

READ THIS FIRST

This Project Spec Document may need additional modifications to suit your project. It is recommended that you proofread each section, paying attention to any “Notes” boxes such as this one--you should remove these “Notes” sections as you go. Also, do a search for all bracket characters “ [] ” as they are used to show you areas containing options or project specific details (you can use Microsoft Word’s Find feature {Ctrl-F} to jump to an open bracket “ [” character quickly). Again, these bracket characters should be removed.

It is important that every paragraph be numbered to allow for easy referencing. If you use the document’s built in styles and formatting your outline should be fine (turn on the formatting toolbar by going to View > Toolbars > Formatting). Most paragraphs will use the style “Numbered Material” and can be promoted (Tab) or demoted (Shift-Tab).

You should not have to manually enter extra spaces, carriage returns or outline characters such as A, B, C, or 1.01, 1.02; the formatting will do this for you. The entire document is 11 pt. Arial. If you paste items in, you may need to reapply the “Numbered Material” format.

Changes to this specification shall be approved by the Erosion Control / Stormwater Engineer.

This specification is for all Port of Seattle construction including Seaport and Airport projects. Designer to verify with Seaport Environmental or Aviation Environmental groups if there are additional environmental permit requirements.

The Design Engineer shall modify this specification to address project specific needs.

PART 1 GENERAL

1.01 SUMMARY OF WORK

- A. This item shall consist of the management of all construction water including collection, conveyance and treatment of onsite stormwater and groundwater, diversion of offsite water away from the project sites, and collection and offsite disposal of process water.
- B. The Contractor shall be solely responsible for design, installation, operation and maintenance of all collection, conveyance and treatment systems and shall modify as needed to meet the requirements of this Section. The Contractor shall take full responsibility for fines imposed due to exceeding the discharge limits.
- C. The minimum treatment system effluent performance requirements shall include oil/water separation, turbidity reduction, solids removal and pH treatment as required to meet the minimum effluent performance requirements listed in this Section.
- D. Any treatment system used shall be approved for use by the Washington State Department of Ecology (Ecology).
- E. All components of the construction water management system shall meet the requirements of the Ecology Chemical Treatment Assessment Protocol (CTAPE)

and the Stormwater Management Manual for Western Washington (SWMM). At a minimum, the following shall apply:

- A. BMP C250 Construction Stormwater Chemical Treatment
- B. BMP C251 Construction Stormwater Filtration
- C. BMP C252 High pH Neutralization Using CO₂
- D. BMP C253 pH Controls for High pH Water

1.02 DESCRIPTION OF WORK

- A. In order to comply with the requirements of this section, the Contractor shall:
 - 1. Develop and submit a Construction Water Management Plan (CWMP).
 - 2. Install temporary structures, modifications, sumps, piping, by-passes, connections, and pumps to contain and convey stormwater to the treatment facility prior to treatment.
 - 3. Provide any pre-treatment of water using oil/water separation, pH adjustment, or other approved methods as required prior to treatment.
 - 4. Treat stormwater with an approved, Contractor-designed, furnished and installed, Construction Water Treatment and Monitoring System.
 - 5. The operating treatment capacity shall be as specified on the drawings.
 - 6. Discharge all treated water at the location shown on the drawings or as directed by the Engineer.
 - 7. Perform all required monitoring, testing and recordkeeping.
 - 8. Remove all temporary system components and restore the Port's stormwater facilities to their original condition.
 - 9. Clean all Port storm conveyances, structures, vaults and facilities to the satisfaction of the Engineer.

1.03 SUBMITTALS

- A. As part of the required Section 01 32 19 - Preconstruction Submittals, the Contractor shall submit the following:

- 1. Construction Water Management Plan.

1.04 PERMITS

Permit #s below are for Airport projects. Coordinate with PM and POS ENV – add/edit/delete as applicable.

- A. Work shall be conducted in accordance with [STIA] NPDES permit number [WA-002465-1].
- B. Work shall be conducted in accordance with Stormwater Pollution Prevention Plan, as required by the [STIA] NPDES permit number [WA-002465-1].

PART 2 PRODUCTS

2.01 PRIMARY WATER TREATMENT EQUIPMENT

- A. The Contractor shall be solely responsible for the water treatment system design, operation, and maintenance, including full responsibility for fines imposed due to exceeding the discharge effluent limits.

- B. The Contractor shall provide a water treatment and monitoring system with the treatment and storage capacity to manage stormwater without causing construction delays.
- C. Contractor shall keep on hand, or have immediate access to, spare equipment and/or materials for any breakdown(s).
- D. The materials and equipment used for the water treatment system shall be no older than 3 years and 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 meter.
- F. Contractor shall choose the type and size of equipment and components needed to accomplish the functions designated.
- G. Contractor shall construct the treatment system with sampling ports and the necessary valves as required to collect water treatment samples.
- H. The Contractor shall maintain dedicated redundant pumps at the treatment facility to provide immediate back-up pumping capacity at the designed treatment and discharge rates.

2.02 WATER TREATMENT SYSTEM CONTROL

- A. Unattended treatment plant operation shall not occur.
- B. The Contractor shall provide a notification system to alert the Operator if system experiences conditions that will potentially cause the treatment system to shut down.
- C. Contractor shall provide high-level alarms on the tanks to prevent overflow conditions. Alarms may cause automatic actions to relieve the condition or may warn the Operator. Contractor shall also set a dedicated overflow level alarm at an elevation as directed by Engineer and notify Port immediately when the alarm is activated.
- 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 STORMWATER STORAGE TANK

- A. Storage tanks shall consist of a weir tank with a capacity adequate to contain the volume determined in the Contractor's analysis. The Port reserves the right to limit the maximum height for tanks and the available location for tank placement. Coordinate with the Engineer for tank placement.

2.04 PUMPING

- A. The Contractor is responsible for all pumping and shall identify structures utilized as sumps for pumping locations. These shall be augmented with other on-site

pumps utilized for collection of standing water and continuous dewatering of excavations.

- B. Pumps shall be sized to provide the minimum conveyance capacity as determined in treatment facility sizing calculations.

2.05 TEMPORARY PIPING

- A. Temporary above ground piping shall be PVC/Woven Synthetic Fibers, EPDM, Ductile Iron, or HDPE Pressure Pipe meeting AWWA C901/C906.
- B. All above ground piping and fittings shall be sized and pressure rated for their application, water tight, free of leaks or tears, and maintained in working condition.

PART 3 EXECUTION

3.01 GENERAL

- A. Design and modifications to conveyances, pumps, sumps, detention facilities and any hydraulic calculations necessary for implementation of this Section shall be stamped by a Professional Engineer licensed in the State of Washington.
- B. Damage to any portion of the Construction Water Management System caused by Contractor operations, weather or negligence shall be repaired immediately at sole cost to the Contractor.
- C. The system shall be designed to handle the specified maximum peak influent flow rates, treat the water to the minimum specified effluent performance criteria, and discharge the treated water at the specified maximum peak effluent flow rates determined in the treatment sizing calculations.
- D. The Contractor shall install elevation gauges in detention facilities.
- E. The Contractor shall initiate treatment system operation and pumping immediately after 0.1 inches of rainfall has fallen in the previous 24 hours unless otherwise approved by the Engineer.
- F. All system components that require fueling shall be maintained with a minimum of 50% fuel in their tanks.
- G. Contractor shall provide all utilities and power required for treatment and water management activities.

3.02 CONSTRUCTION WATER MANAGEMENT PLAN (CWMP)

- A. The Contractor shall prepare a CWMP that describes and includes the management of construction stormwater and non-construction stormwater. The plan shall include 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.
- B. This plan shall describe the management of construction stormwater and by what means non-construction stormwater is segregated from the project site. This consists of planning/phasing, installing, onsite collection, conveyance, plugs, pumps, treatment as required, discharge of water and/or collection, infiltration, and disposal of all construction water collected or related to construction activities or as

ordered by the Engineer to prevent pollution of water, and control, respond to, and manage turbid water and pH during the life of the Contract.

- C. In addition, the CWMP shall include and address, at a minimum, the following:
1. Site Description and Site Drawings
 - a. Provide a detailed project description including phasing and schedule for major work activities.
 2. Construction Water Management Description and Drawings
 - a. Contractor shall provide sufficient detail to show that all site water is managed per the requirements of this Section and to the satisfaction of the Engineer.
 - b. Installation layout drawing for treatment systems.
 3. Design Calculations
 - a. Contractor shall provide product information and/or supporting calculations indicating that their selected pumps and hoses will meet the pump conveyance requirements.
 - b. Contractor shall provide calculations demonstrating that their Construction Water Treatment System can meet or exceed the minimum specified operating capacity.
 - c. Contractor shall provide design calculations for any additional conveyance utilized in their Construction Water Management Plan or that represent a change to Construction Water Management approach.
 - d. All Contractor calculations shall be approved and stamped by a Professional Engineer licensed in the State of Washington.
 4. CTAPE Documentation
 - a. CTAPE documentation shall meet Department of Ecology requirements.
 5. Treatment System Operations Manual
 - a. The treatment system operations manual shall meet Department of Ecology requirements, remain onsite and be submitted to the Engineer.
 6. Construction Water Management Personnel
 - a. Treatment systems shall only be operated by Constructing Water Treatment Operators (Operators) trained and certified by Ecology requirements.
 - b. Operators shall have no other duties other than those specified in this section and shall be onsite at all times the system is operating.
 - c. Operators shall have a minimum of three (3) years full time documented experience operating Ecology-approved treatment systems.

- d. Operators shall be Ecology-certified and current Contractor Erosion and Sediment Control Leads (CESCL).
- e. Contractor shall submit resumes and certification documentation.

3.03 EFFLUENT DISCHARGE PERFORMANCE CRITERIA

- A. All discharge from the project site shall be treated to meet the minimum effluent performance criteria for oil/water separation, pH, and turbidity as described in Table 1 of this Section.

Measurement Parameter for Treated Water (flow-through)	Monitoring Location	Frequency of Sampling Flow Through Treatment	Frequency of Sampling Batch Treatment	Minimum Performance Criteria
Turbidity	Pre-treatment in detention facility	Every 15 minutes	1 per batch	<500 NTU
Turbidity	Post-treatment Effluent	Every 15 minutes ¹	1 per batch	5 NTU Maximum daily average ²
pH	Post-treatment Effluent	Every 15 minutes ¹	1 per batch	6.5-8.5
Total Petroleum Hydrocarbon	Detention Facility	4 times per operating day	1 per batch	No visual Sheen. If visual sheen then 5 mg/L. ³
Flow	Post-treatment Effluent	Every 15 minutes ¹	1 per batch	Report, including maximum discharge rate

TABLE 1- EFFLUENT DISCHARGE PERFORMANCE CRITERIA

3.04 SAMPLING AND CHEMICAL ANALYSIS

- A. Sampling and laboratory analysis of effluent discharges shall be performed by the Contractor per Table 1 in this Section.
- B. The Contractor shall be responsible for all additional sampling and analysis necessary to monitor system performance and verify compliance with this Section.
- C. Residual flocculent testing shall be completed daily

3.05 RECORDKEEPING

- A. Daily treatment logs shall be submitted to the Engineer as part of the Contractor Daily Report.
- B. At a minimum, the daily treatment logs shall include:

1. CTAPE reporting and record keeping requirements
 2. Cumulative inflow volumes using ultrasonic totalizing meter
 3. Cumulative discharge volumes using ultrasonic totalizing meter
 4. Total hours of system operation
 5. Total hours of discharge
 6. System maintenance items
 7. Test data as specified in this Section
 8. Documentation of analysis conducted in Section 3.03
- C. The Contractor shall submit a monthly summary report to the Engineer by the 7th of each month. The report shall summarize the following results for the previous month:
1. Minimum and maximum average daily turbidity
 2. Minimum and maximum pH
 3. Visual sheen and any required test results for TPH.
 4. Minimum, maximum and average daily flow
 5. Total monthly flow
 6. Residual flocculent test results.
 7. Electronic format of all records.
- D. Reports of non-conformances or upset conditions including releases shall be documented in the Contractor Daily Report.
- E. Reports of changes in system configuration or operation due to changing conditions shall be documented in the Contractor Daily Report.
- F. All records shall be kept in hard copy and electronic format suitable to the Engineer.

3.06 SYSTEM REMOVAL AND CLEANING

- A. The Contractor shall clean, flush, jet and vactor out all sediment accumulated in Port conveyances including, but not limited to, storm pipes, manholes, vaults, ponds and ditches. The cleaning operation shall not flush sediment laden water or debris into the active downstream storm system.

3.07 EMERGENCY RESPONSE

- A. The Contractor shall be available 24 hours per day, seven days per week to respond to system emergencies.
- B. The Contractor shall respond to system emergencies within one hour of notification by the Engineer.

3.08 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

3.09 STORMWATER STORAGE

- A. It is the responsibility of the Contractor to verify the adequacy of the existing, specified facilities for use with their proposed water treatment system. The Contractor shall supplement the storage of the existing facilities as required with stormwater storage tanks.
- B. The Contractor shall install additional stormwater storage tanks, within the allowable stormwater storage and treatment area as required.
- C. The Contractor is responsible for conveying construction stormwater within each work area to the specified stormwater storage and treatment area.
- D. Temporary piping, structures and pump facilities required for the conveyance are the responsibility of the Contractor.
- E. The construction stormwater shall be held in the specified storage until treated, hauled and disposed of by the Contractor.
- F. Contractor furnished storage and treatment facilities including pads, access roads, ramps, temporary structures and piping shall be removed at the completion of the work or as directed by the Engineer.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

Coordinate with Design Engineer and Erosion Control/Stormwater Engineer to estimate the maximum number of gallons that will need to be processed for the specific project. This may also be edited to include an end date for the LS and/or a Force Account for additional gallons.

- A. Measurement and 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 [] gallons of water. It includes implementation of temporary stormwater conveyances, storage systems, truckin, 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:

Payment percentages may be adjusted (ie 20/60/20) to reflect specific project.

- 1. Upon receipt of the Construction Water Management Plan 25%
- 2. After NTP and before Substantial Completion, 50% will be pro rated and paid monthly for compliance with the CWMP. Non-compliance will result in withholding of payment for the month of non-compliance.

3. After Substantial Completion, 25% for completion.

[OR]

- 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 Lump Sum price bid for the Project.

End of Section
