPMENT**

1. Hand tools equipped with HEPA filtered local exhaust ventilation shall be utilized during the installation of enclosures and supports if there is any need to disturb asbestos containing materials during this process. (As alternative asbestos material may be partially removed following proper removal procedures prior to the installation of supports and enclosures.)
2. Tools, ladders, and other additional support equipment, as needed.

**E. SCAFFOLDING**

1. Any scaffolding used must be cleaned with no visible debris prior to bringing scaffolding on site, and shall be completely free of debris during and after installation.
2. Follow all manufacturer recommendations and all applicable regulations in the set-up, use and teardown of all scaffolding used.
3. The Contractor's Certified Asbestos Supervisor shall be on-site during all scaffolding set-up, use, and teardown.

**2.03 FABRICATION**

Equipment or items fabricated to suit this project shall be as selected by the Contractor and agreed upon by the Port's RM Project Designer. Submit shop drawings and/or other information in sufficient detail for the Port's RM Project Designer to review for approval.

**PART 3 EXECUTION**

### 3.01 INSPECTIONS

- A. Pre-abatement; the abatement work shall not begin until:
1. Pre-abatement air monitoring has been conducted by the Contractor, and the results have been reviewed and approved by the Port.
  2. The Contractor and the Port have inspected the site to ensure that work can begin.
  3. The work area enclosure system has been inspected and approved by the Port. When enclosure systems are in use, the Contractor's Certified Asbestos Supervisor shall inspect the enclosure on a daily basis as it is being constructed and approve the completed enclosure, controls, and decontamination and waste load-out facilities when completed. Enclosure systems shall be smoke tested prior to ACM removal.
  4. Negative pressure ventilation and supplied air systems, if used, are functioning adequately. Contractor must test all systems. Submit written verification that the system has been tested as per specifications to Engineer prior to ACM removal.
  5. All required pre-work submittals, notifications, postings and permits have been provided and are satisfactory to the Port (see Article 1.05).
  6. All equipment for abatement cleanup and disposal are on hand.
  7. All worker and supervisor training, certification and medical monitoring are current and documentation is available on the job site.
- B. Throughout the Project: The Contractor's competent person shall perform daily inspections of the site. The Port's RM Project Monitor may perform routine inspections of the site to assure compliance with applicable regulations and the project plans and specifications. The Engineer and the Port's RM Project Designer may also conduct spot checks throughout the project. The Contractor's competent person must generate a written daily report. The Contractor's competent person shall also be required to co-sign the daily quality control report generated by the Port's RM Project Monitor.
- C. Post-Abatement: The Clearance process is discussed in Article 3.11 of this Section.

### 3.02 SITE SECURITY

- A. The work area is to be restricted only to authorize, trained and protected personnel. These may include the Contractor's employees; employees of subcontractors; and Port employees and representatives; federal, state and local inspectors and other authorized or designated individuals.
- B. Secure the work area from access by occupant's, staff or users of the building. Accomplish this where possible by locking doors, windows, or other means of access to the work area, or by constructing temporary framing with plywood or gypsum board barriers. All emergency exits/corridors must be kept open.
- C. Entry into the work area by unauthorized individuals shall be reported immediately by the

Contractor to Port Security and the Engineer.

- D. For projects requiring the use of a negative pressure enclosure, a logbook shall be maintained in the clean room area of the worker decontamination system. Everyone who enters the work area must sign in, recording; name, affiliation (Contractor, Port, regulatory agency, etc.), work phone number, purpose of entry, acknowledge existence, review and understanding of the project's emergency contingency plan and time in and time out for each entry.
- E. Contractor shall be responsible for site security during abatement operations.

### 3.03 EMERGENCY PLANNING

- A. Emergency contingency plans shall be developed by the Contractor for approval by the Port prior to initiation of any work. These plans shall be a component of the Contractor's Health and Safety Plan.
- B. Emergency procedures shall be in written form and prominently posted in the clean room, adjacent to the containment in the project area, or as directed by the Port. Prior to performing any abatement activities, all personnel must read and sign these procedures to acknowledge an understanding of work site layout, location of emergency exits and the contents of the plan.
- C. Emergency planning shall include written notification of police, fire and emergency medical personnel of planned abatement activities, work schedule and layout of containment area, particularly barriers that may affect response capabilities. These notifications will be coordinated through the Engineer.
- D. Emergency planning shall include consideration of containment collapse (through negative pressure pull-down) or breach (hit, cut, or torn by), fire explosion, toxic atmosphere, electrical hazards, slips, trips and falls, confined spaces and heat related injury. Written procedures shall be developed and employee training in these procedures shall be provided and documented. Emergency planning shall include procedures to follow in the event of power disruptions during work in a negative air enclosure.
- E. Employees shall be trained in evacuation procedures in the event of workplace emergencies.
  - 1. For non-life threatening situations - employees injured or otherwise incapacitated shall decontaminate following normal procedures with assistance from fellow workers if necessary, before exiting the work place to obtain proper medical treatment.
  - 2. For a life-threatening injury or illness, measures to stabilize the injured worker, remove them from the work place and secure proper medical treatment shall take priority over worker decontamination.

- F. Telephone numbers of all emergency response personnel shall be prominently posted in the clean room, adjacent to the containment in the project area, or as directed by the Port. To assist the Contractor, the Port will provide a list of phone numbers for emergency response to the project at the Pre-Construction meeting.
- G. General Requirements
  - 1. If at any time after barriers or enclosures have been erected, any visible material is observed outside of the work area or if damage to the barrier or enclosure occurs, work shall immediately stop, repairs shall be made and debris and residue shall immediately be cleaned up using appropriate HEPA vacuuming and wet cleaning procedures. Area air monitoring shall be started immediately in the public space to measure the asbestos concentration in the public area as a result of breaching the enclosure.
  - 2. Clean and isolate the work area in accordance with these specifications.
- H. The Contractor must provide a minimum of three phone numbers at which its supervisory personnel may be contacted on or off site at any time during the contract duration. The telephone used outside the work area must be non-coin operated type.

### 3.04 PERSONNEL PROTECTION REQUIREMENTS

- A. Training: All personnel accomplishing asbestos abatement shall be the bearer of current "Certified Asbestos Worker Certificate" issued by the Washington State Department of Labor and Industries.
  - 1. Special on-site training specific to equipment and procedures unique to this job site shall be performed as required.
  - 2. Training in emergency response and evacuation procedures shall be provided.
- B. Safety Meeting: The Contractor shall conduct a safety meeting at the beginning of the contract and weekly thereafter. Topic to be discussed include, but are not limited to: emergency exiting routes and procedures, location of telephone and emergency numbers, fire extinguisher locations, first aid kit, special precautions for toxic or hazardous materials (MSDS information), protective equipment, scaffolding procedures, proper use of ladders, electrical safety, previous week's air sample results, etc. Minutes of these meetings shall be recorded with copies provided to the Engineer weekly. All attendees shall sign an acknowledgment of attendance.
- C. Protective Clothing: Provide protective equipment to all workers in the work area per Article 2.02, "Equipment".
- D. Additional Protective Equipment: Respirators, disposable coveralls and footwear shall be provided by the Contractor to the Port or the Port's representative or other authorized visitors inspecting the jobsite. Provide up to two personally issued respirators, and air lines where required by the Port. Removal of workers from the work area to provide airlines shall not be acceptable.

### 3.05 PREPARATION OF THE WORK AREA

- A. Post barrier tape and caution signs meeting the specifications of WISHA Chapter

296-62-07711 at the locations and approaches to a location where airborne concentrations of asbestos may be expected to exceed the pre-abatement concentration. Signs shall be posted at a distance sufficiently far enough away from the work area to permit an employee to read the sign and take the necessary protective measures to avoid exposure. Additional signs may need to be posted following construction of work place enclosures or barriers. Placement of these signs shall be behind the construction barrier walls erected by the Contractor and shall not be placed in a location visible to the public outside of the project area.

- B. Contractor shall coordinate with the Port to ensure that Port crews perform any required shut down and lock out of utilities such as electric power, water, or HVAC lines to the project area when possible. Contractor shall complete Utility Shutdown Request Forms as soon as possible but no later than 72 hours in advance of shutdown needs.
- C. All conduit joints, junction boxes, control panels, and associated equipment in the work areas shall be protected from amended water. All wire in conduit that passes through the work area shall remain energized at all times; however, the Contractor is responsible for all electrical safety.
- D. Control panels, gauges, etc., in the project area may require Port access during abatement. Contractor shall coordinate with the Port to identify which items/areas must remain accessible to Port personnel. Provide access for those items/areas without the need for personnel to enter the abatement enclosure.
- E. Pre-clean, remove furnishings and install drop cloths using HEPA filtered vacuums or wet cleaning methods as appropriate. Do not use methods that would raise dust such as dry sweeping or vacuuming with equipment not equipped with HEPA filters. Do not disturb asbestos-containing materials during the pre-cleaning phase.
- F. Remove from the work area all objects that are movable to protect them from potential asbestos contamination.

### 3.06 GENERAL REMOVAL PROCEDURES

- A. Wet all asbestos containing material with amended water solution using equipment capable of providing a fine spray mist. Avoid knocking the material loose during the wetting operation. Saturate the material to substrate prior to removal; however, do not allow excessive water to accumulate in the work area. Keep all removed material saturated until it can be containerized for disposal. Maintain a high humidity in the barrier or enclosure throughout the abatement period by misting or spraying to ensure material saturation and reduce the potential for elevated airborne concentrations. Wetting procedures are not equally effective on all types of asbestos containing materials. Nonetheless, they shall be used in all cases.
- B. Saturated asbestos containing material shall be removed in manageable sections. Containerize removed material immediately and prior to moving it to a new location for continuance of work. Adjacent areas shall be periodically sprayed and maintained in a saturated condition until all visible material is sealed and removed from the barrier or enclosure.
- C. Removed material shall not be dropped or thrown. Remove material intact or as

components whenever possible and carefully lower to the floor. If this cannot be feasibly accomplished, a dust-tight chute shall be constructed to transport the material to containers on the floor, or the material may be containerized at elevated levels (e.g., on scaffolds) and carefully lowered to the ground by mechanical means.

- D. Double bag all waste material prior to removal from the enclosure system or immediately upon removal of the barrier (glove bag).
- E. Disposal bags shall not be overfilled. Additionally, handcarts or equivalent shall be used to transport waste containers or materials. Waste containers or materials shall be raised and securely transported, and shall not be dropped or slid.
- F. Disposal containers shall be securely sealed to prevent accidental opening and leakage by taping in a gooseneck fashion, then labeled and dated. Do not seal bags with wire or cord. Bags may be placed in drums for staging and transportation to the landfill. Bags shall be decontaminated on exterior surfaces by wet cleaning and HEPA vacuuming.
- G. Large components removed intact may be wrapped in 2 layers of reinforced 6-mil polyethylene sheeting secured with tape for transport to the landfill.
- H. The work area shall be cleaned of all suspect ACM prior to the visual inspection by the designated Project Monitor and Project Designer. If any accumulation of residue is observed, it shall be assumed to be asbestos. Re-cleaning may be required, at no additional cost to the Port, until all suspect material is removed. Re-cleaning and inspection will continue until no visible suspect material remains. After the work area passes the visual inspection, the Contractor shall perform encapsulation of all cleaned surfaces.
- I. Refer to Article 3.11 of this Section for work area clearance process.

### 3.07 CONTAINMENT ENTRY AND EXIT PROCEDURES

#### A. Personnel Entry and Exit

- 1. All workers and authorized personnel shall enter the containment area through the worker decontamination enclosure system.
- 2. All personnel who enter the containment area must sign the entry log located in the clean room upon entry and exit.
- 3. All personnel before entering the containment area shall read and be familiar with all posted regulations, personnel protection requirements (including work place entry and exit procedures), and emergency procedures. A sign-off sheet shall be used to acknowledge that these have been reviewed and understood by all personnel prior to entry.
- 4. When entering containment, all personnel shall proceed first to the clean room, remove all street clothes and don appropriate respiratory protection and disposable coveralls, head covering and foot covering. Hard hats, eye protection, and gloves shall also be utilized as required. Clean respirators and protective clothing shall be provided and utilized by each person for each separate entry into

the containment area.

5. Personnel wearing designated personal protective equipment shall proceed from the clean room through the shower room and equipment room to the main containment area.
6. Before leaving the containment area, all personnel shall remove gross contamination from the outside of respirators, air hoses, and protective clothing. Each person shall clean bottoms of protective footwear just prior to entering the equipment room.
7. Personnel shall proceed to equipment room where they remove all protective equipment except respirators. Deposit disposable clothing into appropriately labeled containers for disposal.
8. Reusable contaminated footwear shall be stored in the equipment room when not in use in the containment area. Upon completion of abatement it shall be disposed of as asbestos contaminated waste (rubber boots may be decontaminated for reuse at the completion of the abatement).
9. Still wearing respirators, personnel shall proceed naked to the shower area, clean the outside of the respirators and the exposed face area under running water prior to removal of respirator, and shower and shampoo to removal residual asbestos contamination. The HEPA filters on airline respirators are for emergency escape only. The airline shall not be disconnected in the equipment room. The airline shall be placed in a bucket of clean water or hung on a hook next to the shower. A powered air purifying respirator face piece shall be disconnected from the filter/power pack assembly, which is not waterproof upon entering the shower. A dual cartridge respirator may be worn into the shower. Tape over inlet(s) into HEPA filter(s) between usages.
10. After showering and drying off, proceed to the clean room and don clean disposable clothing if there will be later re-entry into the containment area or street clothes if it are the ends of the work shift.
11. These procedures shall be posted in the clean room and equipment room or as directed by the Engineer.

**B. Waste Container Pass-Out Procedures**

1. Asbestos contaminated waste that has been containerized shall be transported out of the containment area through the material decontamination facility.
2. Waste pass-out procedure shall utilize two teams of workers, an "inside" team and an "outside" team.
3. The inside team wearing appropriate protective clothing and respirators for inside the containment area shall clean the outside, including bottoms, of properly labeled containers (bags, or wrapped components) using HEPA vacuums and wet wiping techniques. The workers shall then enclose the single layered ACM waste with another 6-mil layer of plastic sheeting or disposal bag. The double-bagged

material must be carefully placed into the middle chamber of the material decontamination unit. No worker from the inside team shall further exit the containment area through this airlock.

4. The outside team, wearing protective clothing and HEPA-filtered respirators, shall enter the airlock from outside the containment area, enclose the labeled container in a second clean, labeled, 6-mil polyethylene bags and remove them from the airlock to outside and placed into a secure storage/transport container. No worker from the outside team shall further enter the containment area through this airlock. Public view shall be blocked with a temporary screen constructed around the load out during pass-out.
5. The exit from this airlock shall be secured to prevent unauthorized entry.

### 3.08 NEGATIVE PRESSURE ENCLOSURE

- A. Prepare work area as indicated in Article 3.05, this Section.
- B. Verify shut down and lock out all heating, cooling and air conditioning system (HVAC) components that are in, supply, or pass through the containment area, if possible. Seal all ducts and smoke test the containment before beginning abatement work within the enclosure.
- C. Pre-clean all fixed objects in the containment area using HEPA filtered vacuums and/or wet cleaning techniques as appropriate. Careful attention must be paid to machinery bind grills or gratings where access may be difficult, but contamination significant. Pay particular attention to wall, floor, and ceiling penetrations behind fixed items. After pre-cleaning, enclose fixed objects in 6-mil polyethylene sheeting and seal securely in place with tape.
- D. Seal off all windows, doorways, drains, ducts, grills, grates, diffusers and all other openings between the containment area and uncontaminated areas outside of the containment area including the outside of the building and crawl spaces with 6-mil polyethylene sheeting and tape (see Article 3.05 - Isolating work area from occupied areas).
- E. Cover floors in the containment area with polyethylene sheeting as follows:
  1. Seal all floor drains and other floor openings in area with 6-mil sheeting and duct tape. Do not allow any water into Port's waste drain system.
  2. Floors shall be covered with three (3) individual layers of 6-mil (minimum) sheeting. Use "tattle-tales" beneath sheeting in order to detect water leaks from the enclosure. The RM Project Monitor shall approve each layer of sheeting prior to installation of next layer. Protect layers of sheeting as necessary against rips and tears. Install one (1) additional layer 6-mil poly sheeting as drop clothes to aid in cleanup of bulk materials.
  3. Plastic shall be sized to minimize seams. If the floor area necessitates seams, those on successive layers of sheeting shall be staggered to reduce the potential for water to penetrate to the flooring material. A distance of at least 6 feet between



- seams is required. Do not locate seams at wall/floor joints or cracks in the concrete flooring. Pre-seal all cracks in floors before placing any plastic to the satisfaction of the Engineer.
4. Floor sheeting shall extend to at least 12" up the sidewalls of the containment area.
  5. Sheeting shall be installed in a fashion so as to prevent slippage between successive layers of material. (Vinyl sheeting may be used for improved traction of floors.)
- F. Provide sufficient lighting throughout the work area to maintain a minimum lighting level of 50-foot candles at any surface where asbestos is to be removed. Hand held lights, such as flashlights, are not acceptable except for augmentation beyond 50-foot candle minimum illumination.
- G. Clearly identify and maintain emergency and fire exits from the work area.
- H. Cover walls in the containment area with polyethylene sheeting as follows:
1. Seal all opening in wall with critical barriers with 6-mil polyethylene sheeting and duct tape and ensure airtight seal.
  2. Each wall surface shall be covered with three (3) layers of 6-mil polyethylene sheeting.
  3. Plastic shall be sized to minimum seams. Seams shall be staggered and separated by a distance of at least 6 feet.
  4. Wall sheeting shall overlap floor sheeting by at least 12 inches beyond the wall/floor joint to provide a better seal against water damage and for negative pressure.
  5. Wall sheeting shall be secured adequately to prevent it from falling away from the walls. This shall require additional support/attachment when negative pressure ventilation systems are utilized. Wall sheeting shall not be taped to asbestos materials.
  6. Install one or more transparent plastic viewing ports in the walls of the enclosure in such a manner to allow unobstructed viewing of all components within the enclosure, which are involved in the project. Existing windows shall be utilized for viewing ports as needed. Movable curtains on the outside shall cover viewing ports. The Engineer shall approve location of view port.
- J. Worker Decontamination Facility
1. Worker decontamination enclosure systems shall be provided for workers entering or exiting the containment area. The worker decontamination shall consist of a clean change room, a shower and an equipment room, each separated from each other and from the containment area by curtained doorways. The decontamination unit shall be constructed of metal, wood or plastic framing systems. **A worker**

**decon facility is required for any Class I asbestos work involving greater than 25 linear feet or 10 square feet.** Remote decontamination facility may be required for projects less than 25 linear feet or 10 square feet and class III work; coordinate with the Engineer for location.

2. The worker decontamination enclosure systems constructed at the work site shall utilize 6-mil opaque black or white polyethylene sheeting or other acceptable materials for privacy.
3. The worker decontamination facility should be constructed contiguous to the negative pressure work area or regulated area for Class I work. Where construction contiguous to work area is not feasible, the decontamination facility shall be constructed with a polyethylene lined tunnel connecting the decon facility to the work.
4. Entry to and exit from all material decontamination chambers and decontamination enclosure systems shall be through curtained doorways consisting of two (2) sheets of overlapping polyethylene sheeting. One sheet shall be secured at the top and left side, the other sheet at the top and right side. Both sheets shall have weights attached to the bottom to insure that they hang straight and maintain a seal over the doorway when not in use. Doorway designs providing equivalent protection and acceptable to the Engineer may be utilized. Inverted T double sheet doorway with a flap door is also acceptable.
5. Access between any two rooms in the decontamination enclosure system shall be through a curtained doorway. Pathways in from clean to contaminated, and out from contaminated to clean in the containment area shall be clearly designated.
6. Clean room shall be sized to adequately accommodate the work crew. Benches shall be provided as well as storage for employees' street clothes. Shelves for storing respirators shall also be provided in this area. Clean work clothes (if required under disposables); clean disposable clothing, replacement filters for respirators, towels and other necessary items shall be provided in adequate supply at the clean room. A location for postings shall be provided in this area. Lighting, heat, and electricity shall be provided as necessary for comfort. This shall not be used for storage of tools, equipment or materials, except as specifically designated by the RM Project Designer.
7. Shower room shall be lighted, heated, and contain one or more showers as necessary to adequately accommodate workers. Each showerhead shall be supplied with hot (100 degrees F. minimum) and cold water adjustable at the tap. The shower enclosure shall be constructed to ensure against leakage of any kind. The Contractor shall supply an adequate supply of soap, shampoo and towels at all times. See Article 3.11 Paragraph A for water filtration/disposal procedures.
8. The equipment room shall be used for storage of equipment and tools at the end of a shift after they have been decontaminated. A walk-off pan, a small children's swimming pool or equivalent, filled with water shall be located in the containment area just outside the equipment room for workers to clean off foot coverings and contaminated air hoses after leaving the containment area and prevent excessive contamination of the worker decontamination enclosure system. A 6-mil

polyethylene bag for collection of disposable clothing shall be located in this room. Contaminated footwear (e.g., rubber boots, other reusable footwear) shall be stored in this area for reuse the following workday.

**K. Material Decontamination Facility and Emergency Exits**

1. The Material Decontamination Facility shall be constructed separate from the worker decontamination facility. Wherever possible, this shall be located where there is direct access from the containment area to the outside of the building.
2. The Material Decontamination Facility shall consist of an airlock, a container storage area and another airlock with access to outside the containment area.
3. The Material Decontamination Facility shall be constructed in similar fashion to the worker decontamination facility using similar materials and airlock and curtain doorway design.
4. This Material Decontamination Facility airlock shall not be used to enter or exit the containment.
5. Emergency exits shall be established and clearly marked with duct tape arrows or other effective designations to permit easy location from anywhere within the containment area. They shall be secured to prevent access from uncontaminated areas and permit emergency exiting. These exits shall be properly sealed with polyethylene sheeting, which can be cut to permit egress if needed. These exits may be the worker decontamination facility, the material decontamination facility and/or other alternative exits satisfactory to the Port Fire officials.

**L. Air Pressure Differential**

1. Provide a fully operational negative air system within the work area and continuously maintain a pressure differential across work area enclosures of negative 0.02 inches column of water. Demonstrate to the RM Project Monitor the pressure differential by use of a pressure differential meter or a manometer recording with strip chart, or similar digital equipment with alarm before disturbance of any asbestos containing materials.
2. Provide fully operational negative pressure systems supplying a minimum of one air change every 15 minutes. Determine the volume in cubic feet of the work area by multiplying floor area by ceiling height. Determine total ventilation requirement in cubic feet per minute (cfm) for the work area by dividing this volume by the air change rate.
  - a. Vent to outside of building, unless authorized in writing by the Engineer.
3. Supplemental Makeup Air Inlets: Provide where required for proper airflow through the workspace in location approved by the RM Project Designer.
4. Test negative pressure system for a 24 hour time period before any asbestos-containing material is wetted or removed. After the work area has been prepared, the decontamination facility set up, and the exhaust unit(s) installed, start the

unit(s) (one at a time). Demonstrate operation and testing of negative pressure system to the Engineer. Indications of correct negative air system shall include the following:

- a. Plastic barriers and sheeting move lightly in toward work area.
  - b. Curtain of decontamination units moves lightly in toward work area.
  - c. There is a noticeable movement of air through the decontamination unit. Use smoke tube to demonstrate air movement from the Clean Room to Shower Room, from Shower Room to Equipment Room, and from Equipment Room to Work Area.
  - d. Use smoke tubes to demonstrate a positive motion of air across all area in which work is performed.
  - e. Use a differential pressure meter or manometer to demonstrate a pressure difference of at least 0.02 inches column of water across every barrier separating the Work Area from the balance of the building or outside.
  - f. Modify the Negative Pressure System as necessary to successfully demonstrate the above.
  - g. Contractor's on-site competent person shall smoke test the NPE at least once every shift and document testing in daily log.
5. Provide a minimum of one back-up negative air for every four primary negative air units used. A minimum of one back-up negative air unit shall be required if less than four primary units are used. The back-up negative air unit(s) shall be of equal capacity to primary unit(s).

**M. Maintenance of Containment Barriers and Worker Decontamination Facility**

1. Following completion of the construction of all polyethylene barriers and decontamination system enclosures, the negative air machines shall be turned on. The Contractor shall continuously maintain a pressure differential across work area enclosures a minimum of negative 0.02 inches column of water for a 24-hour settling time to insure that barriers will remain intact and secured to walls and fixtures before beginning actual abatement activities.
2. All polyethylene barriers inside the containment, in the worker decontamination enclosure system, in the waste container pass-out airlock and at partitions constructed to isolate the area from occupied areas, shall be inspected by the Contractor at least twice daily including prior to the start of each day's abatement activities. Document inspections and observations into the daily project log and submit to Engineer weekly at the weekly progress meetings.
3. Damage and defects in the enclosure system are to be repaired immediately upon discovery. Use smoke tubes to test the effectiveness of the barrier system when directed by the Port's RM Project Monitor.

4. At any time during the abatement activities after barriers have been erected, if visible material is observed outside of the containment area or if damage occurs to barriers, the work shall immediately stop, repairs made to the barriers, and debris/residue cleaned up using appropriate HEPA vacuuming and wet mopping procedures.
  5. If air samples collected by the Port's RM Project Monitor or the Contractor outside of the containment area during abatement or pre-abatement activities indicate airborne fiber concentrations greater than 0.01 f/cc, or the pre-abatement concentrations, refer to article 1.07, H, 2 of this Section.
  6. Install and initiate operation of negative pressure ventilation equipment as needed to provide one air change in the containment area every 15 minutes. Openings made in the enclosure system to accommodate these units shall be made airtight. If more than one unit is installed, they should be turned on one at a time, checking the integrity of wall barriers for secure attachment and need for additional reinforcement. Insure that adequate power supply is available to satisfy the requirements of the ventilating units. Negative pressure ventilation units shall be HEPA filtered and exhausted to the outside of the building to locations approved by the Engineer. They shall not be exhausted into occupied areas of the building. Twelve inch diameter extension ducting shall be used to reach from the containment area to the outside when required. Careful installation, air monitoring and daily inspections shall be done to ensure that the negative pressure ventilation exhaust does not release fibers into uncontaminated building areas.
- N. Once constructed and reinforced as necessary with negative pressure ventilation units in operation as required, test enclosure for leakage utilizing smoke tubes. Repair or reconstruct as needed.
- O. Clearly identify and maintain emergency and fire exits from the containment area.
- P. Remove, clean and enclose in polyethylene the ceiling mounted objects such as lights and other items that may interfere with the abatement process and were not previously cleaned and sealed off. Utilize localized spraying of amended water and/or HEPA vacuums to reduce fiber dispersal during the removal of these fixtures.
- Q. Removal of Building System Components, Finishes and Appurtenances: Remove lighting fixtures, clean and store as directed by the Engineer. Remove carpet and suspended ceiling system, including hangers. Replace building system components as specified or as directed by the Engineer upon completion of abatement activity per all applicable codes and regulations.
- R. Alternate Procedures
1. Procedures described in this Section shall be utilized at all times.
  2. If non-specified procedures are to be considered, a request must be made in writing using a Port Request for Information form to the Engineer providing details of the problem encountered and recommended alternates.
  3. Alternate procedures shall provide equivalent or greater protection than the

procedures they replace.

4. An alternate procedure must be approved in writing by the RM Project Designer prior to implementation.

### 3.09 PROCEDURES FOR EMERGENCY SPILLS AND UNCONTROLLED RELEASES OF ASBESTOS OR PACM

A. This procedure shall be used in any situation involving an uncontrolled release of asbestos or PACM such as, but not limited to, dislodging of asbestos materials by accident, a rupture in a containment, breaking of a glove bag, tearing open of previously wrapped material, spills of drums for disposal, the use of asbestos contaminated clothing, tools or equipment in an unregulated area, or similar event where asbestos or PACM may be or has the potential to be introduced into the air in an uncontrolled manner.

#### B. Specific Work Procedure

1. Evacuate the immediate area of all unprotected personnel.
2. Establish a regulated area. The work area shall be identified and access restricted in any manner that minimizes the number of persons within the work area and protects persons outside the work area from exposure above the action level in accordance with WAC 296-0771. Seal all openings into work area including drains.
3. Use caution to assure personnel are not tracking asbestos-containing debris to areas outside the regulated area and spreading the contamination.
4. Immediately contact the Engineer. Seal all vents.
5. Wet down, encapsulate and pick up large chunks and place in a properly labeled asbestos disposal bag. Asbestos disposal bags shall meet the requirements of WAC 296-62-07721.
6. Vacuum the entire area using a HEPA equipped vacuum.
7. Wet wipe the entire contaminated area with clean wet rags and/or mops.
8. Encapsulate all surfaces within the work area. Protect equipment, furnishings, and other items in work area during encapsulation.
9. The cleanup procedures shall include the entire affected area.
10. Contractors and Project Monitor logs for the shift when the spill occurred shall include a description of spill and corrective action.
11. Provide the Engineer with a detailed written report of the causes of the accident, the Contractor's response, the results of actions taken and steps to be implemented to avoid future occurrences within 24 hours of the spill.
12. All work performed under this procedure shall be undertaken by Certified Asbestos

Workers in protective clothing with half-face respirators as a minimum. Air monitoring shall be undertaken as specified in Article 1.07.

**3.10 CLEAN-UP OF ASBESTOS-CONTAINING DEBRIS**

- A. Work of this Article is limited to the cleanup of a small quantity of amassed asbestos-containing debris that has fallen.
- B. Remove asbestos-containing debris and decontaminate the area involved using the following sequence:
  - 1. Shut down all ventilation directed into room.
  - 2. Seal entry to Work Area with 6-mil polyethylene. Slit polyethylene for entry. Install a flap to cover the slit automatically; tape slit closed after entry.
  - 3. Start HEPA vacuum or HEPA filtered fan unit before entering the area.
  - 4. Use the HEPA vacuum to clean a path at least 6 feet wide from the entry point of the Work Area to the site of the fallen material.
  - 5. Remove all small debris with the HEPA vacuum.
  - 6. Pick up large pieces of debris and place in the bottom of a disposal bag. Place pieces in the bag without dropping, avoiding unnecessary disturbance and release of material. Wet contents of bag.
  - 7. Remove all remaining visible debris with HEPA vacuum.
  - 8. HEPA vacuum, in two directions each at right angles to the other, an area 3 feet beyond the location that visible debris was found.
  - 9. Place a polyethylene drop cloth immediately on top of the HEPA vacuumed area before performing any repair work on site from which fall-out occurred.
  - 10. HEPA vacuum the site from which material fell, removing all loose material that can be removed by the vacuum's suction.
  - 11. Repair or remove remaining material.
  - 12. HEPA vacuum ladder and/or any tools used and pass out of the Work Area.
  - 13. HEPA vacuum all surfaces in the room that may have been contaminated, starting at the top of wall and working downward to the floor. Then start at corner of floor farthest from entrance to Work Area and proceed towards entrance.
  - 14. HEPA vacuum the floor using a floor attachment with rubber floor seals and adjustable floor to attachment height. Adjust the height so that the rubber seals just touch the floor if carpeted and are within 1/16 inch of hard surface floors. Vacuum the floor in parallel passes with each pass overlapping the previous by one-half the

width of the floor attachment. At the completion of one cleaning, vacuum the floor a second time at right angles to the first.

- C. If there are objects in the Work Area, perform the following:
  - 1. Decontaminate objects wherever possible on a plastic drop sheet.
  - 2. HEPA vacuum all surfaces of object and immediate area before moving the object.
  - 3. Pick-up object, if possible, and HEPA vacuum all surfaces.
  - 4. Hand to off-sheet worker who will wet-clean object, if possible, and place in storage location.
  - 5. Decontaminate area where object was located by HEPA vacuuming twice, in perpendicular directions. Wet clean if necessary to remove any debris.
  - 6. Return object to its original location.

### 3.11 WORK AREA CLEARANCE

- A. The abatement work is complete when the work area is visually clean and airborne fiber levels have been reduced to the level specified below.
- B. To determine if the elevated airborne fiber counts encountered during abatement operations have been reduced to the specified level, the Contractor shall conduct a final visual inspection of the Work Area for completeness of work and the presence of any visible debris following all abatement per ASTM E1368-02, "Standard Practice for Visual Inspection of Asbestos Abatement Projects." Following the Contractor's successful visual inspection the work area must pass the following visual inspection process.
  - 1. The RM Project Designer will perform a visual inspection of the project area and note deficiencies. If less than 10 sq. ft. of surfacing material is removed, the visual inspection may be performed by an AHERA Project Designer, RM Engineer, or RM Project Monitor.
  - 2. If deficiencies are noted, the inspector will create a punch list and forward to the Contractor. Contractor shall resolve all punch list items
  - 3. If the Contractor fails the visual inspection after a punchlist has been created. The Port shall not be charged for the cleanup time, materials, air monitoring costs, or delay costs. Delays resulting from non-compliant visual inspections shall not constitute an extension to the project time.
  - 4. Once the inspector gives the final visual clearance, the Port will provide the Contractor with signed clearance forms.
  - 5. Upon receipt of signed visual clearance forms, the Contractor shall apply a lockdown type asbestos encapsulant to surfaces on which asbestos has been removed.



- a. In cases when negative pressure enclosures have been used, maintain operation of negative air system during the encapsulation process.
  - b. Mix ratio of encapsulant shall be per manufacturer's recommendations.
  - c. Apply encapsulant with airless sprayer onto substrate.
6. After encapsulation, the Contractor shall conduct final clearance sampling as per this Section.
7. Allow encapsulant to dry for eight (8) hours (min) or until surfaces are dry before removing containment.
- C. Following the successful visual inspection, the Contractor shall secure aggressive air clearance samples and shall be analyzed according to the following procedures.
1. All enclosures clearance samples shall be taken using aggressive sampling techniques as follows.
    - a. Before sampling pumps are started, the exhaust from forced air equipment (leaf blower with at least 1 horsepower electric motor) shall be swept against the walls, ceilings, floors, ledges and other surfaces in the room. This procedure shall be continued for 1 minute per 1,000 square feet of area. Fans may be used to circulate air within work enclosure.
    - b. Samples shall be collected in areas subject to normal air circulation away from room corners, obstructed locations and sites near windows, doors or vents in areas coinciding with pre-abatement sample locations.
    - c. The HEPA machines must be left running during the procedure.
- D. General: The number and volume of air samples taken and analytical methods used shall be in accordance with the following schedule. Sample volumes given may vary depending upon the analytical instruments used.
- E. In each work area after completion of all cleaning work, a minimum of one (1) sample shall be taken at a flow rate of 1 to 12 liters per minute with a minimum of 1200 liters of air to be sampled and analyzed as follows:
1. Analysis: Fibers on each filter shall be measured using the NIOSH 7400 procedures and WISHA reference method. This shall include at a minimum the analysis of two blanks from the same lot as the filters used for sample collection, the Contractor shall provide the blanks for analysis.
  2. Release Criteria: Decontamination of the work area is complete when every clearance sample is equal or less than 0.01 fibers/cc or less than pre-abatement levels, whichever is lower. If any sample exceeds 0.01 fibers/cc, then the decontamination is incomplete and re-cleaning is required.
  3. The services of a testing laboratory shall be employed by the Contractor to perform laboratory analysis of the air samples. Verbal laboratory results shall be available within eight (8) hours of taking clearance samples. A complete record of

all air monitoring tests and inspections shall be furnished to the Port via the Contractor within 24 hours of sample collection.

- F. After acceptable clearance samples are received, the Contractor shall provide the Engineer with signed visual clearance forms with air sampling results attached.
- G. The Project Monitor shall conduct a final visual inspection after all containment and equipment has been removed.

**3.12 DISPOSAL PROCEDURES**

- A. Shower water shall be drained, collected, and filtered through a system with at least a 5.0-micron particle size collection capability.
- B. Sealed and labeled containers of asbestos containing waste shall be removed from the immediate project area and transported to the prearranged disposal location as the work progresses. Remove waste containers from the site between midnight and 5:00 a.m. in a cart covered with black plastic sheeting, unless the Port has approved an alternate time in writing.
- C. Labeling: Each bag of asbestos waste shall be pre-labeled in accordance with 29 CFR 1910.1200 (f) of OSHA's Hazard communication Standard as follows:

<p><b>DANGER</b> <b>CONTAINS ASBESTOS FIBERS</b> <b>AVOID CREATING DUST</b> <b>CANCER AND LUNG DISEASE</b> <b>HAZARD</b></p>
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In addition, a second pre-printed label must be present on each bag in accordance with 49 CFR Parts 171 and 172 of U.S. Department of Transportation regulation as follows:

<p><b>RQ HAZARDOUS SUBSTANCE</b> <b>SOLID, NOS</b> <b>ORM-E, NA 9188</b> <b>(ASBESTOS)</b></p>
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The Contractor shall mark each container with a permanent label listing the contractor's name, the name of the Certified Asbestos Supervisor, the contractor's phone number, the contractor's certification information, the date of removal, the location where the waste was generated, the facility owner (Port of Seattle), the Port contract number, and the Port's project number/work order number.

- D. All demolition debris materials, including ACM, except those containing substances classified as hazardous or dangerous by controlling local, state or federal regulatory agencies, shall upon their demolition become the property of the Contractor. All such material, including those containing hazardous or dangerous substances, shall be removed and properly disposed of away from the site and on property not owned by the

Port.

- E. Disposal must occur at an authorized site in accordance with regulatory requirements of PSCAA, Article 4, Regulations III and applicable state and local guidelines and regulations.
- F. Waste shipment, waste manifest, and disposal records shall be delivered to the Port within 45 days of completion of the abatement work. This information shall document the pickup site and disposal site, the quantity of the asbestos waste and the type of containers used. The Contractor and the Disposal Site Operator shall sign waste manifest. If a separate hauler is employed, their name, address, telephone number and signature shall also appear on the manifest.
- G. Transportation to the Landfill
  - 1. All transportation of asbestos containing waste material shall adhere to federal, state and local regulations, including, but not limited to:
    - a. Hazard material regulation 48 CFR parts 171.180.
    - b. 49 CFR part 107
  - 2. Once drums, bags and wrapped components have been removed from the work areas, they shall be loaded into an enclosed or covered truck for transportation.
  - 3. Utilize hand trucks or carts when moving containers. Containers shall not be dragged, dropped, or thrown.
  - 4. The enclosed cargo area of the truck shall be free of debris and lined with 6-mil polyethylene sheeting to prevent contamination from leaking or spilling containers. Floor sheeting shall be installed first and extend up the sidewalls. Wall sheeting shall be overlapping and taped into place.
  - 5. Containers shall be placed on level surfaces in the cargo areas and packed tightly together to prevent shifting and tipping. Large structural components shall be secured to prevent shifting and bags placed on top. Do not throw containers into truck cargo area.
  - 6. Personnel transferring or loading asbestos containing waste shall be protected by disposable clothing (including head, body, and foot protection) and, at a minimum, by half-face respirators using HEPA filters.
  - 7. Any debris or residue observed on containers or surfaces outside the work area shall be immediately cleaned up using HEPA filtered vacuum equipment, or wet methods.
  - 8. Large metal dumpsters are sometimes used for asbestos waste disposal. These shall have doors or tops that can be closed and locked to prevent vandalism or other disturbances. Containers shall be placed, not thrown, into these containers to avoid rupture.
  - 9. Asbestos-containing or-contaminated wastes shall be segregated and transferred

separately from non-asbestos wastes.

H. Disposal at the Landfill

1. Upon reaching the landfill, trucks are to approach the dump location as closely as possible for unloading of the asbestos containing waste.
2. Personnel off-loading containers at the disposal site shall wear protective equipment consisting of disposable head, body, and foot protection, and at a minimum, half-face piece, air-purifying respirators equipped with high-efficiency filters.
3. Bags, drums and components may be inspected, as they are off-loaded at the disposal site. Material in damaged containers shall be repacked in empty drums or bags as necessary.
4. Waste containers shall be placed on the ground at the disposal site, not pushed, thrown or dumped out of trucks.
5. Following the removal of all containerized waste, the truck cargo shall be decontaminated using HEPA vacuums or wet methods to meet the no visible residue criteria. Polyethylene sheeting shall be removed and discarded along with contaminated cleaning materials and protective clothing in bags or drums at the disposal site.

3.13 RE-ESTABLISHMENT OF THE WORK AREA AND SYSTEMS

**DIVISION 2 - SITE WORK**  
**Section 02085 - Asbestos Abatement**

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- A. Re-establishment of the work area shall occur following the completion of cleanup procedures and after clearance air monitoring has been performed and documented per contract documents.
- H. Polyethylene barriers shall be removed from walls and floors at this time, maintaining decontamination enclosure systems and barriers over floors, windows, etc., as required.
- I. Refer to Clearance procedures listed in Article 3.11 of this Section.
- J. Following satisfactory clearance of the work area, remaining polyethylene barriers may be removed and disposed of in accordance with these specifications.
- K. Relocate objects that were removed to temporary locations back to their original positions.
- L. Re-establish HVAC, mechanical and electrical systems in proper working activities.
- M. After all plastic barriers have been removed; the Port's RM Project Monitor may collect another set of clearance samples in cases where debris has been discovered. These samples must indicate that the airborne fiber concentration is equal to or less than the pre-abatement levels or 0.01 f/cc, whichever is lower. If fiber levels are not met, remedial clean up shall be conducted by the Contractor at no additional cost to Port.
- N. Comply with safety standards and governing regulations for cleaning operations. Remove waste materials from the site and dispose of in a lawful manner.
- O. Following this Section is an example of "Certificate of Clearance". This certification is to be completed by the Contractor, the Engineer during the clearance process.

**PART 4 MEASUREMENT AND PAYMENT**

**4.01 GENERAL**

- A. No separate measurement or payment will be made for the Work required by this Section. The cost for this portion of the Work will be considered incidental to, and included in, the payments made for "Site Demolition".

End of Section
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PART 1 GENERAL

1.01 SUMMARY

- A. This Section includes the procedures and requirements for the disposal or recycling of wastes generated by the construction activities.
- B. Disposal work (Wastes) shall include furnishing all labor, tools, equipment and incidentals required for transport and recycling or disposal of site demolition and deconstruction materials and debris, upland excavated soils and associated debris and dredged sediments and associated debris to an off-site disposal or recycling facility. Disposal work also includes all transportation and disposal fees.
- C. This Section includes any required chemical sampling and analysis for disposal characterization. Existing site characterization information (See Appendices) shall be used, to the extent possible, for this characterization. Additional characterization of waste may be needed for treated timber or other debris.

1.02 GENERAL REQUIREMENTS

A. All Wastes generated during the course of the project shall be disposed of in accordance with all applicable local, state, and federal regulations. All disposal of hazardous and nonhazardous waste shall be conducted in compliance with the CERCLA Off-Site Policy (40 CFR 300.440, Procedures for Planning and Implementing Off-Site Response Actions). The waste is either Subtitle “D” Waste, including all non-TSCA soil, sediment, and debris removed from the site except for demolished surface materials that can be recycled or reused, and/or the TSCA (or Subtitle “C”) Waste. Toxic Substances Control Act (TSCA) (40 CFR 761) establishes prohibitions of and requirements for the manufacture, processing, distribution in commerce, use, cleanup, storage and disposal of polychlorinated biphenyls (PCBs) after January 1, 1978. TSCA regulations for PCBs apply to concentrations of PCBs equal to or greater than 50 ppm and is subject to disposal requirements set for in 40 CFR 761.60 (a) (2) to 761.60(a) (5) and storage requirements of 40 CFR 761.65. Soil with total PCB concentrations exceeding the TSCA criteria areis Subtitle “C” Waste

~~A.~~

B. Effective June 1, 1991 and in accordance with SMC 21.36 as amended by Ordinance 115589, no Waste generated within the City of Seattle shall be deposited in a Waste disposal facility owned and operated by King County.

~~C.~~ ~~Toxic Substances Control Act (TSCA) (40 CFR 761) establishes prohibitions of and requirements for the manufacture, processing, distribution in commerce, use, cleanup, storage and disposal of polychlorinated biphenyls (PCBs) after January 1, 1978. TSCA regulations for PCBs apply to concentrations of PCBs equal to or greater than 50 ppm and is subject to disposal requirements set for in 40 CFR 761.60 (a) (2) to 761.60(a) (5) and storage requirements of 40 CFR 761.65.~~

~~D.C.~~ The U.S. Environmental Protection Agency (EPA) has developed the off-site disposal rule to avoid having wastes from CERCLA actions contribute to present or future environmental problems. This is accomplished by directing CERCLA wastes to management units determined to be environmentally sound. The EPA must make an affirmative determination that a receiving facility (for any waste that

leaves the site) is in compliance and releases are controlled before a facility may receive CERCLA wastes. The EPA must approve the receiving disposal facility in advance of any waste stream leaving the property. The offsite rule acceptability status is dynamic in nature and subject to change. EPA Region 10 has instituted a standard operating procedure where they conduct a verification of continued acceptability on the facilities that have been previously found acceptable under the offsite rule. The purpose of a verification of continued acceptability is to provide a periodic check to assure that the facility continues to be acceptable. A verification of continued acceptance is conducted when a request for the offsite rule acceptance is received and the previous verification of continued acceptance has been conducted more than 60 days prior. A verification of continued acceptance is valid for 60 days.

### 1.03 REFERENCES

- A. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only. The most recent version of the reference applies.

#### CODE OF FEDERAL REGULATIONS (CFR)

40 CFR 107	Hazardous Materials Program Procedures
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packaging
49 CFR 178	Specifications for Packaging
40 CFR 260	Hazardous Waste Management System- General and Characteristics of Hazardous Waste
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 279	Standards for the Management of Used Oil
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 302	Designation, Reportable Quantities, and Notification

40 CFR 761 Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions

WASHINGTON ADMINISTRATIVE CODE (WAC)

WAC 173-303 Washington Dangerous Waste Regulations

WAC 173-304 Minimum Functional Criteria for Solid Waste

1.04 SUBMITTALS

- A. The Contractor shall submit a Transportation and Disposal Plan in accordance with Section 01400 – Removal Action Work Plan. The plan shall address the handling, storage, transportation, and disposal of non-hazardous and hazardous wastes generated at the Site. The plan shall comply with regulations administered by the EPA, the U.S. Department of Transportation (DOT), and the Washington State Department of Ecology (Ecology) and the County and City. The plan shall include the following:
1. A list of Wastes that will be generated by the Project. A proposed recycling facility or disposal site shall be identified for each waste stream. The list shall identify estimated quantities and the type of material to be wasted or removed from the Site. This includes but is not limited to site demolition and deconstruction debris and materials; upland excavated materials and associated debris; and dredged materials.
  2. On-site management practices for non-hazardous and hazardous waste, including types and volumes of waste anticipated, inventory controls, and waste minimization methods.
  3. Proposed on-site temporary storage methods for all waste streams, and off-site disposal methods and facilities. Proposed disposal sites for dredged or excavated sediment, soil, and debris shall be permitted RCRA Subtitle D landfill, or Subtitle C landfills in the case of the TSCA designated upland excavation areas, identified on the Drawings. Identify whether the proposed disposal site has an exclusion from the paint filter test requirement for material potentially containing free water.
  4. Procedures for packaging, labeling, and manifesting of waste streams generated and managed by the Contractor. If materials are determined to be a non-hazardous and non-dangerous waste, they shall be shipped using a non-hazardous Waste manifest or standard BOL provided by the transporting company or generator.
  5. Documentation that facilities proposed for off-site disposal or recycling of hazardous and non-hazardous materials are in compliance with the CERCLA Off-Site Policy (40 CFR 300.440). Include copies of permits for waste sites and recycling operations. Include EPA ID numbers, names, locations, and telephone numbers of all proposed disposal and recycling facilities and transporters.
  6. Procedures for “Cradle to Grave” documentation of all wastes generated at the project Site.
  7. Certification that the waste shall be handled in accordance with all applicable RCRA Toxics Substances Control Act (TSCA), and Hazardous Materials Transportation Act (HMTA) laws and regulations.



8. A list of all subcontractors to employed in transportation, types of trucks, containers and liners to be used, inspection procedures prior to transport, and best management practices to prevent any leakage or spillage.
  9. A description of all haul routes, transfer facilities, estimated hours and days of operation, estimated number of trucks per day, and on-site traffic control measures.
  10. A description of and proposed sequencing of, all sampling and analysis of any waste materials that may be required by the landfill for disposal characterization. The specific waste characterization sampling and analysis procedures shall be defined in a SAP prepared in accordance with Section 01330 – Submittals.
- B. Should additional or alternate disposal or recycling sites become necessary during the life of the Contract, the locations and information for each site shall be submitted to the Engineer for approval at least 20 Working Days prior to their proposed use.
  - C. Weekly disposal reports shall be submitted to the Engineer for all dredge/excavated material and debris transferred to approved disposal or recycling facilities. The weekly reports shall include the total number of truckloads, total estimated volume, total tons of material received at the disposal facilities and a copy of the completed waste disposal tracking sheets.
  - D. All transportation-related shipping documents shall be submitted to the Engineer, including draft manifests for waste; draft bills of lading; lists of proposed labels, packages, markings, and placards to be used for shipment; and any waste profiles and/or supporting waste analysis documents, for a review a minimum of 7 days prior to anticipated shipment. Generator copies of manifests used for initiating shipments of waste, bill of ladings, and supporting waste analysis documents shall be furnished when shipments are originated. The Contractor shall not allow any hazardous waste to leave the project site until shipping documents have been approved and signed by an authorized Port signer. The Engineer can sign non-hazardous shipping papers and manifests.
  - E. Receipt copies of waste shipment records at the designated disposal facility shall be furnished no later than 35 days after acceptance of the shipment. When required by law, waste shipping papers shall be returned to the Owner within the legally specified time.

#### 1.05 REQUIREMENTS FOR WASTE DISPOSAL AND RECYCLING SITES

- A. A list of waste and recycling sites shall be provided by the Contractor and must be approved by the Engineer and EPA prior to their use.
- B. The selection of Waste and recycling sites and their operation shall at all times be subject to the approval of the Engineer and EPA.

### PART 2 PRODUCTS

#### 2.01 MATERIALS

- A. The Contractor shall provide all of the materials and labor required for the packaging, labeling, marking, placarding, and transportation of hazardous wastes and hazardous and nonhazardous materials in conformance with DOT standards.

- B. Packaging - The Contractor shall provide bulk and non-bulk containers for packaging hazardous materials/wastes consistent with the authorizations referenced in the Hazardous Materials Table in 49 CFR 172.101, Column 8.
- C. Markings - The Contractor shall provide markings for each hazardous material/waste package, freight container, and transport vehicle consistent with the requirements of 49 CFR 172, Subpart D, 40 CFR 262.32 (for hazardous waste), and 40 CFR 761.45 (for PCBs).
- D. Labeling - The Contractor shall provide primary and subsidiary labels for hazardous materials/wastes consistent with the requirements in the Hazardous Materials Table in 49 CFR 172.101, Column 6.
- E. Placards - For each off-site shipment of hazardous material/waste, the Contractor shall provide primary and subsidiary placards consistent with the requirements of 49 CFR 172, Subpart F. Placards shall be provided for each side and each end of bulk packaging, freight containers, transport vehicles, and rail cars requiring such placarding.
- F. Liners – Each container of dredged or excavated material shall be lined with a minimum 6 mil new intact plastic liner.

### PART 3 EXECUTION

#### 3.01 GENERAL

- A. Use only EPA and Engineer approved waste disposal and recycling sites.
- B. All wastes shall be transported in accordance with federal, state, and local transportation requirements, including driver training, placarding, and use of shipping papers or waste manifests.
- C. Notify the Engineer at least five working days in advance of any proposed changes to the operations outlined in the approved Transportation and Disposal Plan.
- D. Dredged sediment and debris and upland soil and debris shall be transported in sealed containers meeting all requirements of 49 CFR 173 and other applicable requirements, each lined with a minimum 6 mil new intact plastic liner. Haul in standard dump trucks and pups is not allowed without the specified lining. No spillage or drainage from containers is allowed at any time during hauling or mode transfer off-site. Containers shall be not be overloaded, shall meet applicable weight restrictions, shall have adequate free-board so as to prevent spillage during transit, and shall be covered in accordance with applicable regulations. Contractor is advised that sediments may generate free liquid during haul due to separation and settling, and the Contractor's hauling methods and Transportation and Disposal Plan shall address this possibility. TSCA excavated material shall be placed in segregated containers from any other waste streams.
- E. Any required sampling and analysis for disposal characterization of waste materials shall be the Contractor's responsibility and is considered incidental to the other payment items. Contractor shall sequence any required sampling and analysis to avoid any delays in the Work.

#### 3.02 ON-SITE HAZARDOUS WASTE MANAGEMENT

- A. Should hazardous wastes be encountered during work activities, the Contractor shall be responsible for ensuring compliance with all Federal, State, and local hazardous waste laws and regulations. The Contractor shall identify hazardous

materials using criteria set forth in 40 CFR 261 and WAC 173-303 and other applicable State and local laws, regulations, and ordinances. When accumulating hazardous waste or hazardous materials on Site, the Contractor shall comply with generator requirements in 40 CFR 262 and WAC 173-303.

- B. Inspection - The Contractor shall inspect all hazardous waste areas daily and shall provide written documentation of the inspection. Inspection logs will contain date and time of inspection, name of individual conducting the inspection, problems noted, and corrective actions taken.

### 3.03 OFF-SITE WASTE MANAGEMENT

- A. The Contractor shall use RCRA Subtitle C-permitted facilities which meet the requirements of 40 CFR 264 or facilities operating under interim status which meet the requirements of 40 CFR 265 for hazardous waste disposal.
- B. The Contractor shall use RCRA Subtitle D or recycling facilities for nonhazardous material being disposed of off Site.
- C. Packaging Certification - Prior to shipment of any material off site, the Contractor shall provide written certification to the Engineer that hazardous and nonhazardous materials have been properly packaged, labeled, and marked in accordance with Department of Transportation and EPA requirements.
- D. Transportation - The Contractor shall use manifests for transporting hazardous wastes as required by 40 CFR 263 or any applicable state or local law or regulation. Transportation shall comply with all requirements in the Department of Transportation referenced regulations in the 49 CFR series. The Contractor shall acquire manifests in accordance with the hierarchy established in 40 CFR 262.21. The Contractor shall prepare hazardous waste manifests for each shipment of hazardous waste shipped off Site. Manifests shall be completed using instructions in 40 CFR 262, Subpart B, and any applicable state or local law or regulation. Manifests and waste profiles shall be submitted to Engineer for review and signature by an authorized representative of the Engineer. The Contractor shall prepare land disposal restriction notifications as required by 40 CFR 268 or any applicable state or local law or regulation for each shipment of hazardous waste. Notifications shall be submitted with the manifest to the Engineer for review and approval.
- E. Treatment and Disposal of Hazardous Wastes - Any hazardous waste shall be transported to an approved hazardous waste treatment, storage, or disposal facility within 90 days of the accumulation start date on each container. The Contractor shall ensure wastes are treated to meet land disposal treatment standards in 40 CFR 268 prior to land disposal.

### 3.04 SHIPPING DOCUMENTS

- A. The Contractor, in consultation with the Engineer, shall evaluate prior to shipment of any material off Site whether the material is regulated as a hazardous waste in addition to being regulated as a hazardous material; this shall be done for the purpose of determining proper shipping descriptions, marking requirements, etcetera, as described below.
- B. Identification of Proper Shipping Names - The Contractor shall use 49 CFR 172.101 to identify proper shipping names for each hazardous material (including hazardous wastes) to be shipped off Site. Proper shipping names shall be

submitted to the Engineer in the form of draft shipping documents for review and approval.

- C. Packaging, Labeling, and Marking - The Contractor shall package, label, and mark hazardous materials/wastes using the specified materials and in accordance with the referenced regulations.
- D. Hazardous Material Shipping Documents - The Contractor shall ensure that each shipment of hazardous material, hazardous waste, or dangerous waste sent off Site is accompanied by properly completed uniform hazardous waste manifest (EPA Form 8700-22, Rev. 3-05).
- E. Nonhazardous Material Shipment Documents - The Contractor shall prepare a bill of lading (Contractor Solid Waste Tracking Sheet) for each shipment nonhazardous material which fulfills the shipping paper requirements. The bill of lading shall satisfy the requirements of 49 CFR 172, Subpart C, (and 40 CFR 279 if shipping used oil) and any applicable state or local law or regulation, and shall be submitted to the Owner for review and approval. For laboratory samples, the Contractor shall prepare bills of lading and other documentation as necessary to satisfy conditions of the sample exclusions in 40 CFR 261.4(d) and (e), and any applicable state or local law or regulation. Bills of lading requiring shipper's certifications shall be signed by an authorized representative of the Owner.

### 3.05 EMERGENCY CONTACTS

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

### 3.06 SITE MAINTENANCE

- A. Keep work area, site, and adjacent properties free from accumulations of waste materials, rubbish, and windblown debris resulting from Contractor's operations.
- B. Provide on-site containers for collection of waste materials, debris, and rubbish. Periodically remove waste from the site.
- C. Dispose of trash and debris in compliance with governing codes, ordinances, regulations, and anti-pollution laws.

- D. Locate dumpster(s) or other waste containers or stockpiles inside the staging area or at a location designated by the Engineer.
- E. Control all operations in accordance with Section 01631 – Pollution Prevention, Planning and Execution.

**PART 4 MEASUREMENT AND PAYMENT**

**4.01 GENERAL**

- A. This measurement and payment shall cover loading and disposal of all Project site waste streams: site demolition and deconstruction materials and debris; upland excavated soils and associated debris; and, dredged sediments and associated debris.
- B. There will be no separate measurement or payment for the Transportation and Disposal Plan. It shall be incidental to “Removal Action Work Plan” as described in Section 01400 – Removal Action Work Plan.

**4.02 MEASUREMENT**

- A. Measurement will be distinguished by each waste stream:
  - 1. Asphalt Debris Handling and Recycling derived from Site Demolition and deconstruction will be measured per ton as described in Section 02220 – Site Demolition.
  - 2. Concrete Debris Handling and Recycling derived from Site demolition and deconstruction will be measured per ton as described in Section 02220 – Site Demolition.
  - 3. Metal Debris Handling and Recycling will not be measured and will be considered incidental to “Site Demolition” as described in Section 02220 – Site Demolition.
  - 4. Site Demolition will be measured as a single Lump Sum Unit as described in Section 02220 – Site Demolition
  - 5. All soils and associated debris derived from upland and riverbank excavation activities that are characterized as TSCA waste requiring disposal at a Subtitle C Landfill will be measured as described in Section 02300 – Earthwork.
  - 6. All soils and associated debris derived from upland and riverbank excavation activities that are characterized as non-TSCA waste requiring disposal at a Subtitle D Landfill will be measured as described in Section 02300 – Earthwork.
  - 7. All dredged sediments and soils and associated debris will be measured as described in Section 02325 – Dredging.

**4.03 PAYMENT**

- A. No separate measurement or payment will be made for the Work required by this section. The costs for this portion of the work shall be considered incidental to, and included in, the payments made for the applicable bid items in the Schedule of Unit Prices bid for this project.

End of Section

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This Section includes on-site temporary stockpiling and loading of excavated materials for transport to the appropriate waste disposal facility.

**1.02 SUBMITTALS**

- A. As part of the Pre-Construction Submittals and prior to initiation of earthwork activities, provide the Engineer with a Soil Stockpile Plan as part of Section 01400 – Removal Action Work Plan that includes locations and dimensions of temporary stockpile areas for excavated soils, construction details of the stockpile cells, and plans for segregating TSCA and non-TSCA contaminated soils. The Soil Stockpile Plan shall provide detail on the truck loading, empty truck staging and truck decontamination areas.

**PART 2 PRODUCTS**

**2.01 MATERIALS**

- A. Furnish all materials, equipment, and labor required for the construction and maintenance of stockpiles at Terminal 117.
- B. Stockpile bottom liners, shall have a minimum thickness of 40 mils and shall consist of high-density polyethylene (HDPE) and shall be resistant to weathering and degradation due to contact with contaminated materials for the duration of the Project work. The liner shall be furnished with prefabricated shop welded seams or seams welded in accordance with the manufacturer’s recommendations. Dimensions may be maximized to provide the largest manageable sheet.
  1. The HDPE liner for the stockpiles shall be manufactured of polyethylene resins and shall be compounded and manufactured specifically for the intended purpose. The resin manufacturer shall certify each lot for the following properties.

<b>Property</b>	<b>Test Method</b>	<b>HDPE Requirements</b>
Density,g/cc	ASTM D 1505 or ASTM D 792	0.935 - 0.940
Melt Index,g/10 min.	ASTM D 1238 Condition E	< 0.4

2. The geomembrane shall be a minimum 23.0 feet seamless width. Carbon black shall be added to the resin if the resin is not compounded for ultra-violet resistance.
3. The surface of the smooth geomembrane shall not have striations, roughness, pinholes, or bubbles.
4. The geomembrane shall be supplied in rolls. Labels on each roll shall identify the thickness of the material, the length and width of the roll, lot and roll numbers, and name of manufacturer.
5. Once the liner is in place and the stockpile area ready to receive/ store material, the Contractor shall install a cushioning layer to protect the liner in accordance with the liner manufacturer’s recommendations. This layer can consist of onsite waste as long as it meets the liner manufacturer’s

recommendations. Leave this cushioning layer over the liner during operations to protect the liner from tear by stockpiling and loading operations. Should the liner be torn, the Contractor shall immediately repair the tear and not allow contaminated material or run-off to escape the stockpile.

- C. Stockpile covers shall be 6-mil (minimum thickness) black or clear reinforced polyethylene sheeting. The stockpile cover sheets shall be of sufficient length and width to completely and fully cover all of each stockpile with no more than two sheets.
- D. Stockpile covers and liners shall be free of holes or tears. Defective material shall be immediately repaired or replaced and not allow leakage or escape of material from the stockpile area, as determined by the Engineer.
- E. Furnish sand bags or other devices as approved by the Engineer of sufficient quantity and weight and with sufficiently close spacing to completely and fully hold the stockpile cover in position. Only clean, uncontaminated material shall be used to weigh down the covering; stockpile material shall not be used for cover weight. In particular, the edges of the stockpile cover shall be adequately anchored to completely trap the material within.

### PART 3 EXECUTION

#### 3.01 STOCKPILING – GENERAL

- A. Coordinate stockpiling and stockpile maintenance work with excavation work as specified in Section 02300 – Earthwork
- B. Establish separate stockpiles for TSCA and non-TSCA classified excavated soils if not directly transported from the site.
- C. The frequency of material sampling will depend upon the requirements of the waste disposal facility. It shall be the responsibility of the Contractor to conduct and coordinate any sampling requirements mandated by the waste disposal facility.
- D. Stockpiling shall be allowed only within the upland remediation site boundaries.
- E. The Contractor shall be responsible for constructing and maintaining all stockpiles, furnishing all waste containers, and for the inspection, maintenance, modification, and repair of stockpiles and waste containers required for this work.
- F. Line bottom of stockpiles as outlined in these Specifications, except where Drawings indicate sealed concrete slab is acceptable. Provide stormwater run-on control, manage all drainage from stockpiles, prevent rain, stormwater, and surface water from contacting material contained in the stockpiles. Cover stockpiles during lengthy periods of inactivity while on site, at the end of each work day, just prior to and during periods of precipitation, and as necessary to control dust, erosion and odors.
- G. The edges of the stockpiles shall be located no closer than 10 feet from the designated Project perimeter and 20 feet from top of bank.

#### 3.02 STOCKPILE CONSTRUCTION

- A. Prepare the designated area for stockpile construction in accordance with these Specifications:



1. Clean and remove debris from the stockpile footprint, prepare a smooth surface (existing concrete pad, or compacted sand leveling layer incorporating geotextile, as needed) that meets the liner manufacturer's recommendations.
  2. Stockpile berms (or Ecology Blocks) shall be firm, non-yielding and stable. Bottom liner shall cover entire berm and be placed such that all drainage from the stockpile is contained within the stockpile cell.
  3. Install bottom liner to fully cover the smooth ground surface for each stockpile. Field seaming, if necessary, shall be completed in accordance with the liner manufacturer's recommendations to provide a water tight seam. Simple overlapping of seams without sealing is not allowed. Anchor the liner adequately to prevent displacement. Monitor and maintain liner integrity. Immediately repair tears or punctures where damaged.
- B. Install stockpile cover in a manner that minimizes wrinkles and provides for a straight placement. All seams shall be taped or weighted down full length and there shall be at least 4 feet of overlap of all seams. Place sandbags or other pre-approved clean weighted objects on the cover at sufficiently close spacing to prevent uplift from wind. The toe of slopes shall be tightly secured and covered by the sheeting.
- C. Protect the cover from damage. Remove and replace damaged polyethylene sheeting as needed or if directed by the Engineer.

### 3.03 STOCKPILING OF MATERIALS

- A. The Contractor shall prepare the stockpile cells in accordance with the details outlined in these Specifications.
- B. No construction equipment shall be allowed to drive directly over geomembrane liners without first bedding the liner surface with at least 12 inches of soil that meets the requirements of the liner manufacturer.

### 3.04 STOCKPILE MANAGEMENT

- A. Contaminated materials shall be placed only in properly constructed and maintained stockpiles. Do not place any designated TSCA excavated materials in the stockpiles designated for non-TSCA excavated materials.
- B. Prevent dust from the stockpiles from becoming airborne. Place and anchor stockpile covers during lengthy periods of inactivity while on site, at the end of each work day, just prior to and during periods of precipitation, and to control dust, erosion and odor.
- C. Provide run-on controls to divert storm water and precipitation away from stockpiles. Collect accumulated leachate from lined stockpile areas and manage the water as outlined in Section 02455 – Construction Water Management System.
- D. Install and maintain legible signs at conspicuous locations immediately adjacent to all stockpiled materials clearly indicating the nature of stockpiled materials, e.g., TSCA Materials, non-NON-TSCA materials, contaminated materials, backfill materials, etc.

### 3.05 STOCKPILE INSPECTION

- A. The Contractor shall inspect stockpiles daily to document and affirm the integrity and maintenance of the stockpile liner and cover system.
- B. Any deficiencies noted by the Engineer or Contractor shall be immediately corrected to the satisfaction of the Engineer.

### 3.06 LOADING

- A. The Contractor shall provide equipment and labor to load all trucks for transport and disposal of materials excavated from the Project as specified in this document.
- B. Coordinate with the waste disposal facility for truck unloading of contaminated materials for the Project site as required.
- C. The Contractor shall bear full responsibility for coordinating with the waste disposal facility the number of trucks, loading operations, and hours for loading.
- D. Load trucks within the remediation site boundary so that spills are contained within the area. If required by the Engineer, spread polyethylene sheeting over an area sufficient for truck loading in order to avoid contaminating the loading site. Spilled material shall be immediately picked up and deposited in the appropriate stockpile area.
- E. The Contractor shall be fully and completely responsible for proper loading and adhering to load and weight limits of all trucks leaving the Project. All fines, taxes, penalties, or judgments resulting from overweight or improperly loaded vehicles shall be the full and complete responsibility of the Contractor.
- F. All equipment shall be decontaminated per Section 02223 – Decontamination prior to leaving the site.
- G. The Contractor shall be responsible for ensuring that all material loaded for off-site disposal meets applicable transportation laws and regulations as well as the requirements of the receiving off-site waste disposal facility.

### 3.07 TEMPORARY STOCKPILE REMOVAL

- A. After the completion of the excavation, stockpiling, and disposing of the excavated materials, the Contractor shall remove liners and top cover of any temporary stockpile areas and dispose at the designated off-site waste disposal facility.
- B. If the stockpile area is located over soil that is contaminated, no special provisions for sampling the underlying subgrade will be required since the already contaminated soil below the stockpile area will be removed.
- C. Stockpiles located on areas overlying clean soils shall mandate that sampling of the underlying soils be performed upon stockpile removal to demonstrate that stockpiling did not affect clean underlying soils. Contractor shall notify Port when stockpiles have been completely removed and the Port will sample the underlying soils. If the underlying soils are found, through sampling or visual observations by the Engineer, to be contaminated by the Contractor's stockpiling activities, the Contractor shall be responsible for remediating the contaminated soils to the Engineer's satisfaction at no additional cost to the contract.

## PART 4 MEASUREMENT AND PAYMENT

### 4.01 GENERAL

**DIVISION 2 – SITEWORK**  
**Section 02114 - Stockpiling and Loading Of Contaminated Soil**

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- A. No separate measurement or payment will be made for the Work required by this section. The cost for this portion of the Work will be considered incidental to, and included, in the payments made for the applicable bid items in the Schedule of Unit Prices.

End of Section

PART 1 GENERAL

1.01 SUMMARY

- A. This Section specifies requirements to provide temporary excavation support and engineering controls in support of the upland excavation activity. Since excavation sloping is not allowed on adjacent properties outside of the study boundary (including the City of Seattle, the South Park Marina and Boeing), excavation shoring shall be installed where the required excavation cannot be completed without affecting the surrounding property outside of the study boundary. Shoring is anticipated to be used to provide structural support and to facilitate continuation of the remediation as indicated in the Drawings. Other excavation areas requiring support shall be identified by the Contractor.
- B. Existing subsurface exploration data is available to the Contractor for their use in the shoring design. Refer to the Appendices.
- C. The Contractor shall design, provide materials, and install all necessary controls required for stability of the remediation excavation and to protect adjacent roadways and structures.
- D. The Contractor shall locate and protect any underground utilities and structures not designated for removal in the Drawings.
- E. This section does not apply to the shoreline sheet piling.

1.02 REFERENCES

- A. Standards
  - 1. R.C.W. Chapter 49.17 Washington Industrial Health and Safety Act (WISHA).
  - 2. WAC 296-155-Safety Standards for Construction Work.
  - 3. WAC 296-155-657-Requirements for Protective Systems.
  - 4. R.C.W. Chapter 39.04.180 Public Works/Trench Excavations - Safety Systems Required.
- B. Qualifications
  - 1. Shoring Design Engineer: Registered Professional Engineer licensed in the State of Washington.
  - 2. Welder: Currently certified by the AWS.
  - 3. Competent Person: The Contractor shall have a competent person, as required by WAC 296-155-650 (2f) on the site at all times to properly evaluate sloping/shoring requirements of excavations. This person shall be identified in the Excavation Support System Plan outlined in 1.03 and shall have the required training to be a competent person.

1.03 SUBMITTALS

- A. The Contractor shall prepare and submit, as part of Section 01400 – Removal Action Work Plan an Excavation Support System Plan that details excavation support system(s) required in support of this Project. The Plan shall consist of the following:
1. The names and qualifications of the excavation support system Shoring Design Engineer and the onsite representative that will evaluate sloping/shoring requirements of excavations.
  2. Design calculations and drawings prepared, stamped, dated, and signed by a Professional Engineer registered in the State of Washington.
    - a. Demonstrating the integrity of the design and conformance to the design criteria, taking into consideration all loads, sequences, and conditions during the various construction and removal stages.
    - b. For the anticipated wall deflections.
  3. Detailed drawings showing pertinent dimensions, spacing, and layout of components of the excavation support system. Include plan, elevations, sections, and details showing the arrangement and method of installation.
    - a. Show structures, pipelines, and other improvements located within the area of influence of the excavation.
  4. Proposed layout and sequence of construction, equipment needs, and methods for installation and removal of the excavation support system.
  5. Other information as required by the appropriate local jurisdictional authority of the Excavation Support System Plans.

1.04 SHORING DESIGN ENGINEER COORDINATION

- A. Shoring Design Engineer of excavation support system shall review settlement monitoring data in accordance with the Settlement Monitoring Plan (Specification 02340 – Earthwork Instrumentation and Monitoring) and perform on-site inspections of excavation support system as the systems are constructed.
- B. Shoring Design Engineer shall certify that the excavation support system is constructed per the applicable stamped, dated, and signed excavation support system of the Design Engineer following completion of each support system and following any modifications by Contractor during construction.

1.05 DESIGN CRITERIA

- A. Soil parameters: Soil data and logs of explorations are available for review in the Appendices. Contractor shall verify and independently interpret the surface information presented in the Contract Documents, associated Appendices, and supplement existing data as they deem necessary in order to complete the design

and construction. . The costs of any supplemental information shall be included in the bid for this item.

- B. Excavation support systems shall be designed to withstand all anticipated loads. Design steel members in accordance with the International Building Code (IBC) and the American Institute of Steel Construction (AISC) Manual.
- C. Design excavation support systems involving materials other than steel in accordance with the IBC.
- D. In the event tie-back anchors are used, Contractor shall be responsible for obtaining from both public and private entities the rights to property as required for the use of tie-back anchors.

#### 1.06 SUPPORT SYSTEM REQUIREMENTS

- A. The design, planning, installation, monitoring, and removal of all excavation support systems shall be accomplished in such a manner as to maintain the required excavation or trench section and to maintain the stability of the soils below and adjacent to the excavation.
- B. Assess existing conditions, including property rights of adjacent property whether private or public, for the possible effects of proposed temporary works and construction methods.
- C. Select and design support systems, methods, and details to assure safety to the public, adjacent property, and the completed work.
- D. Support system stiffness and installation methods as required to conform to settlement restrictions indicated in the Design Documents.
- E. Design seals and ground stabilization as required to meet all settlement and drawdown criteria.
- F. When the construction sequence of structures requires the transfer of bracing to portions of any new structure or to any existing structure, provide a complete design analysis of the expected impact of that bracing on the structure. This action shall in no way absolve the Contractor of responsibility of damage resulting from said bracing.

#### 1.07 EXCAVATION MONITORING

- A. The Contractor shall monitor excavation activity in accordance with the excavation requirements specified on the accepted excavation support system plans.
- B. The Contractor shall not begin excavation work until approved to do so in writing by the Engineer.
- C. The Engineer may make adjustments to the excavation work or additional shoring should observation indicate a safety issue.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.01 GENERAL

- A. Provide excavation support systems to safely retain excavations, and control ground movements and deformations in accordance with the specified requirements.
- B. Monitor excavation support system to maintain movement within limits in accordance with the Settlement Monitoring Plan.
- C. Notify the Engineer immediately upon encountering deformations larger than predicted, distress, or damage to the excavation support system.
- D. Notify the Engineer immediately if any excavation support element is not in accordance with the requirements of the design.
- E. Suspend excavation and perform stabilization measures, as required, to meet requirements of the excavation support system Design Engineer.
- F. Recommence excavation activities only after corrective measures have been implemented and are deemed satisfactory.
- G. Perform structural welding in accordance with the applicable clauses of AWS D1.1.
- H. Excavation support system removal:
  - 1. Remove components completely, performing decontamination of components as necessary. Refer to Section 02223 – Decontamination.
  - 2. De-stress all tie-backs, if used.

3.02 INSTALLATION DOCUMENTATION

- A. Include record certification by the Design Engineer of the as-constructed excavation support system.

3.03 SLOPING AND BENCHING

- A. Excavation slopes and benches shall conform to OSHA/WISHA requirements at all times.
- B. Sloping or benching for excavations greater than four (4) feet deep shall be in accordance with the accepted excavation support system plan, unless flatter slopes are deemed appropriate due to site conditions as determined by the competent person. Safety is of primary importance in making adjustments to the accepted Plans and any adjustments require the approval of the Design Engineer and acceptance of the Engineer.
- C. The Contractor shall be responsible for determining proper sloping of excavation walls based on the evaluation of actual soil conditions by Contractor's competent person.

- D. The Contractor shall provide written documentation in Contractor's Daily Report for sloping and benching, including acceptable grades and dimensions, soil types, and soil conditions.
- E. The Contractor shall monitor excavations to assure stability of slope and benches, and adequacy of shoring methods.

3.04 SHORING

- A. Shoring methods shall be consistent with the accepted Excavation Support System Plan.
- B. The Contractor is advised of potential difficulty inherent to installing shoring due to possible cobbles, large boulders, and other obstructions in the subsurface. The Contractor shall take into consideration in the preparation of the Shoring Plan the likelihood of needing to pre-trench the shoring alignment or remove or drill and split oversized material from the alignment of the shoring in order to facilitate installation.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. No separate measurement will be made for Contractor-Designed Support.

4.02 PAYMENT

- A. No separate payment will be made for the "Excavation Support System Plan" as required by this section. The cost for this portion of the Work will be considered incidental to the "Removal Action Work Plan" as described in 01400 – Removal Action Work Plan.
- B. Payment for "Contractor-Designed Support" will be made at the contract lump sum price as stated in the Schedule of Prices and will be full compensation for furnishing all labor, materials, equipment and incidentals required to design (including any supplemental information deemed necessary by the Contractor to complete the design), provide, construct, maintain, and remove excavation support systems as specified.

End of Section
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PART 1 GENERAL

1.01 SUMMARY

- A. Extent of Work: The extent and location of the “Demolition” work is indicated on the Drawings and includes at-grade and above-grade features in the Upland Area and in-water structures in the LDW. Material or structures in contact with the subgrade soil are described in Earthwork. The upland work includes the requirements for the removal, wholly or in part, and satisfactory disposal of, but is not limited to, all surface materials (asphalt pavement, concrete surface, concrete slab on grade), fence posts and fabric (not foundations), curbs, and the decommissioning and removal of the heating oil underground storage tank (UST) located near the north building as shown on the Drawings.
- B. Removal of the hazardous building materials in the north building, south building, and central building structures are described in Sections 02075 Lead Controls in Construction and Demolition, 02081 Light Ballast Removal and Disposal, 02082 Removal and Disposal of Universal Waste, and 02085 Asbestos Awareness.
- C. Removal of the structures of the north building, south building, and central building structures, after removal of the hazardous building materials, is described in Section 02227 Deconstruction.
- D. The in-water demolition work includes the removal of the debris deflector structure, piles along the shoreline, and removal of South Park Marina float piles.
- E. The Drawings are for guidance only and to indicate typical general construction features of the various types of structures and are not to be construed as definitive or adequate to supplant the actual on-site inspection by the Contractor.
- F. The Contractor shall identify and notify the Port of which South Park Marina piles require removal and the date planned for removal the temporary debris deflector six (6) weeks prior to the start of work in the Sediment Area.

1.02 JOB CONDITIONS

- A. Protection
  - 1. Contractor shall demolish all features shown on the Drawings that are not deconstructed, including, but not limited to all surface materials and pavements, fence posts and fabric (not foundations), curbing, and a heating oil UST and related piping, hazardous building materials in the three (3) on site buildings, and in-water features including the debris deflector structure and guide piles, and marina float guide pile.
  - 2. The Contractor shall protect all utilities not designated for removal and other structures to remain from damage during site demolition activities.
  - 3. The approximate locations and dimensions of demolition features are shown on the Drawings, where they are known.
- B. Site demolition work involves handling materials containing substances that may be harmful to the health and safety of the workers. The Contractor shall perform all Work in full compliance with the Site Specific Construction Health and Safety Plan and Section 01860 – Safety Management.

**1.03 SUBMITTALS**

- A. The Contractor shall prepare and submit a Demolition Plan as part of Section 01400 – Removal Action Work Plan that, at a minimum, addresses the following:
  - 1. Worker safety.
  - 2. Protection of the public.
  - 3. Equipment to be used in performance of the demolition work.
  - 4. Work sequence including upland, and in-water demolition.
  - 5. Schedule showing coordination of operations with other activities including excavation, dredging, transloading, backfilling, and other applicable items.
  - 6. Means and methods to minimize waste.
  - 7. Proposed measures to control dust.
  - 8. Disposal and recycling procedures.
  - 9. Protection of the environment.
  - 10. Disposal site(s) as described in 02111 – Waste Material Disposal.

**1.04 QUALITY CONTROL**

- A. The Contractor shall conform to the Site-Specific Construction Health and Safety Plan (HASP), including adherence to all applicable local, state and Federal health and safety standards and guidelines as specified in Section 01860 – Safety Management.
- B. The Contractor shall conform to the requirements for site controls specified in Section 01860 – Safety Management for odor and dust control, during surface and subsurface feature removal as well as the excavation operation.
- C. The Contractor shall conform to the requirements in the Construction Quality Control Plan (CQCP) and other components of the RAWP as they pertain to Quality Control. The CQCP also describes the Contractor's plan for inspecting/maintaining equipment, surveying, and monitoring soil and building settlement, among other things

**PART 2 PRODUCTS – Not used**

**PART 3 EXECUTION**

**3.01 PREPARATION**

- A. Coordinate with work required in Section 02227 – Deconstruction which will contain some overlap with the requirements of this Section. For example, the hazardous building materials shall be required to be removed prior to building deconstruction.
- B. Demolish and remove the features in accordance with the Drawings and all applicable regulations.

**3.02 DEMOLITION OF FEATURES**

- A. Upland: Completely remove all upland surface materials, fence posts and fabric (not foundations), curbs, and other surface features including asphalt. All materials designated for demolition shall be broken up as needed, loaded and

recycled or disposed of by the Contractor at an EPA-approved facility. This activity shall also include exposure and removal of the heating oil UST in the area of the north building.

1. Care shall be taken in removing the pavement so that damage does not occur to the existing pavement in adjacent roadways, which are to remain in place and that all removals are accomplished by making a neat vertical saw cut at the boundaries of the area to be removed. Adjacent materials designated to remain that are damaged by the Contractor due to his operations shall be replaced at no additional cost to the Port.
  2. Vegetation shall be cut at the ground surface and segregated for composting at an approved facility.
  3. Notify the Engineer of any material designated for recycling that appears to be stained.
  4. The removal of the heating oil UST shall be in accordance with Seattle Fire Code Administrative Rule 34.02.07 and all other applicable local, municipal or state rules and regulations.
- B. In-water: Unless otherwise noted on the Drawings when conducting in-water demolition, the Contractor shall:
1. Slowly pull piling in its entirety. The use of a vibratory pile driving hammer is acceptable within the in-water window and is the preferred method for removal. Contractor shall “wake up” the pile to break the bond with the sediment (if using a vibratory hammer).
  2. Avoid pinching the pile below the water line to minimize releases of creosote or other pile treatment during removal.
  3. Breaking the pile intentionally by twisting, bending or other deformation is not allowed. Breaking off piling at the bottom of the removal prism will only be allowed at the discretion of the Engineer. If the pile cannot be removed, the pile shall be cut with a pneumatic underwater saw at or below the bottom of the sediment dredge prism.
  4. Transfer the removed pile to a containment area where the pile and any adhering sediment is contained. The pile shall not be shaken, hosed-off, stripped or scraped off, left hanging to drip, or any other action intended to clean or remove adhering material from the pile outside of the containment area.
  5. Utilize a floating surface boom to capture floating surface debris.
  6. Dispose of treated timber piling. Do not allow timber, once removed, to enter the waters of the State.
  7. If piling breaks above mudline, Contractor shall attempt to remove remainder of pile with a chain or similar means to remove the pile before resorting to cutting the pile. Repeated attempts to remove the pile with a clamshell bucket (i.e., “grubbing”) is not allowed.

### 3.03 RECYCLING OF MATERIALS

- A. All asphalt concrete pavement, concrete pavement, concrete slab on grade, ecology blocks, and above grade metals shall be recycled at an approved recycling facility per Section 02227 Deconstruction.
- B. Vegetation shall be composted at an approved facility.
- C. The Contractor is encouraged to identify and notify the Engineer of additional demolition materials suitable for recycling per Section 02227 Deconstruction.

**3.04 DISPOSAL**

- A. General: All materials will be recycled or disposed of in accordance with Section 02111 – Waste Material Disposal.
- B. The Contractor shall submit to the Port of Seattle copies of trip tickets and receiver tickets for all material transported to approved landfills and/or recyclers.

**3.05 CLEANUP**

- A. After removal of concrete and asphalt surfaces, clean and grade the area. There shall be no debris, rubble, or litter left at the Site from any of the demolition operations.
- B. After removal of in water structures, there shall be no floating debris, rubble, or litter left at the Site from any of the demolition operations.

**3.06 SUBSURFACE SAMPLING BELOW NORTH BUILDING**

- A. Contractor shall notify the Engineer 20 days prior to the removal of the north building. The Contractor shall provide a route suitable for a truck mounted drill rig to access the building pad. The Contractor shall accommodate up to three (3) weeks commencing at the completion of the removal of the north building for the Engineer to perform exploration and analysis prior to commencing excavation.

**3.07 HAZARDOUS BUILDING MATERIALS**

- A. Contractor shall remove all hazardous building materials per the requirements listed in the regulated materials sections included in this Division. Existing hazardous building material data for the three (3) buildings is available to the Contractor in the Appendices.

**PART 4 MEASUREMENT AND PAYMENT**

**4.01 MEASUREMENT**

No separate measurement will be made for “Site Demolition”.

**4.02 PAYMENT**

- A. No separate payment will be made for the “Demolition Plan” as required by this section. The cost for this portion of the Work will be considered incidental to the “Removal Action Work Plan” as described in 01400 – Removal Action Work Plan.
- A. Payment for “Site Demolition” will be made at the Contract lump sum price as stated in the Schedule of Prices and will be full compensation for furnishing all labor, equipment, and incidentals required to accomplish the demolition as specified.
- B. Hazardous Building Material handling and disposal required for “Site Demolition” shall be considered incidental to the related work and no additional payment will be made.

- C. Concrete and Asphalt debris handling and required for "Site Demolition" shall be considered incidental to the related work and no additional payment will be made. This does not include the payment for recycling or reuse of the ecology blocks, which are included in Section 02227 – Deconstruction.

End of Section

PART 1 GENERAL

1.01 SUMMARY

- A. This Section consists of planning for and executing decontamination of personnel and equipment used in the completion of the Work shown on the Drawings and outlined in these Specifications.

1.02 JOB CONDITIONS

- A. All equipment, materials, and personnel that come in contact with contaminated site soil and water shall undergo decontamination so that contamination is not spread from the site exclusion zone to other areas of the site or to offsite areas.

1.03 DECONTAMINATION PROCEDURES

- A. The Contractor shall submit decontamination procedures as part of the Contractor's Site-Specific Construction Health and Safety Plan (HASP) specified in Section 01860 – Safety Management. The decontamination procedures shall address the following:
  - 1. Worker safety, including methods and procedures to minimize worker contact with contaminants during removal of PPE and disposal procedures of PPE.
  - 2. Equipment to be used in performance of decontamination work.
  - 3. Procedures to prevent the cross-contamination of clean areas.
  - 4. Location and details of decontamination work and vehicle wheel wash stations shown clearly in relation to site exclusions zone(s), decontamination zone(s) and support zone(s).
  - 5. Methods and procedures for inspection and decontamination of vehicles leaving the site.
  - 6. Methods and procedures for decontamination of all equipment and materials having direct contact with site soil and groundwater, including, but not limited to, construction equipment, sheet piles, trench boxes, and other shoring equipment and materials.
  - 7. Protection of the public.
  - 8. Protection of workers or other persons in areas surrounding the site.
  - 9. Equipment to be used in performance of the decontamination work.
  - 10. Means and methods to minimize waste.
  - 11. Procedures for the collection, treatment, and disposal of all decontamination water and residuals.
  - 12. Protection of the environment.
  - 13. Disposal site(s) approved by the Port and EPA, and other necessary agencies, including permits and permissions as necessary.

1.04 QUALITY CONTROL

- A. The Contractor shall conform to the Site-Specific Construction HASP, including adherence to all applicable local, state and federal health and safety standards and guidelines as specified in Section 01860 – Safety Management.

- B. The Contractor shall conform to the requirements for site controls specified in Section 01860 – Safety Management for odor and dust control, during decontamination operations.
- C. The Contractor shall operate the truck wheel wash station in accordance with the manufacturer recommendations and shall clean the system as necessary to maintain clean water for truck washing.

**1.05 SUBMITTALS**

- A. Decontamination Procedures as part of the Site-Specific Construction HASP as required in Section 01860 – Safety Management.
- B. Vehicle Inspection Log as part of the Contractor Daily Report.

**PART 2 PRODUCTS – Not Used**

**PART 3 EXECUTION**

**3.01 DECONTAMINATION FACILITIES**

- A. Construct and maintain decontamination facilities and wheel wash stations as described in Section 01500 - Temporary Facilities and Controls.

**3.02 DECONTAMINATION OF TRUCKS AND OTHER VEHICLES**

- A. Prior to exiting the Exclusion Zone, the Contractor shall inspect and decontaminate all vehicles and equipment that have entered the Exclusion Zone. All decontamination shall be accomplished in the Decontamination Zone.
- B. Trucks that are loaded with waste shall proceed through a truck wheel wash station prior to exiting the Decontamination Zone.
  - 1. The Contractor shall thoroughly decontaminate all trucks and equipment before they leave the stockpile and vehicle loading containment area. Of particular importance are tires, undercarriages, tracks and soil and sediment contact surfaces. Contractor shall supply a portable, self contained truck, equipment and vehicle wheel wash system with both side and bottom spray nozzles capable of fully cleaning wheels and the under carriage of trucks and other vehicles leaving the site.
  - 2. The tire wash system rolling surfaces shall be designed by the manufacturer so that the truck tires are cleaned per the performance criteria of this Section, fit on the project site within the Contractor's identified work areas, and shall meet a standard of HS-20 loading for trucks of 80,000 lbs and HS-25 for trucks over 80,000 lbs. The system must have as many pumps as the manufacturer deems necessary to meet the performance criteria. It is the burden of the manufacturer to determine the pump quantity, size, performance, and maker. Pumps shall be easily accessible for system trouble shooting. Systems that employ debris screens below the water surface as their main debris catching screen shall not be utilized even if it has a below the water surface cleaning mechanism. All debris screens shall be easily accessed from above ground. The Contractor shall maintain the necessary spare parts on site or provide proof of a service agreement with a third party that demonstrates

the ability to repair the system within 24 hours of failure or damage. Damage to the system as a result of Contractor regular operations or normal use shall be repaired at the Contractor's expense.

3. During regular operation the wash system shall be actuated by vehicles driven in a fixed path between tire guides at a crawl speed regulated by the wash system. All washing operations and related water recycling operations shall be automatically activated by the vehicle's presence and movement. The system has met the performance criteria when there is no mud at the paved or stabilized exit of the wash system and the tires and under carriage of trucks and equipment is visibly clean. If the exit has any mud or debris present, it may be determined by the Engineer that the system has not met the performance criteria. The Contractor shall modify the system to meet the performance criteria at their own expense and at no delay to the Contract.
  4. The Contractor shall locate wash down facilities as necessary in the designated contamination reduction zones identified in the Section 01400 – Removal Action Work Plan to ensure that no materials are tracked out onto public streets or on surfaces located outside of the indicated vehicle limits occurs. The vehicle wash down facility shall provide clean water for spraying by performing treatment of the water to remove solids during the washing operations.
  5. Decontamination work shall include the removal of soil and residues from the chassis (which includes undercarriage, suspension, tires and wheels, tracks, loader buckets, excavator buckets) and other parts of the vehicle known to have been in contact with site soil and groundwater.
- C. The Contractor shall take care while decontaminating vehicles to avoid contaminating personnel, other parts of the vehicle or equipment, or the surroundings. Personnel involved in vehicle and equipment decontamination shall be dressed in the appropriate level of PPE and determined by the Site-Specific Construction HASP. All personnel shall follow all applicable safety procedures specified in Section 01860 – Safety Management.
- D. Inspect and decontaminate haul trucks after loading and before the haul trucks exit the Exclusion Zone each time.
- E. Maintain a Vehicle Inspection Log to document all trucks and equipment leaving the site have been properly inspected and decontaminated prior to operating on public streets and to ensure and document that tailgates are secured and cleaned and the tarp covers are in place. Submit this log on a daily basis in the Contractor's Daily Construction Report.

### 3.03 PERSONNEL DECONTAMINATION

- A. Ensure that personnel who have entered the Exclusion Zone perform decontamination as required in Section 01860 – Safety Management, prior to leaving the Exclusion Zone.

### 3.04 DECONTAMINATION OF EQUIPMENT AND METHODS

- A. All equipment having contact with site soil or groundwater, including, but not limited to, shoring, sheet piling, trench boxes, hand tools, and survey equipment shall be thoroughly decontaminated after each use.



- B. Physical decontamination techniques for equipment and vehicles shall include, but are not limited to, brushing for removal of loose materials with a brush or broom or other suitable scraping tool.
- C. A pressure washer shall be used to provide application of pressurized water to agitate and remove soil and contaminated residuals from equipment and vehicle surfaces not removed through physical decontamination.
- D. Soaps and detergents must be approved by the Engineer prior to use in decontamination operations.
- E. All equipment and vehicle decontamination procedures shall be performed in a decontamination facility as specified in Section 01500 – Temporary Facilities and Controls.
- F. Overspray barriers shall be provided on each side of the decontamination area to prevent contamination of adjacent areas.

**3.05 MANAGEMENT OF DECONTAMINATION WATER AND RESIDUALS**

- A. Collection of decontamination liquid that is developed as a result of personnel decontamination shall be pumped to the on-site construction water treatment system and manage water as specified in Section 02245 – Construction Water Management System.
- B. Decontamination water that is developed as a result of decontaminating any over-the-road vehicle shall be segregated from site contact or dewatering water and treated/disposed of separately since decontamination of over-the-road vehicles may result in incorporation of contaminants not found on the site into the wash water. This water shall be batched, sampled and disposed of in accordance with contaminant levels and at EPA-approved facilities.
- C. Dewater and collect all decontamination solids. Dewatered decontamination solids will be combined with soil and debris excavated as part of the upland excavation and managed as outlined in these Specifications.
- D. Manage contaminated PPE with contaminated soil for landfill disposal.

**PART 4 MEASUREMENT AND PAYMENT**

**4.01 MEASUREMENT**

- A. No separate measurement will be made for “Decontamination”.

**4.02 PAYMENT**

- A. No separate measurement or payment will be made for the work required by this section. The cost for this portion of the Work will be considered incidental to, and included in, the payments made for the applicable bid items in the Schedule of Unit Prices bid for the Project.

End of Section

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. The T-117 Sediment and Upland Areas project includes the removal of all above ground existing structures. These above ground existing structures include the following three buildings and structures:
  - 1. Building 1, the northern building, is a mix of warehouse space and a two story office space. The warehouse roof is damaged and is currently supported from the inside with staging and shoring.
  - 2. Building 2, the central building, is a mix of carport space and stick-framed storage/work space.
  - 3. Building 3, the southern building, is a structural steel building with various loose processing equipment stored inside of it.
  - 4. There are a number of other items to be removed, including but not limited to: ecology blocks around the site and the site perimeter fence.
- B. These structures will be systematically deconstructed to maximize reuse and the recycling of materials from these structures. The deconstruction of the T-117 structures shall be conducted with diligence to meet the Port's diversion requirements as specified in this Section. Materials from these structures will become the property of the Contractor to distribute or use assuming local laws and regulations are complied with.

1.02 DEFINITIONS

- A. Co-mingled or Off-site Separation: Collecting all material types into a single bin or mixed collection system and separating the waste materials into recyclable material types in an off-site facility.
- B. Construction, Demolition and Land Clearing Waste (CDL): For purpose of this section, includes all non-hazardous solid wastes such as building materials, packaging, rubbish, debris and rubble resulting from construction, remodeling, alterations, repair, deconstruction, demolition and land clearing.
- C. Deconstruction; The process of removing existing building materials from renovation and demolition projects for the purposes of reuse, and recycling, in as efficient and safe manner as possible.
- D. Hazardous Waste: As defined by Chapter 70.105.010 Revised Code of Washington
- E. Proper Disposal: As defined by the jurisdiction receiving the waste.
- F. Recyclable Materials: Products and materials that can be recovered and remanufactured into new products.

- G. Recycling: The process of sorting, cleaning, treating and reconstituting materials for the purpose of using the material in the manufacture of a new product. Can be conducted on site (as in the grinding of concrete for reuse on site).
- H. Recycling Coordinator: The person responsible for identifying, tracking, and reporting the site reuse, recycling and overall landfill diversion. This person shall have experience in deconstruction and recycling.
- I. Recycling Facility: An operation that can legally accept materials for the purpose of processing the materials into an altered form for the manufacture of a new product. Recycling facilities have their own specifications for accepting materials.
- J. Salvage: Existing usable product or material that can be saved and removed intact (as is) from the project site to another site for resale, reuse or recycle without remanufacturing.
- K. Source-Separated Materials: Materials that are sorted at the site for the purpose of reuse or recycling.
- L. Sources Separation: Sorting the recovered materials into specific material types with no, or a minimum amount of, contamination on site.
- M. Time-Based Separation: Collecting waste during each phase of construction or deconstruction that results in primarily one major type of recovered material. The material is removed before it becomes mixed with the material from the next phase of construction.
- N. Trash: Product or material unable to be salvaged for resale, reuse, or recycle.
- O. Waste: Excess materials generated by the construction and demolition operations of the Project that are produced on site or brought to the site. Waste includes, without limitation, packaging materials such as banding, crates, pallets, plastic film, polystyrene, and cardboard. Waste does not include excavated soils, rocks, vegetation, and hazardous waste removed from the site

### 1.03 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, all deconstructed or otherwise removed materials shall become the property of the Contractor.
- B. The following items will be salvaged by the Contractor:
  - 1. A minimum of 90% of the metal roofing on Building #3
  - 2. A minimum of 55 of the 57 ecology blocks present at the site
  - 3. A minimum of 95% of the staging and shoring materials present in the warehouse section of Building #1
  - 4. A minimum of 90% of the loose industrial processing equipment present inside of Building #3 to be reused or recycled

5. A minimum of 90% of the existing site perimeter fencing along Dallas Ave S.

#### 1.04 SUBMITTALS

- A. The Contractor shall submit a Deconstruction Plan as a part of Section 01400 Removal Action Work Plan (RAWP) The Deconstruction Plan shall include the following components:
  1. Detailed sequence of deconstruction with the overall schedule for deconstruction showing how deconstruction integrates with other site activities
  2. Qualification data submitted by deconstruction firm that confirms their ability to perform this scope of work
  3. Present how deconstruction will be completed safely
  4. Indicate how other activities like asbestos abatement will be integrated to minimize loss of reusable and recyclable materials
  5. Discuss utility disconnects and how long utilities will be interrupted as part of the work. Indicated how utilities will be capped or disconnected
  6. Site plan showing locations of proposed dust and noise-control controls, temporary partitions and barriers, and means of egress (as needed)
  7. Detail how items to remain and items in path of material removal from site will be protected (i.e. concrete/asphalt paving, fence posts in contact with contaminated soil, etc.) Also pay special attention to detailing how the staging/shoring materials will be protected during removal of the roof above.
  8. How Deconstruction will be measured and documented in the field so that diversion percentages can be determined and compared to requirements.
  9. Name of designated Recycling Coordinator
  10. A list of waste materials that will be salvaged for resale, salvaged for reuse, recycled, and disposed.
  11. Estimated quantities of each waste material by weight.
  12. Description of waste handling methods to be used, including one or more of the following:
    - a. Requiring subcontractors to take their waste to an approved recycling facility.
    - b. Contracting with diversion/recycling hauler to haul recyclable waste to an approved recycling or material recovery facility.

- c. Processing and reusing materials on-site.
    - d. Self-hauling to an approved recycling or material recovery facility.
  13. Name, address and phone number and qualifications of each proposed diversion/recycling hauler that will be used in the Project.
  14. Identification of each recycling or material recovery facility to be utilized.
  15. Description of the method to be employed in collecting, and handling, waste materials, including a description of the methods that will be used to protect recycled materials from contamination.
  16. Description of the means of transportation of waste materials.
  17. Description of methods to communicate Deconstruction Plan to personnel and subcontractors.
  18. Calculation shall be done by weight (tons).
- B. Progress Reports – to be included in the Contractor’s Daily Construction Report Include deconstruction components in the Contractor’s Daily Construction Report during deconstruction activities. Information to include in deconstruction section of the daily report includes:
  1. An inventory of what has been salvaged, recycled, and disposed of including all documentation of these items including receipts, scale tickets, waybills, etc. Enough data must be collected in order to determine the diversion percentage, by weight, excluding hazardous materials and asphalt/paving, etc. from those calculations
  2. Deconstruction Photographic Documentation: Document general condition of materials to be salvaged prior to removal, after materials are removed, and as each load leaves the site (debris/recycle/reuse loads)
- C. Deconstruction Final Report
  1. The Deconstruction Final Report shall be submitted prior to Substantial Completion and shall list the following for the duration of the project:
    - a. Each waste material recycled, salvaged, or reused from the Project.
    - b. Total quantities for each waste material.
    - c. Total quantity of waste removed from the site.
    - d. Name of each diversion/recycling hauler or the location and name of each recycling or material recovery facility as appropriate.
  2. Calculations shall be done by weight (tons).

1.05 PERFORMANCE REQUIREMENTS

- A. General: Divert a minimum 75% Construction Debris Landfill waste and reuse minimum of 30% (measured by weight), not including the weight of paving, concrete foundations, fence post concrete bases, or any other item outside this contract's scope of work, by weight, from the landfill by one, or a combination of the following activities:
  - 1. Salvage by Contractor for distribution
  - 2. Reuse by Contractor or donation or sales of materials for reuse
  - 3. CDL recycling
- B. Co-mingled CDL recycling
  - 1. CDL waste materials that can be salvaged, resold, reused or recycled, include, but are not limited to the following:
    - a. Scaffolding and shoring
    - b. Clean dimensional wood, pallet wood, plywood, OSB, and particleboard
    - c. Reusable products such as a door with glass or an appliance made of a mix of materials
    - d. Asphalt
    - e. Concrete and concrete masonry units
    - f. Brick
    - g. Ferrous and non-ferrous metals
    - h. Gypsum products
    - i. Acoustical ceiling tile
    - j. Glass, both window and bottle
    - k. Plastics, including plastic film
    - l. Carpet and pad
    - m. Cardboard, paper, paper-based packaging
    - n. Insulation
- C. Hazardous materials such as paints, solvents, adhesives, batteries, and fluorescent light bulbs and ballasts which cannot be reused shall be disposed of/recycled at authorized hazardous waste outlets in compliance with applicable Division 2 specifications.

## 1.06 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable requirements of the jurisdictional authorities, local ordinances and regulations concerning management of construction waste, clearing, and inert materials.
- B. Deconstruction Firm Qualifications (see 1.04) Submittals
- C. Pre-deconstruction Conference: Conduct a walk-through with the Owner/Contractor to (but not limited to):
  - 1. Inspect buildings and materials condition
  - 2. Review structural shoring and bracing of existing structures
  - 3. Review proposed schedule and finalize; verify availability of personnel, equipment, and facilities/resources needed to make progress without delays
  - 4. Discuss other trades/sub-contractors and confirm their work will not adversely affect the deconstruction work
  - 5. Review areas where existing construction is to remain/be protected (i.e. paving, fence post bases, foundations, shoreline areas
  - 6. Review procedures for removing materials from site post proper documentation
- D. Progress Meetings: Waste management requirements and issues shall be discussed at regularly scheduled progress meetings as specified in Section 01310 - Project Meetings.
- E. Disposal Site, Recyclers and Waste Materials Processors: Use only facilities properly permitted in the State where the Project is located, and/or by local authorities where applicable.

## PART 2 - PRODUCTS

### 2.01 WASTE CONTAINERS

- A. Provide durable, covered, secured, reusable container for each category of waste. Categories shall be defined in the Deconstruction Plan, but shall include reuse, recycling and disposal.
- B. All recycling containers shall be clearly marked and shall list the materials which can be recycled as well as appropriate materials which cannot.

PART 3 - EXECUTION

3.01 PROJECT / SITE CONDITIONS

- A. Field Measurements: Contractor is to verify that field measurements are as indicated on construction drawings. This process will also confirm the presence and condition of the specified quantity of materials as written in the specifications.
- B. Provide necessary fire protection measures where required by the Contractor's operations
- C. The warehouse section of Building #1 is supported by shoring that is already in place. Contractor shall plan on removing building materials in a safe manner given the condition of the building.
- D. Provide necessary engineering controls to:
  - 1. Minimize disturbance to roads, streets, walks, walkways, and other adjacent facilities.
  - 2. Provide temporary barricades and other protection required to prevent injury to workers and all others and all reusable materials on and around the site including:
    - a. Safe passage around the jobsite
    - b. Provide weather protection for all salvaged materials before, during and after deconstruction. No paving may be disturbed during the work or any sub-soils exposed to the weather (i.e. fence posts must be cut just above the surface)
    - c. Maintaining temporary shoring to prevent unexpected or uncontrolled movement or collapse of structure being deconstructed
    - d. Strengthening or adding new supports when required during progress of deconstruction as needed
- E. Hazardous Materials: Hazardous material surveys have been completed for the buildings on the site. Removal of hazardous materials from the buildings is specified elsewhere. If previously unknown potentially hazardous materials are encountered during deconstruction, do not disturb, but immediately notify the Port representative.

3.02 PACKING AND SHIPPING

- A. Shipping: Coordinate the schedule of product pickup from designated prepared areas in order to minimize site storage time and potential damage to stored materials. Also:



1. Place no more than 10% non-recyclable materials in a co-mingled recycling bin/recycling bin
2. Monitor and remove contaminants from recycling containers to avoid these from being rejected by the recycler.

3.03 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, stray nails/fasteners, and debris caused by deconstruction operations. Return adjacent areas to condition existing before deconstruction operations began.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. No separate measurement will be made for “Deconstruction”.

4.02 PAYMENT

- A. No separate payment will be made for “Deconstruction Plan” as required by this section. The cost for this portion of the Work will be considered incidental to the “Removal Action Work Plan” as described in 01400 – Removal Action Work Plan.

- B. Payment for “Deconstruction” will be made at the contract lump sum price as stated in the Schedule of Unit Prices and shall be full compensation for furnishing all labor, equipment, materials and tools to implement and maintain the Deconstruction Plan as shown on the drawings or as required to complete the work. Payments will be made as follows:

1. After NTP and before Beneficial Occupancy, 80% will be prorated and paid monthly for compliance with the Deconstruction Plan. Non-compliance will result in withholding of payment for the month of the non-compliance.
2. Upon demonstration by Contractor that they have achieved the diversion requirements and completed the work including final reporting, 20%.

End of Section

PART 1 GENERAL

1.01 SUMMARY

- A. This Section describes onsite collection, treatment, and discharge of water and/or collection, trucking, and offsite treatment of water collected during field activities. Water discussed in this Section includes site stormwater stockpile drainage, decontamination fluids, and groundwater collected during dewatering. Some excavation areas will likely require dewatering, as discussed in Section 02525 Dewatering.
- B. The system is expected to be operated intermittently throughout the project. Water collection and treatment will be required for all site stormwater, including water collected within stockpile areas, from other disturbed areas within the Site where stormwater contacts contaminated or potentially contaminated soil, and from paved areas after either building deconstruction or ground-breaking activities have begun.
- C. If collected water is not trucked offsite for treatment and disposal, a construction water treatment system is required to comply with the substantive requirements of the National Pollutant Discharge Elimination System (NPDES; regulated by the Department of Ecology). Water treatment shall also comply with the requirements that will be included in the EPA issued Water Quality Certification (WQC) for the work. The WQC will be issued when the RAWP is approved by EPA, a draft WQC is provided in the Appendices. The Contractor is solely responsible for water treatment system design, operation, and maintenance and will have full responsibility for fines imposed due to exceedances of the discharge limits.
- D. The minimum system requirements shall include oil/water separation, solids removal, polishing with granulated activated carbon, and pH and dissolved oxygen treatment. Contractor shall add to the system to the degree they believe necessary to comply with the discharge limits.
- E. All project water that contacts contaminated or potentially contaminated soil, or that contacts onsite pavement, shall be treated onsite to remove all Contaminants of Concern (COCs) and metals before discharge to the LDW or shall be trucked to an EPA-approved offsite facility for treatment, or a combination of both. The exception is for over-the-road truck wheel wash water which shall be handled separately (offsite disposal) due to the potential for different contaminants.
- F. Contractor shall utilize either or both methods, whichever is deemed necessary to ensure that no discharge of non-compliant water occurs at any time or under any circumstance.
- G. Sufficient storage shall be available onsite to prevent non-compliant discharges. Storage capacity design shall consider flow-through discharge rates and/or trucking capacity and turnaround times.
- H. For offsite disposal, truck tickets shall be provided to the Engineer weekly and will identify location of facility and volume of water discharged.
- I. For onsite treatment and disposal, daily treatment logs shall be provided to the Engineer as part of the Daily Construction Report and shall include cumulative inflow and discharge volumes, hours of treatment system operation and discharge, maintenance activities, and test data that demonstrate discharged water meets all

criteria specified in this Section, for the Engineer's verification and approval, in accordance with the EPA-provided Water Quality Certification (WQC).

- J. Treatment system(s) shall be approved for use by the Washington State Department of Ecology BMP C250 and the Chemical Treatment Assessment Protocol – Ecology (CTAPE).
- K. The construction water treatment system shall only be operated by the Construction Water Treatment System Operator(s) (Operator).
- L. Operator shall be onsite at all times the construction water treatment system is operating and shall have no other duties.
- M. If onsite treatment is used, Contractor shall perform a "Proof of Treatment" to demonstrate the effectiveness of the treatment system prior to starting discharge.

#### 1.02 CONSTRUCTION WATER MANAGEMENT PLAN (CWMP)

- A. The CWMP shall provide sufficient detail to ensure that there shall be no discharge of water that does not comply with EPA requirements at any time and under any circumstance.
- B. The CWMP shall include the following sections:
  - 1. Design calculations stamped by a P.E. licensed in Washington State
  - 2. All information required by the Washington State Department of Ecology CTAPE process
  - 3. Proof of Treatment and details of system shakedown
  - 4. Treatment System Operations Manual
  - 5. Construction Water Treatment System Operator Requirements.

#### 1.03 PROJECT DESCRIPTIONS

- A. Treated water shall be discharged to the Duwamish River near the South end of the site in such a way to minimize erosion of the riverbank and river bed.
- B. Discharge requirements are listed in subsection 1.04 of this specification.
- C. This Section covers the Work to be performed by the Contractor for treating and discharging water generated during site operations. Related work also covered includes disposing of any light non-aqueous phase liquid (LNAPL), sediment/sludge produced during water treatment, and any spent adsorption and filtration media used to treat the water.
- D. The Contractor shall design, install, and operate the construction water treatment system, so as to meet all discharge requirements and conditions listed subsection 1.04 of this specification.
- E. Contractor shall arrange process equipment components and provide means to contain any spills or overflows from the treatment process within the Site and to keep spilled contaminated water from infiltrating into the site soil.
- F. Contractor shall ensure that the supplied treatment system includes the following general components as a minimum. Additional components may be required to achieve the discharge limits listed. The minimum components shall include:

1. Oil/Water separation that is adequate for the anticipated treatment system capacity
  2. Solids removal to satisfy the listed discharge requirements. This component shall include an active treatment technology such as flocculent injection or other Ecology-approved methods to enhance solids removal from the waste water stream.
  3. Carbon filtration through granular activated carbon cells
  4. pH or dissolved oxygen treatment.
- G. All water treatment and storage equipment shall remain the property of the Contractor and shall be removed from the site at the completion of the Work.
- H. The water treatment system shall be designed to handle maximum anticipated influent flow rates calculated by the Contractor as a result of site activities.

**1.04 PERFORMANCE REQUIREMENTS**

- A. Approvals: Contractor shall design and operate the system to meet the discharge requirements listed in in this subsection. The Contractor shall obtain any other necessary approvals for construction water treatment and discharge. A “Proof of Treatment” process shall occur prior to starting discharge to demonstrate that the system is operating as designed and is capable of removing contaminants to satisfy the discharge requirements.
- B. Compliance: Contractor shall be responsible for compliance with the substantive requirements for NPDES construction stormwater management, the EPA-provided WQC, and approvals regarding treatment, monitoring, and reporting.
- C. The Contractor shall comply with the following general procedures at a minimum:
1. Pre-Treatment: Oil/Water separation and any pH adjustment required to enable adequate performance of the flocculent shall occur during pre-treatment. Water leaving the pre-treatment tank must be tested daily using a hand-held meter and must have turbidity below 500 NTU.
  2. Treatment: Chitosan (or alternate pre-approved method/equivalent) shall be added during treatment to condition the water for filtration and subsequent granulated activated carbon adsorption to remove dissolved organics.
  3. Filtration: Water shall be passed through a sand filtration system to remove solids. Additional filtration (such as bag or canister) may be required.
  4. Adsorption: Granular activated carbon shall be used to remove dissolved constituents.
  5. Final Treatment: This step may include pH or dissolved oxygen adjustment to satisfy the discharge limits. It also shall include monitoring and control of residual flocculent concentrations to satisfy discharge limits.
- D. The Contractor shall conduct the following testing and monitoring procedures, at a minimum:
1. Effluent samples shall be tested daily for turbidity, dissolved oxygen, temperature, residual flocculant, and pH using a field meter.

2. An effluent sample shall be collected weekly for laboratory analysis of PCB Aroclors, metals, and total suspended solids and must meet the following criteria:
  - a. Total PCB Aroclors must be below 0.3 µg/L.
  - b. Dissolved metals must be below the marine chronic criteria specified in WAC 173-201A-240 and in the WQC
  - c. Total suspended solids data is for informational purposes to accompany the PCB and metals data.
3. Water samples shall also be collected weekly from before and after the first GAC unit at the same time as weekly effluent sampling. The samples shall be submitted for laboratory analysis for PCB Aroclors.
4. Twice during treatment plant operation, laboratory samples shall be collected and analyzed for PAHs, TPH (diesel range), and dioxins/furans. The first sample shall be collected near the start treatment process, and the second one shall be collected 30 days after the start of water treatment.. These data are for informational purposes only, and will not be used for modifications to the plant operation.
5. During plant operation, two samples shall be collected and submitted for whole effluent toxicity testing by an EPA-approved laboratory. The first sample shall be collected near the start treatment process, and the second one shall be collected 30 days after the start of water treatment.
6. Continuous flow monitoring and recording shall be performed
7. The following table summarizes the minimum monitoring requirements.

<b>Parameter</b>	<b>Monitoring Location</b>	<b>Frequency</b>	<b>Criteria</b>
Turbidity	Pre-treatment	Daily	<500 NTU
Turbidity	Effluent	Daily	< 5 NTU above background when background ≤ 50 NTU
pH	Effluent	Daily	6.5 – 8.5
Temperature	Effluent	Daily	< 16°C (60.8°F)
Dissolved Oxygen	Effluent	Daily	≥6.0 mg/L
Residual Flocculent	Effluent	Daily	0.1 mg/L
PCB Aroclors	Before and after first GAC unit	Weekly	Informational
PCB Aroclors	Effluent	Weekly	0.03 µg/L
Dissolved Metals	Effluent	Weekly	Below the marine chronic criteria specified in WAC 173-201A-240
Polycyclic Aromatic Hydrocarbons	Effluent	Twice during operation	Informational
Dioxins/Furans	Effluent	Twice during operation	Informational
Whole Effluent Toxicity	Effluent	Twice during operation	Effects to biota evaluated relative to control
Total Suspended Solids	Effluent	Weekly	Informational

**1.05 SUBMITTALS**

- A. All submittals shall be completed in accordance with Section 01305 - Preconstruction Submittals and Section 01330 - Submittals.
- B. Contractor shall submit a Construction Water Management System Plan as part of the Section 01400 - Removal Action Work Plan.
  - 1. Construction Water Management System Plan shall include the procedure outlines for start-up, normal operations, process monitoring sampling and analysis, monitoring and control of residual flocculent, control philosophy, alarm conditions and responses, freeze protection, normal shutdown, and decommissioning. The Plan shall also have a section on safety including applicable MSDS sheets, safety equipment, and required personal protective equipment.
  - 2. Contractor shall submit an installation layout drawing for the construction water treatment system.

3. Contractor shall submit resumes of the Operator(s). Contractor shall demonstrate that the Operator is competent to operate the construction water treatment system and they meet the qualifications in section 3.03.
4. Approval of the Removal Action Work Plan by the EPA does not relieve the Contractor of responsibility to perform the Work in accordance with these Specifications. Contractor shall follow the approved Construction Water Management System Plan so as not to deviate from the approved Plan or permit constituent concentration exceedances.
5. During each day that the system discharges water, the Operator shall complete a daily log of water treatment activities that includes daily and cumulative discharge volumes from a ultrasonic totalizing water meter, hours of treatment system operation and discharge, and other pertinent data for the Engineer's verification and approval, in accordance with any NPDES substantive requirements and with the WQC. These logs will be included in the Contractor's Daily Construction Report, shall be in a format acceptable to the Engineer, and shall include the results of the daily system inspections.
6. Contractor shall be responsible for water quality monitoring and reporting to the Engineer in accordance with the WQC and any substantive requirements. The Engineer may take duplicate samples of the treated water.

**1.06 SEQUENCING AND SCHEDULING**

- A. Contractor is responsible for all fines and penalties associated with non-conformance of the construction water treatment system in meeting discharge requirements.
- B. Contractor shall conduct water treatment activities in conjunction and coordination with all other Site activities.
- C. Contractor shall conduct water storage and treatment such that other Work is not delayed due to insufficient treatment capacity.

**PART 2 PRODUCTS**

**2.01 PRIMARY WATER TREATMENT EQUIPMENT**

- A. The Contractor is solely responsible for the water treatment system design, operation, and maintenance, including full responsibility for fines imposed due to exceeding the discharge limits. Contractor shall add to the system described herein to the degree they believe necessary to comply with the discharge limits.
- B. The Contractor shall provide a water treatment system with the treatment and storage capacity to manage stormwater and water from excavation dewatering operations without causing construction delays.
- C. Contractor shall keep on hand, or have immediate access to, spare components to provide reasonably for any breakdown(s).
- D. The materials and equipment used for the water treatment system may be new or used but must be suitable for the Work and be maintained in good condition.
- E. Contractor shall provide and maintain at all times an ultrasonic totalizing flow meter to record effluent discharge. The flow meter shall display instantaneous flow

and record cumulative flow. The Engineer reserves the right to install a redundant flow meter in series with the Contractor's meter.

- F. Contractor shall choose the type and size of equipment and components needed to accomplish the functions designated.

## 2.02 WATER TREATMENT SYSTEM CONTROL

- A. Unattended treatment plant operation shall not occur without approval of the Engineer and demonstration that the treatment plant is operating within the prescribed limits. If unattended operation is approved by the Engineer, Contractor shall provide adequate system controls to permit unattended operation with occasional operator checks for monitoring and adjustments.
- B. The Contractor shall provide a notification system to alert the Operator if system experiences conditions that will potentially cause the treatment system to shutdown.
- C. Contractor shall provide high-level alarms on tanks to prevent overflow conditions. Alarms may cause automatic actions to relieve the condition or may warn the Operator.
- D. Contractor shall design the control system to accomplish the functions designated. The control system is subject to review and approval by the Engineer.
- E. If an upset condition occurs which may result in a release or non-conformance with the discharge requirements, Contractor shall immediately suspend operation and notify the Engineer.

## 2.03 DISPOSAL OF OTHER RESIDUALS

- A. Contractor shall manage oil and sediment/sludge produced by the treatment system for disposal with excavated soil ensuring that they meet all transportation laws and regulations and the receiving landfill requirements.
- B. Contractor shall manage any spent filtration media with excavated soil.

## PART 3 EXECUTION

### 3.01 WATER TREATMENT – GENERAL

- A. Contractor shall furnish all labor, materials, power, and equipment and perform all operations required to design, furnish, install, test, operate, and maintain the water treatment equipment including: storage tanks, pumps, process equipment, water treatment chemicals, water meters, process controls, operator alarms, dikes, sandbags, electric power supply and distribution, and domestic water supply and distribution as required to treat the collected water.
- B. Contractor shall utilize electrical power from the power grid and not generators as the primary power source for all treatment system components.
- C. Contractor shall treat all the water collected for treatment with the system provided to meet the NPDES substantive requirements, the requirements in this Section, and the WQC.
- D. Protection of offsite facilities and designated onsite facilities, during water treatment Work shall be solely the Contractor's responsibility.
- E. Contractor shall construct the system with sampling ports and the necessary valves as required to collect water treatment samples in accordance with the



substantive and any discharge permit requirements. The Operator shall perform sampling and chemical analyses and provide Engineer with a copy of laboratory analytical results.

- F. In as much as possible, treatment equipment should be located in a permanent location for the entire duration of the project.
- G. Contractor shall provide an Operator meeting the requirements in 3.03.
- H. Contractor shall provide adequate freeze protection required for all water treatment equipment if necessary.
- I. Contractor shall provide spill containment for any water treatment chemicals used on the site.
- J. Contractor shall provide all necessary safety equipment and personal protective equipment for safe handling of contaminated water and water treatment chemicals.

### 3.02 QUALITY CONTROL

- A. Operator shall establish, maintain, and document quality control in a form acceptable to the Engineer for water treatment. Quality control documentation by the Operator is required to assure compliance with discharge permit requirements and reporting procedures. Detailed records shall be maintained by the Contractor for all water treatment operations including, but not limited to:
  - 1. Fabrication, layout, installation, testing, and operation of the system
  - 2. Installation and monitoring of discharge flow meter
  - 3. Layout of water treatment equipment.
- B. Water treatment performance monitoring and documenting requirements shall meet the following during operations:
  - 1. Daily influent tank levels
  - 2. Daily effluent tank levels
  - 3. Daily control charts for effluent pH, temperature, dissolved oxygen, influent turbidity (following pre-treatment) and effluent turbidity and residual chemical concentrations in the effluent-updated daily.
  - 4. Daily and cumulative treatment plant throughput (in gallons).
  - 5. Reports of non-conformances or upset conditions, including releases.
  - 6. Reports of changes in system configuration or operation due to change in conditions.
  - 7. Reports of any sampling performed to satisfy WQC or substantive requirements or to document performance of the system.
  - 8. All analysis results in hard copy and electronic format suitable to the Engineer.
- C. The Engineer may specify additional records as needed to satisfy permit requirements.

### 3.03 CONSTRUCTION WATER TREATMENT SYSTEM OPERATOR (OPERATOR)

- A. If onsite construction water treatment is selected, qualifications for the Operator include the following:
  - 1. The Operator(s) shall be certified to operate a Chitosan-Enhanced Sand Filtration (CESF) system through a Washington Department of Ecology approved, 40-hour training program. CESF training certificates shall remain current for the duration of the operation of the construction water treatment system.
  - 2. The Operator(s) shall be a Certified Erosion and Sediment Control Lead (CESCL) through a Washington Department of Ecology approved training program. CESCL training certificates shall remain current for the duration of the operation of the construction water treatment system.
  - 3. The Operator(s) shall have had operated a CESF system with carbon filtration on at least one cleanup project in the past five years, which included the removal of PCBs and other COCs from site water to allowable discharge levels.

#### 3.04 PROOF OF TREATMENT

- A. If an onsite water treatment facility is utilized for the work, the Contractor shall perform a proof of treatment test to demonstrate that the water treatment system is functioning and can remove contaminants as required in this Section.
  - 1. Contractor shall batch at least 15,000 gallons of water in the treatment system that is pumped from a source on the site that is from an contaminated excavation area.
  - 2. Contractor shall run the water through the treatment system a single time and retain the treated water in a holding tank.
  - 3. Contractor shall sample the treated water using all of the methods required in the weekly sampling of effluent.
  - 4. Contractor shall not discharge any water until the Engineer approves discharge to begin based on the results of the proof of treatment testing.

#### 3.05 SAMPLING AND CHEMICAL ANALYSIS

- A. Sampling and laboratory analysis of effluent discharge shall be performed by the Contractor to ensure that the discharge meets discharge reporting requirements.
- B. The Engineer may periodically sample and analyze influent water and may take duplicate samples of effluent water.
- C. Results of the laboratory analysis shall be forwarded to the Engineer by the Contractor upon receipt.
- D. The Contractor is responsible for any additional sampling and analysis needed to monitor the performance of the water treatment process.

#### 3.06 INSPECTION AND MAINTENANCE

- A. Contractor shall inspect and repair or replace damaged components of the construction water treatment system weekly or more frequently as directed by the Engineer.
- B. Contractor shall monitor discharge to ensure that all discharge requirements are being met.

- C. Damage to construction water treatment system caused by construction operations, weather, or negligence shall be repaired immediately by the Contractor at the Contractor's sole cost.

#### PART 4 MEASUREMENT AND PAYMENT

##### 4.01 MEASUREMENT

- A. No separate measurement will be made for "Construction Water Management System". For the onsite treatment system, the discharge volume will be determined through use of a flow meter as detailed in this specification. For off-site haul and disposal, volume will be determined from truck tickets provided to the Engineer.
- B. "Construction Water Management System-Force Account" will be on a Force Account basis in accordance with Document 0700 – General Conditions, Paragraph G-08.06. An estimated amount has been entered in the Schedule of Unit Prices.

##### 4.02 PAYMENT

- A. No separate payment will be made for the "Construction Water System Management Plan" as required by this section. The cost for this portion of the Work will be considered incidental to the "Removal Action Work Plan" as described in 01400 – Removal Action Work Plan.
- B. Payment for "Construction Water Management System" will be made at the contract lump sum price as stated in the Schedule of Unit Prices and shall be full compensation for furnishing all labor, hardware, equipment, materials, consumables, rentals, and tools to implement and maintain the CWMP to manage up to and including six (6) million gallons of water. It includes implementation of temporary stormwater conveyances, storage systems, trucking, discharging, sampling, documentation, and other measures as specified herein through the duration of the contract, with the exception of those items measured and paid for separately. Payments will be made as follows:
  - 1. After Notice to Proceed and before Substantial Completion, 80% will be prorated and paid monthly for compliance with the CWMP. Non-compliance will result in withholding of payment for the month of the non-compliance.
  - 2. Final payment 20% following Substantial Completion.
- C. Payment for "Construction Water Management System-Force Account" as stated in the Schedule of Unit Prices will be made on a Force Account basis in accordance with Document 00700 – General Conditions, Paragraph G-08.06 and shall be full compensation to complete only construction water management measures that are not part of the contract work, not covered under existing bid items and are at the specific direction of the Engineer.
- D. No payment will be made for "Construction Water Management System-Force Account" after the Beneficial Occupancy Milestone date of October 31, 2013. Any costs incurred after this date are the responsibility of the Contractor.

End of Section

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This Section specifies requirements for the safety systems to be used in the excavation of trenches for construction on the site.

**1.02 REFERENCES**

- A. R.C.W. Chapter 49.17 Washington Industrial Safety and Health Act (WISHA)
- B. RCW Chapter 39.04.180 Public Works/Trench Excavations – Safety Systems Required
- C. WAC 296-155 Safety Standards for Construction Work.

**1.03 SUBMITTALS**

- A. Contractor will submit documentation demonstrating that the safety systems for trench excavations greater than four feet deep are designed in accordance with WAC 296-155-657 and other applicable regulations.

**1.04 JOB CONDITIONS**

- A. Meet safety requirements for trenching activities to be used in earthwork excavation activities on this Project.
  - 1. Include trench safety systems for earthwork activities.
  - 2. Include trench safety systems for the following systems, including, but not limited to:
    - a. All contaminated material and debris excavation work.
    - b. Storm drainage system.
    - c. Water main and services.
    - d. Sanitary sewer main and services.
    - e. Mechanical sections requiring trenching.
    - f. Electrical sections requiring trenching.
    - g. Structural systems requiring trenching or similar construction techniques.
- B. Work of this Section is designed specifically to meet the unique conditions of the Project.
  - 1. Perform investigative analysis as appropriate to determine safety systems designed to meet the regulations that are sufficient to protect workers and property.
  - 2. Comply with requirements of Section 02340 – Earthwork Instrumentation and Monitoring.

**1.05 QUALITY ASSURANCE**

- A. Regulatory Requirements: See referenced codes, regulations in Section 01410-Environmental Regulatory Requirements.
- B. A qualified, experienced person familiar with the regulations and standards is required to design excavation safety systems.

- C. Compliance with the regulations shall be the responsibility solely of the Contractor. The Contractor shall be responsible for worker safety and the Owner and Engineer assume no such responsibility. Damages resulting from improper shoring or failure to shore shall be the responsibility of the Contractor.

**1.06 DESIGN CRITERIA**

- A. Contractor shall verify and independently interpret the surface information presented in the Contract Documents, associated Appendices, and supplement existing data as they deem necessary in order to complete the design and construction. The costs of any supplemental information shall be included in the bid for this item

**PART 2 PRODUCTS - Not Used**

**PART 3 EXECUTION**

**3.01 TRENCH EXCAVATION SAFETY SYSTEMS**

- A. Protect all trench excavation in excess of four feet in depth with a safety system conforming to the referenced requirements.
- B. All excavation not included in trench safety systems shall also meet the WISHA safety standards and the requirements of Section 02300 - Earthwork.
- C. Trench safety systems shall be decontaminated at each relocation as described in Section 02223 – Decontamination.

**PART 4 MEASUREMENT AND PAYMENT**

**4.01 MEASUREMENT**

- A. No separate measurement will be made for “Trench Safety Systems”.

**4.02 PAYMENT**

- A. Payment for “Trench Safety Systems” will be made at the Contract lump sum price as stated in the Schedule of Prices and will be full compensation for furnishing all labor, equipment, materials, and incidentals required to design, provide, construct, maintain and remove safety systems for trench excavation equal to or exceeding a depth of four (4) feet.

End of Section
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**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This item shall consist of planning, installing, inspecting, maintaining, upgrading, and removing temporary erosion and sedimentation control Best Management Practices (BMPs) as shown on the Drawings, in the Contractor's Erosion and Sedimentation Control Plan (CESCP), or as ordered by the Engineer to prevent pollution of air and water and to control, respond to, and dispose of eroded sediment and turbid water during the life of the Contract.
- B. The provisions and intent of the Contract, including the General Conditions, Supplementary Conditions, and General Requirements, apply to this work as if specified in this Section.
- C. This work shall apply to all areas associated with contract work including, but not limited to, the following:
  - 1. Work areas
  - 2. Equipment and material storage areas
  - 3. Staging areas
  - 4. Stockpiles
  - 5. Access roads.

**1.02 DESCRIPTION OF WORK**

- A. In order to comply with the requirements of this Section, the Contractor shall:
  - 1. Develop and submit a project specific CESCP.
  - 2. Revise and modify the CESCP during the life of the contract and maintain records.
  - 3. Install, maintain, and remove all erosion prevention, containment, and countermeasures BMPs during the life of the Contract.
  - 4. Contain, clean up, and dispose of all sediment and turbid water.
  - 5. Perform other work shown on the project Drawings, in the CESCP, or as directed by the Engineer.
  - 6. Properly inspect CESCP requirements including BMPs as required; facilitate, participate in, and implement directed corrective actions resulting from inspections conducted by others including the Environmental Protection Agency (EPA) and Port employees/consultants, as directed by the Engineer.
  - 7. Educate all Contractor and subcontractor staff in environmental compliance issues at weekly meetings and document attendance and content.

**1.03 SUBMITTALS**

- 1. The Contractor shall submit a CESCP as part of Section 01400 – Removal Action Work Plan. The plan shall include and address at a minimum:
  - a. Site Description and Drawings

- b. Contractor Erosion and Sedimentation Control Personnel
- c. Schedule
- d. BMP Installation
- e. BMP Maintenance
- f. BMP Inspection
- g. Record Keeping
- h. BMP Removal
- i. Emergency Response
- j. Fugitive Dust Planning
- k. Education.

**1.04 REFERENCES**

- A. The following rules, requirements, and regulations specified may apply to this work:
  - 1. Puget Sound Storm Water Management Plan, Puget Sound Water Quality Action Team, 1998
  - 2. WAC 173-201 A, Water Quality Standards of the State of Washington
  - 3. Storm Water Management Manual for Western Washington (current edition).

**1.05 ADMINISTRATIVE REQUIREMENTS**

- A. The provisions of this Section shall apply to the Contractor, subcontractors at all tiers, suppliers, and all others who may have access to the work site by way of the Contractor's activities.
- B. Failure to install, maintain, and/or remove BMPs shown on the Drawings, in the approved CЕСP, and specified herein or by order of the Engineer; or failure to conduct project operations in accordance with this Section will result in the suspension of the Contractor's operations by the Engineer in accordance with Section 00700 - General Conditions, paragraph G-10.04.
- C. The Contractor shall be solely responsible for any damages, fines, levies, or judgments incurred as a result of Contractor, subcontractor, or supplier negligence in complying with the requirements of this section.
- D. Any damages, fines, levies, or judgments incurred as a result of Contractor, subcontractor, or supplier negligence in complying with the requirements of this Section will be deducted from payment due by Modification.
- E. Any time and material costs incurred by the Port due to damages, fines, levies, or judgments incurred as a result of Contractor, subcontractor, or supplier negligence in complying with the requirements of this Section will be deducted from payment due by Modification.
- F. The Contractor shall be solely responsible for any schedule impacts from damages, fines, levies, judgments, or stop work orders incurred as a result of Contractor, subcontractor, or supplier negligence in complying with the



requirements of this Section. The project schedule will not be changed to accommodate the time lost.

- G. Contractor shall not clear, grub, grade, demolish, dredge, or perform any other work after Notice to Proceed is issued until the following has been installed per the project Specifications and Drawings, the approved CЕСSР, or as directed by the Engineer:
  - 1. Silt fence or other perimeter controls shall be in place.
  - 2. Areas not to be disturbed shall be delineated with safety fence.
  - 3. Water flows from off site shall be tight lined and directed away from work area.
  - 4. All construction entrances are stabilized, and tire wash systems shall be in place and operational.
  - 5. Catch basin inserts shall be installed in all catch basins that receive drainage from the Work area and on haul routes.
  - 6. Stormwater storage tanks shall be located onsite to provide for storage volume necessary to prevent non-compliant discharges of construction water.

**1.06 AUTHORITY OF ENGINEER**

- A. The Engineer has the authority to limit clearing, excavation, demolition, dredging, filling, and any other Contractor operation and to direct the Contractor to provide immediate permanent or temporary erosion and sedimentation control (TESC) measures to prevent contamination of the adjacent waterway or of municipal storm drains.
- B. In the event that any TЕСSР measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or as ordered by the Engineer, such work shall be performed by the Contractor at their own expense.
- C. In the event that areas adjacent to the work area are suffering degradation due to erosion, sedimentation, water flows, or other causes, the Engineer may stop construction activities until the situation is rectified.
- D. In the event that the Washington State Department of Ecology or the Environmental Protection Agency issues an Inspection Report, a Notice of Non-Compliance, Notice of Violation, or Enforcement Action, the Engineer will stop all construction activities until it has been determined that the project is in compliance. The number of working days will not be changed to accommodate the work stoppage. All costs associated with work stoppages, mitigation of the event, and training shall be paid by the Contractor.
- E. In the event that the Contractor discharges stormwater, groundwater, or process water to storm drains, ditches, gutters or any conveyance that discharges to a receiving water as defined by the Department of Ecology without prior approval

of the Engineer, the Engineer will stop all construction activities and require that all parties involved in the unapproved discharge be removed from the project for a time determined by the Engineer. The project schedule will not be changed to accommodate the time lost.

- F. All costs associated with mitigation of the unauthorized discharge, including but not limited to, cleaning storm system conveyances, work stoppages, training, and removal of personnel from the project shall be paid by the Contractor.

#### 1.07 COORDINATION MEETINGS

- A. The Contractor shall be available, at a minimum, for a weekly coordination meeting with the Engineer, other Port staff and EPA to review the ongoing contract work for compliance with the provision of this Section.

### PART 2 PRODUCTS

#### 2.01 GENERAL

- A. All products used to construct the Contractor selected BMPs shall be suitable for such use. Products or "cut sheets" shall be submitted to the Engineer for approval.

#### 2.02 OIL ABSORBENT PADS

- A. Oil absorbent pads shall be made of white, 100% polypropylene fabric that absorbs oil-based fluids and repels water-based fluids. Each pad shall be a minimum of 15x19 inches in size and absorb no less than 50 ounces of oil-based fluids.

#### 2.03 TESC – ASPHALT CURBS AND BERM

- A. Asphalt curb shall be constructed as directed by the Engineer. The asphalt concrete shall meet the requirements of WSDOT HMA class ½-inch.

#### 2.04 SILT FENCE

- A. Geotextile material shall meet the requirements of the Washington State Department of Ecology "Stormwater Management Manual for Western Washington", Current Version. Geotextile material shall be backed by 2x4-inch wire mesh and shall be attached to steel "T" posts using wire or zip ties. Dimensions and spacing shall be as detailed on the Drawings.

#### 2.05 STRAW WATTLE

- A. Wattles shall consist of cylinders of biodegradable plant material, such as straw, coir, or compost, encased within biodegradable or photodegradable netting. Wattles shall be a minimum of 5 inches in diameter, unless otherwise specified. Encasing material shall be clean; evenly woven; free of debris or any contaminating material, such as preservative; and free of cuts, tears, or damage.

#### 2.06 EROSION CONTROL BLANKET

- A. Erosion control blanket shall meet the requirements of WSDOT Specification Section 9-14, paragraph 9-14.5(2) "Erosion Control Blanket". Installation in ditches and swales shall be per WSDOT Standard Plan I-60.20-00 "Erosion Control Blanket Placement in Channel". Installation on

slopes shall be per WSDOT Standard Plan I-60.10-00 "Erosion Control Blanket Placement on Slope.

**2.07 RIVERBANK EROSION CONTROL BLANKET**

- A. Erosion control blanket shall be TenCate Mirafi 1120N or Layfield Environmental Systems LP12., or approved equal.

**2.08 CATCH BASIN PROTECTION**

- A. Catch basin protection shall be designed and installed for the purpose of preventing sediment from entering the storm system. Protection shall:
  - 1. Be constructed of non-woven geotextile fabric with sewn seams
  - 2. Contain a built-in lifting strap
  - 3. Have a built-in, high flow bypass
  - 4. Be sized such that all water draining to the catch basin flows into the insert and does not flow directly into the storm system.
- B. Catch basin covers shall be 30 mil PVC liner material.

**2.09 ROCK CHECK DAMS**

- A. Rock check dams shall be constructed of quarry spalls per the details shown in the Drawings and as specified in Section 02300 - Earthwork.

**2.10 STABILIZED CONSTRUCTION ENTRANCE**

- A. Stabilized construction shall be constructed of stabilization geotextile fabric and quarry spalls as specified in Section 02300 – Earthwork.

**2.11 WHEEL WASH**

- A. Wheel wash system shall be designed by the manufacturer in accordance with Section 02223 - Decontamination so that truck tires and wheels, undercarriage, suspensions, tracks, loader buckets, excavator buckets, and other parts of the vehicles having contact with site soil and groundwater are cleaned per the performance criteria outlined in Section 02223 - Decontamination

**2.12 GEOTEXTILE FABRIC CHECK DAMS**

- A. Geotextile check dam shall be a urethane foam core encased on Geotextile material. The minimum length of the unit shall be 7 feet. The foam core shall be a minimum of 8 inches in height, and have a minimum base width of 16 inches. The geotextile material shall overhang the foam by at least 6 inches at each end, and shall have apron type flaps that extend a minimum of 24 inches on each side of the foam core. The geotextile material shall meet the requirements for silt fence.

**2.13 PLASTIC SHEETING**

- A. Plastic sheeting shall be clear, reinforced, and a minimum of 6 mil thick. Sandbags or other Engineer-approved material shall be used to secure the plastic sheeting in place. Black plastic may be used to cover stockpiles.

**PART 3 EXECUTION**

**3.01 GENERAL**

- A. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other Federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.
- B. Contact water (water that has come in contact with contaminated material) and all site-generated stormwater shall be treated in accordance with Section 02245 - Construction Water Management System.
- C. Discharge of water that does not meet Washington and federal water quality standards, as defined in the EPA-provided Water Quality Certification, shall not be allowed.
- D. The CЕССР required by this Section shall be based upon ТЕСС requirements of the Contract but shall specifically phase, adjust, improve, and incorporate the ТЕСС requirements into the Contractor's specific schedule and plan for accomplishing the work. The CЕССР shall be modified as changes are made to improve, upgrade, and repair BMPs used by the Contractor and as the work progresses and ТЕСС needs change.
- E. The Contractor shall be wholly responsible for control of water onto and exiting the construction site and/or staging areas, including groundwater, stormwater, and process water. Stormwater from offsite shall be intercepted and conveyed around or through the project and shall not be combined with onsite stormwater.
- F. Modifications to project hydraulic conveyances, detention facilities, and ТЕСС plan sheets shall be stamped by a Professional Engineer (P.E.) licensed by the State of Washington. All other changes to the CЕССР shall be signed by the Certified Erosion and Sediment Control Lead (CESCL).

**3.02 CONTRACTOR'S EROSION AND SEDIMENTATION CONTROL PLAN (CESCP)**

- A. Site description and Drawings
  - 1. A written description of the construction site, including location of staging areas, stockpile areas, material storage areas, natural and constructed drainage systems within the work area and staging areas, and proximity to other construction projects
  - 2. Drawings shall show the location of the construction site, including location of staging areas, stockpile areas, material storage areas, natural and constructed drainage systems within the work area and staging areas, containment exclusion/reduction/support zones, and proximity to other construction projects.
  - 3. Drawings shall show locations of BMPs during each phase of construction as identified by the Contractor in the Baseline Schedule.
- B. Contractor Erosion and Sedimentation Control Personnel
  - 1. The Environmental Compliance Manager (ECM) shall be responsible for ensuring compliance with all requirements of this Section. Duties and responsibilities of the ECM shall include:
    - a. Maintaining file on site at all times which includes the CЕССР, the SWPPP, and any associated substantive requirements and Drawings

- b. Directing BMP installation, inspection, maintenance, modification, and removal
  - c. Availability 24 hours per day, 7 days per week by telephone;
  - d. Updating all drawings with changes made to the CESC
  - e. Keeping daily logs as part of the Contractor's Daily Construction Report
  - f. Preparing and submitting for approval a CESC
  - i. Inspecting CESC requirements including BMPs as required to ensure adequacy
  - j. Facilitating, participating in, and taking corrective actions resulting from inspections performed by EPA, Port employees, and Port consultants.
- C. Schedule
- 1. The CESC schedule shall include:
    - a. Schedules for accomplishment of temporary and permanent erosion control work, as applicable for clearing, grading, construction, saw cutting, and dewatering
    - b. Estimated removal date of all TESC measures.
    - c. Estimated date of final site stabilization.
  - 2. TESC activities consistent with the CESC shall be included in the Baseline Schedule.
- D. BMP Installation
- 1. The CESC shall include installation instructions and details for each BMP used during the life of the Project.
  - 2. Installation instructions and details shall be equivalent to the "Storm Water Management Manual for Western Washington", Dept. of Ecology, Current Version.
- E. Maintenance and Inspection
- 1. The CESC shall include a description of the maintenance and inspection procedures to be used for the life of the project.
  - 2. BMPs shall be maintained for the life of the Project or until removed by order of the Engineer.
  - 3. BMPs shall be maintained during all suspensions of work and all non-work periods.
  - 4. BMPs shall be maintained and repaired as needed to assure continued performance of their intended function.
  - 5. Sediment removed during BMP maintenance shall be disposed of in accordance with Section 02111 - Waste Material Disposal.

6. The Contractor shall inspect all TESCOs daily during workdays and any time 0.5 inches of rainfall has occurred within 24 hours on weekends, holidays, and after hours. Hourly rainfall and weather data can be obtained from the NOAA Boeing Field station webpage at:  
<http://www.crh.noaa.gov/data/obhistory/KBFI.html>.
7. Deficiencies identified during the inspection shall be corrected within 24 hours or as directed by the Engineer.
8. Needed repairs or improvements shall be noted immediately and identified to the ECM who will direct the implementation of improvements
9. The ECM shall implement additional BMPs, if needed, to eliminate any observed erosion or sedimentation.
10. The ECM shall inspect streets surrounding site for dirt tracking. The wheel wash system shall be inspected and adjusted/maintained if dirt originating from trucks leaving the site is observed on surrounding streets.
11. The ECM shall inspect for fugitive dust. The Port will conduct air quality monitoring at the site perimeter if dust is observed, and additional TESCO may be implemented, at the direction of the Engineer, to protect community health.
12. The ECM shall visually inspect all detainment and conveyance systems to ensure that all site-generated stormwater is collected and treated by the onsite treatment system as described in Section 02245 – Construction Water Management System.

F. Record Keeping

1. Forms summarizing the scope of inspections, the date of the inspection, major observations relating to the TESCO, and actions taken as a result of these inspections shall be prepared and submitted in the Contractor's Daily Construction Report. The form shall also include:
  - a. All TESCO to be inspected and monitored for all work areas and work activities identified in the schedule for the life of the Contract
  - b. Weather information including current conditions, total rainfall since last inspection and rainfall in the 24 hours prior to the current inspection
  - c. Locations of BMPs inspected
  - d. Locations of BMPs that need maintenance and why
  - e. Locations of BMPs that failed to operate as designed or intended
  - f. Locations where additional or different BMPs are needed and reasons why
  - g. General comments and notes, including a description of any BMP repairs, maintenance or installations made as a result of the inspection
  - h. A statement that, in the judgment of the ECM, the site is either in compliance or out of compliance with the CESCO. If the site

inspection indicates that the site is out of compliance, the inspection form shall include a summary of the corrective actions required to bring the site back into compliance, as well as a schedule of implementation. If the site inspection indicates that the site is out of compliance, the ECM shall notify the Engineer immediately.

- i. Name, title, and signature of the ECM conducting site inspection and the following statement; "I certify that this report is true, accurate, and complete, to the best of my knowledge and belief.
  - 2. All inspection reports shall be kept on-site during the life of the project and available for review upon request of the Engineer or the EPA. Copies shall also be submitted to the Engineer in the Contractor's Daily Construction Report.
  - 3. Copies of all inspection records and updated CESCOP, if applicable, shall be submitted to the Engineer as part of the Contractor's Daily Construction Reports.
- G. BMP Removal
  - 1. Before Project closeout, all sediment shall be removed from temporary and permanent drainage conveyances, ditches, culverts, and channels to maintain operation.
  - 2. All temporary BMPs shall be removed upon permanent stabilization or as directed by the Engineer.
  - 3. Areas disturbed during removal of temporary BMPs shall be permanently stabilized.
  - 5. Permanent stabilization shall occur upon the achievement of:
    - b. On grades 3:1 and less, soil is covered by a minimum of 80% grass growth, as determined by the Engineer.
    - c. On grades greater than 3:1 soil is covered by an approved erosion control blanket or bonded fiber matrix and a minimum of 80% grass growth, utilizing the "Line Interceptor Method".
- H. Construction Water
  - 1. All site-generated stormwater, soil stockpile drainage, decontamination fluids, and water pumped from deep excavations or from behind the sheet pile wall shall be managed per Section 02245 – Construction Water Management System.
- I. Fugitive Dust Planning
  - 1. The CESCOP shall detail the Contractor-proposed approach to fugitive dust management. The plan shall include the following:
    - a. Identification of all fugitive dust sources for each work activity
    - b. Description of the fugitive dust control measures to be used for each source
    - c. Schedule, rate of application, and calculations to identify how often, how much, and when the control method is to be used

- d. Provisions for monitoring and recordkeeping
  - e. Contingency plan in case the first control plan does not work or is inadequate
  - f. Provisions for responding to community air quality monitoring data
  - g. Name and telephone number of the person responsible for fugitive dust control.
  - h. Source and availability of fugitive dust control materials.
- 2. The Contractor shall provide whatever means is necessary to keep fugitive dust onsite and at an absolute minimum during working hours, non-working hours and any shut-down periods.
  - 3. The Contractor's methods for fugitive dust control will be continuously monitored, and if the methods are not controlling fugitive dust to the satisfaction of the Port, the Contractor shall improve the methods or utilize new methods at no additional cost to the Port.
  - 4. The Contractor shall maintain as many water trucks onsite during working and non-working hours as required to maintain the site free from fugitive dust.
  - 5. During time periods of no construction activity, water trucks must be ready with onsite Contractor's personnel available to respond immediately to a dust or debris problem as identified by the Engineer.
  - 6. At no time shall there be more than a 10-minute response time to calls concerning fugitive dust/debris problems during work hours and a 90-minute response at all other times on a 24-hour basis.
- J. Utilities Planning Education – The CЕСSCP shall identify when and how all underground utility work will be conducted so that water quality compliance is maintained. At a minimum, the Contractor shall:
- 1. Have all shut off valves located and have procured the means to shut off valves within 10 minutes of a water line break.
  - 2. Before cutting into an existing water line, the Contractor shall verify to the Engineer that the water line is not pressurized.
  - 3. The Contractor shall not cut into an existing storm drain or connect new stormwater conveyance systems into existing systems until it has been verified to the Engineer there will be no discharge of non-compliant water during and after cutting and connection operations.
  - 4. The Contractor shall grout all holes, seams, cracks, joints, cast iron rings and grates within 24 hours of installation of each item.
  - 5. Storm systems to be demolished in place shall be first blocked at the point of connection to existing section to prevent contamination of existing storm system.
  - 6. Chlorinated water shall be discharged to sanitary sewer or removed from the site.
  - 7. Air plugs shall not be utilized for more than 24 hours and shall be in new condition with no leaks and monitored daily for proper air pressure.



8. Mechanical plugs shall not be utilized for more than 5 calendar days and shall be used according to the manufacturer's instructions and engineering parameters. The Contractor shall submit instructions and engineering documentation before use.
9. When a plug needs to remain in place longer than 5 days, the Contractor shall utilize grout. The grout shall be installed so that the length is one and a half times the diameter of the pipe.

**K. Education**

1. The CESCP shall describe how the Contractor shall educate all personnel including subcontractors.
2. The Contractor shall train staff through regularly scheduled meetings to discuss environmental protection subjects related to the Work. This may be added to any existing weekly meetings (such as safety meetings).
3. Training shall emphasize water quality compliance, BMP installation and maintenance, sensitive areas, emergency response, spill prevention, and inspections.
4. Minutes of the meetings detailing attendees and subjects discussed shall be kept and submitted to the Engineer in the Contractor's Daily Construction Report.
5. Prior to commencing work, all Contractor and subcontractor personnel at any tier shall complete a Port of Seattle Environmental Compliance Orientation given with the required Safety Orientation.

**3.03 CONSTRUCTION REQUIREMENTS**

**A. Saw Cutting**

1. Saw cut slurry and cuttings shall be vacuumed during cutting operations.
2. Saw cut slurry and cuttings shall not remain on permanent concrete or asphalt pavement overnight.
3. Collected slurry and cuttings are the responsibility of the Contractor and shall be disposed of offsite in a manner that does not violate groundwater or surface water quality standards.

**B. Soil and debris stockpiles shall be managed in accordance with Section 02114 – Stockpiling and Loading of Contaminated Soil.**

**C. Construction Roads, Entrances, and Exits**

1. Before leaving the Site, all trucks and equipment shall drive through a wheel wash station.
2. At no time shall dust, mud, or debris be allowed outside of the Site and on any public roads.
3. Mud and debris shall be removed from pavement by vacuum sweeping and shoveling and transported to a stockpile.
4. Use of water to wash concrete or asphalt pavement shall be allowed only after sediment has been removed by vacuum sweeping and shoveling, and a Road Wash Plan has been submitted and accepted by the Engineer.

5. Power brooms shall not be utilized at any time.
  6. Contractor shall have sufficient working vacuum sweepers onsite at all times work is being performed. All sweepers shall have on-board water spray systems that shall be operating at all times.
  7. If, in the Engineer's opinion, the Contractor does not adequately manage the tracking of soil, the Port may subcontract out the control of soil tracking at the Contractor's expense.
- D. Storm Drain Inlet Protection
1. All catch basins within the project limits shall be protected with catch basin inserts.
  2. All catch basins outside the project limits but within the project drainage basin, including haul roads, shall be protected with catch basin inserts.
  3. Catch basin inserts or protection shall be installed where shown in the Drawings, in all storm drainage structures within the work area, or as otherwise directed by the Engineer.
- E. Wheel Washes
1. All haul vehicles exiting the work site to public roads shall pass through a wheel wash system to control sediment tracking per Section 02223 - Decontamination.
- F. Silt Fence
1. Silt fence shall be constructed at the locations shown in the Drawings, in the approved CESCP, or otherwise directed by the Engineer.
  2. The geotextile shall be attached to the up-slope side of the posts, and the wire mesh using staples, wire rings, or in accordance to the manufacturer's recommendations.
  3. Where seams are required to join two sections of fence material, the seams shall be taped together, wrapped three times around a 2" steel post and the post driven into the ground. All rips, tears, holes, and other damage to silt fences shall be repaired within 24 hours of locating the damage.
- G. Bonded Fiber Matrix Stabilization
1. The installation of Bonded Fiber Matrix with Seed and Fertilizer shall be applied at a minimum rate of 3,000 pounds per acre and provide a minimum of 95% soil cover.
- H. Construction Entrances
1. A construction entrance shall be provided at each location where construction vehicles enter or exit the work areas onto public or access roads.
- I. Construction Stormwater

1. The Contractor shall be responsible for conveying all stormwater generated onsite to the Water Treatment Plant described in Section 02245 – Construction Water Management System.
  2. Temporary piping, structures, and pump facilities required for the conveyance are the responsibility of the Contractor.
- J. Surface Roughening:
1. All soil shall be roughened, loose and friable, by ripping or with equipment tracks before being stabilized.

**PART 4 MEASUREMENT AND PAYMENT**

**4.01 MEASUREMENT**

- A. No separate measurement will be made for “TESC – Planning”.
- B. Measurement for “TESC – Execution” will be as a unit.

**4.02 PAYMENT**

- A. No separate payment will be made for “TESC – Planning” as required by this section. The cost for this portion of the Work will be considered incidental to the “Removal Action Work Plan” as described in 01400 – Removal Action Work Plan.
- B. Payment for “TESC –Execution” will be made at the contract lump sum price as stated in the Schedule of Unit Prices and shall be full compensation for furnishing all labor, equipment, materials, and tools to implement and maintain the CЕСSCP including implementation of temporary stormwater conveyance facilities either as shown on the drawings or as required to complete the work, dust control, operation, maintenance and modification of wheel wash systems, construction of the construction entrances, control of sediment tracking, providing and operating vacuum sweepers and water trucks, and other measures as required as detailed on the Drawings and specified herein through the duration of the Contract, with the exception of those items measured and paid for separately. Payments will be made as follows:
  1. After Notice to Proceed and before Substantial Completion, 80% will be prorated and paid monthly for compliance with the CЕСSCP. Non-compliance will result in withholding of payment for the month of the non-compliance.
  2. At final payment, 20% for a clean and stabilized site.
- C. Payment for “TESC – Force Account” as stated in the Schedule of Unit Prices will be made on a Force Account basis in accordance with Document 00700 – General Conditions, Paragraph G-08.06 and shall be full compensation to complete only temporary erosion control measures that are not part of the contract work, not covered under existing bid items and are at the specific direction of the Engineer.

End of Section

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This section includes furnishing transportation, labor, materials, equipment, and incidentals necessary to perform excavation, handling, and disposal of Subtitle” C” and Subtitle” D” contaminated upland and riverbank soil and subsurface debris as shown on the Drawings and described in these specifications. This work includes soil removed from the riverbank adjacent to the South Park Marina (Marina) property. Removal of contaminated soil on the riverbank will require work during low tide periods so that river water does not inundate the work area.
- B. This section also includes furnishing transportation, labor, materials, equipment, and incidentals necessary to perform re-grading and backfilling of the site and placement of riprap as described in these specifications and shown on the Drawings.
- C. Excavation of the upland and riverbank will include removal of soil, sediment, and associated timbers and debris to the limits shown on the Drawings. Subsurface debris encountered in the excavated soil will not be segregated, but may require modification (typically size limitations as dictated by the disposal facility) to make the debris suitable for disposal with the soil. Excavated material will be temporarily stockpiled on site (as necessary) in accordance with the specifications in Section 02114 Stockpiling and Loading of Contaminated Soil and will be disposed off-site in accordance with the specifications in Section 02111 Waste Material Disposal.

**1.02 REFERENCES**

- A. Washington State Department of Transportation (WSDOT) - Standard Specifications for Road, Bridge, and Municipal Construction-2012
- B. Washington State Department of Transportation (WSDOT) – Materials Manual M 46-01.13, last revised 2012.

**1.03 SUBMITTALS**

- A. The Contractor shall submit an Earthwork Plan as part of Section 01400 Removal Action Work Plan that documents the proposed approaches, equipment, means, and methods of accomplishing the excavation, handling, and disposal of soil and associated subsurface debris. The Plan shall include the sequencing approach to the sediment, riverbank, and upland removal parts of the work.
  - 1. The Earthwork Plan shall specify the approaches to the excavation of the riverbank and the upland soil and associated debris. The Plan shall address the safe handling of contaminated materials and maintaining close tolerances on the excavation limits shown on the Drawings. The plan shall include details on the riverbank removal that define the approach and timing of the work including proposed equipment, estimated production rate(s), and proposed erosion control with sufficient detail to allow agency

and Engineer evaluation of the proposed plan. The plan shall also include contingent approaches that will be enacted to maintain the project schedule if required.

2. The Drawings identify confirmation sampling grid cells that must be sampled by the Port to determine if cleanup goals have been met. The Earthwork Plan shall be developed to sequence the work to coincide with this sampling protocol.
  3. The Earthwork Plan shall describe the Contractor's equipment, means, and methods for excavation of the riverbank and upland soil and shall include the sequencing of the work.
- B. The Contractor shall submit daily excavation reports to the Engineer as part of the Contractor's Daily Construction Report. Forms to be used shall be submitted to the Engineer for approval prior to use, see Section 01400 Removal Action Work Plan. Daily excavation reports are required until all upland and riverbank excavated materials have been disposed of at the approved off-site disposal facility.
- C. Submit test results prior to importing any backfill material on the site, one test for every source of backfill material, and each time the material source is deemed to change. Each sample shall be representative of the current production and stockpile being supplied to the site. The test data will be submitted to EPA by the Engineer and EPA approval is required prior to import of any backfill material.
- D. Contractor shall submit three samples of a geotextile fabric to be placed as an indicator layer between the excavated site grade or onsite backfill grade (in those areas where onsite backfill is placed) and the imported backfill according to the fill requirements of 3.03 of this specification.

#### 1.04 DEFINITIONS

- A. Subtitle "C" Waste includes all soil with total PCB concentrations exceeding the Toxic Substance Control Act Criteria (40 CFR 761) of 50 mg/kg (TSCA level soil). The TSCA level soil shall be separated during the excavation process, maintained in completely separate stockpiles and disposed of as outlined in Section 02111 Waste Material Disposal. Excavation limits for TSCA level soils are shown on the Drawings.
- B. Subtitle "D" Waste is defined from a regulatory standpoint in Section 02111. Subtitle "D" waste includes all non-TSCA level soil, sediment, and debris removed from the site except for demolished surface materials that can be recycled or reused.

#### 1.05 JOB CONDITIONS

- A. Information for subsurface explorations performed at the site is contained in The Appendices. Contractor shall make their own evaluation of the data to determine how to construct the project.
- B. Existing Utilities: The Contractor shall locate existing underground and aboveground utilities in the area of the Work. Those utilities which are to remain shall be adequately protected from damage. The Contractor shall make arrangements with all utility providers that will be affected by earthwork activities and shall design site activities (shoring, dewatering) to account for the utilities. Contractor coordination with Seattle City Light will be required to relocate a guy wire that exists on the site near the entrance gate. The Contractor will be required to coordinate with Seattle City Light for relocation of the guy wire (up to 2 times) so the excavation is completed as designed and the guy wire is ultimately installed back at its original location (within the existing easement) when the restoration is complete. Seattle City Light costs for relocating the guy wire will be the responsibility of the Contractor and considered incidental to the project.
- C. Debris will be common in excavated upland and riverbank soil. Debris encountered may include (but not be limited to) timbers, concrete debris, roofing tar and materials, concrete foundations, concrete/grout filled underground storage tanks, utilidor material, scrap metal, and plastic debris.
- D. Onsite monitoring wells shall be decommissioned in accordance with Section 02522 Monitoring Well Decommissioning and Protection prior to any earthwork activities.
- E. Excavated soil and associated debris may be temporarily stockpiled (as deemed necessary by the Contractor) on site in accordance with Section 02114 Stockpiling and Loading of Contaminated Soil.

#### 1.06 ENVIRONMENTAL PROTECTION

- A. The Contractor shall provide and maintain during the life of the Contract, environmental protective measures in accordance with Section 01631 Pollution Prevention Planning and Execution, Section 02223 Decontamination, Section 02270 TESC Planning and Execution, and other applicable Contract provisions. The measures shall include, but not be limited to, erosion control, vehicle decontamination, and spill response.
- B. It is possible that disturbance of historical Native American materials may occur as a result of upland excavation operations. The excavation crew shall attend a 1-hour onsite orientation held by the site Archaeologist (retained by the Port) where personnel will be made aware of the potential to discover cultural resources within the upland and riverbank removal areas. The Contractor will be made aware of their responsibilities during monitoring by the site Archaeologist and their obligations in the case of an inadvertent discovery. If any archaeological resources are discovered during removal, the Contractor shall cease excavation

and notify the Engineer. Contractor shall allow access to work areas as requested by the Engineer to allow inspection for cultural resources.

- C. Riverbank excavation and subsequent backfilling will require upland equipment to operate in very close proximity to the river. Vegetable/biodegradable oil shall be used in the hydraulic lines/systems of upland equipment used within 50 feet of the Lower Duwamish River to minimize the potential impacts of leaking hydraulic fluids on the aquatic environment. The Contractor shall inspect upland excavation equipment used for the riverbank removal each day before work begins for leaking hydraulic fluid. Any equipment found to be leaking during the daily inspections, or at any time during the riverbank excavation activity shall be removed from service immediately until the leak is repaired.

## PART 2 PRODUCTS

### 2.01 TEST RESULTS

- A. Submit test results prior to importing any backfill material to the site, in accordance with:
  - 1. Sieve analyses and comparison to the WSDOT Standard for the imported material
  - 2. Moisture Density Curve for Gravel Borrow in accordance with ASTM D1557 (Modified Proctor)
  - 3. Compliance of Riprap with the specifications outlined in Section 2.05 B
  - 4. Imported backfill material shall be naturally occurring or natural material blended to achieve gradation requirements listed herein. The backfill shall not contain recycled material of any type and shall not be from an industrial site.

### 2.02 GRAVEL BORROW

- A. Aggregate for Gravel Borrow shall consist of granular material, either naturally occurring or blended, and shall meet the following requirements for gradation:

SIEVE SIZE (INCHES)	PERCENT PASSING
4	99 – 100
2	70 – 100
No. 4	50 – 80
No. 40	30 max.
No. 200	7.0 max.*

Sand Equivalent	50 min.
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Notes: All percentages are by weight. \* for backfill in wet conditions the fines content (material passing No. 200) shall be limited to 5.0%.

- B. Chemical Acceptance Criteria: Contractor shall provide documentation of the chemical composition to demonstrate that the proposed backfill is free from environmental contamination. Backfill analytes, reporting limits, methods, and criteria are:

Analyte	Unit	Analytical Method	Reporting Limit	Criteria
PCB Aroclors	µg/kg dw	EPA 8082	4	ND
Semi-volatile organic compounds (SVOCs)	µg/kg dw	EPA 8270	20 <sup>a</sup>	ND
Dioxin/Furan TEQ	ng/kg dw	EPA 1613	1	4
Arsenic	mg/kg dw	EPA 6010	5	7.3
Cadmium			0.2	2.5
Chromium			0.5	130
Copper			0.2	195
Lead			2	225
Silver			0.3	2
Zinc			1	205
Mercury			mg/kg dw	EPA 7471
Diesel range hydrocarbons	mg/kg dw	NWTPH-Dx	5	ND
Lube oil range hydrocarbons			10	

Notes: ND = not detected at reporting limit; TEQ = toxicity equivalent.

<sup>a</sup> : most SVOCs, such as PAHs, have reporting limits of 20 ug/kg dw. Some SVOCs have higher reporting limits: 2,4-dimethylphenol – 35, 4-methylphenol – 35, benzoic acid – 400, bis(2-ethylhexyl)phthalate - 30, hexachlorobutadiene – 90, diethylphthalate – 50, pentachlorophenol – 200.

**2.03 RIPRAP**

- A. Riprap shall be hard, sound, and durable material, free from seams, cracks, and other defects that tend to destroy its resistance to weather and it shall consist of broken or processed rock. Riprap shall have a well graded structure that conforms to the following:

APPROXIMATE SIZE (INCHES)	PERCENT PASSING
18	100
16	80 – 95



12	50 – 80
8	15 – 50
4	15 max.

Note: Approximate size can be determined by taking the average dimension of the 3 axes of the rock: length, width, and thickness, by adding up the 3 individual dimensions and dividing by 3 to obtain the average.

- B. Riprap must be visually accepted by the Engineer before it is placed. The Engineer may require that a load be dumped on a flat surface for sorting and measuring the individual rocks contained in the load.
- C. Riprap shall also meet the following requirements:

TEST	REQUIRED RESULT
Specific Gravity (AASHTO T-85)	2.55 min.
Degradation Factor (WSDOT T-113)	15 min.
Freeze/Thaw (ASTM C666)	< 10%
Absorption (AASHTO T-85)	3% max.
Expansive Breakdown (15 day CRD C145)	< 8.5%
Los Angeles Wear, 500 Rev. (AASHTO T-96)	50% max.

2.04 QUARRY SPALLS

- A. Quarry Spalls shall meet the requirements of WSDOT Section 9-13.6.

2.05 GEOTEXTILE FABRIC

- A. Geotextile fabric shall be TenCate Mirafi 1120N, Layfield Environmental Systems LP12, or approved equivalent.

2.06 SAND

- A. See Section 02325 Dredging for the complete requirements for imported sand.

**PART 3 EXECUTION**

3.01 GENERAL

- A. Before beginning excavation, grading, and embankment operations in any area, the area shall be cleared in accordance with Section 02220 Site Demolition.
- B. The Contractor shall participate in training along with all workers performing excavation activities regarding the identification of cultural resources that may be uncovered during excavation. When the Contractor's excavation operations encounter possible artifacts of historical or archaeological significance, the operations shall be temporarily discontinued and the Engineer shall be notified.
- C. If it is necessary to interrupt existing surface drainage, sewers, under-drainage, conduits, utilities, or similar underground structures not shown for removal, the Contractor shall be responsible for and shall take all necessary precautions to preserve them or provide temporary services. The Contractor shall at their own expense, satisfactorily repair or pay the cost of all damage to such facilities or structures which may result from any of the Contractor's operations during the period of the contract.

### 3.02 EXCAVATION

- A. The Contractor shall conduct the Work in accordance with the EPA-approved final RAWP. The Work shall include excavation of the earth, sand, gravel, clays, or mixtures of the above and associated man-made debris common within the soil in the upland and riverbank, required to be removed as shown on the Drawings.
- B. Remove all soil and associated debris within the removal prisms as identified on the Drawings or in areas identified by the Engineer.
- C. Previous removal actions on the site occurred on the upland in 1999 and 2006 and on the riverbank in 2008 and 2011, as shown on the Drawings. The Contractor shall remove backfill placed in 2006 in the upland and riprap/ cobbles placed on the riverbank in 2008 and 2011 above the visual fabric layer taking care not to mix it with underlying soil. The Contractor shall stockpile and sample the 2006 backfill (minimum of two representative samples) to determine if it can be reused as clean backfill for the site. It must meet the chemical criteria in 2.02 B to be deemed acceptable for reuse as backfill. Contractor shall visually inspect the riprap placed in 2008 and 2011. Any debris, adhering soil, or visual evidence of contamination must be segregated from the riprap/cobbles, and disposed of, before the riprap/cobbles can be reused as backfill.
- D. TSCA level soil shall be separated during the excavation process, maintained in completely separate stockpiles and disposed of as outlined in Section 02111 Waste Material Disposal.
- E. The extent of soil excavation beneath the north building has not been adequately defined due to the presence of the building. This area also includes a heating oil tank which shall be abandoned and removed by the Contractor. This area will be defined by the Engineer after building deconstruction, and the information will be supplied to the Contractor for excavation. The Contractor must provide the Engineer access to the building footprint for sampling activities.

- F. Excavated soil and associated debris may be temporarily stockpiled onsite in accordance with Section 02114 Stockpiling and Loading of Contaminated Soil and as outlined in the Soil Stockpile Plan included in the RAWP.
- G. The area of cleanup of the riprap-covered shoreline in the Marina is shown on the Drawings. Exposed sediment within the interstitial openings of the riprap shall be removed using a vacuum truck, or equivalent. The Contractor shall use small diameter hoses and receivers to minimize intake of larger diameter cobbles and allow access to the smaller interstitial openings in the existing riprap.
  - 1. All Marina bank excavation shall be completed using land-based equipment.
  - 2. Jetted water shall not be used to fluidize the sediment.
  - 3. Marina bank excavation shall be completed between June 15, 2013 and September 30, 2013, outside of the in-water work window. All work shall be completed at low tide when the area is not inundated by river water to prevent release of sediment to the water column during work. The intake end of the vacuum, or equivalent, shall be above the tide level at all times during work.
  - 4. The Engineer will observe the area as the removal is completed and may require the Contractor to modify the removal equipment/process (still using a vacuum truck) and the removal area as the process proceeds to achieve the cleanup goals of the site.
  - 5. Following completion of the Marina bank excavation, the riverbank shall be overlaid with riprap protection according to the Backfill requirements in this Specification.
- H. The riverbank excavation and backfilling (outside of the sheet pile wall) shall be completed while the area is not inundated by water. The Contractor shall comply with all the requirements of these Specifications as they relate to water quality, slope stability, and TESC.
  - 1. Excavation of the riverbank material outside of the sheet pile wall shall be completed during low tides between June 15 and September 30, 2014.
  - 2. All riverbank removal excavation shall be completed using land-based equipment.
  - 3. A 2-ft vertical (elevation) or a 6-ft horizontal separation shall be required between the tide level and all excavation and backfill activity (outside of the sheet pile wall).
  - 4. Contractor shall allow sufficient time to excavate bank material, survey the removal areas, allow for the Engineer to collect confirmation samples and place erosion control protection during one low-tide period while the area is not inundated by river water.

5. Contractor shall place temporary erosion protection over the exposed bank soil within the disturbed area prior to tidal inundation by river water. The Contractor shall use BMPs to limit erosion and to achieve water quality requirements. At a minimum, the erosion protection shall consist of geotextile fabric placed and anchored on the newly exposed surfaces. The Contractor shall determine if this minimum level of erosion protection is sufficient to limit erosion and protect water quality in accordance with the Water Quality Certification, and if not, shall install additional BMPs to limit erosion as necessary at no additional costs to the Contract. Geotextile fabric anchorages shall be in accordance with the manufacturer's recommendations and may consist of a temporary system until the Engineer indicates that the cleanup goals have been met for the area. After approval of the area by the Engineer, the Contractor shall install anchorages to keep the erosion protection in place until final finished filling and grading of the slope occurs.
  6. Sampling will occur on three decision units in the north bank and three in the south bank (outside of the sheet pile wall). If sampling indicates that cleanup goals for the unit have not been met, the Contractor shall remove the erosion protection and complete additional removal to the levels indicated by the Engineer. Preparation of the area, additional removal, confirmation sampling, and re-establishment of the TESC on the area shall occur while the area is not inundated by river water during a single low tide cycle.
  7. Contractor shall take steps to ensure slope stability during all excavation activities and periods of inactivity.
  8. Backfill shall not occur until confirmation sampling is complete and a determination has been made by the Engineer that no additional removal is required.
  9. The riverbank shall be constructed according to the requirements in this Specification and during periods when the riverbank is not inundated by water. It may be necessary to wait until dredging and sediment backfilling operations have been completed prior to finishing final backfilling and riprap protection of the riverbank slopes. The Contractor shall detail the intended backfill reconstruction sequence in the Earthwork Plan. The Contractor shall provide erosion protection of the slopes until final restoration is complete.
- I. For grid cells that do not require confirmation sampling: Upon completion of upland and riverbank soil and associated debris excavation to the limits shown on the Drawings for the nine (9) grid cells that do not require sampling the Contractor shall:
1. Notification:

- a. The Contractor shall notify the Engineer upon completion of excavation and demonstrate that the excavation configuration shown on the Drawings has been achieved via survey. The notification will not be considered “complete” without survey information that demonstrates the excavation has been completed in accordance with the lines and grades shown on the Drawings.
  - b. For the 9 confirmation grid cells that do not require sampling, the Engineer will notify the Contractor within 1 day (excluding Sundays and Holidays) of completion by the Contractor.
  - c. The Contractor shall be responsible for safety around open excavations and shall be responsible for backfilling the open excavations with clean backfill.
- J. For grid cells that require confirmation sampling: Upon completion of upland and riverbank soil and associated debris excavation to the limits shown on the Drawings, the Engineer will conduct confirmation sampling within the upland soil grid cells and the riverbank units indicated on the Drawings to determine if the soil remaining at the base of each excavation meets the required cleanup goals.
1. Notification:
    - a. The Contractor shall notify the Engineer upon completion of excavation and demonstrate that the excavation configuration shown on the Drawings has been achieved via survey. The notification will not be considered “complete” without survey information that demonstrates that the excavation has been completed in accordance with the lines and grades shown on the Drawings.
    - b. For the confirmation grid cells and riverbank unit that do require sampling, the Engineer will notify the Contractor within 3 days (excluding Sundays and Holidays) of a complete notification by the Contractor if the cleanup goals have been met each grid cell or riverbank unit.
      - (1) Six of the confirmation sampling grid cells will be tested for dioxins/furans which require more time for analysis than the other analytes. These 6 grid cells will be selected during the RAWP development process by the Port and the Contractor using criteria set forth by the EPA for grid cell sampling. For these 6 confirmation grid cells, the Engineer will notify the Contractor within 10 days (excluding Sundays and Holidays) if the cleanup goals have been met within a grid cell..
  2. Actions that will result from sampling include:

- a. If the cleanup goals have been met within a grid cell or riverbank unit, it will be considered ready to backfill by the Engineer and shall be backfilled to the final site grades by the Contractor at a time they deem appropriate.
  - b. If the cleanup goals have not been met within a grid cell or riverbank unit, the Engineer will determine what additional depth of soil shall be removed from the excavation and inform the Contractor of the new required excavation elevation(s). The Contractor shall perform the additional removal and provide notification as described in this section. This process will continue until the site cleanup goals have been met.
3. The Contractor shall provide a safe entrance into the excavation for the Engineer to secure the confirmation samples and work with the Engineer to achieve the sample which may include providing an excavator with operator that can be used to reach to the bottom of the deeper excavations to obtain a sample.
  4. The Contractor shall be responsible for safety around open excavations and shall be responsible for backfilling the open excavations with clean backfill.

### 3.03 EMBANKMENTS AND FILLS

- A. The Contractor shall notify the Engineer one day (excluding Sundays and Holidays) before they begin to perform regrading of site soil so that the Engineer can observe the grading activities and the newly exposed soil as the grading proceeds. Contractor shall be responsible for observing and reporting visual impacts and debris to the Engineer. All regrading activities shall be observed by the Engineer and any debris or visually contaminated soil shall not be used as backfill.
- B. Onsite material shall be used as backfill to balance out the fill on the site to achieve the final restoration grades only after confirmation sampling has demonstrated that site cleanup goals have been met in and around the area that will be the source of the onsite backfill. There are areas on the site where the planned excavation to remove contaminated material stops higher in elevation than the final restoration grades. Once the cleanup goals have been met in that area, the non-contaminated soil that will need to be removed to achieve the final site grades shall be re-used on the site in areas where the excavated site grade is below the final site grade, where there is no standing groundwater present, and where confirmation sampling has confirmed that no additional excavation will be needed. The site will be re-graded so there is a minimum of 12 inches of imported gravel borrow over all portions of the site.
  1. Reused site soil may not be graded into excavation extending below the groundwater table. Any excavations with standing water must be filled with

import gravel, after confirmation sampling has indicated that no additional excavation is necessary, until the gravel overtops the groundwater. Then re-graded soil may be used for additional backfill.

- C. The Contractor shall place a geotextile fabric as an indicator layer between the excavated site grade or onsite backfill grade (in those areas where onsite backfill is placed) and the imported backfill.
- D. For areas behind the sheetpile wall, the Contractor shall place backfill as indicated in the drawings. Below the riprap sand shall be placed, See Section 02325 Dredging for performance requirements for sand.
- E. The Contractor shall place material used for the construction of embankments and fills in horizontal layers upon earth which has been stabilized or otherwise approved by the Engineer for embankment construction. The following compaction methods shall be used:
  - 1. For areas with standing water construct earth embankments and fills in successive horizontal layers not exceeding 2-foot lifts to above the level of standing water. A hoe-pack compactor shall be used over the entire area or at least 3 passes with a 10-ton vibratory compactor to a firm non-yielding surface.
  - 2. For areas backfilled with regraded site soil, construct earth embankments and fills in successive horizontal layers not exceeding 1.5-foot thickness, at least 3 passes with a 10-ton vibratory compactor to a firm non-yielding surface.
  - 3. For areas backfilled with gravel borrow, construct earth embankments and fills in successive horizontal layers not exceeding 8 inches in loose thickness. Compact each layer of the top 2 feet of embankment to 95% of its maximum dry density, as determined by test method ASTM D-1557 (Modified Proctor) and each layer of embankment below the top 2 feet to 90% of the maximum dry density as determined by test method ASTM D-1557.
  - 4. Carry the layers up full width from the bottom of the embankment or fill area. Compact the slopes of all embankments to the required density as part of the embankment compaction work. The backfill shall be compacted with modern, efficient compacting units satisfactory to the Engineer.
- F. Prior to the placement of filter fabric for riprap slope, the bank shall be graded and dressed to eliminate any irregularities. Irregularities in the slope shall be filled with Gravel Borrow.
- G. Place riprap bedding material (Gravel Borrow) in one operation in a manner to avoid displacing the underlying material or placing undue impact force on underlying materials and supporting subsoil. Place bedding in a manner to

produce a resultant graded mass of stone with minimum voids. Placement of riprap bedding shall begin at the bottom of the slope and proceed upward.

- H. Place riprap in one operation in a manner to avoid displacing the underlying material or placing undue impact force on underlying materials and supporting subsoil. Place riprap in a manner to produce a resultant graded mass of stone with minimum voids. Placement of riprap shall begin at the bottom of the slope and proceed upward.

### 3.04 COMPACTION CONTROL TESTS

- A. Laboratory and field tests shall be performed in accordance with the applicable provisions of Section 01451 Quality Control; Testing Laboratory Services, to determine compliance with these specifications. Furnish soil samples suitable for the laboratory tests at no cost to the Port.
- B. Compaction control density shall be at the specified percentage of the maximum density at optimum moisture content as determined by ASTM D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort, Methods A or B as applicable. Testing shall be performed at least once for each lift and at a minimum of one per 10,000 sf.
- C. Field tests to determine in-place compliance with required densities as specified, shall be performed in accordance with ASTM D1556, D2167, or D6938.
- D. Compaction test shall be completed by the Contactor and the results shall be provided to the Engineer daily as part of the Contractor's Daily Construction Report.

### 3.05 GRADING AND LEVELING

- A. Non-paved areas (back slopes, fill slopes, landscape areas) shall be graded to a smooth and uniform appearance in accordance with the grades indicated on the Drawings.

## PART 4 MEASUREMENT AND PAYMENT

### 4.01 MEASUREMENT

- A. "Upland and Riverbank Subtitle "D" Waste" will be measured by the grades and lines shown on the drawings as demonstrated by certified survey.
  - 1. No separate measurement will be made for stockpiling; modifying subsurface debris to make it suitable for offsite disposal; or loading, transporting, and disposing of soil and debris.
  - 2. No separate measurement will be made for additional material that might be developed through sloping, benching, or sloughing that occurs on the site beyond the lines and grades shown on the Drawings.
- B. "Upland and Riverbank Additional Subtitle "D" Waste" will be measured on a per cubic yard basis using in-place volumes based on direction from the Engineer on



depths and areas for additional excavation and certified site survey using the previous excavation bottom survey and the new survey completed after the additional removal.

1. No separate measurement will be made for stockpiling; modifying subsurface debris to make it suitable for offsite disposal; loading, transporting, and disposing of soil and debris; backfilling; or compaction of backfill.
- C. “Upland and Riverbank Subtitle “C” Waste” will be measured by the grades and lines shown on the drawings as demonstrated by certified survey.
1. No separate measurement will be made for stockpiling; modifying subsurface debris to make it suitable for offsite disposal; or loading, transporting and disposing of soil and debris.
- D. “Upland Re-Grading” will be measured by the site restoration lines and grades shown on the Drawings.
1. No separate measurement will be made for re-grading the site so the restoration contours are achieved.
  2. No separate measurement will be made under this line item for additional volume beyond the lines and grades shown on the drawings if additional Subtitle D waste is removed from the site. Additional backfill is included under the additional excavation line item.
  3. Item shall include all incidental work to achieve final site restoration excluding: fencing and gates.
- E. “Riverbank Armor/Riprap” will be measured by ton based on certified weight tickets from delivery trucks (or barges). Present certified truck weight tickets to the Engineer at the time of delivery.
- F. “Marina Removal Area” will be measured by each 4-hour duration for all labor, materials, and equipment required to provide selective removal of sediment in the Marina Removal Area as directed by the Engineer. The “Marina Removal Area” is shown on the drawings.
- G. “Marina Soil Disposal” will be measured by ton based on certified truck weight tickets presented to the Engineer generated at the time of disposal for sediment removed from the Marina Removal Area.
- H. “Marina Riprap Restoration” will be measured by ton based on certified weight tickets from delivery trucks for material to restore the Marina Removal Area. Present certified truck weight tickets to the Engineer at the time of delivery.

#### 4.02 PAYMENT

- A. No separate payment will be made for the “Earthwork Plan” as required by this section. The cost for this portion of the Work will be considered incidental to the “Removal Action Work Plan” as described in 01400 – Removal Action Work Plan.

- B. Payment for “Upland and Riverbank Subtitle “D” Waste” will be made at the contract lump sum price stated in the Schedule of Unit Price will be full compensation for furnishing all material, labor, equipment, and tools to excavate, haul and dispose of material including loading, hauling, temporary stockpiling and covering, disposal of the material at approved disposal facility, including all fees, permits and all incidentals to complete the work.
- C. Payment for “Upland and Riverbank Additional Subtitle “D” Waste” will be made at the contract price per cubic yard as stated in the Schedule of Unit Prices and will be full compensation for furnishing all material, labor, equipment, and tools to excavate, haul and dispose of material. The unit price shall include loading, hauling, temporary stockpiling and covering, disposal of the material at approved disposal facility, including all fees, permits and all incidentals to complete the work.
- D. Payment for “Upland and Riverbank Subtitle “C” Waste” will be made at the contract lump sum price stated in the Schedule of Unit Prices. The price shall be full compensation for furnishing all material, labor, equipment, and tools to excavate, haul and dispose of material including loading, hauling, temporary stockpiling and covering, disposal of the material at approved disposal facility, including all fees, permits and all incidentals to complete the work.
- E. Payment for “Upland Re-Grading” will be made at the contract lump sum price stated in the Schedule of Unit Prices. The price shall be full compensation for furnishing all labor, equipment, materials, and incidentals necessary for the work required to achieve final site restoration including regrading as well as providing, hauling, placing and compacting backfill.
- F. Payment for “Riverbank Armor/Riprap” will be paid for per ton as stated in the Schedule of Unit Prices. The price shall be full compensation for furnishing all labor, equipment, materials and incidentals required to provide, haul, and place the material as specified.
- G. Payment for “Marina Isolated Soil Removal” will be made at the contract unit price per 4-hr duration as stated in the Schedule of Unit Prices. The price shall be full compensation for furnishing all material, labor, equipment, and tools to excavate including all incidentals to complete the work..
- H. Payment for “Marina Soil Disposal” will be made at the Contract unit price per ton as stated in the Schedule of Unit Prices. The price shall be full compensation for furnishing all material, labor, equipment, and tools to haul and dispose of material including loading, hauling, disposal of the material at approved disposal facility, including all fees, permits and all incidentals to complete the work.
- I. Payment for “Marina Riprap Restoration” will be paid for at the Contract unit price per ton as stated in the Schedule of Unit Prices. The price shall be full compensation for furnishing all labor, equipment, materials, and incidentals required to provide, haul, and place the material as specified.

End of Section

## PART 1 GENERAL

### 1.01 SUMMARY

- A. This Section specifies requirements for the open water removal of debris, sediment and man-made structures, transport, transload and disposal of dredged sediment and debris, and backfilling the dredged area to the contours shown on the Drawings. This work is to be completed within a prescribed work window and is to be completed in a public waterway with consideration given to protection of the public and separation of the work activities from the public waterway users. The work to be performed as described in this Section includes the following:
1. In-water removal of debris and approximately 8,100 cubic yards (to the design dredge prism shown on the Drawings) of Subtitle "D" waste from the Terminal 117 Early Action Area of the Lower Duwamish Waterway Superfund site, river mile 3.5 to 3.7. The bottom of the dredging surface will be sampled by the Engineer to determine if site cleanup goals have been met and cleanup cut dredging may be required based on the results of the sampling.
  2. Removal of man-made structures that include the debris deflector, the existing shoreline piling, and the South Park Marina (Marina) dock piling at the south end of Marina (northern end of the project dredging area). Man-made structures that shall be replaced include the dock piling and the debris deflector. The floating docks that were relocated to facilitate dredging activities will be returned and re-attached as applicable. These items are discussed in detail Section 02220 – Site Demolition and in Section 02488 – In-Water Structures.
  3. Backfilling the dredged area to the lines, grades, and contours shown on the backfilling plans.
- B. This is an environmental dredging project in which the important elements are:
1. Safe handling of contaminated sediment and debris
  2. Avoiding water quality impacts and minimizing resuspension and recontamination potential
  3. Maintaining close tolerances on the dredging depths and locations to minimize the volume of sediment to be disposed of in an approved upland facility.

### 1.02 REFERENCES

- A. Included as an Appendix to this specification is the Draft Water Quality Monitoring Plan (WQMP). The Contractor shall finalize the WQMP as part of the RAWP process using the draft WQMP as a basis. The Environmental Protection Agency (EPA) will administer a Water Quality Certification (WQC) which will specify the sampling program to be followed during in-water work.

1. The Contractor shall be responsible for abiding by all of the requirements listed in the WQC and the WQMP and shall be subject to all fines the Port receives as a result of the Contractor's activities not abiding by all of these requirements.
2. The Contractor shall conduct all operations in compliance with water quality criteria required by the WQC and the WQMP. The Contractor is required to implement the WQMP (including all sampling before and during dredging) and comply with the WQC. Compliance will be determined by the Engineer.
3. The Contractor shall comply with the SMC Chapter 25.08.

1.03 SUBMITTAL

- A. Dredging Plan: The Contractor shall submit a Dredging Plan as part of Section 01400 – Removal Action Work Plan. The Dredging Plan shall document the proposed equipment, means, and methods of accomplishing the dredging/removal, handling, transloading, and disposal of sediment and debris, as well as accomplishing backfilling of the dredged area.
1. The Dredging Plan shall specify the construction approaches to be used for removal of debris within the dredging area, dredging of sediment, handling of any associated debris, dewatering and transloading, and backfilling where required.
  2. The Dredging Plan shall identify the Dredging Superintendent and Dredging Operator.
  3. The Plan shall describe the proposed survey controls that will be utilized to demonstrate that dredging is being completed in accordance with the design dredging prism. The plan shall describe and define Dredge Units (DU) if they differ from the DUs shown on the Drawings. The discussion on site control shall include how pre-established control will be used on the site to accurately locate the dredging operations and what operational controls will be in place to demonstrate day-to-day location and vertical control.
  4. The Plan shall address the proposed safe handling of contaminated sediment and maintaining close tolerances on the dredging depths and the volume of sediment.
  5. The Plan shall describe in detail the water quality monitoring that will be performed to comply with the final WQMP.
  6. The Plan shall describe dewatering and transloading to the land of all dredged sediment, and debris. As a minimum, this will include turbidity control and dewatering of sediment transfer barges, product data on proposed dewatering filter media, and the transloading facility location, design, and operation.
  7. The transload facility is required to be approved by the EPA specifically for use on this project. The Contractor shall include documentation that all required permits to operate the transload

facility have been obtained by the Contactor. Demonstration that all required permits to operate the transloading facility have been obtained does not necessarily mean that the facility will be suitable to the EPA without additional modifications to the facility.

8. The Plan shall describe the Contractor's equipment, means and methods, and approaches for dredging near the riverbank to assure stabilized slope conditions for the previous upland excavation. Riverbank soil is generally to be excavated down to +2 ft MLLW using land-based equipment. Dredging will accomplish the remainder of the excavation not achieved by upland means.
  9. The Plan shall describe the Contractor's equipment, means, methods, and approaches for dredging; specific BMPs to be used during these activities to control turbidity and avoid spillage; potential equipment or operational controls that will be employed in the event of an exceedance of water quality criteria; and proposed sequencing including addressing tidal issues and equipment-specific draft requirements.
  10. The Plan shall describe the Contractor's specific approaches to avoid cross-contamination of clean areas outside of the dredge prism and clean areas that have been previously dredged as part of this project. The Plan shall specifically describe a sequencing approach that allows appropriate time for confirmation sampling by the Owner and that allows for cleanup cut dredging of areas that do not meet site cleanup criteria.
  11. The Plan shall describe how the dredging operation will accommodate the required in-water activities (including debris removal, dredging, confirmation sampling, cleanup cut dredging, backfilling, and rebuilding the removed/displaced Marina structures) while maintaining the dredging schedule.
  12. The Plan shall describe the backfilling operations including the source of the backfill, movement of backfill barges and a detailed description of backfill placement while maintaining water quality.
- B. Vessel Management Plan. The Contractor shall submit a Vessel Management Plan as part of Section 01400 – Removal Action Work Plan that documents the proposed vessels, navigation routes, and coordination of activities with waterway users (including recreational, commercial and Tribal use of the waterway). The Contractor's Vessel Management Plan shall describe the proposed vessels, navigation routes, coordination of activities with waterway users, and the methods for controlling vessel traffic during the Work. The Vessel Management Plan shall include, but shall not be limited to, the following:
1. Compliance with the Reference standards listed in Paragraph 1.02 of this Section for all vessel operations employed in the Work

2. Methods for monitoring navigation activities of others near dredging and capping activities
  3. Vessel traffic plan indicating proposed navigation routes, names, types, and dimensions of vessels accessing the slip, and projected schedule of access requirements for coordination with other waterway users
  4. Measures to coordinate with other waterway users including, but not limited to, tribal fishing, commercial transportation, and public pleasure craft including kayakers
  5. Proposed vessels, including signal lighting
  6. Moorage, anchoring, and tie-off areas.
  7. Certified tonnage displacement table for each vessel to be used for transporting imported cap materials to the Site, in accordance with Section 01200 – Measurement and Payment Procedures.
- C. Daily Dredge Reports. Prepare and maintain a Daily Dredge Report of operations and furnish a copy to the Engineer.
1. Forms proposed shall be submitted with the Contractor's Daily Construction Form submittal of the RAWP. The Daily Dredge Report shall be a part of the Contractor's Daily Construction Report.
  2. Report the date, period covered by the report, equipment used, location of areas dredged as identified by station and offset, volume of material dredged that day and to date, downtime and delays to the operations, safety issues/concerns, other relevant comments concerning the conduct of the operation, and the signature of the Contractor's dredging superintendent.
  3. Include the results of all inspections, surveys, and monitoring activities.
  4. Daily Dredge Reports are required until all dredged material has been removed and disposed of at an appropriate upland facility, the post dredge survey and confirmation sampling are completed to demonstrate compliance (including any cleanup cut dredging), and all backfilling operations, including pile removal and replacement, are completed and approved.

#### 1.04 JOB CONDITIONS

- A. The sediment to be removed is relatively soft, unconsolidated sediment and will contain debris, riprap, and other man-made and natural objects. The sediment underlying the contaminated sediment is not contaminated based upon previous sampling and site investigations. Sediment removed to achieve the lines and grades depicted on the Drawings and as a result of required cleanup passes shall be treated as RCRA Subtitle "D" waste. References characterizing the sediment to be dredged and the anticipated debris that may be encountered are included in the Appendices.

1. The Contractor shall make their own determination and conclusions regarding the nature of these materials and the methods and procedures to be utilized in performance of the work while staying within the requirements of this specification. Sediment characterization required for disposal in accordance with Section 02111 – Waste Material Disposal, beyond what is available in the Appendices shall be the responsibility of the Contractor at no additional cost to the Port.
- B. It is possible that disturbance of historical Native American materials may occur as a result of sediment dredging. The dredging crew shall be required to attend an orientation held by the site Archeologist (retained by the Port) where personnel will be made aware of the potentials of archeology within the dredging area. The Contractor will be made aware of their responsibilities during monitoring by the site Archeologist and their obligations in the case of an inadvertent discovery and they will be made aware of the inadvertent discovery plan and protocol. If any archaeological resources are discovered during removal, the Contractor shall cease dredging and proceed in accordance with the Archaeological Monitoring and Discovery Plan. Contractor shall allow access to transfer barge as requested by the Engineer to allow inspection for cultural resources.
- C. The Drawings identify the cut elevations of the design-dredge removal prism. This design-dredge prism represents the minimum amount of sediment that shall be removed from the site. Final dredging prism will be determined based on post-dredge sampling of DUs and the potential resulting requirement to perform cleanup cut dredging.
  1. The contract documents describe land-based riverbank excavation extending down to +2 ft MLLW, and sediment dredging beginning at +2 ft MLLW. However, if performance criteria are met, the Contractor may select to excavate deeper using land-based equipment.
- D. Man-Made/Other Obstructions
  1. Obstructions shall be removed and transported with any sediment to a transloading site, then delivered to a final disposal site. These obstructions include the Marina debris deflector and associated piling, the shoreline piling, the Marina float piling at the north end of the dredging area, and any other debris encountered. The debris may have contaminated sediment adhering to it, so it shall be treated as contaminated sediment for disposal purposes. The size of the debris may need to be modified to be acceptable to the disposal facility and work under this section includes proper modification to make the debris acceptable for disposal.
  2. The Contractor, during the dredging, will encounter other debris such as riprap, broken concrete, woody debris, steel pipe, old timber piling, and other natural debris that were not identified



and removed prior to start of dredging. These items shall be disposed of as contaminated sediment. Encountering such obstructions shall not be the basis for extra payment. These item costs are considered incidental to the contract and are considered to be included in the Contract Bid item for Dredging.

**PART 2 PRODUCTS**

**2.01 IDENTIFICATION**

- A. Material sources shall be those identified in the Dredging Plan. Suitable representative samples and test reports (physical and chemical) must be submitted for approval by the Engineer prior to delivery of materials to the site. The Contractor shall ensure that there is an availability of adequate and acceptable materials source, based on quantity, quality, and gradation to complete the work. All borrow sources and imported material used by the Contractor shall meet the specifications listed below.
- B. In addition to the physical and chemical characterization requirements, the Contractor shall visually inspect import material upon delivery to the site for the presence of foreign, recycled, or reprocessed materials. The presence of such materials will be cause for rejection and return to the supplier.

**2.02 BACKFILL MATERIAL**

- A. At the completion of dredging, and following bathymetric surveys and confirmatory sampling, and approval of the Engineer indicating that the dredging is complete, the Contractor shall backfill the dredged area to the lines and grades indicated on the Drawings.
- B. Sand
  - 1. The Contractor shall select materials that meet the quality requirements listed below from an existing commercial source or sources. Sand shall consist of clean, naturally occurring rounded or sub-rounded, well-graded material free from deleterious substances, having hard, strong, durable particles free from adherent coating. Bulk material shall be free of soil, clay balls, debris, wood, organic matter, and other extraneous material. Sand backfill shall be a well-graded mixture of sand meeting the following gradation requirements:

Sieve Size (U.S. Standard)	Percent Passing (by weight)
3/8 inch	99-100
U.S. No.4	95-100
U.S. No. 16	45-80
U.S. No. 30	15-55
U.S. No. 50	5-30
U.S. No. 100	2-10
U.S. No. 200	0-2.5

- 2. Aggregate shall meet the following test requirements for

quality:

Degradation Factor	15 minimum
Los Angeles Wear, 500 Revolutions	50% maximum
Bulk Specific Gravity	2.55 minimum.

### 2.03 GRADATION AND CHEMISTRY ACCEPTANCE TESTING

- A. Prior to importing materials to the site, the Contractor shall direct the completion of at least one test for every source of imported material.
- B. Materials shall be inspected by the Contractor at the site prior to placement. The Contractor shall be responsible for maintaining gradations and chemical requirements as specified. Materials that do not meet gradation or quality as herein specified will be rejected, and no payment will be made regardless of any general or provisional acceptance of materials from a source.
- C. Import material shall not be obtained from an industrial site, nor suspected to have been modified by the addition of man-produced chemicals unless specified.
- D. All costs of such tests shall be borne by the Contractor and shall be incidental to placing materials.
- E. The following physical tests of the backfill must be completed by the Contractor:
  - 1. Grain Size Distribution (ASTM D422-63)
  - 2. Degradation Factor (Washington DOD 113)
  - 3. Los Angeles Wear (American Association of State Highway and Transportation Officials Method T-96)
  - 4. Specific Gravity (American Association of State Highway and Transportation Officials Method (T-85).
- F. Chemical Acceptance Criteria:
  - 1. Contractor shall provide documentation of the source area land use and operation history and chemical composition to demonstrate that the proposed backfill is free from environmental contamination.
  - 2. Backfill analytes, reporting limits, methods and criteria:

Analyte	Unit	Analytical Method	Reporting Limit	Criteria
<b>PCB Aroclors</b>	µg/kg dw	EPA 8082	4	ND
<b>Semi-volatile organic compounds (SVOCs)</b>	µg/kg dw	EPA 8270	20 <sup>a</sup>	ND
<b>Dioxins/Furan TEQ</b>	ng/kg dw	EPA 1613	1	4
<b>Arsenic</b>	mg/kg dw	EPA 6010	5	7.3
<b>Cadmium</b>			0.2	2.5
<b>Chromium</b>			0.5	130
<b>Copper</b>			0.2	190
<b>Lead</b>			2	225
<b>Silver</b>			0.3	2.
<b>Zinc</b>			1	205
<b>Mercury</b>	mg/kg dw	EPA 7471	.02	0.2
<b>Diesel range hydrocarbons</b>	mg/kg dw	NWTPH-Dx	5	ND
<b>Lube oil range hydrocarbons</b>			10	ND

Notes: ND = not detected at reporting limit; TEQ = toxicity equivalent. Most SVOCs, such as PAHs, have reporting limits of 20 µg/kg dw. Some SVOCs have higher reporting limits: 2,4-dimethylphenol – 35, 4-methylphenol –35, benzoic acid – 400, bis(2-ethylhexyl)phthalate - 30, hexachlorobutadiene –90, diethylphthalate – 50, pentachlorophenol – 200.

- G. Material may not be shipped to the site for backfill purposes until it meets the criteria described in this Section.

**PART 3 EXECUTION**

**3.01 DREDGING AND BACKFILL**

- A. The Contractor shall conduct the Work in accordance with the EPA-approved final RAWP. The Contractor shall notify the Engineer at least 14 days prior to commencing dredging.
- B. Work shall be conducted to minimize the dispersion or resuspension of sediment.
- C. All in-water activities shall be completed in accordance with the Vessel Management Plan and in accordance with USCG Instruction Manual M16672.2D, Navigation Rules International-Inland, and most recent version. These requirements apply to all in-water activities conducted by the Contractor.
  - 1. In the event that the Contractor’s construction equipment (dredges, barges, work boats, anchor buoys, etc.) obstructs any channel or berthing areas as to make difficult or endanger the safe passage of vessels, said equipment shall be immediately moved on the approach of any vessel to such an extent as may be necessary to afford a practical and safe passage.
  - 2. The Contractor shall cooperate with other waterway users and

shall coordinate directly with the Engineer and other waterway stakeholders for access and timing of operations. The schedule and the Contractor's RAWP shall take into account such anticipated interruptions to the Contractor's operations.

- D. Based on the Interlocal Agreement between the Port and The Muckleshoot Tribe, there may be restrictions on day or night time operations, should a conflict with tribal treaty fishing occur. The Contractor shall incorporate allowances for downtime or decreased productivity due to conflicts with tribal fisheries into the construction schedule. The Contractor shall be responsible for fines and compensation for net damage that they cause.
- E. All in-water obstruction removal, dredging, cleanup cut dredging, backfill/sediment cover shall be performed during the period of December 1, 2013 through February 15, 2014, or as allowed by the resource agencies.
- F. Removal of existing piling, debris, or other known obstructions in each DU will be accomplished prior to start of dredging in that DU. Occasional presence of submerged debris will require immediate notification of condition to the Engineer. The Engineer will make the determination for continued dredging with existing equipment, or change of operation to facilitate removal of debris.
- G. Dredging to attain the final design elevations shall proceed from the top of the slope downward and generally from the upstream end of the site to the downstream end of the site. Extreme care must be taken to avoid undercutting and over-steepening the slope. Over-excavation (in excess of the allowable 1 foot over-dredge amount) shall be brought to grade with approved fill material. Under no circumstances will backfilling with dredged material be allowed.
- H. Dredging will be conducted adjacent to the Marina floating docks and supporting piles. Exercise care when conducting dredging and support activities in the vicinity of the docks and boats so as not to damage or otherwise disturb these facilities except for where relocation of the facilities is allowed on the drawings. Any damage to the existing facilities/boats/docks that is caused by the Contractor's operations, as determined by the Engineer, shall immediately be repaired to the pre-project conditions at the Contractor's expense.
- I. After completion of the specified DU identified in the Dredge Plan (initial cut) and after surveying has confirmed the dredging has achieved the complete removal of the dredge prism shown on the Drawings, the exposed sediment surface will be sampled by the Engineer to confirm the removal of contaminants to the required cleanup goals.
  - 1. If the samples meet the required cleanup goals:
    - a. The DU remedial dredging will be approved, as complete.
    - b. The volume of the dredged area will be calculated by

the Engineer and will be the volume of the dredge prism indicated on the Drawings and any material that has been removed within an allowable 1 foot over-dredge amount.

- c. The dredged area will be backfilled to the lines and grades shown on the Drawings.
2. If sampling and testing of the specified DU following the initial cut dredging does not meet the cleanup goals, a first cleanup cut dredging of either the entire DU or of either the nearshore or offshore half of the DU, depending upon the degree of cleanup goal exceedance(s), will be conducted. The Engineer will provide the required finished elevation of the first cleanup cut dredging and will perform sampling of the dredged surface upon notification by the Contractor and demonstration by the Contractor that the dredged surface is at the elevation as prescribed by the Engineer. A 1-foot payable over-dredge will be allowed below the elevation prescribed by the Engineer for the first cleanup cut. If the sampling results indicate that the site cleanup goals have been met for the area of the first cleanup cut, the area shall be completed as described above. If the site cleanup goals have not been met by the first cleanup cut, a second cleanup cut will be required.
  3. If a second cleanup cut is required, the Engineer will determine the required finished elevation to be dredged for completion of a second cleanup cut. The elevation will include a payable over-dredge limit of 1 foot below the second cleanup cut dredging elevation. The Engineer will sample the surface remaining after the second cleanup pass. No additional dredging will occur after the second cleanup pass dredging.

### 3.02 CONFIRMATION SAMPLING

- A. Upon completion of dredging in a DU (or nearshore or offshore half of a DU as may be the case for cleanup cut dredging), the Contractor shall notify the Engineer in writing that all of the dredging in that DU is complete. Part of this notification shall include a bathymetric survey demonstrating that the required sediment has been removed. Confirmation samples will be collected by the Engineer, and the Contractor will be notified within 3 days (excluding Sundays and Holidays) whether the cleanup goals have been met or whether additional dredging will need to be completed. The Contractor will continue dredging and working in other DUs while sample procurement and testing is completed.

### 3.03 BACKFILL

- A. Backfill material will be placed on the bed over the dredged area after approval of dredging.
  1. Backfill shall be placed using best management practices so as to limit disturbance to the clean sediment surface, and to limit any washing of silt from the backfill during placement, and to

limit grain size segregation of the backfill.

2. Backfill shall be placed by releasing the backfill from the placement bucket within 2 feet of the sediment surface.

#### 3.04 DREDGING EQUIPMENT

- A. Dredging shall be completed by mechanical dredge. The bucket shall be an environmental (closed) bucket that completes level cuts. The equipment will be designed and operated to minimize the development of dredge residual material and to minimize turbidity in the water column. The material dredged will be placed on a haul barge for transport to the offloading site. A conventional dredge bucket may only be used with Engineer approval if the environmental bucket is demonstrated to not be effective for the site conditions.
- B. Debris removal may be performed using a grapple or a conventional open bucket for removal of near surface debris prior to initiation of closed bucket dredging of finer grain sediment.
- C. The mechanical dredge will be equipped with RTK-GPS survey control that allows horizontal control of +/- 0.5 feet accuracy and vertical control of +/- 0.5 feet.
- D. The haul barges shall be of adequate size and depth to effectively allow decanting of free water during dredging.

#### 3.05 HAUL BARGE DEWATERING

- A. The general approach for haul barge dewatering on the project shall include passive dewatering from the barge during loading and during a required 8-hour resting period when the barge sits over the sediment remediation area. The 8-hour resting period shall start after the barge is filled with sediment with the resting haul barge located over the sediment removal area but not over areas that have been backfilled.
- B. A dewatering for the haul barges shall be described in the Dredge Plan developed by the Contractor. The Dredge Plan shall describe how the decant water will be managed during dredging, resting, transport, removal, and disposal. The Contractor may dewater from a flat-deck barge or scow that is equipped with sideboards and scuppers located around the perimeter of the deck line as long as the barge is within the sediment area. The sediment could be slightly heaped to promote drainage of excess water to the scuppers, but in no case will overtopping of the barge sideboards be allowed. The barge scuppers or the slots between the sideboard that will be used for drainage will be covered with filter fabric (woven geotextile fabric with apparent opening size between #30 and #100 US sieve size or approved equivalent) or other approved materials to filter and retain sediment while allowing water to drain into the water over the sediment area.
- C. Monitoring water quality during barge dewatering shall comply with the WQC, and the approach shall be specified in the WQMP.

- D. The filtration of the decanted water prior to discharge to the waterway must result in acceptable water quality/turbidity conditions as required by the WQC and WQMP. Decanted water may only be discharged to the waterway within the footprint of the T-117 sediment area. Water may not be discharged from the barge when it is en route to the transloading facility.

### 3.06 TRANSLOAD, TRANSPORT, AND DISPOSAL OF DREDGED MATERIAL

- A. The dredged sediment placed in the haul barge will be transported to a barge offloading site to be determined by the Contractor where it will be removed, rehandled, and placed onto trucks or railcars for ultimate disposal. The facilities planned for use for transload, transportation, and ultimate disposal shall be selected by the Contractor, detailed in the Transportation and Disposal Plan as part of the RAWP, and these operations shall require and have the appropriate permits for operation. The facilities will then need to be approved by EPA as part of the RAWP approval process. The fact that a facility has all operating permits does not guarantee that EPA will approve a facility without modifications.

### 3.07 RANGES, GAGES, AND HORIZONTAL/VERTICAL CONTROL

- A. The Contractor shall establish and protect benchmarks, survey control points, existing structures, floats, gangways, and riprap from dredging equipment and vessel traffic.
- B. The Contractor shall furnish, set, and maintain in good order all ranges, buoys, and other markers necessary to define the Work and to facilitate inspection. The Contractor shall also establish and maintain gages (tide boards) in locations where they may be clearly seen during operations and inspection.
- C. The Contractor shall use RTK - GPS method of horizontal control to required standards. Contractor shall use the dredging control points established on the drawings to demonstrate during dredging that control of the dredging operations is being maintained. The proposed method and maintenance of the horizontal control system shall be subject to the approval of the Engineer. If at any time the method fails to provide accurate location for the dredging operation and fails to meet the Engineer's inspection expectation, the Contractor may be required to suspend dredging operations and submit a revised horizontal control plan. Layout all Work using horizontal and vertical measurements from control points as indicated on the drawings. The accuracy of all measurements taken from these points is the Contractor's responsibility. Furnish and maintain all stakes, templates, platforms, equipment, range markers, transponder stations, and labor as may be required to lay out the Work from the control points or features shown on the Drawings. Maintain all points established of the Work until authorized to remove them.

### 3.08 PROGRESS CHECK AND COMPLETION SURVEY.

- A. Daily soundings or sweepings shall be made and included in the contractors daily progress reports.
- B. Bathymetric survey shall be made by the Contractor as each DU section is completed. Survey shall be performed in accordance with Section 01722 – Surveying. The contractor shall submit verification to the Engineer demonstrating that they have met the lines and grades shown on the drawing. Submittal shall consist of plans or sections comparing the design surface and the completed dredge surface. In the event the slope requires cutting to bring it to the design slope or depth, the Contractor shall correct these defects to his satisfaction and proceed with placing the fill.

#### PART 4 MEASUREMENT AND PAYMENT

##### 4.01 MEASUREMENT

- A. Measurement for the initial cut dredging will be as a Lump Sum (LS) for complete removal of the sediment within the design dredge prism as shown on the drawings and shall include an allowable 1-foot over-dredge amount within the LS. Material removed below the allowable over dredge or outside of the prescribed dredge prism will be subtracted from the LS paid to the Contractor.
- B. Measurement for first and second cleanup cut dredging will be measured per hour of dredging to a depth prescribed by the Engineer plus material within a 1-foot allowable over-dredge depth. A demonstration the cleanup pass dredging is complete will be based on the hydrographic survey of the actual post dredge bottom of the DU (or portion thereof) and the elevation prescribed by the Engineer for the cleanup cut dredging. A payable overdredge limit of 1-foot below the required dredge elevation prescribed by the Engineer will be allowed. Independent surveys will be accomplished in accordance with Section 01722. Material removed below the allowable overdredge or outside of the prescribed dredge prism will be subtracted from the amount paid to the Contractor for the cleanup pass dredging.
- C. Measurement for Sediment Backfill will be by the ton using the approved barge displacement or belt scale method. Clean fill cover placement will be monitored and confirmed by hydrographic survey and/or lead line soundings completed before placement and after placement. Cover material will be placed within plus 1.0 foot or minus 0.5 feet of bed elevations shown on the Drawings.
- D. Measurement for Disposal of dredged material will be by the ton delivered to the transload facility using the barge displacement method.
- E. Barge Displacement and Belt Scale Methods
  - 1. No barge shall be used in the Work until a tonnage displacement table certified by a registered professional engineer or naval architect has been furnished by the



Contractor and approved by the Engineer. Each barge shall be plainly marked by a distinctive number, letter, or name that shall not be changed or given to any other barge during the period of the Contract. A barge load data sheet shall include light and loaded draft readings at each corner of the barge, the resulting gross, tare, and net tonnages, resulting net volume, and times when the loading began and was completed. The data sheet, when completed, shall be signed and dated by the Contractor.

2. Displacement measurements shall be made at a point of delivery immediately prior to unloading, during unloading (as specified above), and immediately upon completion of unloading. All measurements shall be made in the presence of the Engineer. The Contractor shall give the Engineer at least one working day advance notice of barge deliveries. The Engineer will record barge measurements for payment quantity purposes before unloading starts.
3. If the belt scale method is approved by the Engineer, the Contractor shall furnish the Engineer with documentation of calibration and certification of the belt scale, and a weight ticket from the material supplier for each barge load of material. No unloading of material will be permitted until the Engineer has approved the weight ticket.

#### 4.02 PAYMENT

- A. No separate payment will be made for the "Dredging Plan", the "Water Quality Monitoring Plan", or the "Vessel Management Plan" as required by this section. The cost for this portion of the Work will be considered incidental to the "Removal Action Work Plan" as described in 01400 – Removal Action Work Plan.
- B. Payment for "Offshore Subtitle "D" Waste: Dredging" will be made at the contract lump sum price as stated in the Schedule of Prices and will be full compensation for all labor, materials, equipment and incidentals required to complete debris removal and the initial cut dredging as specified.
- C. Payment for "Additional (Cleanup Pass) Offshore Subtitle "D" Waste: Dredging" will be made at the contract unit price per hour as stated in the Schedule of Prices and will be full compensation for all labor, materials, equipment and incidentals required for first and second cleanup cut dredging as specified.
- D. Payment for "Sediment Backfill" will be made at the contract unit price per ton as stated in the Schedule of Prices and will be full compensation for all labor, materials, equipment and incidents required for procurement, characterization, import, handling, transport, and placement of backfill as specified.
- E. Payment for "Offshore Subtitle "D" Waste: Disposal" will be made at the contract unit price per ton as stated in the Schedule of Prices and will be full compensation for all labor, materials, equipment and

incidents required for transport, transload and disposal of the initial cut and first and second cleanup cut dredging as specified.

- F. Final quantity payment will be subject to deductions or corrections of deductions previously made due to material removed beyond the lines and grades shown on the Drawings or disposal of material in an unauthorized manner. The deduction for material removed below the allowable over dredge limit on the initial cut or any of the cleanup cuts will be calculated by obtaining the volume of the material removed below the allowable over dredge limit and performing the following:
1. If the excess material is from the initial cut LS dredging, subtracting an amount equal to the total LS for initial cut dredging divided by the total in place volume in the contract multiplied by the excess volume above the over dredge amount. This same excess volume will be multiplied by 1.6 to obtain a weight of the material outside of the dredged prism which will be multiplied by the unit cost for sediment handling and disposal to be subtracted from the disposal costs to account for the extra material removed.
  2. If the excess material is from a cleanup cut unit cost dredging activity, the excess volume will be multiplied by a unit cost derived from the LS initial dredging and subtracted from the contract value. This same excess volume will be multiplied by 1.6 to obtain a weight of the material outside of the dredged prism which will be multiplied by the unit cost for sediment handling and disposal to be subtracted from the disposal costs to account for the extra material removed.

End of Section

PART 1 GENERAL

1.01 SUMMARY

- A. This Section specifies instrumentation and settlement monitoring required to monitor earthwork and structures adjacent to the Terminal 117 Site and elsewhere for the Project.

1.02 SUBMITTALS

- A. Settlement Monitoring Plan.
- B. Existing condition survey and photo documentation of the surrounding buildings and structures.
- C. As-Built Surveys.
- D. Monitoring Data.

1.03 DEFINITIONS

- A. Optical Survey Monitoring: Precise field measurements using survey techniques for determination of elevations, coordinates, and distances for performing geotechnical monitoring.
- B. Settlement Points:
  - 1. Fixed markers placed on utilities, structures, pavements, and curbs for the purpose of monitoring changes in elevations of existing ground, new and existing structures, and existing utilities.
  - 2. Monitored by optical survey methods to determine vertical or horizontal displacements.
- C. Action Level: Specified amount of measured movement at which point action shall be taken to the excavation and construction operations.

1.04 SETTLEMENT MONITORING PLAN

- A. This plan shall be developed by the Contractor's Shoring Design Engineer and shall be submitted as part of Section 01400 – Removal Action Work Plan. Additional monitoring (points, frequency etc.) may be required by the Contractor's shoring designer beyond what is depicted in this Section. Requirements in this Section should be considered to be minimum requirements.
- B. Schedule and outline of procedures and timing for installation and performance of monitoring:
  - 1. Schedule to include summary table for all instrument installations by number and location and to include detailed monitoring timetable as follows:
    - a. Schedule for each installation.
    - b. Initial baseline monitoring schedule.
    - c. Schedule for monitoring commencement and schedule of monitoring for each settlement point.
  - 2. Data review process for comparison to indicated Action Levels.

- C. Specifications and installation procedures for each type of settlement point.
  - D. Detailed plan of locations.
  - E. Details including casing, covers, and grout backfill.
  - F. Certification: Manufacturer's certification that products, materials, and equipment furnished meets the specified requirements.
  - G. Data, (i.e. Easting and Northing coordinates, Elevation, etc.) for each settlement point.
  - H. Corrective Action Plan:
    - 1. Details of actions to be taken in the case of settlement exceeding the Action Levels indicated in this Section.
    - 2. Details of actions to be taken in the case of movement exceeding the limit of movement indicated.
    - 3. Include operational changes to reduce the rate of soil movement, settlement, or heave.
    - 4. The Corrective Action Work Plan shall be submitted prior to any excavation adjacent to the South Park Marina (SPM) buildings and shall include a list of potential Contractor activities that may induce settlement and the proposed corrective actions should the Action Levels be exceeded.
- 1.05 EXISTING CONDITIONS SURVEY
- A. The Contractor shall provide an existing conditions survey and photo documentation of the SPM buildings and structures adjacent to the Site.
- 1.06 AS-BUILT DRAWINGS
- A. Settlement points on a maximum scale of 1-inch equals 20-feet, and elevation and Easting and Northing coordinates.
- 1.07 MONITORING DATA
- A. Obtain data in accordance with schedule indicated on the Drawings and in this Section.
  - B. Prepare data plots, review reports and plots for accuracy and completeness, and submit paper copies of data reports and plots from monitoring points within four hours of taking the monitoring data and readings.
- 1.08 DESIGN CRITERIA
- A. Tolerances:
    - 1. Establish the initial elevations of settlement points to 0.01 foot.
    - 2. Record the subsequent elevations of settlement points to 0.01 foot.
    - 3. Achieve level circuit closure with an error of closure of 0.017N-feet or less, where N is the circuit distance in miles.
    - 4. Establish the initial horizontal coordinates of settlement points to 0.01 foot.
- 1.09 AVAILABILITY OF DATA

- A. Do not disclose data reports and all other unprocessed data, readings, and observations to third parties.

1.10 RIGHT OF ENTRY

- A. Right of entry to SPM property as indicated in the SPM access agreement conditions shall be coordinated through the Engineer.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Provide instrumentation reading devices, fixtures, cables, and necessary software for the various monitoring systems.
- B. Access covers for settlement points:
  - 1. Frame: Heavy-duty steel or cast iron construction.
  - 2. Lid:
    - a. Solid.
    - b. Steel or cast iron.
    - c. Locking (requiring a flush surface entry).
    - d. Gasketed.
  - 3. Dimensions: Appropriate to instrumentation requirements.

PART 3 EXECUTION

3.01 GENERAL

- A. Install settlement points as indicated and as close as practicable to the locations and sequence indicated on the Drawings. Adjust for the actual conditions in the field.
- B. Exact locations of settlement points shall be field-determined and shall be approved by the Engineer prior to installation.
- C. Verify location of buried utilities before installation.
- D. Install access covers to protect installed settlement points as identified on the Drawings.
- E. Provide as-builts within five days of installation.

3.02 PROTECTION AND MAINTENANCE

- A. Keep protective access covers in place at all times other than during manual monitoring and maintenance.
- B. Replacement settlement points shall be available within 24 hours for repair and replacement of existing installed settlement points.
- C. Repair or replace damaged or missing settlement points as required for operation within 24 hours of detection of damage.

3.03 MONITORING

- A. Monitor and report all settlement points as indicated on the Drawings.
- B. Make initial readings on all settlement points:

1. Three complete sets of baseline measurements and readings shall be taken at all of the settlement points indicated on the Drawings.
  2. Baseline readings shall be comparable and equal.
- C. The frequency of readings shall increase where Action Levels are reached.

3.04 MONITORING LIMITS AND ACTION LEVELS

- A. Conduct all work in a manner such that ground movement and settlements do not exceed the maximum allowable limits indicated on the following table:

1. Performance Monitoring and Action Level Requirements

Structure	Action Level	Limit (inches)
Ground Surface adjacent to the Project Site (Dallas Ave, etc.)	First	0.6
	Maximum	1
Buildings	First	0.3
	Maximum	0.5
Sheet Pile Wall	First	1.2
	Maximum	2

B. Action Levels:

1. First Action Level – If the first action level limit on any settlement point is reached, the following actions shall be taken by the Contractor:
  - a. Identify the cause of movement.
  - b. Notify the Engineer.
  - c. Implement the Corrective Action Plan within two hours of trigger level exceedance or notification.
  - d. Make modifications to construction procedures and means and methods as required by corrective actions.
  - e. Notify the Engineer in writing of the level of movement and settlement and the corrective actions being taken.
  - f. Double the monitoring frequency.
  - g. Verify success of corrective actions and report to Engineer.
  - h. If corrective actions are not successful, modify all related operations and repeat process listed above.
2. Maximum Level - If the maximum action level limit on any settlement point is reached, the following actions shall be taken by the Contractor:
  - a. Identify the cause of movement.
  - b. Notify the Engineer.
  - c. Implement the Corrective Action Plan immediately.

- d. Make modifications to construction procedures and means and methods as required by corrective actions.
- e. Notify the Engineer in writing of the level of movement and settlement and the corrective actions being taken.
- f. Double the monitoring frequency.
- g. Verify success of corrective actions and report to Engineer.
- h. If corrective actions are not successful, modify all related operations and repeat process listed above.

3.05 REMOVAL OF GEOTECHNICAL SETTLEMENT POINTS

- A. The timing of the removal of settlement points shall be following the completion of monitoring and as approved by the Engineer.
- B. Restore disturbed or damaged surfaces to the conditions existing before installation of any instrumentation or settlement points.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. No separate measurement will be made for "Earthwork Instrumentation and Monitoring".

4.02 PAYMENT

- A. No separate payment will be made for the Work as required by this section. The cost for this portion of the Work will be considered incidental to, and included in, the payments made for ~~"Upland and Riverbank Subtitle "D" Waste"~~the applicable bid items in the Schedule of Unit Prices bid for this project.

End of Section

PART 1 GENERAL

1.01 SUMMARY

- A. This section specifies requirements for the installation of the steel sheet pile barrier wall. The Contractor shall build the barrier sheet pile wall according to the design as outlined on the Drawings and the installed wall will remain in place after the Contract. The Contractor shall use block nets during sheet pile wall installation to keep fish out of the area of wall installation and from becoming trapped behind the wall. Sheet pile used for temporary excavation support elsewhere on site, shall conform to the requirements of Section 02217 – Contractor Designed Excavation Support. Sheet pile barrier wall shall be installed during low tides, between June 15 and September 30, 2013.
- B. The work to be performed under these specifications, includes by not limited to, the following:
  - 1. Procure sheet piling
  - 2. Driving sheet piling
  - 3. Staging sheet pile
  - 4. Excavation, removal, and disposal of all materials and obstructions of whatever nature encountered that interfere with the driving of the sheet piling within the top 10 feet of the installation.

1.02 REFERENCES

- A. Standards
  - 1. ASTM A6/A6M-11-Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.
  - 2. ASTM A572/A572M-07-Standard Specification for High-Strength, Low-Alloy Columbium-Vanadium Structural Steel.
- B. Qualifications
  - 1. Welder: Currently certified by American Welding Society (AWS)
  - 2. Competent Person: The Contractor shall have a competent person, as required by WAC 296-155-650 (2f) on the site at all times to properly evaluate sheet pile installations. This person shall have a minimum of five years of heavy construction experience driving sheet piles and monitoring sheet pile installation on projects similar to this project.

1.03 SUBMITTALS

- A. The Contractor shall submit a Sheet Pile Driving Plan as part of Section 01400 – Removal Action Work Plan (RAWP). The plan shall include:
  - 1. Resume of experienced sheet pile driving competent person, to include years of experience, project and company information, and references.
  - 2. Material Test Reports
    - a. Certified materials tests reports showing sheet piling and appurtenant metal materials meet the specified requirements shall be submitted for each shipment and identified with specific lots prior to installing materials.



- b. Material test reports shall meet the requirements of ASTM A6/A6M-11 for all Contractor-supplied shoring components.
- 3. Pile Driving Schedule, Equipment and Procedures
  - a. Include pile driving schedule, methods to be utilized including templates and driving sequences, and contingency plan for difficult driving conditions. Specific attention shall be made to address sheet pile driving in windy conditions.
  - b. Detail of installation method for sheet pile joint sealant
  - c. Pile Driving Equipment Schedule. This submittal is not for Port approval but is intended to provide information as to the equipment the Contractor shall use for driving/vibrating the piling. The Contractor shall be responsible for ensuring the equipment selected is properly sized for the anticipated driving conditions.
    - (1) Complete descriptions of sheet piling driving equipment including vibratory hammers, pile templates, pile threaders, extractors, protection caps and other installation appurtenances shall be submitted for review prior to commencement of work.
    - (2) The vibratory pile driving hammer shall be variable moment and variable frequency with maximum moment and amplitude matched to the site and sheet pile conditions. Pile driving equipment submitted by the Contractor shall be designed by a person experienced in matching adequate sheet pile driving equipment to the sheet pile provided on the project, and to the anticipated driving conditions at the site. Consideration shall be given to the weight of the piling to be driven, the soil conditions at the site, the groundwater conditions at the site, the proximity of residential and commercial structures to the shoring walls, the possibility of difficult driving conditions, the construction schedule and the length of wall being installed.
- B. Driving Records
  - 1. A sample sheet pile driving record shall be submitted to the Engineer for acceptance, prior to the start of pile driving.
  - 2. Records of the sheet piling driving operations shall be submitted as part of the Contactor's Daily Construction Report each day after driving is completed. These records shall provide a system of identification which shows the disposition of approved piling in the work, driving equipment performance data, piling penetration rate data, piling dimensions, and top and bottom elevations of installed piling.

#### 1.04 JOB CONDITIONS

- A. The Contractor shall anticipate encountering interfering riprap, large boulders, abandoned timber, and other subsurface obstructions within 10 ft of the final ground elevation (mudline). The Contractor shall employ accepted obstruction clearing methods as required to install piles without damage and allow for proper alignment and location.

- B. Geotechnical Report:
1. Geotechnical data used in the design are based on information presented in "Terminal 117 Geotechnical Data Report", dated September 2011, by Jacobs Associates. The complete report is among the documents provided with the Appendices.
  2. Neither the Port nor the Geotechnical Engineer can warrant that subsurface conditions will not vary in areas immediately adjacent to those that have been assessed. The Contractor shall make his own risk assessment based on the incomplete soils information presented in the report and his own interpretation, deduction, or conclusion regarding the nature of the materials and subsurface soil conditions that may be indicated or implied by the plans, specifications, and geotechnical report.
- C. Varying Driving Conditions: The Contractor shall make his own determinations and conclusions regarding the methods and procedures to be used in performing the work.
1. There will be no extra compensation for varying driving conditions caused by localized variations in surface or subsurface conditions.
  2. Noise Ordinance: The Contractor shall comply with the City of Seattle Noise Ordinances for pile driving and other construction noise which include the following:
    - a. Noise to residential receiving properties shall not exceed 85 dB(A) between the hours of 7:00 am and 10:00 pm weekday, 9:00 am and 10:00 pm weekends. For night time hours, noise shall not exceed 75 dB(A). For the same time periods, noise received at commercial properties (South Park Marina) shall not exceed 90 dB(A) and 80 dB(A), respectively. For certain short-duration construction activities, the Maximum Permissible Sound Levels may be exceeded as follows:
      - 5 dB(A) for 15 minutes in any 1-hour period
      - 10 dB(A) for a 5 minutes in any 1-hour period
      - 15 dB(A) for a 90 seconds in any 1-hour period.
    - b. During pile driving, sound measured at the receiving property line or 50 feet from the equipment, whichever is greater, may exceed the performance criteria in any 1-hour period between the hours of 8:00 am and 5:00 pm on weekdays and 9:00 am and 5:00 pm on weekends. But in no event may the sound level exceed:
      - 90 dB(A) continuously
      - 93 dB(A) for 30 minutes
      - 96 dB(A) for 15 minutes
      - 99 dB(A) for 7 1/2 minutes
    - c. The Contractor shall use a Bubble Curtain to mitigate underwater sound, as described in Section 02460 Steel Piles.4. The Contractor should consult chapter 25.08 of the Seattle Municipal Code or contact the City of Seattle Department of Planning and Design for

specific information including maximum permissible sound levels and sound duration.

**1.05 SUPPORT SYSTEM REQUIREMENTS**

- A. The installation and monitoring of the sheet pile shoring system shall be accomplished in such a manner as to maintain the required excavation section and to maintain the stability of the soils below and adjacent to the shoring.

**1.06 EXCAVATION MONITORING**

- A. The Contractor shall monitor sheet pile shoring installation activity in accordance with Section 02340-Earthwork Instrumentation and Monitoring

**PART 2 PRODUCTS**

**2.01 METAL SHEET PILING**

- A. Metal sheet piling supplied by the Contractor shall consist of hot-rolled, Grade 50 Z-sheet pile sections of varying lengths.
  - 1. Arcelor Mittal AZ38-700N
  - 2. Gerdau PZC 37
  - 3. or equal.

The Contractor shall furnish and install all other components of the system.

**2.02 JOINT SEALANT**

- A. Joint sealant, shall be a single component, hydrophilic paste specifically designed to be used in water-stop and repair applications that can be applied uneven surfaces. The sealant shall be installed in accordance with the manufacturer's recommendations and shall be:
  - 1. Adeka Ultraseal P-201
  - 2. De neef Swellseal waterstops for sheet piles
  - 3. or an approved equal.

**2.03 BLOCK NETS**

- A. Contractor shall utilize block nets during sheet pile installation for fish exclusion. The block net shall be a 3-centimeter knotless nylon mesh beach seine, or approved equal.

**2.04 TESTS, INSPECTIONS, AND VERIFICATIONS**

- A. Requirements for material tests, workmanship and other measures for quality assurance shall be as specified.
  - 1. Sheet piling and appurtenant materials shall be tested and certified by the manufacturer to meet the specified chemical, mechanical and section property requirements prior to delivery to the site. Testing of sheet piling for mechanical properties shall be performed after the completion of all rolling and forming operations.

**2.05 DELIVERY, STORAGE, AND HANDLING**

- A. Materials delivered to the site, shall be undamaged and shall be accompanied by certified test reports. The manufacturer's logo and mill identification mark shall be

provided on the sheet piling as required by the referenced specifications. Care shall be taken during transport and storage so the piles are not damaged.

- B. Contractor shall supply an adequate number of sheet piles and corner pieces for the sheet pile locations as shown on the Drawings.
- C. The Contractor shall supply and install all other components of the shoring walls including any additional accessories from the manufacturer, if needed.
- D. The sheet piling shall be staged at the locations determined by the Contractor. Contractor-supplied piles shall have picking holes cut in the tops of the piles. The Contractor shall handle the sheet pile in a manner recommended by the manufacturer to prevent permanent deflection, distortion or damage to the interlocks. Any damage that does occur shall be drawn to the attention of the Engineer and the Contractor shall submit their proposal for remedial works for acceptance by the Engineer prior to commencement. The repairs or replacement shall be made at the Contractor's expense.

#### 2.06 PILE DRIVING EQUIPMENT

- A. Pile Hammers: Hammer selection shall be the responsibility of the Contractor. The hammer used shall have a delivered energy suitable for the total weight of the pile, the character of subsurface material to be encountered, and the pile capacity to be developed. The driving/vibrating energy of the hammer shall be sufficient to drive the steel piling to the respective tip elevations shown on the plans. Pile Hammers and all related equipment shall be inspected by the Contractor prior to use, and shall not be allowed on the project site if visible leaks are detected.
- B. Use a vibratory hammer of an approved type with a capacity at least equal to the hammer manufacturer's recommendation for the total weight of pile and character of subsurface material to be encountered. The piles shall be vibrated to the indicated tip elevation.

### PART 3 EXECUTION

#### 3.01 INSTALLATION

- A. Contractor shall coordinate installation of shoring systems as shown on the Drawings.
- B. Pile Driving Equipment and Operators
  - 1. All vibratory pile driving equipment shall be inspected prior to use on the Project site for proper operation, condition, leaks, etc. and conform to the following requirements:
    - a. Impact hammers will not be allowed without prior approval of the Engineer.
  - 2. All equipment operators shall be experienced for the equipment they are operating and shall conduct daily inspections of their equipment prior to operating.
- C. Marking
  - 1. The piling shall be marked with a line at 1-foot increments starting at the bottom of the pile with a waterproof white or yellow marker. Depth labels shall be placed at 5-foot increments next to the appropriate line, beginning at the bottom of the pile.

D. Placing

1. Holes shall not be burnt or drilled nor lifting brackets welded to the sheet piling without prior approval of the Engineer.
2. Pilings shall be placed plumb with out-of-plumbness not exceeding 1/8 inch per foot of length.
3. Temporary wales, templates, or guide structures shall be provided to ensure that the piling are placed and driven to the correct alignment. At least two templates shall be used in placing each pile and the maximum spacing of templates shall not exceed 20 feet.
4. Variation from the proposed alignment shall not exceed one foot horizontally unless approved by the Engineer.
5. When placing sheets, "riding" of sheet piles (even with stirrups and full body harness) shall not be permitted. A sheet pile mechanical pile threader shall only be used due to the windy conditions, unless otherwise directed by Engineer.

E. Driving

1. Pilings shall be installed with the proper size hammer and by methods accepted by the Engineer so as not to subject the pilings to damage and to ensure proper interlocking throughout their lengths.
2. Driving hammers shall be maintained in proper alignment during driving operations by use of leads or guides attached to the hammer.
3. Caution shall be taken in the sustained use of vibratory hammers when a hard driving condition is encountered to avoid interlock-melt or damages. The use of vibratory hammers should be discontinued and the Engineer notified when the penetration rate is one foot or less per minute.
4. Pilings damaged during driving or driven out of interlock shall be removed and replaced at the Contractor's expense.
5. Adequate precautions shall be taken to ensure that pilings are driven plumb. If at any time the forward or leading edge of the piling wall is found to be out-of-plumb, in the plane of the wall, the piling being driven shall be driven to the required depth and tapered pilings shall be provided by the Contractor and driven to interlock with the out-of-plumb leading edge or other corrective measures accepted by the Engineer shall be taken to ensure the plumbness of succeeding pilings. Tapered piling shall be supplied by the Contractor only after acceptance by the Engineer.
6. Pilings in each run or continuous length of piling wall shall be driven alternately in increments of depth to the required depth or elevation. No piling shall be driven to a lower elevation than those behind it in the same run except when the pilings behind it cannot be driven deeper. If the piling next to the one being driven tends to follow below final elevation it may be pinned to the next adjacent piling. During hard driving conditions, sheet piling shall not be advanced at greater than 4 feet drive lengths per application of impact.
7. The Contractor shall have a dedicated excavator onsite during sheet pile driving to remove obstructions in the path of the sheet piling. The

excavator will be capable of removing a two ton obstruction up to 10 feet below the ground surface. The Contractor shall notify the Engineer of obstructions that restrict driving a piling to the specified penetration depth immediately upon detection. The Contractor shall then evaluate if the obstruction can be removed. With concurrence of the Engineer, the Contractor shall immediately begin to remove the obstruction. If the obstruction is not removed within 20 minutes of effort, the Engineer will direct the Contractor to either continue working to remove the obstruction, to leave the sheet pile in place at its current depth, to attempt to drive the pile at a later time, or to grout the window.

8. Pilings shall be driven to the minimum depths shown on the Drawings.
9. The sheet pile shall extend up to the elevation as shown on the Drawings.

F. Cutting-Off and Splicing

1. Pilings driven to refusal or to the point where additional penetration cannot be attained shall be left high and not cut off.
2. Splicing will not be allowed on the project.

3.02 BLOCK NETTING

- A. Block netting shall be installed to keep fish away from the land side of the sheet pile wall so they do not get trapped behind the wall as the tide goes out and the river elevation lowers. The netting shall be installed prior to sheet pile installation so there is no chance for fish to get behind the wall. Herding fish out after wall installation will not be allowed. The block netting shall be maintained and extended as necessary to accommodate the sheet pile wall installation until the full wall is enclosed and the wall returns are constructed.

3.03 INSPECTION OF DRIVEN PILING

- A. The Contractor shall inspect the interlocked joints of sheet pilings extending above ground. Pilings found to be out of interlock shall be removed and replaced at the Contractor's expense.
- B. The Engineer may have a representative on-site, but the Contractor shall be responsible for monitoring all driving and verification records.

3.04 OBSTRUCTIONS

- A. Obstructions should be anticipated at the site during sheet pile driving. Removal of obstructions by excavation in the top 10 feet of the installation shall be expected to advance sheets to the desired depth.

3.05 PULLING AND REDRIVING

- A. If obstructions occur deeper than 10 feet below the ground surface, if directed by the Engineer, the Contractor shall pull the pilings, after driving to determine the condition of the underground portions of pilings. Any piling so pulled and found to be damaged to the extent that its usefulness in the structure is impaired shall be removed and replaced. Pilings pulled and found to be in satisfactory condition shall be redriven when directed.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. Measurement for “Shoreline Sheet Piling” shall be a unit.
- B. Measurement for “Pile Driving – Unanticipated Obstructions” shall be on a Force Account basis in accordance with Document 00700 – General Conditions, Paragraph G-08.06.

4.02 PAYMENT

- A. No separate payment will be made for the “Sheet Pile Driving Plan” as required by this section. The cost for this portion of the Work will be considered incidental to the “Removal Action Work Plan” as described in 01400 – Removal Action Work Plan.
- B. Payment for “Shoreline Sheet Piling” will be made at the contract lump sum price as stated in the Schedule of Prices and will be full compensation for furnishing all labor, tools, materials, equipment and incidentals required to provide and install sheet piling, including the furnishing of all necessary tools, equipment, labor and incidental expenses and materials required to drive the piles and remove obstructions within 10 feet of the ground surface.
- C. Payment for “Pile Driving – Unanticipated Obstructions” as stated in the Schedule of Unit Prices will be made on a Force Account basis in accordance with Document 00700 – General Conditions, Paragraph G-08.06 and shall be full compensation to complete only scope for unanticipated obstructions during pile driving that are not part of the contract work, not covered under existing bid items and are at the specific direction of the Engineer.

End of Section
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PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. The extent and location of the "Steel Pile" Work is indicated on the drawings. The work includes the requirements for furnishing, installing, and driving/vibrating steel pipe piles. It also includes the requirements for cutting off or building up these piles as necessary, all in accordance with these specifications, the reference standards, and the applicable provisions of pertinent codes.
- B. The Work shall consist of replacement guide piles at the South Park Marina, and replacement of piling for Debris Deflector structure.
- C. The project conditions require that the piles first be vibrated to the specified depth. If vibrating refusal occurs before the specified penetration depth, then a drop hammer shall be used to advance the pile to the design depth.
- D. Obstructions to advancement are possible from either debris in the bottom sediments or from natural glacial boulders. If this occurs, the Engineer may direct the Contractor to move to a new location.

1.02 REFERECE STANDARDS

- A. The publications listed below form a part of this specification to the extent referenced. References shall be the latest edition available as of the date of the invitation to bid unless otherwise specified.
  - 1. American Society for Testing and Materials (ASTM)
    - a. ASTM A 139 Standard Specifications for Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over)
    - b. ASTM A 148 Standard Specifications for Steel Castings, High Strength, for Structural Purposes
  - 2. American Welding Society (AWS)
    - a. AWS D1.1 Structural Welding Code – Steel
  - 3. American Petroleum Institute
    - a. API5LSpecification for Line Pipe, Jan 2000

1.03 QUALITY ASSURANCE

- A. The Contractor shall assist in keeping a complete record of each pile driven, noting the rate, type, time, location and driving record with blow counts for every foot or fraction of a foot driven. Data shall be recorded on the "Pile Driving Record Sheet" provided by the Port or equivalent.
- B. The pile records shall be current, and the as-built locations shall be noted on the Record Drawings.

1.04 SUBMITTALS

- A. Submit the following information in accordance with Section 01330 – Submittals.
- B. Pile Driving Equipment: Description of pile driving equipment shall be employed in the work, prior to commencement of pile installations; including details of the pile hammer, power plant, leads, cushion material, and helmet as required. This submittal is not for Port approval but is intended to provide information as to the equipment that the Contractor shall use for driving/vibrating the piling. The



Contractor shall be responsible for ensuring that the equipment selected is properly sized for the anticipated driving conditions.

- C. Steel Pipe Piles: Detail drawings of steel Pipe Pile make-up including all locations, markings, layouts, materials, sizes, and shapes and indicate all methods of connection and bracing.
- D. Material: Certified copies of mill test reports for Pipe Pile steel prior to delivery of pile to the project site, including:
  - 1. Manufacturer or fabricator of piling.
  - 2. Certificates of treatment and quality of materials.
- E. Pile Driving: Provide a complete and accurate record of each driven pile. The record shall indicate the pile number or identification, location, inclination, size, final elevations of tip and top, pile weight, number of splices and locations, blows or time interval required for each foot of penetration throughout the entire length of the pile and for the final 6 inches of penetration. The record shall also include the type and size of the hammer, the rate of operation, the vibration energy settings during the operation and the changes used at various depths, and the type and dimensions of driving helmet and cushion block used. Any unusual conditions encountered during pile installation shall be recorded and immediately reported to the Engineer. Submit pile driving data sheet available from the Engineer as part of the Contractor's Daily Construction Report.
- D. Pile Driving Procedure: Detail drawings and description of a pile template, if used, shall be submitted for acceptance. Provide drawings and details for any method to be used to maintain the tolerance required in the specifications for approval.

#### 1.05 JOB CONDITIONS

- A. The Contractor shall anticipate encountering interfering riprap, large boulders, abandoned timber, and other subsurface obstructions within 10 feet of the final ground elevation (mudline). The Contractor shall employ accepted obstruction clearing methods as required to install piles without damage and allow for proper alignment and location.
- B. Geotechnical Report
  - 1. Geotechnical data used in the design are based on information presented in the Terminal 117 Geotechnical Data Report, prepared by Jacobs Associates, located in the Appendices.
  - 2. Neither the Port nor the Geotechnical Engineer can warrant that subsurface conditions will not vary in areas immediately adjacent to those that have been assessed. The Contractor shall make their own risk assessment based on the incomplete soils information presented in the report and his own interpretation, deduction, or conclusion regarding the nature of the materials and subsurface soil conditions that may be indicated or implied by the plans, specifications, and geotechnical report.
- C. Varying Driving Conditions: The Contractor shall make his own determinations and conclusions regarding the methods and procedures to be used in performing the work.
  - 1. There will be no extra compensation for varying driving conditions caused by localized variations in surface or subsurface conditions.

D. Noise Ordinance

The Contractor shall comply with the City of Seattle Noise Ordinances for pile driving and other construction noise which include the following:

- a. Noise to residential receiving properties shall not exceed 85 dB(A) between the hours of 7:00 am and 10:00 pm weekday, 9:00 am and 10:00 pm weekends. For night time hours, noise shall not exceed 75 dB(A). For the same time periods, noise received at commercial properties (South Park Marina) shall not exceed 90 dB(A) and 80 dB(A), respectively. For certain short-duration construction activities, the Maximum Permissible Sound Levels may be exceeded as follows:
    - 5 dB(A) for 15 minutes in any 1-hour period
    - 10 dB(A) for a 5 minutes in any 1-hour period
    - 15 dB(A) for a 90 seconds in any 1-hour period.
  - b. During pile driving, sound measured at the receiving property line or 50 feet from the equipment, whichever is greater, may exceed the performance criteria in any 1-hour period between the hours of 8:00 am and 5:00 pm on weekdays and 9:00 am and 5:00 pm on weekends. But in no event may the sound level exceed:
    - 90 dB(A) continuously
    - 93 dB(A) for 30 minutes
    - 96 dB(A) for 15 minutes
    - 99 dB(A) for 7 1/2 minutes
2. The Contractor shall use a Bubble Curtain to mitigate underwater sound, as described in this Section.

1.06 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer at no additional cost to the Port.

1.07 EXPERIENCE

- A. Installer: The work shall be performed by a general Contractor or a specialty subcontractor specializing in the installation of piles and having a minimum of 5 years' experience installing the piles under similar subsurface conditions.

1.08 BUBBLE CURTAINS

- A. Design, furnish, install, and operate a bubble curtain system to attenuate underwater sound pressure caused by impact pile driving. The primary requirement is that the piles shall be completely engulfed in bubbles during impact pile driving.
- B. At the end of the project, the bubble curtain components shall become the property of the Contractor.

## PART 2 PRODUCTS

### 2.01 STEEL PILING

- A . Material: Steel pipe piles shall be of size and type shown on the drawings. At the Contractor's discretion, the steel material shall confirm to either:
  - 1. API5L GR 52 pipe piles
  - 2. AWWA C200 using ASTM A572 GR 50 steel
- B . Seam welds shall be full penetration welds developing the strength of the base metal. Spiral-lap construction is not permitted.
- C . Fabrication:
  - 1. In fabricating piles, the number of welds shall be restricted to a minimum. Material for bearing collars, end plates, and splices shall meet the requirements of ASTM A36. Work shall conform to the details indicated on the drawings, or equivalent details accepted by the Engineer.
  - 2. Mark piling with lines of high visibility paint or ink at one-foot intervals from bottom to top. Number every five feet. Markings shall be clearly visible and legible to the naked eye at a distance of 75 feet. Paint markings on coated pile sections shall be of material approved by the coating manufacturer. Piles not properly marked will be rejected.
- D . Welding: Conform to the requirements of the applicable provisions of American Welding Society (A.W.S.) D1.1/D1.1M. Steel pipe piles shall be of size and type shown on the drawings. Pipe piles shall be round, seamless or longitudinally welded. Piles may be of continuous length or shop spliced to make up the required length. Only one shop splice will be permitted in each pile length. Field splices will not be allowed.
- E . Shop Finishing: After fabrication, piles shall be coated to not less than sixteen (16) mil thickness on surfaces as shown on the drawings. Prepare surface and apply coating in conformance with manufacturer's recommendation. Coating shall be epoxy poly amide, applied in 3 coats, and shall be:
  - 1. Devran 261 QC
  - 2. Interzone 954
  - 3. or approved equal.
- F . All piles shall have a round fiberglass pile cap when completed by:
  - 1. Henderson Marine Supply Inc. of Petaluma, CA (Item No. 11-038)
  - 2. Cheyenne Manufacturing Inc. (Fiberglass Piling Cap)
  - 3. or approved equal.

### 2.02 PILE DRIVING EQUIPMENT

- A. Pile Hammers: Hammer selection shall be the responsibility of the Contractor. The hammer used shall have a delivered energy suitable for the total weight of the pile, the character of subsurface material to be encountered, and the pile capacity to be developed. The driving/vibrating energy of the hammer shall be sufficient to drive the steel piling to the respective tip elevations shown on the plans. Pile Hammers

and all related equipment shall be inspected by the Contractor prior to use, and shall not be allowed on the project site if visible leaks are detected.

- B. Use a vibratory hammer of an approved type with a capacity at least equal to the hammer manufacturer's recommendation for the total weight of pile and character of subsurface material to be encountered. The piles shall be vibrated to the indicated tip elevation. If refusal is reached prior to achieving the indicated tip elevation, the piles shall be driven with an impact hammer to the indicated tip elevation.
- C. Driving Helmets: If impact hammer is used, use a driving helmet or cap between the top of the pile and the ram to prevent impact damage to the pile. The driving helmet shall be capable of protecting the head of the pile, minimizing energy absorption and dissipation, and transmitting hammer energy uniformly over the top of the pile. The driving helmet or cap shall fit loosely around the top of the pile so that the pile is not restrained by the driving cap if the pile tends to rotate during driving.
- D. Pile Driving Shoe: The Contractor shall use appropriate means and methods to keep pile driving stresses within allowable limits. The steel pipe piles may be equipped with an inside driving shoe at the discretion of the Contractor's designer and consistent with the driving equipment. The driving shoes shall conform to ASTM A148 Grade 90/60.

### 2.03 BUBBLE CURTAINS

- A. The bubble curtain system shall consist of one or more compressors with power source, primary and secondary feed lines, distribution manifold(s) with valves, bubbler manifolds, air pressure gauges and flow meters, appurtenant fittings and deployment gear.

## PART 3 EXECUTION

### 3.01 PREPARATION

- A. Use driving method which will not cause damage to piling or nearby structures.
- B. Protect existing structures and vessels near the Work from damage.

### 3.02 SHOP SPLICES

- A. Perform visual inspection of welding, in accordance with AWS D1.1/D1.1M by qualified inspectors hired by Contractor. Welds shall be acceptable if the criteria of Table 6.1 (AWS D1.1/D1.1M) for Cyclically Loaded Non-tubular Connections are satisfied.
- B. After welds are completed, they shall be hand or power-brushed and thoroughly cleaned before the inspection.
- C. Correction of Defective Welds: Weld areas which contain defects which exceed the standards of acceptance in AWS D1.1/D1.1M shall be repaired by the Contractor to the satisfaction of the Engineer.

### 3.03 DRIVING TOLERANCES

- A. Maximum Variation from Vertical For Plumb Piles: 1 in 200.
- B. Maximum Variation From Top of Pile Elevation: 3 inches.
- C. Maximum Horizontal Out-of-Position: 2 inches.

- D. Manipulation of piles to force them into position will not be permitted. Piles will be checked for heave. Piles found to have heaved shall be re-driven to the required tip elevation. Piles damaged or driven outside the above tolerances shall be removed and replaced or additional piles driven at locations specified by the Engineer at no expense to the Port.

### 3.04 INSTALLATION

- A. Pile Driving: Drive piles to the design tip elevation in accordance with the elevations shown on the contract documents.
- B. The initial driving, to either the specified elevation or to refusal, shall be with a vibratory hammer. Manufacturer's data showing the size of pile and its proper match to the size of vibratory hammer being used shall be submitted to the Engineer to show compliance that the hammer and pile are properly matched. The driving / vibration energy of the hammer shall be sufficient to drive the piles to the tip elevations specified in the plans but the hammer cannot be so large that it creates damage in the pile.
- C. If refusal to vibratory installation occurs, then a Diesel-powered or hydraulic hammer shall be operated at the rate recommended by the manufacturer throughout the entire driving period. Manufacturer's data showing the size of pile and its proper match to the size of hammer being used shall be submitted to the Engineer to show compliance that the hammer and pile are properly matched. The driving energy of the hammer shall be sufficient to drive the piles to the tip elevations specified in the plans but the hammer cannot be so large that it creates damage in the pile. The soil causing refusal to the vibrating installation shall be used in the modeling of the hammer / pile system and submitted to the Engineer.
- D. Refusal Criteria:
  - 1. Vibratory hammer: when the pile hammer is operating at resonant frequency for 1 minute with no penetration.
  - 2. Ram energy hammers: there is no refusal criteria; the energy must be enough to penetrate the soil conditions present.
- E. Obstructions to driving may be either debris in the bottom mud or natural glacial boulders that are unknown at this time. If refusal to the driving is occurring and it appears to the Engineer that it is a result of an obstruction, then the Contractor may be told to stop driving and to move a short distance over and begin driving again.
- F. Each pile shall be driven continuously and without interruption until the required depth of penetration has been attained. Any interruption of more than 15 minutes would be considered a stop in continuous driving.
- G. Pre-Drilling: Pre-drilling of piles will be not be permitted.
- H. Jetting of Piles: Jetting of piles will not be permitted.
- I. Method of Pile Cutting: Piles shall be cut off at the elevations indicated by a method approved by the Engineer. All cutting shall be done in a neat and workmanlike manner. A straight edge shall be used in cuts made by burning to avoid abrupt nicks. Bolt holes in steel piling shall be drilled or may be burned and reamed by approved methods which will not damage the surrounding metal. Holes

other than bolt holes shall be reasonably smooth and the proper size for items to be inserted.

J. Protection: All piles shall be coated and repaired per Section 2.01D.

### 3.05 PILE DISPOSAL

A. Pile cutoffs shall be disposed of legally by the Contractor off Port property. Disposal of cutoffs shall be at the Contractor's expense.

### 3.06 UNACCEPTABLE PILES

A. Unacceptable Piles: Piles that fail tests, are placed out of tolerance, are below cut-off elevations, or are damaged.

B. Provide additional piles or replace piles to conform to specified requirements.

### 3.07 BUBBLE CURTAINS

A. Piling shall be completely engulfed in bubbles over the full depth of the water column at all times when an impact pile driver is in use. Bubbles are not required during vibratory pile driving.

B. Air shall be delivered from bubbler manifold assemblies ("bubblers") located on the river bottom and at intervals not exceeding ten (10) feet between the water surface and the river bottom with the last bubbler always in contact (resting on) the bottom of the river bottom. Bubblers shall be adequately weighted and supported to hold position vertically and horizontally when filled with air (operating) and when not operating. A minimum of two bubblers is required unless the water depth is less than five (5) feet.

C. Bubblers shall be constructed of two-inch (minimum) inside diameter pipe with one-sixteenth-inch (1/16") diameter bubble release holes. Bubblers shall be durable enough to withstand repeated deployment during pile driving and shall be constructed to facilitate underwater setup, knockdown, and reuse on the next pile.

D. One or more compressors shall be provided to supply air in sufficient volume and pressure to self-purge water from the bubblers and maintain the required bubble flux for the duration of pile driving. Compressors shall be of a type that prevents the introduction of oil or fine oil mist by the compressed air into the water. The presence of oil film or sheen on the water surface in the vicinity of the operating bubbler will indicate that Contractor has failed to meet this requirement. Contractor shall immediately stop work until the source of oil film or sheen is identified and corrected.

E. Bubbler feed lines (primary and secondary feed lines) shall be sized taking into account backpressure at the exit point, in-line friction losses and losses through fittings.

F. The system shall provide a minimum bubble flux as follows: Total air volume shall be 16 standard cubic feet per minute (scfm) per lineal foot of bubbler, delivered at 100 psi to the secondary feed lines. Compressor output shall be distributed to the individual bubblers through a distribution manifold fitted with a shut off valve, pressure gauge, flow regulating valve and flow meter for each secondary bubbler feed line, and a pressure gauge for the primary feed line. Contractor shall monitor the flow and pressure to each bubbler, and balance as necessary using the valves to maintain constant, uniform air volume through each bubbler for the duration of pile driving. Airflow volume shall be distributed equally to all bubblers and

uniformly over the length of each bubbler. Pressure to each bubbler may vary and shall be sufficient to maintain the required flow.

- G. Prior to first use of the bubble curtain during pile driving, the fully assembled system shall be test-operated to demonstrate proper function and to train personnel in the proper balancing of the air flow to the bubblers.

#### PART 4 MEASUREMENT AND PAYMENT

##### 4.01 MEASUREMENT

- A. No separate measurement will be made for “Steel Piles”.
- B. Measurement for “Pile Driving – Unanticipated Obstructions” shall be on a Force Account basis in accordance with Document 00700 – General Conditions, Paragraph G-08.06.

##### 4.02 PAYMENT

- A. No separate payment will be made for the Work required by this section. The cost for this portion of the Work will be considered incidental to, and included in, the payments made for “In-Water Structures”. This does not include payment for Unanticipated Obstructions while performing the Work.
- B. Payment for “Pile Driving – Unanticipated Obstructions” as stated in the Schedule of Unit Prices will be made on a Force Account basis in accordance with Document 00700 – General Conditions, Paragraph G-08.06 and shall be full compensation to complete only scope for unanticipated obstructions during pile driving that are not part of the contract work, not covered under existing bid items and are at the specific direction of the Engineer.

End of Section
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PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. The extent and location of the “In-Water Structures” Work is indicated on the drawings. The Work shall consist of replacement guide piles at the South Park Marina, installation of a temporary Debris Deflector and installation of permanent Debris Deflector structure.
- B. Work that includes the requirements for furnishing, installing, and driving/vibrating steel pipe piles are included in Section 02460 - Steel Piles.

1.02 SUBMITTALS

- A. South Park Marina Impacts
  - 1. The Contractor shall identify the South Park Marina floats which require temporary removal - these will be referenced as affected portions of the docks. The Contractor shall notify the Port eight (8) weeks prior to the start of work in the Sediment Area. The Marina owner will disconnect any utilities serving the affected portions of the docks, clear any vessels and relocated affected portions of the docks. The Marina owner will be responsible for the storage and protection of the affected portions of the docks. The Marina owner is also responsible for the re-installation of the affected portions of the docks, including the re-installation of utilities.
- B. Debris Deflector
  - 1. Floating Debris Boom: Shop drawings indicating the layout and size of proposed floating boom, boom dimensions, connection details to piling, and catalog sheets for manufactured items that are to be incorporated into the system.
  - 2. Temporary Floating Debris Deflector: Catalog sheets for manufactured items that are to be used for temporary floating debris deflector
  - 3. Placement location(s) of Temporary Debris Deflector and duration at each location.
  - 4. The replacement debris deflector shall be installed by February 15, 2014.

1.03 MATERIAL HANDLING

- A. Protection: Use all means necessary to protect the materials of this section before, during, and after removal, storage, and reinstallation and to protect the existing work and materials to remain in place.
- B. Replacements: In the event of damage related to construction activities, immediately make all repairs and replacements necessary to the approval of the Engineer at no additional cost to the Port.
- C. Significant damage (as determined by the Engineer) shall require shop drawing submittals and approval prior to performing repairs.

1.04 EXPERIENCE

- A. Installer: The work shall be performed by a general Contractor or a specialty subcontractor meeting the same qualifications as in Section 02460 Steel Piles.

1.05 TEMPORARY DEBRIS DEFLECTOR



- A. Contractor shall provide and maintain a temporary debris deflector for the South Park Marina if the sequencing requires any duration between removal of the existing deflector structure and the installation of the permanent one. The temporary debris deflector shall be a rigid continuous structure of at least the same length and draft as the permanent deflector shown on the Drawings. Temporary deflector and any required anchorage shall be constructed with materials that are suitable for site conditions.
- B. Anchorage details for temporary floating debris deflector shall be designed, fabricated and installed by Contractor.
- C. Temporary Debris Deflector will provide protection of South Park Marina from floating debris. Contractor may move temporary deflector multiple times during the course of construction within the zone identified on the Drawings.

#### 1.06 DEBRIS DEFLECTOR

- A. Debris deflector shall include floating debris boom.
- B. Contractor shall design, fabricate and install floating debris boom as indicated on the plans and described in these specifications.
- C. The floating debris boom shall be designed to be restrained by piling as indicated on the drawings. Restraining system shall not damage surface finish on piling as water surface level fluctuates due to tides or river flow. Floating boom shall float level at all water levels. For low water levels, portions of the boom may rest on mudline. Contractor shall account for individual boom segment that may be partially supported on land and partially floating during low water levels.
- D. For piling, see Section 02460 – Steel Piles.

### PART 2 PRODUCTS

#### 2.01 FLOATING DEBRIS BOOM

- A. HDPE pipe, ASTM F 714, ASTM D 3350, cell class PE345464C, Polyethylene 3408 DR-32.5 high density polyethylene
- B. Flat stock for end caps, flanges: ASTM D 3350 class 345464C
- C. Water: Water used for controlling floatation of HDPE pipe shall be potable.
- D. All HDPE to HDPE welds to be full penetration heat fusion welds. Extrusion welds will not be accepted as full penetration welds.

### PART 3 EXECUTION

#### 3.01 GENERAL

- A. Coordinate all activities of this section with South Park Marina management through the Engineer.

#### 3.02 GUIDE PILE INSTALLATION

- A. Refer to Section 02460 – Steel Piles.

#### 3.03 CLEANUP

- A. After the Work is complete, and before final inspection, remove construction/installation generated debris, dirt, equipment, tools, and material from the South Park Marina, its property, and adjacent waters.

3.04 TEMPORARY DEBRIS DEFLECTOR

- A. Provide anchorage for temporary debris deflector per the approved shop drawings.

3.05 DEBRIS DEFLECTOR

- A. Install floating debris boom in accordance with approved shop drawings.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. No separate measurement will be made for “In-Water Structures”.

4.02 PAYMENT

- A. Payment for “In-Water Structures” will be made at the contract lump sum price as stated in the Schedule of Prices and will be full compensation for furnishing all materials, tools, equipment, labor and incidentals required to complete the work specified including providing and installing temporary and permanent debris deflector, providing and installing piling, design, installation, maintenance, and demolition of the bubble curtain at the location of the installation, and clean up the affected sections of the Marina.

End of Section
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**PART 1 GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. The Work includes protection of existing off-site monitoring wells during construction and decommissioning of existing on-site monitoring wells.
- B. All work shall be conducted according to WAC 173-160 (Minimum Standards for Construction and Maintenance of Wells), Chapter 18.104 RCW (Water Well Construction Act), and these Specifications.

**1.02 QUALIFICATIONS**

- A. Work shall be performed by a firm licensed for well installation, refurbishment, and decommissioning as required in WAC 173-162(Regulation and licensing of well contractors and operators).

**1.03 SUBMITTALS**

- A. Well Decommissioning Notification Forms, available from the Washington State Department of Ecology.
- B. Well Records.

**1.04 PROTECTION OF EXISTING WELLS**

- A. During work activities it shall be the responsibility of the Contractor to protect existing off-site monitoring wells that have not been designated for decommissioning. Work shall be conducted so as to prevent damage to those off-site existing monitoring wells.

**1.05 RECORD KEEPING**

- A. Contractor shall submit to DOE, as required, the Notice of Intent to Decommission a Well Forms. The Contractor shall submit a copy of these forms to Engineer prior to well decommissioning.
- B. Contractor shall report the completion of all well work on Well Record Forms and submit them to the DOE within thirty (30) days of completion of well work. The Contractor shall submit to the Engineer a copy of the Well Record Forms.

**PART 2 PRODUCTS**

**2.01 GENERAL**

- A. Materials shall be of the quality herein specified, new, free from defects, of the best commercial grade and approved by a nationally recognized testing laboratory for the purpose used, if such approval is granted to the equipment in question. Each type of material shall be of the same make and quality throughout the Project.

**PART 3 EXECUTION**

**3.01 NOTICE**

- A. Contractor shall provide five (5) working days' notice to the Engineer prior to well decommissioning.
- B. Contractor shall notify the Department of Ecology (DOE) of their intent to decommission a well at least seventy-two hours before starting work or as

otherwise required by the DOE. Notice of Intent to Decommission a Well Forms shall be submitted to the DOE as required.

**3.02 PROTECTION OF MONITORING WELLS DURING CONSTRUCTION ACTIVITIES**

- A. Contractor shall be responsible for the protection of existing off-site monitoring wells during construction activities. Contractor shall be responsible for the repair and monitoring of wells designated to remain or be protected which become damaged during construction activities.
- B. Wells identified to be protected, which are damaged and unable to be repaired, shall be decommissioned and replaced at Contractor's expense.

**3.03 DECOMMISSIONING**

- A. Monitoring wells shall be decommissioned in accordance with WAC 173-160.
- B. Method of Decommissioning Well:
  - 1. Monitoring wells (MW2, MW3, MW5R, MW6, MW7 and MW8R) located within areas of proposed excavation and extending to below the bottom anticipated depth of the excavation shall be decommissioned prior to excavation through removal of well casing and filter pack and filling the borehole in accordance with WAC 173-160-460(1)b.  
  
Monitoring well (MW4R) located within areas of proposed excavation but planned to be completely removed during excavation shall be decommissioned prior to excavation by filling in accordance with WAC 173-160-460(2)a.

**3.04 WASTE GENERATED DURING DECOMMISSIONING**

- A. All waste materials generated from decommissioning of monitoring wells shall be disposed of off-site at Contractor's expense and according with the requirements of Section 02111 – Waste Material Disposal.

**PART 4 MEASUREMENT AND PAYMENT**

**4.01 MEASUREMENT**

- A. No separate measurement will be made for "Monitoring Well Decommissioning and Protection".

**4.02 PAYMENT**

- A. No separate payment will be made for "Monitoring Well Decommissioning and Protection" as required by this section. The cost for this portion of the Work will be considered be incidental to "Upland and Riverbank Subtitle D Waste" as described in Section 02300 - Earthwork.

End of Section
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PART 1 GENERAL

1.01 SUMMARY

- A. This Section specifies requirements for designing, furnishing, installing, maintaining, operating, and decommissioning a temporary dewatering system(s) and controls as required to control water levels and subsurface uplifting hydrostatic pressures during the Work. The Work includes monitoring water quantity and quality, treatment and disposing of pumped water; constructing, maintaining, observing, and removing the equipment and instrumentation when no longer needed.
- B. Dewatering includes intercepting, pumping, monitoring, and treatment of seepage and hydrostatic head produced by adjacent tidal levels.

1.02 DESCRIPTION OF WORK

A. Design Guidelines

- 1. The Contractor shall be responsible for the design and adequacy of the methods and systems to accomplish the following:
  - a. Cells that require confirmation sampling, dewatering (where required) shall be used to lower the groundwater level to at least 2 feet below the bottom level of excavation for the duration of the excavation, confirmation sampling and as required to meet backfill criteria.
  - b. Cells that do not require confirmation sampling (identified in the Drawings); dewatering shall be used to provide a substantially dry and stable subgrade and sidewalls for the execution of surveying and backfilling.
  - c. Prevent damage to adjacent buildings, structures, utilities, and other work that may result from settlement or other groundwater-related effects. Ensure dewatering design has been reviewed and approved by the Port before start of dewatering work.
- 2. The methods for dewatering shall be at the Contractor's discretion and may be a system comprised of several different components including, but not limited to trenches and pumps, sheet piling, wells, and well points. While the Contractor will be given the discretion in assembling, operating and maintaining the system, performance of the system shall be monitored by the Engineer. The Contractor shall make adjustments to the dewatering system to ensure that open excavation areas are hydrostatically controlled at all times. The Engineer will have final determination as to acceptability of the dewatering system performance. The Contractor shall also control surface runoff so as to prevent entry or collection of water in excavations.
- 3. Locate dewatering facilities where they will not interfere with utilities and construction work to be performed by others including any follow on contractors. Obtain approval for facility locations from the Engineer.
- 4. Conduct groundwater discharge, conveyance, treatment in accordance with Section 02455 – Construction Water Management System.

5. The Contractor shall review all information pertinent to the Work, visit the site and carry out all necessary examinations or investigations and shall make independent interpretations of all available information regarding the requirements, limitations, and constraints of the work and the conditions under which the work will be performed. The Contractor shall promptly notify the Engineer of any ambiguity, inconsistency, or error in the contract documents that may be discovered.
6. The Contractor shall monitor groundwater levels in and around the excavations to ensure groundwater levels and hydrostatic pressures are reduced as required prior to excavation, such that groundwater will not prevent proper completion of all work performed under this Contract. The Contractor may use existing monitoring wells.
7. Acceptance by the Engineer shall not in any way relieve the Contractor from the responsibility for errors therein or from the responsibility for complete and adequate design, materials, installation methods, operation methods, or adequate maintenance of the system.
8. The Contractor shall employ materials, equipment, and construction methods commonly used and proven as suitable for the duration of construction dewatering and any surface water control systems.
9. The Contractor shall bear full responsibility for acquiring a water supply and electrical service with which to install and operate any dewatering system components proposed in the Dewatering System Plan.
10. The Contractor shall verify and independently interpret the available subsurface information presented in the contract documents and associated Appendices and supplement the existing data necessary in order to complete the design and construction.

#### 1.03 QUALITY ASSURANCE

- A. The Dewatering system shall be designed by a professional civil engineer or certified hydrogeologist, registered in the State of Washington and specialized in hydrogeology or geotechnical engineering, with at least 3 years experience in the design, operation and maintenance of similar dewatering systems to design and direct operation of dewatering system.
- B. Provide water quality and quantity monitoring and maintain records as required by the applicable permits.
- C. The Dewatering system shall be installed and operated by a contractor or sub-contractor with at least 5 years experience in the installation, operation and maintenance of similar dewatering systems.

#### 1.04 SUBMITTALS

- A. Submit all drawings and data in accordance with Section 01330 – Submittals.

- B. The Contractor shall submit a Dewatering Plan as part of Section 01400 – Removal Action Work Plan (RAWP) to include details of the design of dewatering system, submit working drawings and design data, indicating the following:
  - 1. The proposed type of dewatering system for each type and location of dewatering.
  - 2. Arrangement, location, and depths of system components. Show on drawings the coordinate locations of wells.
  - 3. Complete description of equipment and instrumentation to be used, with installation, operation, and maintenance procedures. Include technical data on each pump, monitoring elements of the system, and a discussion of the operation, scheduled or regular checking of the operation and fueling requirements if not electric driven.
  - 4. Types and sizes of filters, if applicable.
  - 5. Design calculations demonstrating adequacy of the proposed systems and equipment.
  - 6. Methods, locations, and treatment for disposal of pumped water.
  - 7. Removal and decommissioning procedures.
  - 8. Submit qualifications of dewatering system designer and installer/operator.
- C. Submit copies of the special permits required for performing the work of this Section.
- D. Submit records as specified herein.

## PART 2 PRODUCTS

### 2.01 MATERIALS

- A. Furnish all materials, tools, equipment, facilities, and services as required for providing the necessary dewatering work and facilities. Make available equipment, machinery and piping, including standby power and pumps in good working order and of adequate capacity to continue dewatering operations due to equipment failure.

## PART 3 EXECUTION

### 3.01 CONSTRUCTION

- A. Dewatering System
  - 1. Perform dewatering in accordance with working drawings and design data. Keep the Engineer advised of changes made to accommodate field conditions and, on completion of the dewatering system installation, revise and resubmit working drawings as necessary to indicate the installed configuration.

2. Jetting will be allowed for installation of dewatering components. Jetting water and cuttings shall be contained at the installation area (using trenches or other means) and managed as contaminated soil and water in accordance with Section 02111 – Waste Material Disposal.
3. Dispose of pumped material from excavation, and drainage from areas in accordance with Section 02455 – Construction Water Management System.
4. Construct pipelines, pumps and ancillary transmission systems as necessary.
5. Organize dewatering operations to maintain the groundwater level within excavations as required for prosecution of the work, and to provide a stable, substantially dry subgrade for confirmation sampling, where required.
6. Meet quantity and quality discharge permit requirements as specified under Section 02455 – Construction Water Management System.

B. FIELD QUALITY CONTROL

1. Records
2. Observe and record the average flow rate and time of operation of each pump used in the dewatering system. Where necessary, provide appropriate devices, such as flow meters, for observing the flow rates. Submit flow-rate data during the period that the dewatering system is in operation.
3. During initial period of the dewatering, make required observations on a daily basis. When dewatering operations have stabilized, reduce observations to longer intervals approved by Engineer. Intervals between observations shall not exceed 2 days. Submit observation records to the Engineer within 24 hours of reading

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. No separate measurement will be made for “Dewatering”.

4.02 PAYMENT

- A. No separate payment will be made for the “Dewatering Plan” as required by this section. The cost for this portion of the Work will be considered incidental to the “Removal Action Work Plan” as described in 01400 – Removal Action Work Plan.
- B. No separate payment will be made for “Dewatering” as required by this section. The cost for this portion of the Work will be considered incidental to “Water Management” as described in Section 02245 – Construction Water Management System.



End of Section

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. **Extent of Work:** The extent and location of “Permanent Chain Link Fence and Permanent Chain Link Gates” Work is indicated on the Drawings. The Work includes the requirements for furnishing and installing all items and components of a completed fence system in conformance with these Specifications and the dimensions and sections indicated on the Drawings or as established by the Engineer.

**1.02 QUALITY ASSURANCE**

- A. **Installer Qualifications:** Engage an experienced Installer who has at least three years’ experience and has completed at least five chain link fence projects with same material and of similar scope to that indicated for this Project with a successful construction record of in-service performance.
- B. **Single-Source Responsibility:** Obtain chain link fences and gates, including accessories, fittings, and fastenings, from a single source.

**1.03 SUBMITTALS**

- A. Submit all shop and erection Drawings in accordance with Section 01330 – Submittals, of these Specifications.
- B. The Contractor shall submit Shop Drawings of fencing, gates and appurtenances. Shop Drawings must be approved by the Engineer prior to fabrication or installation.

**1.04 JOB CONDITIONS**

- A. Clearing of the fence line shall be required. Clearing shall consist of the removal and disposal of all vegetation measuring more than one inch in diameter or higher than 15 inches above the ground. The clearing width shall be approximately ten feet for chain link-type fences and approximately three feet for wire-type fences.
- B. Grading of the fence line shall be accomplished to eliminate abrupt changes in ground contours. Boulders, rocks, or excess excavation shall be graded along the fence line or placed adjacent to the clearing on Port of Seattle property as directed by the Engineer.

**PART 2 PRODUCTS**

**2.01 CHAIN LINK FENCE**

- A. The fence shall be chain link fabric-supported on a steel frame, the posts of which are embedded in concrete foundations. Materials shall be heavy industrial chain link fencing in accordance with ASTM F1043, with the additional requirements as follows:
- B. **Fabric:** The fabric shall be manufactured in accordance with ASTM A392 for Class 1 coating, except that the wire shall be No. 11 gage and the fabric shall be twisted and barbed on both selvages.
- C. **Framework:**
  - 1. Framework and coating shall be in accordance with ASTM F1083 and ASTM F1043.

2. Framework shall be hot dipped galvanized Schedule-40 pipe conforming to ASTM F1083 or cold rolling and radial frequency welded steel pipe conforming to ASTM A653 or A569 with a minimum yield strength of 50,000 psi. Exterior and interior coatings in accordance with ASTM F1043 Type B outside with a minimum of 0.9 oz of zinc per sq. ft. after welding, a chromite conversion coating and a clear polymer overcoat; type B inside with a minimum of 0.9 oz of zinc per sq. ft.
3. All tubular framework shall meet the following performance requirements in accordance with ASTM B117.
  - a. Exterior: 1000 hours with maximum 5% red rust.
  - b. Interior: 650 hours with maximum 5% red rust.
- D. Line posts shall be 2.375-inch O.D., at 3.65 pounds per foot, or "C" section at 2.10 pounds per foot.
- E. End, corner, or pull posts shall be 2.875-inch O.D., at 5.79 pounds per foot.
- F. Top rails and post braces shall be 1.66-inch O.D., at 2.27 pounds per foot, or Type II "C" section, as detailed on the Drawings at 1.35 pounds per foot.
- G. Tension Wire shall be No. 7 gage, coil spring, high tensile strength wire, marcelled and coated with not less than 0.80 oz of zinc per square foot of uncoated wire surface.
- H. Fittings: All fittings, accessories, and hardware for galvanized chain link fence shall conform to the requirements of ASTM Designation F626 and other ASTM Designations listed therein.
- I. Gates:
  1. Chain link gates shall be constructed with chain link fabric fastened to the end bars of the gate frame by tension bars and fabric bands, and to the top and bottom bars of the gate frames by tie wires in the same manner as specified for the chain link fence fabric.
  2. Gate frames shall be constructed in accordance with ASTM F900. The corners of the gate frame shall be manufacturer's standard galvanized cast corner connections, or welded and coated with two coats of a fast-drying, exterior, minimum of 95% zinc cold galvanizing compound for iron and steel. The coating shall be:
    - a. Lanco GALVACON
    - b. ZRC Cold Galvanizing Compound
    - c. or approved equal, or shall be applied in strict accordance with the manufacturers recommendations.
  3. Provide diagonal cross-bracing where necessary to obtain frame rigidity without sag or twist. Cross-trussing shall be 3/8-inch galvanized steel adjustable rods.
  4. Each gate shall be provided complete with necessary hinges, latch, and drop bar locking device designed for the type of gate, posts, and lock used.
  5. Gates shall have positive-type latching devices with provisions for padlocking. Padlocks will be furnished by the Port of Seattle.

- J. General: All steel fabric, framework, and fittings shall be hot-dipped galvanized after fabrication in accordance with the applicable ASTM specification.
- K. Coatings: All fence and gate parts shall have a black vinyl clad coating in accordance with ASTM F934 and ASTM F668 Class 2A. Coating of fabric shall be extruded/bonded to 0.015 inch thick. Coating for post and rails shall be 3 MIL powder coat. All bolts, nuts, and wire ties shall be powder coated to match the color of the fence fabric.

2.02 OTHER MATERIALS

- A. Concrete used in anchorage of posts shall be 2,500 psi, 28 day test, standard ready-mixed concrete from an approved plant.

PART 3 EXECUTION

3.01 GENERAL

- A. The location and alignment of the fence corners and gates will be provided by the Engineer. The Contractor shall locate all intermediate line posts.

3.02 INSTALLATION

- A. Fencing, gates, and appurtenances shall be erected and installed by an organization regularly engaged in this business, employing labor skilled in this type of work to provide a complete security fencing system.
- B. Fabric shall be fastened to posts, the top rail and the bottom wire, with wire ties spaced as indicated on the Drawings.
- C. Top rails shall be continuous. The Contractor shall provide for expansion or contraction of the continuous rail. Expansion and contraction spring couplings shall be installed at intervals of 100 feet maximum.
- D. Posts shall be installed vertically in the concrete with a minimum depth of embedment indicated on the Drawings and at the spacing specified for the type of posts approved for the Project. In unpaved areas, the concrete shall be struck off two inches above the surrounding grade. In paved areas, it shall be struck off flush with the paving. The top of the concrete shall be troweled smooth, with a slight slope away from the posts.
- E. Gates: Install gates plumb, level, and secure, with full opening without interference. Install ground set items in concrete for anchorage as recommended by the fence manufacturer. Adjust hardware for smooth operation and lubricate where necessary.

3.03 SURFACES REPAIR

- A. Minor damage to galvanizing of fabric and fence appurtenances shall be repaired by thorough cleaning of the damaged surfaces and the application of final protection coat (Section 2.01), in strict accordance with the manufacturer's recommendations.
- B. Upon completion of the fence, the Contractor shall clean the fence of all soiled places and repair marred or abraded areas.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. Measurement for “Permanent Chain Link Fences will be measured by linear foot of completed fence, along the ground line, exclusive of openings.
- B. No separate measurement will be made for “Permanent Chain Link Gates”.

**4.02 PAYMENT**

- A. Payment for “Permanent Chain Link Fences” will be made at the Contract unit price per linear foot as stated in the Schedule of Unit Prices and shall be full compensation for furnishing all labor, materials, tools and equipment necessary or incidental to the construction of the completed fence. The contract unit price shall include all excavation, grading, coring, fence posts, furnishing and the installation of signage, fabric as specified, concrete, base plates, anchors, framework, fittings and all incidentals for a complete fence installation as shown on the drawings and described herein.
- B. Payment for “Permanent Chain Link Gates” will be made at the contract lump sum price as stated in the Schedule of Unit Prices and shall be full compensation for furnishing all labor, materials, tools and equipment necessary or incidental to the construction of completed fence gates. The contract lump sum price shall include all excavation, grading, coring, fence posts, fabric as specified, concrete, base plates, anchors, framework, fittings and all incidentals for complete gate installations as shown on the drawings and described herein.

End of Section

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. This item shall consist of the application of seed, fertilizer, and mulch with tackifier in areas shown on the plans or as directed by the Engineer in accordance with these specifications.
- B. The extent and location of seeding work includes all areas not paved in this project which are disturbed by construction, grading, pavement removal, utility installation, and any other of the Contractor's operations or as directed by the Engineer in accordance with these specifications.

**1.02 SUBMITTALS**

- A. Submit the following in accordance with Section 01330 - Submittals.
  - 1. Seed and Material Certifications
    - a. Label data substantiating that these materials comply with specified requirements.
    - b. Seed vendor's certified statement for each seed mixture required, stating botanical and common name, percentages by weight, and percentages of purity, germination, and weed seed for each seed species.
    - c. Product information on Bonded Fiber Matrix.
    - d. Product information on fertilizer where required.
  - 2. Seeding Schedule. Submit a proposed seeding schedule to the Engineer for approval at least 30 days prior to start of work under this Section. After approval, no modification shall be made to this schedule without written authorization by Engineer. Include schedule for specified maintenance until the end of the plant Establishment Period. Once accepted, revise dates only as approved in writing, after documentation of reasons for delay.
  - 3. Weed Control. Submit schedule and method for weed control for the approval of the Engineer at least thirty days before beginning seeding.
  - 4. Submit certification of seed availability 60 days prior to planting.

**PART 2 – PRODUCTS**

**2.01 SEED**

- A. Provide fresh, clean new-crop that complies with tolerance for purity and germination established by official Seed Analysts of North America.
- B. Seed Mix Application Rate: 120 PLS/ acre (PLS – pounds of live seed)
- C. Seed Mix Description

<u>Seed Mix</u>	<u>Application Rate</u>
Elka Perennial Ryegrass	60 PLS/acre
Creeping Red Fescue	20 PLS/acre
Annual Ryegrass	40 PLS/acre

**2.02 BONDED FIBER MATRIX**

- A. Bonded Fiber Matrix shall be labeled as such on the unopened bags furnished by the manufacturer. Bonded fiber matrix shall be installed per manufacturer’s instructions with seed and fertilizer included in the homogenous mix, at a rate of 3,000 lbs. per acre, providing a minimum of 95% soil cover. Upon request of the Engineer, the Contractor shall provide all empty bonded fiber matrix bags.

**2.03 FERTILIZER**

- A. Fertilizer shall be standard commercial fertilizer total nitrogen. It shall be furnished in standard containers with name, weight and guaranteed analysis of contents clearly marked thereon. No cyanamide compounds or hydrated lime shall be permitted in mixed fertilizers. Nitrogen shall be a 50% mix of coated, slow release form, and 50% standard uncoated form.
- B. Fertilizers shall be of commercial fertilizer grade and shall be spread at the rate of 120 lbs. of 100% total nitrogen per acre.

**2.04 WATER**

- A. Water shall be clean, fresh, and free of substances or matter which could inhibit vigorous grass growth.

**PART 3 – EXECUTION**

**3.01 PREPARATION**

- A. An area to be seeded shall be considered a satisfactory seedbed without additional treatment if it has recently been thoroughly loosened and worked to a depth of not less than 5 inches (125 mm) as a result of grading operations and, if immediately prior to hydroseeding, the top 3 inches (75 mm) of soil is loose, friable, and if shaped to the required grade.
- B. Areas to be seeded shall be cleared of stones, clods, rocks, roots, or other undesirable matter larger than 6 inches (50 mm) in any diameter that might interfere with sowing of seed, growth of grasses, or subsequent maintenance of grass-covered areas.
- C. If any damage by erosion or other causes has occurred after the completion of grading and before beginning the application of hydroseed, the Contractor shall repair such damage. This may include filling gullies, smoothing irregularities and repairing other incidental damage.

All areas to be hydroseeded for temporary erosion control shall be roughened with equipment tracks, disc, ripper tooth, or other means approved by the Engineer before application of hydroseed.

**3.03 SEEDING**

- A. Areas to be seeded include areas disturbed by construction, areas shown on the Drawings, and/or areas directed to be seeded by the Engineer.
- B. Notify the Engineer not less than 24 hours in advance of any seeding operation and do not begin the Work until areas prepared or designated for seeding have been approved. Following the Engineer’s approval, immediately begin seeding and fertilizing of the approved slopes. Unless otherwise approved, accomplish seeding between August 15 to September 15 and March 1 to May 15.
- C. Do not perform seeding during windy weather or when the ground is frozen. Bonded Fiber Matrix shall be installed on dry soil, on dry days, and shall have a minimum of 24 hours of cure time before a rain event. Place seed and fertilizer at the rate and mix specified herein or as directed by the Engineer. Seed and fertilizer shall be sown by an approved-type hydroseeder which utilizes water as the carrying agent and maintains a continuous agitator action that will keep seed and fertilizer mixed in uniform distribution until pumped from the tank. Pump pressure shall be such as to maintain a continuous, non-fluctuating stream of solution.
- D. It shall be the Contractor’s responsibility to provide personnel experienced in seeding and fertilizing operation, equipment and methods as herein specified.
- E. Application shall be made at the following rates or as approved by the Engineer:

Seed	120 PLS/acre
Fertilizer	120 lbs./acre (Total Nitrogen)
Bonded Fiber Matrix	3,000 lbs./acre

**3.04 MAINTENANCE OF SEEDED AREAS**

- A. The Contractor shall protect seeded areas against traffic or other use by warning signs or barricades, as approved by the Engineer. Surfaces gullied or otherwise damaged, following seeding, shall be repaired by regrading and reseeding as directed. The Contractor shall mow and water as required to maintain seeded areas in a satisfactory condition until final inspection and acceptance of the work.
- B. When seed, fertilizer, mulch, and tackifier is applied between June 1 and August 31, the Contractor shall protect the application from dehydration and when applied between October 15 and March 31, the Contractor shall protect the application from freezing and excess moisture.
- C. An acceptable stand of grass shall be defined as a minimum of 80% grass coverage of bare soil using the U.S. Department of Agriculture/Natural Resource Conservation Service (USDA/NRCS) Line Intercept Method or other method approved by the Engineer.



**3.04 GUARANTEE**

- A. As a portion of this work, the Contractor guarantees grass germination. Should the above-specified procedure be deemed not adequate for grass germination in any areas, the Contractor shall perform, as a part of this Contract, all re-work necessary to produce germination.
- B. Should seeded areas fail to germinate, the Contractor shall rework, re-fertilize, water, and reseed such areas as described above until adequate germination is effected at no cost to the Port.
- C. Final acceptance will be based on a uniform stand of grass providing a minimum of 80% soil cover.

**PART 4 – MEASUREMENT AND PAYMENT**

**4.01 GENERAL**

- A. No separate measurement or payment will be made for the Work required by this section. The cost for this portion of the Work will be considered incidental to, and included in, the payments made for Section 02300 – Earthwork.

End of Section
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