

STORMWATER SITE PLAN

PORT OF OLYMPIA MARINE TERMINAL STORMWATER TREATMENT AND CONVEYANCE PROJECT

Prepared for
Port of Olympia

Prepared by
Herrera Environmental Consultants, Inc.

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STORMWATER TREATMENT AND
CONVEYANCE PROJECT**

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I hereby certify that this Stormwater Site Plan Plan for the Port of Olympia Stormwater Treatment and Conveyance Project has been prepared by me or under my supervision and meets minimum standards of the City of Olympia (jurisdiction), and normal standards of engineering practice. I hereby acknowledge and agree that the jurisdiction does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities designed by me.

PREPARED BY

Mary K. Larkin

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CONTENTS

1. Facility Summary Form	1
2. Project Overview and Maps	1
2.1. Project Elements	1
3. Existing Conditions summary	2
3.1. Existing Drainage	2
3.2. Soils3	
3.3. Hazardous Materials Investigation	4
4. Offsite Analysis	5
5. Summary of Minimum Requirements	5
6. Permanent Stormwater Control Plan	6
6.1. Treatment Facility Design Development.....	6
6.2. Developed Site Hydrology	7
6.2.1. Model Development	9
6.2.2. Data and Assumptions.....	9
6.2.3. Results.....	1
6.3. Conveyance System Design.....	1
6.3.1. Rehabilitation of C-Line	1
6.3.2. Outfall Abandonment	1
6.3.3. Pipe Capacity and Sizing	2
6.4. Pump Station and Diversion Structure	2
6.4.1. General Requirements	2
6.5. Stormwater Treatment Facility	3
6.6. Treatment Ponds	3
6.6.1. Oxidation Cell	4
6.6.2. Berm	4
6.6.3. pH Adjustment Cell	4
6.6.4. Turbidity Curtain	5
6.6.5. Settling Cell	5
6.7. Sludge Pond	5
6.8. Treatment Facility Building.....	5
6.9. Sand Filters	5
6.10. Retrofit of Existing Vegetated Stormwater Pond.....	6
6.11. Construction Stormwater Pollution Prevention Plan.....	6
7. Special Reports and Studies	6
8. Other Permits	6
9. Operations and Maintenance Manual	7

10. References..... 9

- Appendix A Facility Summary Form
- Appendix B Figures

TABLES

Table 1. Contributing Area in Acres to Each Outfall by Design Conditions. 1

1. FACILITY SUMMARY FORM

Appendix A provides the Facility Summary Form.

2. PROJECT OVERVIEW AND MAPS

To meet the requirements of its Industrial Stormwater General Permit (ISGP), the Port of Olympia (the Port) must provide a stormwater treatment system for its marine terminal site with the goal of achieving the applicable benchmark values listed in the ISGP. The proposed treatment system relies on chemical oxidation with hydrogen peroxide to attain benchmark values. The treatment system is a centralized facility that will treat stormwater from all areas subject to log handling and operations. The new stormwater treatment system also requires reconstruction of the existing storm sewer system.

Stormwater runoff from the site discharges to Budd Inlet through four outfalls. The four drainage subbasins (A, B, C, and I) and corresponding outfalls are shown on Figure 1 (Appendix B) and described in the next section. The depth of the conveyance system varies, with depths of up to approximately 20 feet below ground surface. There is high groundwater in much of the site, and tidal water currently backs up into the storm sewer. There are also joint and cracking deficiencies with the existing storm sewer that have been observed through a pipe survey. Those factors necessitate several stormwater conveyance system improvements be made to facilitate effective stormwater routing to the pump station and treatment facility.

2.1. Project Elements

Specific project elements, shown on Sheet G6 (Appendix B), are described in this section.

- Construct a new storm sewer (Storm Line 1) to divert drainage from existing Outfall B to the main storm sewer that discharges through existing Outfall C (referred to as the C-line in the remainder of this report). This will allow stormwater from the site to be diverted to a single location for treatment.
- Plug and abandon in place Outfall I and construct a new storm sewer (Storm Line 2) to divert drainage from the abandoned outfall to the main storm sewer that discharges through the C-line. This will allow stormwater from the site to be diverted to a single location for treatment.
- Rehabilitate the existing C-line. Based on preliminary design activities that the Port conducted in 2012 (Kennedy/Jenks 2012), the existing storm sewer to Outfall C has many locations of infiltration and inflow. There are also structural defects in several sections of pipe, including pipe deformation, spalling, joint separation, longitudinal cracking, cracked wall offsetting, and areas of missing pipe.

- Reroute roof runoff and drainage, which does not require treatment, from the existing terminal warehouse building to Outfall A.
- Construct a combined diversion structure/pump station that will prevent tidal water from entering the primary storm sewer system except under extremely high tides. Treated stormwater will also connect to this structure downstream of the weir. The pump station will deliver stormwater to the treatment facility. Figures C29-C31 (Appendix B) provide the pump station layout and configuration.
- Construct new force main to route stormwater from the pump station to the treatment facility.
- Construct new gravity conveyance pipe to convey treated stormwater from the treatment facility to the diversion structure.
- Construct a stormwater treatment system that will provide oxidation, settling, filtration, and polishing of stormwater. Components are shown on Sheet C34 (Appendix B) and include:
 - Three-cell treatment pond that provides equalization, oxidation, pH adjustment, and settling
 - Treatment facility building with chemical storage, mixing tanks, injection, and monitoring and controls
 - Backflushing sand filters
 - Sludge pond, filter press, and sludge pumping, transport, and conditioning facilities
 - Decant facility
 - Existing stormwater pond, which will be retrofit to include a dedicated cell for potential future polishing of treated stormwater, if necessary, as well as cells that will treat offsite runoff.

3. EXISTING CONDITIONS SUMMARY

3.1. Existing Drainage

The depth of the conveyance system varies, with depths of up to approximately 20 feet below ground surface. There is high groundwater in much of the site, and tidal water currently backs up into the storm sewer.

Figure 1 (Appendix B) shows the Terminal in its existing condition. The site is predominantly covered with impervious surface used for log storage and handling activities, with Port offices located at the south end of the Terminal. Stormwater runoff from the site discharges to Budd

Inlet through four outfalls. There are four drainage subbasins (A, B, C, and I). The corresponding outfalls are shown on Figure 1.

- Drainage Subbasin A includes approximately 6 acres of the Terminal. (Subbasin A also receives stormwater from approximately 5 acres of impervious surface from an offsite area south of the site.) It receives runoff from approximately one-fourth of the Terminal warehouse building roof as well as from pavement areas. Stormwater discharges from Subbasin A have only had a single instance of exceeding a benchmark. Stormwater from existing Subbasin A, along with the additional area of the Terminal warehouse building as noted below, will continue to discharge through Outfall A without further treatment.
- Drainage Subbasin B is approximately 11 acres in size. The Terminal warehouse building comprises approximately 1.7 acres of Subbasin B. Stormwater from Subbasin B routinely fails to meet ISGP benchmarks. The sections of the Terminal warehouse roof that currently discharge through Outfall B will be rerouted to Outfall A under the proposed conveyance and stormwater treatment project; no further treatment is proposed for warehouse roof drainage. Other stormwater from Subbasin B will be routed to the treatment facility under the proposed conveyance and stormwater treatment project.
- Drainage Subbasin C is approximately 45 acres in size. It covers most of the log operations area along the northern and eastern sides of the Terminal. Stormwater from Subbasin C routinely fails to meet the benchmarks. Stormwater from Subbasin C will be routed to the treatment facility under the proposed conveyance and stormwater treatment project.
- Drainage Subbasin I is approximately 3 acres in size. It is located at the northwestern corner of the Terminal. Through recent investigations it was determined that Outfall I conveys only stormwater from within the Terminal site (i.e., no offsite drainage). Stormwater from Subbasin I routinely failed to meet the benchmarks. Stormwater from Subbasin I will be routed to the treatment facility under the proposed conveyance and stormwater treatment project.

3.2. Soils

A geotechnical investigation was conducted in support of the design (HWA Geosciences, Inc. 2013). The field investigation included drilling eight exploratory borings to investigate subsurface conditions (see Figure 1). Piezometers and wells were installed in the explorations for the proposed pump station and treatment facility to assist in evaluating groundwater conditions at those locations.

Explorations conducted near the proposed pump station indicated that there is an approximately 3-foot layer of structural and hydraulic fill near the surface and that it is underlain by tidal flat deposits and glacial deposits of sands, silts, and clays.

At the proposed treatment facility location, structural fill over tidal flat sediments was observed. The layer of fill increased in thickness from north to south, from approximately 4 to 10 feet.

Groundwater was observed at depths of 6 to 10 feet below ground surface in the vicinity of the proposed stormwater treatment facility. Groundwater was observed at a depth of approximately 8 feet below the existing ground surface in the location of the proposed pump station.

3.3. Hazardous Materials Investigation

Because soil excavation and dewatering will be required during construction of stormwater conveyance and treatment improvements at the marine terminal, an investigation of potential contaminants in the soils and groundwater was performed. Recommendations from that investigation have been incorporated into the project specifications. The following is a brief summary of the findings.

Shallow and deep soil samples were collected from each of 10 borings located along the proposed conveyance route. The samples were collected to characterize fill material near the surface as well as in the deeper soil below the water table that may be associated with contaminated groundwater. Groundwater samples were collected at four of the boring locations and during a pump test at the proposed pump station. (During the pump test, a sample was collected shortly after pumping began and then again halfway through the pump test, approximately one hour and a half later.) Samples were analyzed based on the potential presence of petroleum and metals near the Olympia Oil and Wood and Texaco lease areas, and the potential for petroleum, metals, and volatile organic compounds near the historical General Administration Olympia Motor Pool.

Lube-oil-range petroleum hydrocarbons were detected in shallow soil samples at five locations; one of the samples slightly exceeded the Model Toxics Control Act (MTCA) cleanup level. Diesel- and/or lube-oil-range petroleum hydrocarbons were found in deep soil samples at three locations, none of which exceeded MTCA cleanup criteria. While some metals (barium and chromium) were at detectable limits in all soil samples, no samples had concentrations of those metals that exceeded MTCA cleanup criteria. Cadmium was detected in the deep soil sample from probe number 8 at a concentration above the MTCA cleanup criterion. No soil sample metals results indicated the potential for designation as a hazardous waste. Solvents were detected at three locations—two in deep soil samples and one in shallow soil samples. None of the three solvents detected exceeded MTCA cleanup criteria.

Diesel-range petroleum hydrocarbons significantly exceeded the MTCA method A cleanup criterion in both groundwater samples collected at the proposed pump station. The nine volatile organic compounds (VOCs) detected in groundwater near the historic motor pool site were all lower than MTCA regulatory criteria. No water quality criteria (WAC 173-201A) exist for any of the organic constituents found. The LOTT discharge acceptance criteria do not include any of the organic compounds identified in groundwater at the site.

Soil containing petroleum hydrocarbons will be managed in accordance with *Guidance for Remediation of Petroleum Contaminated Sites*, Washington State Department of Ecology (Ecology) Publication No. 10-09-057. Water cannot be discharged to Puget Sound if constituents exceed water quality criteria (WAC 173-201A).

4. OFFSITE ANALYSIS

The project discharges stormwater through existing outfalls to Budd Inlet. Modeling has been conducted and is described in previous design reports to confirm that the existing outfalls have capacity for the runoff.

5. SUMMARY OF MINIMUM REQUIREMENTS

Based on review of Figure 2.3 (b) in the Drainage Design and Erosion Control Manual for Olympia (DDES; City of Olympia 2009), minimum requirements (MRs) #1 through #10 apply to the new and replaced impervious surfaces and the land disturbed, because the land disturbing activity exceeds 7,000 square feet and the project adds more than 5,000 square feet of new impervious surface. The minimum requirements and how they are addressed are summarized below:

1. MR#1: Preparation of Stormwater Site Plan - this report complies with MR#1
2. MR#2: Construction Stormwater Pollution Prevention (SWPP) - Sheets G6 and ESC1-ESC4 (Appendix B) provide the information for the SWPP. The project specifications Section 01 57 13 (Temporary Erosion and Sediment Control) and Section 31 23 19 (Dewatering) include additional details related to MR#2.
3. MR#3: Source Control of Pollution - Section 01 57 19 of the specifications, *Spill Prevention Control and Countermeasures Plan* requires that the Contractor prepare a spill prevention control and countermeasures (SPCC) plan. Section 01 35 43, *Environmental Controls* includes additional source control requirements for dust control, air pollution control, street sweeping, and other source control measures.
4. MR#4: Preservation of Natural Drainage Systems and Outfalls: All of the site runoff currently discharges to Budd Inlet and will continue to do so. The project includes abandonment of an existing outfall (I) and modifications to the drainage system that will divert runoff from existing outfalls A, B and I to Outfall C so that runoff from all contributing areas requiring stormwater treatment will be routed to the treatment facility. Modeling has been conducted and is described in previous design reports to confirm that the existing storm drain and outfall have capacity for the runoff.
5. MR#5: Onsite Stormwater Management, Including Easements and Setbacks: A geotechnical investigation was performed during design to evaluate whether infiltration of some of the treated stormwater runoff would be feasible in the existing stormwater pond. The initial design concept included bioretention cells to retain stormwater onsite. However, due to low infiltration rates and high groundwater elevations, the bioretention cells were not included in final design. All features associated with the project are located on Port property, and maintenance access has

been included in the design for all elements. The design included modeling to confirm that the project would not cause onsite or offsite flooding or erosion impacts.

6. **MR#6: Runoff treatment.** The primary objective of this project is runoff treatment in conformance with the Port's industrial permit. The Port has conducted exhaustive stormwater characterization, testing, and pilot testing to identify a treatment technology with the goal of achieving applicable benchmark values in future discharges. Based on the data collection and testing efforts, a chemical oxidation based system followed by backflushing sand filters and sludge processing was selected. The proposed treatment facility will treat 91 percent of the runoff volume in accordance with Ecology's guidance for preparing ISGP Engineering Reports (Ecology 2013). EPA SWMM (Version 5.0.022) was used to simulate the hydrology and hydraulic routing for the Terminal to size the pump station and determine the required storage volume and flow rates to treat 91 percent of the runoff volume. The treatment technology is expected to greatly exceed treatment technologies commonly used for stormwater treatment in terms of pollutant removal and control.
7. **MR#7: Flow Control:** Per Section 2.5.7 of the DDES, the project is exempt from flow control because stormwater discharges directly into Budd Inlet at or below the ordinary high water elevation.
8. **MR#8: Wetlands Protection:** MR#8 applies only to projects whose stormwater discharges into a wetland, either directly or indirectly through a conveyance system. This does not apply to this project.
9. **MR#9: Basin/Watershed Planning:** There are no basin plans that are specific to the project site that are intended to influence stormwater designs.
10. **MR#10: Operation and Maintenance:** The contract documents require that the Contractor prepare an operation and maintenance manual (Section 46 01 00 of the specifications, *Operation and Maintenance of Water and Wastewater Equipment*).

6. PERMANENT STORMWATER CONTROL PLAN

Both the treatment facility and the pump station have been sited based on analysis of existing conditions. The layout was refined during the design process based on the site investigations as described in this section.

6.1. Treatment Facility Design Development

The proposed treatment facility location is on the eastern side of the Port property in the same general area as an existing treatment pond and a stockpile of excavated material (Figure G-6; Appendix B). The existing topography is nearly flat, there are no existing wetlands and it is within the industrial site footprint and not located near any designated residential area.

The Port conducted a geotechnical investigation to support the design of the treatment facility. The geotechnical investigation included an evaluation of infiltration facility in the existing vegetated pond and characterization of subsurface soil conditions in the vicinity of the proposed treatment facility.

The pond design was informed by findings from the geotechnical investigation. The base elevation of the pond was established to be above groundwater elevations observed during the geotechnical investigation. The geotechnical investigation also was the basis for pond features such as the liner, which was added to the treatment pond to assure water tightness and slope stability, and the underdrain.

Based on site investigations, the proposed treatment facility site is highly suitable for a treatment facility. The site is outside of the limits of most log operations, so it will not be an obstacle to operations and will be safely accessible for maintenance and monitoring purposes. The design is appropriate and incorporates features responding to the subsurface conditions at the location. The adjacent existing vegetated pond will provide a safe emergency overflow location and a potential future polishing cell, if needed.

The proposed pump station is located near the lowest point of the conveyance system to collect runoff from all contributing areas where log handling activities are occurring. The pump station location is in a high-use operational zone, so the footprint for the aboveground elements has been minimized. Figure 2 shows the proposed location of the pump station, including the three underground structures (wet well/diversion structure, valve vault, and pigging vault), and an aboveground control panel.

The proposed pump station wet well is located in the same precast vault as the new diversion structure. The pump station will discharge to a force main that will convey the water to the treatment facility. The wet well and diversion structures have been combined to minimize construction costs, utility conflicts, operation disturbances, construction complexity, and impacts associated with groundwater and potential soft soils anticipated during construction.

The location for the aboveground elements associated with the pump station (e.g., motor control center and programmable logic controller) were selected for access to power, for proximity to the wet well, and because it is as out of the way of the operational zone as possible.

Appendix B includes drawings of the water quality system, conveyance system, and pump station facilities included in this project.

6.2. Developed Site Hydrology

The proposed treatment facility has been designed to treat 91 percent of the runoff volume in accordance with Ecology's guidance for preparing ISGP Engineering Reports (Ecology 2013).

A US Environmental Protection Agency (EPA) Stormwater Management Model (SWMM), Version 5.0.022, was used to simulate the hydrology and hydraulic routing for the study basin to evaluate existing and proposed pipe capacity, and to size the pump station, equalization basin, and primary treatment facilities. SWMM is a dynamic rainfall-runoff simulation model used for single-event or long-term (continuous) simulation of runoff quantity and quality. The

runoff component of SWMM operates on a collection of subcatchment areas on which rain falls and runoff is generated. The routing component of SWMM transports this runoff through a conveyance system of pipes, channels, storage/treatment devices, pumps, and regulators. SWMM tracks the quantity and quality of runoff generated within each subcatchment area, and the flow rate, flow depth, and quality of water in each pipe and channel during a simulation period.

The input data (and data sources) used in the SWMM model for the proposed project are summarized below.

- **Single-Event Rainfall Time Series:** a single-event simulation was used to determine capacity of the existing system and to size proposed conveyance. A storm with a return frequency of 25 years and duration of 24 hours (Thurston County hydrograph; referred to herein as the 25-year design storm) was selected. Runoff was evaluated at a 1-minute computation time step and a 1-second routing time step to maintain numerical stability within the dynamic wave routing and Hazen-Williams force main approximations.
- **Continuous Rainfall Time Series:** an extended 30-year time series was used to size the pump station (referred to herein as the 30-year extended time series) and to evaluate treatment system performance. The 30-year extended time series is truncated from the 158-year synthetic time series (MGS 2002). The last 30 years (2067 to 2097) of the 158-year time series were selected because these years are the most extreme in terms of variability of total precipitation and annual peak flow between years. Runoff was evaluated at a 5-minute computational time step and a 10-second routing time step to maintain numerical stability over the extended time series.
- **Drainage Area and Subcatchment Width and Slope:** subcatchment areas, subcatchment width, and slope were derived from survey data and refined based on field observations by Herrera on March 20, 2013. All subcatchments were assumed to be 100 percent impervious.
- **Surface Roughness:** impervious = 0.015, pervious = 0.1 (not used). Manning's n values are used by the runoff module for the routing of overland flows. Separate roughness coefficients are applied to pervious and impervious surfaces.
- **Tidal Conditions:** A continuous tide time series was developed from observed water levels at the Seattle, Washington, National Oceanic and Atmospheric Administration (NOAA) 9447130 station. Data from 2003 to 2013 was repeated to create a 30-year time series. Water levels were scaled to match Budd Inlet mean high-high water and mean low-low water datums.
- **Surface flooding:** A two-dimensional model was built in PCSWMM, Version 5.2.1319, based on elevations provided by the field survey to determine surface flooding depths associated with conveyance limitations during the 25-year design storm.

6.2.1. Model Development

6.2.1.1. Conveyance Model Using Single Event Time Series

An existing and proposed conveyance model was built in EPA SWMM to evaluate the effect of proposed conveyance improvements on system capacity. The 25-year design storm was used to size new conveyance and compare capacity between existing and proposed conditions. Proposed conveyance improvements include:

- Rerouting of roof runoff from the existing terminal warehouse building to Outfall A (which is not included in the area contributing to the treatment facility)
- Rerouting of flows from existing Outfalls B and I to the C-line for treatment
- Rehabilitation of the existing C-line

6.2.1.2. Treatment Model Using Continuous Time Series

The 30-year extended time series was modeled to determine the pumping rate required to treat 91 percent of the annual runoff volume, to size the equalization pond, and to determine the number of sand filters required to treat peak flows.

6.2.2. Data and Assumptions

A Thurston County hydrograph was used for the 25-year, 24-hour design storm with a depth of 5.1 inches. Tide levels were scaled from observed tide levels at NOAA's Seattle tide station to match Budd Inlet's mean high-high and mean low-low water level datums. A 30-year tide level time series was developed based on the most recent 10 years of tide data (2003 to 2013).

The Port site was delineated into 68 subbasins based on existing site topography and the existing storm conveyance system. Because the drainage area routed to each outfall will change with the proposed conveyance modifications, each of the subbasins was assigned to an outfall based on the scenario of interest (i.e., existing conditions, design conditions). The design conditions correspond to the proposed drainage improvements scenario described above. Under the design conditions, Outfall I and Outfall B will be abandoned and the subbasins draining to those outfalls under existing conditions will be routed to Outfall A and Outfall C via the proposed conveyance system.

Table 1 shows the area contributing to the treatment facility under existing and proposed design conditions. The areas routed to each outfall under those conditions are also listed.

	Existing Conditions	Design Conditions
Outfall A	10.11	11.36
Outfall I	3.32	–
Outfall C	43.71	56.30
Outfall B	10.53	–
Total	67.66	67.66

6.2.3. Results

6.2.3.1. Pump Station Operation

Using the 30-year extended time series, the pump station and overflow weir were designed such that 91 percent of the annual runoff would be diverted to the treatment facility. The weir elevation was set to maximize the portion of the tide cycle in which the pumps were operational (i.e., the pumps will shut off during tidal conditions that exceed the weir elevation) and to minimize surface flooding during large rainfall events. Pumps were selected and sized to maintain a minimum drawdown time and a maximum pump rate to manage peak flows.

A weir elevation of 7.77 feet was found to minimize surface flooding with a maximum pump rate of 7 cubic feet per second (cfs), while managing 91 percent of surface runoff for the 30-year extended time series

6.2.3.2. Treatment System Design Flow Rates

The treatment facility includes a pH adjustment, settling, and equalization pond. The equalization pond volume (approximately 144,000 cubic feet) has been sized to control the inflow so that a consistent treatment flow rate is maintained. The design treatment flow rate to the sand filters is 2,200 gallons per minute (gpm), or approximately 4.9 cfs.

6.3. Conveyance System Design

6.3.1. Rehabilitation of C-Line

The Port hired CUES, Inc., to inspect the existing C-line via closed-circuit television video (CCTV) in 2008. Herrera reviewed reports, sections of the video where structural defects or significant infiltration had been noted on the reports, and information on cured-in-place pipe technologies (sliplining) and techniques to assess the viability of the technology to address defects. Herrera also identified sections of pipe or structures that would need to be replaced rather than sliplined.

6.3.2. Outfall Abandonment

Outfall I will be abandoned as part of the project. Due to the high traffic and heavy truck loadings on the site, the abandoned pipes must be filled to avoid potential collapse and

settlement of soils or pavement. The design includes plugging the existing outfall at the shoreline and abandoning it in place by filling (tremie pumping) with controlled density fill.

Outfall B will not be used during initial treatment system operation. However, the Port may decide to divert warehouse drainage to Outfall B at a future time, so abandonment or plugging of the outfall is not included in the design. If stormwater is diverted to Outfall B, any necessary treatment (e.g., downspout filters) will be included at that time.

New Storm Lines 1 and 2 will divert runoff from Outfalls B and I, respectively.

6.3.3. Pipe Capacity and Sizing

Storm drainpipes (except the force main and gravity return pipe from the treatment pond) have been sized to carry the maximum anticipated runoff for a storm with a return frequency of 25 years and a duration of 24 hours (based on the Thurston County hydrograph). EPA SWMM was used to determine the flow rates and verify capacity. The model predicts flooding in limited areas under existing conditions. Under proposed conditions, in the Outfall A network, the model predicts that duration of surface flooding will increase by 19 percent and volume of surface flooding will increase by 18 percent. The Outfall A drainage network will receive additional runoff, as compared to existing conditions, due to rerouting of the warehouse roof drainage.

The model predicts that Outfall C will experience lower flooding duration and volume relative to existing conditions when the pump is operational. In the event of pump failure, the model predicts an increase in flood duration and volume of 18 percent and 73 percent, respectively.

The pipe capacity and design storm have also been sized in coordination with the treatment plant capacities to achieve treatment of 91 percent of annual stormwater volume.

6.4. Pump Station and Diversion Structure

The pump station evaluation in this report includes information on pump station equipment, spatial requirements, wet well sizing, influent hydraulics, stormwater characteristics, flow rate to head relationships, motors and drivers, pump type, impeller size, operation, pump system performance and efficiency, valve vault requirements, mechanical systems codes and design standards, valves and actuators, structural codes and design standards, geotechnical considerations, access and egress, identification and evaluation of auxiliary systems, siting evaluation, coordination with other utilities, environmental assessments, construction phasing issues, and identified potential impacts.

6.4.1. General Requirements

The pump station includes the following elements (Figures C29 -C31; Appendix B):

- Wet well/diversion structure
- Valve vault
- Pigging vault
- Control panels

- Instrumentation and controls
- Power supply
- Force main
- Emergency bypass/overflow
- Bar screen

6.5. Stormwater Treatment Facility

The treatment facility includes the following primary elements, each of which are described in this section.

- Treatment ponds
- Control building
- Sand filters
- Sludge pond and handling facilities
- Retrofit of existing vegetated stormwater pond

6.6. Treatment Ponds

The treatment facility includes a three-cell pond as shown in Sheet C34 (Appendix B). Based on SWMM modeling a peak pumping rate of 7 cfs will be needed to ensure that 91 percent of the annual runoff volume is treated under initial operation. This rate governs the peak pumping rate at the pump station and flows in the force main. The force main enters the control building (described in the next section) for oxidation chemical injection and flow measurement. The force main discharges into the southernmost pond cell (the oxidation cell). Water then flows through a flume to the pH adjustment cell, and then through the turbidity curtain to the settling cell.

Most of the internal side slopes are set at 3H:1V, while the berms separating the cells are inclined at 2H:1 V. The proposed base elevations of the cells is at an elevation of approximately 12 feet (the bottom is sloped, so the depth varies). The base elevation was raised from the 60 percent design due to high groundwater elevations observed during the geotechnical investigation.

A liner was also added to the treatment pond to assure water tightness and slope stability. An underdrain has been added.

The pond will have 2 feet of freeboard depth. An overflow structure is included in the event of an extreme storm event. A level sensor in the pond will also ensure that the pump at the pump station does not operate if the pond is nearing capacity. There will be a 12-foot-wide berm surrounding the pond for maintenance access, and access ramps at both the south and north cells of the pond.

Division 46 of the specifications provides information on all of the treatment system processes, including oxidation, aeration, sand filtration, sludge collection and management, and treatment system operation and control.

6.6.1. Oxidation Cell

After oxidation chemical injection in the control building, water will enter the oxidation cell at a peak flow rate of 7 cfs. Floating aerators will keep the water agitated, prevent settling of solids, and introduce mechanical oxidation to reduce the overall chemical requirements of the system. The oxidation cell will be lined. The design includes two, 3 horsepower, surface eductor aerators. The aerators will minimize chemical injections and will maintain agitation of the cell to limit settling. Under normal operation run times, aerators will be run on alternating schedules. The aerators will be moored to the cell embankments via three cables attached to mooring posts. Each aerator assembly will be composed of a single-shaft, 3 horsepower motor mounted to a float with a submerged cone/anti-vortex cross assembly. Water will be conveyed up through the submerged intake cone via a propeller and then diffused across the surface of the cell via a diffusion head.

6.6.2. Berm

A berm will divide the oxidation cell from the pH adjustment cell, which is the second cell in the series. The berm will be a 12-foot-wide earthen berm with a top elevation established to provide 2 feet of freeboard above the design water surface elevation in the oxidation cell. The berm will serve to isolate the oxidation cell from the other cells to allow optimization of aerators. It will also provide a point of contact for the tethers to fix the aerators in place and can be used for maintenance access. The primary conveyance pathway between the oxidation and pH adjustment cells is through a flume located near the top of the berm. The flume will control flow rates between the oxidation cell and the pH adjustment cell and will allow for accurate flow monitoring. The flow monitoring results will be sent to the PLC, which controls the dosage of hydrated lime required for pH adjustment. Hydrated lime will be injected through a diffuser located at the end of the flume. A drain pipe with a manual shear gate will be located near the bottom of the berm to allow for gravity drainage between the oxidation cell and the pH adjustment cell so that the oxidation cell can be drained if necessary for maintenance activities.

6.6.3. pH Adjustment Cell

Together, the second and third cells provide equalization in addition to pH adjustment and settling. The combined equalization volume of the two cells is approximately 144,000 cubic feet. The cell volume has been established to ensure a minimum 2-hour residence time for pH adjustment and equalization without exacerbating flooding during peak flow conditions. Hydrated lime for pH adjustment is injected at the end of the flume as the water enters the second cell. In that cell, the hydrogen peroxide will be lost through volatilization, and settling of solids will occur as pH is adjusted. Solids will settle out as sludge and collect in a sludge collection trench within the bottom of this cell. A perforated manifold header and lateral system will be fixed to the bottom of the concrete trench with Unistrut® support and will operate in suction when connected to the sludge transfer pump. The sludge transfer

pump will pump sludge from the sludge collection trench and discharge to the sludge pond. The cell will be lined with an HDPE liner.

6.6.4. Turbidity Curtain

The pH adjustment cell and the settling cell are separated by a turbidity curtain. The turbidity curtain is a floating containment boom with an attached geotextile curtain that is intended to encourage solids settlement in the sludge collection trench while allowing liquids to pass through and be collected and conveyed to the sand filters.

6.6.5. Settling Cell

The third cell is the settling cell, which will provide equalization and further settling. Two floating, suction-line intakes will be used to draw water from the settling cell for conveyance to the sand filters. The cell will be lined.

6.7. Sludge Pond

The volume of the sludge pond is approximately 32,300 cubic feet and has been optimized to the extent possible, given other site constraints, to promote operational flexibility of the sludge management system. The sludge pond provides both sludge storage and additional settling. Two sludge grinder pumps located at the bottom of the sludge pond will convey settled sludge to a batch tank for sludge conditioning using polymers. After polymer injection and mixing, a progressive cavity pump will pump sludge to the filter press, where the bulk of the sludge liquids will be filtered out. Liquid filtrate from the filter press will be discharged to the sludge pond and later pumped via floating intakes from the sludge pond back to the settling cell for further treatment.

The sludge cake will be of appropriate consistency and content to be acceptable for use as landfill cover. It is expected that it will be disposed of at the nearest landfill.

6.8. Treatment Facility Building

The treatment facility building will house the chemical storage and monitoring equipment and will be equipped with a restroom and electrical/mechanical room (Sheet C52; Appendix B). There will be a roof overhang to the south, under which the filter press for solids dewatering will be placed. One roll-up door will be provided on the east side of the building, allowing chemical delivery, storage, and mixing of bulk treatment additives. The building will be a slab-on-grade, pre-manufactured, metal building with a shed roof.

The chemical storage containers and locations within the building have been selected based on health and safety criteria and risk considerations. The hydrogen peroxide tank is a double-walled container located on a separate, cast-in-place pad to provide extra protection.

6.9. Sand Filters

The design pumping rate to the sand filters is 4.9 cfs under initial operation configuration. Future sand filter pumping rates (at the time of construction of Berth 4) would increase to 5.7 cfs.

Sand filter units, configured in a 54-inch by 8-pod filtration system, will operate at rates ranging from 200 gpm to 2,000 gpm. The design includes redundancy to allow maintenance of sand filters while others are operating. A control unit will monitor sand filter effluent to allow flexibility in operation of the treatment system. Treated effluent may be routed directly to the storm drain for discharge via Outfall C. If additional polishing is needed, the treated stormwater can be routed to the existing stormwater pond for polishing. Alternatively, the stormwater may be recirculated through the treatment system for further treatment.

6.10. Retrofit of Existing Vegetated Stormwater Pond

The existing stormwater pond located east and north of the proposed treatment facility and adjacent to Marine Drive will be retrofitted to: 1) provide treatment for offsite areas contributing to the pond to current Ecology standards for basic treatment, and 2) be used for potential polishing of treated stormwater from the new system. The linear shape of the pond will be retained, as will the three areas that were initially designed as sediment forebays for outfalls. The Ecology Blocks will also be retained, functioning as a weir for stormwater pretreatment before it enters the treatment areas of the ponds. The pond will be divided into three sections. Two new berms will be constructed to establish the three pond sections.

6.11. Construction Stormwater Pollution Prevention Plan

A Construction stormwater pollution prevention plan (SWPPP) that conforms to the DDES will be prepared by the Contractor in accordance with Section 01 57 13 of the specifications, *Temporary Erosion and Sediment Control*.

7. SPECIAL REPORTS AND STUDIES

A geotechnical investigation, including installation of piezometers and a pump test; hazardous materials investigation; and survey were completed as part of this design. In addition, extensive water quality testing to optimize the treatment process and sludge handling were conducted.

8. OTHER PERMITS

Permits required for this project include; SEPA checklist, grading permit, shoreline permit, building permit and general construction stormwater permit. Any expected special conditions for these permits have been considered and detailed in the paragraphs above.

9. OPERATIONS AND MAINTENANCE MANUAL

The contractor will prepare an operations and maintenance manual for the facility in conformance with Section 46 01 00, *Operation and Maintenance of Water and Wastewater Equipment*.

10. REFERENCES

City of Olympia. 2009. Drainage Design and Erosion Control Manual for Olympia. Olympia, Washington.

Ecology. 2013. Guidelines for the Preparation of Industrial Stormwater General Permit Engineering Reports. Ecology Publication No. 13-10-007. Washington State Department of Ecology, Olympia, Washington.

HWA GeoSciences. 2013. Final Geotechnical Engineering Report. Marine Terminal-Stormwater Conveyance and Treatment Improvement. Port of Olympia, Olympia, WA. Prepared for Herrera Environmental Consultants, Inc., by HWA Geosciences, Inc., Bothell, Washington. October 30, 2013.

Kennedy/Jenks Consultants. 2012. Draft Summary of Pre-Design Activities: Port of Olympia Marine Terminal Stormwater and Pavement Rehabilitation. Prepared for Port of Olympia by Kennedy/Jenks Consultants, Federal Way, Washington.

MGS. 2002. Extended Precipitation Time-Series for Continuous Hydrological Modeling in Western Washington. MGS Engineering Consultants, Inc., Olympia, Washington.

APPENDIX A

Facility Summary Form

**THURSTON REGION
FACILITY SUMMARY FORM**

Complete one (1) for each facility (detention/retention, coalescing plate filter, etc...) on the project site. Attach 8 1/2 x 11 sketch showing location of facility.

Proponent's Facility Name or Identifier (e.g., Pond A): Port of Olympia Stormwater Treatment Facility
 Name of Road or Street to Access Facility: Franklin Street
 Hearings Examiner Case Number: N/A
 Development Rev. Project No./Bldg Permit No.: 14-1491
 Parcel Number: Port of Olympia Marine Terminal

To be completed by Utility Staff:

Utility Facility Number _____
 Project Number (num) _____
 Parcel Number Status, (num, 1ch)
 0, Known; 1, Public; 2 Unknown; 3, Unassigned _____
 Basin and Subbasin: (num, 6ch) _____
 (2ch for basin, 2ch for subbasin, 2ch future)
 Responsible jurisdiction: (alpha, 1ch) _____
 (O)lympia, (C)ounty, (T)umwater, (L)acey

Part 1 - Project Name and Proponent

Project Name: Stormwater Conveyance and Treatment Improvements
 Project Owner: Port of Olympia
 Project Contact: Tyson Carpenter
 Address: 915 Washington Street NE
 Phone: 360-528-8006
 Project Proponent: (if different) _____
 Address: _____

Phone: _____

Project Engineer: Mary Larkin

Firm: Herrera Environmental Consultants Phone: 971-200-8873

Part 2 - Project Location

Section 14

Township 18

Range 2W

Names and Addresses of Adjacent Property Owners:

Located within Port boundary. Information was submitted with the Land Use Application. However, it is attached for your reference.

Part 3 - Type of Permit Application

Type of permit (e.g., Commercial Bldg): Commercial Bldg

Other Permits (circle)

DOF/W HPA

COE 404

COE Wetlands

DOE Dam Safety

FEMA

Floodplain

Shoreline Mgmt

Rockery/Retaining Wall

Encroachment

Grading

NPDES

Other _____

Other Agencies (Federal, State, Local, etc.) that have had or will review this

Drainage Erosion Control Plan:

Part 4 - Proposed Project Description

What stream basin is this project in (e.g., Percival, Woodland):

Capitol

Project Size, acres	<u>6.5</u>
Zoning:	<u>Industrial</u>
Onsite:	
Residential Subdivision:	
Number of Lots:	<u> </u>
Lot size (average), acres:	<u> </u>
Building Permit/Commercial Plat:	
Building(s) Footprint, acres:	<u>.046</u>
Concrete Paving, acres:	<u>.79</u>
Gravel Surface, acres:	<u> </u>
Lattice Block Paving, acres:	<u> </u>
Public Roads (including gravel shoulder), acres:	<u> </u>
Private Roads (including gravel shoulder), acres:	<u> </u>
Onsite Impervious Surface Total, acres:	<u> </u>

Part 5 - Pre-Developed Project Site CharacteristicsStream through site, y/n: Name: N DNR Type:

Type of feature this facility discharges to (i.e., lake, stream, intermittent stream, pothole, roadside ditch, sheetflow to adjacent private property, etc):

Budd Inlet

Swales, Ravines, y/n:	<u> N </u>
Steep slopes, (steeper than 15%) y/n:	<u> N </u>
Erosion hazard, y/n:	<u> N </u>

Multiple orifice	_____
Weir	_____ <u>1</u> _____
Spillway	_____ <u>1</u> _____
Pump(s)	_____ <u>1</u> _____
Other	_____

Part 7 - Release to Groundwater

Design Percolation Rate To Groundwater (if applicable) N/A in/hr

Part 8 - Release to Surface Water (if applicable)

	Thurston County MSL Elevation (ft)	Present Design Full	Volume (cu ft)	Discharge to Surface Water (cfs)
Empty:	_____	_____ <u>0</u> _____	_____ <u>0.0</u> _____	_____ <u>0.0</u> _____
	_____	_____ <u>25</u> _____	_____	_____
	_____	_____ <u>50</u> _____	_____	_____
	_____	_____ <u>100</u> _____	_____	_____

THURSTON COUNTY TITLE COMPANY
105 EAST 8TH AVE
OLYMPIA WA, 98501
PHONE: (360) 943-7300
FAX: (360) 786-9315

DATE: March 21, 2014

TO: Rick Anderson
Port Of Olympia
Engineering Department
915 Washington St. NE
Olympia, WA 98501

The 48 mailing addresses within 300' feet of the following described subject premises were taken from the Thurston County Assessor's website. Please find a set of labels and an excel sheet listing all properties. I will also be sending electronic copies of the above documents.

Tax Parcel Number: 6613-00-00100

Site Address: 915 Washington St. NE

Thurston County Title Company

Clark Summerfield
Customer Service
clark@tctitle.net

APPENDIX B

Figures

PROJECT NUMBER: 2013-001
 ENVIRONMENTAL IMPROVEMENTS
 CONTRACT NUMBER: 2013-001
 SHEET NUMBER: 3 OF 23

**MARINE TERMINAL
 STORMWATER CONVEYANCE AND
 TREATMENT IMPROVEMENTS**

GENERAL NOTES

REVIEWED BY: _____ DATE: _____
 Project Manager


Port of Olympia
 ENGINEERING DEPARTMENT
 915 Washington Street NE
 Olympia, Washington



DATE	BY	DATE

SCALE: NONE
 DRAWN BY: _____
 CHECKED BY: _____
 PROJECT MANAGER: _____

RECORD DRAWING
 THESE DRAWINGS CONFORM TO THE CONTRACTOR'S CONSTRUCTION RECORDS.
 DRAWN BY: _____
 PROJECT MANAGER: _____

No.	Date	Revision

GENERAL NOTES

- CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO BEGINNING WORK AND REVISIONS SHALL BE MADE PRIOR TO BEGINNING WORK.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO BEGINNING WORK AND REVISIONS SHALL BE MADE PRIOR TO BEGINNING WORK.
- ALL WORKSHOPS AND MATERIALS SHALL BE IN ACCORDANCE WITH PORT OF OLYMPIA'S REQUIREMENTS AND THE CONTRACT DOCUMENTS.
- TOPOGRAPHIC SURVEY INFORMATION WAS PROVIDED BY GPS, BASED ON DATUM NAD83/01 - WASHINGTON SOUTH ZONE, VERTICAL DATUM NAVD83.
- LOCATIONS OF EXISTING UTILITIES HAVE BEEN ESTABLISHED BY FIELD SURVEY OR OBTAINED FROM AVAILABLE RECORDS, AND SHOULD THEREFORE BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO UNDEPENDENTLY VERIFY THE ACCURACY OF ALL UTILITY LOCATIONS AND TO DISCOVER AND AVOID ANY UTILITIES NOT SHOWN THAT MAY BE AFFECTED BY THE IMPLEMENTATION OF THIS PLAN.
- PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL CALL UTILITY NOTIFICATION CENTER AT 1.800.424.2555 (OR 811) A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION FOR UTILITY LOCATIONS. IT IS ALSO CONTRACTOR'S RESPONSIBILITY TO NOTIFY AND COORDINATE WITH ALL AFFECTED PRIVATE UTILITIES.
- A COPY OF THE APPROVED PLANS SHALL BE ON SITE DURING CONSTRUCTION.
- CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH PERMIT REQUIREMENTS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL PRIOR TO BEGINNING CONSTRUCTION. ALL TRAFFIC CONTROL MEASURES SHALL BE PREPARED AND SUBMITTED TO THE ENGINEER FOR APPROVAL. NO WORK SHALL COMMENCE UNTIL ALL APPROVED TRAFFIC CONTROL IS IN PLACE. SEE SECTION 01.39.24.
- USE CARE TO AVOID EXCAVATING OR REMOVING MATERIALS WHICH ARE TO REMAIN IN PLACE. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING AND MAINTAINING OR REPLACEMENT OF ANY WORK IN AREAS AFFECTED, MODIFIED OR DAMAGED BY THE WORK.
- CONTRACTOR SHALL SUBMIT A HEALTH AND SAFETY PLAN PER SECTION 01.73.16.
- THE CONTRACTOR SHALL TAKE WHATEVER PRECAUTIONS ARE NECESSARY TO AVOID INJURY TO PERSONS OR DAMAGE TO PROPERTY. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND LICENSES IN THE STATE OF WASHINGTON. SEE SECTION 02.11.00.
- RECONSTRUCTION MEASURES WILL BE HELD FROM TO THE START OF CONSTRUCTION. SEE SECTION 01.31.16.

SLURRY WALL PROTECTION NOTES

- SET WELL/JUNCTION STRUCTURE IS LOCATED APPROX. 10' TO 15' FROM EXISTING UTILITY. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND LICENSES THROUGH 33 FOR MONITORING, CONSTRUCTION, NOTIFICATION, AND REPAIR REQUIREMENTS.
- CLEARING AND GRUBBING NOTES
- THE AREA TO BE CLEARED AND GRADED SHALL BE FLAGGED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO BEGINNING ANY WORK ON THE SITE.
- CLEARING SHALL BE LIMITED TO THE AREAS WITHIN THE APPROVED SURROUNDANCE LIMITS. EXPOSED SOILS SHALL BE COVERED PER SECTION 01.57.12.

CIVIL NOTES

- WHERE CONNECTIONS REDUCE FIELD VERIFICATIONS, CONNECTION POINTS SHALL BE DIVIDED BY CONTRACTOR AND FITTINGS VERIFIED 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH UTILITY COMPANIES ON THE TIMING OF REGULATION OF THEIR FACILITIES.
- THE CONTRACTOR SHALL PROTECT EXISTING UTILITIES AND FACILITIES AT ALL TIMES DURING CONSTRUCTION.
- WHERE CONNECTING TO AN EXISTING PIPE, THE CONTRACTOR SHALL EXPOSE LOCATION AND ELEVATION, CONDITION, AND POSITIVE FLOW BEFORE LAYING ANY NEW PIPE ON THAT SYSTEM.
- GROUND AND EXISTING WORK SHALL COMPLY WITH THESE PLANS AND THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT PREPARED BY HMA.

TEMPORARY EROSION AND SEDIMENT CONTROL (TESC) NOTES

- DURING CONSTRUCTION, THE CONTRACTOR SHALL BE REQUIRED TO CONTROL EROSION/SEDIMENTATION CONTROL PROCEDURES. SEE SHEETS E01 - E04 AND SECTION 01.37.16.
- CONTRACTOR SHALL MAINTAIN A STREET SWEEPER ON-SITE DURING EXISTING CONSTRUCTION THAT HAS BEEN THROGGED AND PAVED AREAS AS A RESULT OF CONSTRUCTION.
- TRASH/DEBRIS MONITORING MAY BE REQUIRED AS A CONDITION OF CLEARING AND GRUBBING PERMIT APPROVAL. IF REQUIRED, TRASH/DEBRIS MONITORING MUST BE PERFORMED IN ACCORDANCE WITH THE APPROVED TRASH/DEBRIS MONITORING PLAN DURING EXISTING CONSTRUCTION UNTIL THE FINAL SHUT-OFF BY THE ENGINEER.
- CONTRACTORS SHALL SUBMIT A DETAILED DRAINAGE PLAN PER SECTION 31.23.19.
- A CERTIFIED EROSION AND SEDIMENT CONTROL PLAN (CESS) IS REQUIRED FOR ALL CONSTRUCTION PROJECTS.
- APPROVAL OF THE EROSION/SEDIMENTATION CONTROL (ESS) PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G., FACILITIES, UTILITIES, ETC.).
- THE IMPLEMENTATION OF THE ESD PLANS AND THE CONSTRUCTION OF PERMANENT ROAD AND DRAINAGE DESIGN SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.
- THE CLEARING LIMIT BOUNDARIES SHALL BE CLEARLY PLACED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO BARRIERS SHALL BE PLACED WITHIN THE CLEARING LIMIT BOUNDARIES UNTIL THE END OF CONSTRUCTION.
- THE ESD FACILITIES SHOWN ON THE ESD PLANS MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRUBBING ACTIVITIES, AND IN SUCH A MANNER AS TO PREVENT EROSION AND SEDIMENTATION FROM ENTERING THE DRAINAGE SYSTEM, ROADWAYS, OR VOLATE APPLICABLE SURFACE WATER, GROUND WATER, OR DISCHARGE STANDARDS.

OUTFALL ABANDONMENT NOTES

- WHERE INDICATED, EXISTING OUTFALLS SHALL BE ABANDONED BY THE CONTRACTOR.
- TO ABANDON OUTFALL, PLUG DISTAL END WITH TEMPORARY PLUG AND FILL WITH CONTROL DENSITY FILL FOR FULL LENGTH OF PIPE. SEE SECTION 03.34.00.

TRACK CROSSINGS

- CONTRACTOR SHALL COORDINATE WITH PORT PROJECT REPRESENTATIVE FOR ALL TRACK INTERFERENCES. SEE SECTION 01.14.17 FOR COORDINATION REQUIREMENTS.
- ALL TRACK CROSSINGS SHALL BE SLEEVED.
- CONTRACTOR SHALL NOT BE PERMITTED TO PLACE OR ALLOW TO REMAIN ANY PERMANENT OR TEMPORARY MATERIAL WITHIN TRACK ROLLOVER STORAGE VESSEL, ABOVE-GROUND OR UNDERGROUND TANK, OR OTHER STORAGE VESSEL, UNLESS THE MATERIAL IS PROTECTED BY A MINIMUM OF 2 FEET OF COVER ABOVE THE TRACKS OR WITHIN 24 FEET VERTICALLY FROM THE TOP OF THE RAIL OF THE TRACKS.
- SEE DRAWINGS, AND SECTION 34.11.00 FOR TRACK REPAIR REQUIREMENTS.

SECURITY AND ACCESS NOTES

- ALL WORKERS ACCESSING THE SITE SHALL BE ACCOMPANIED BY A CONTRACTOR REPRESENTATIVE WHO HAS A VALID TRANSPORTATION WORKER IDENTIFICATION CARD (TWIC) AT ALL TIMES. SEE 00.72.00.
- REFER TO THE SECTION 01.11.00 FOR ACCESS RESTRICTIONS AND NOTIFICATION REQUIREMENTS.

GENERAL NOTES

- THE ESD FACILITIES SHOWN ON THE ESD PLANS ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESD FACILITIES SHALL BE IMPROVED AS NEEDED FOR CHANGING SITE CONDITIONS. CONTRACTOR SHALL MAINTAIN SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.
- THE ESD FACILITIES ON ACTIVE SITES SHALL BE INSPECTED MONTHLY - TO ENSURE THEIR CONTINUED FUNCTIONING.
- THE ESD FACILITIES ON INACTIVE SITES SHALL BE INSPECTED MONTHLY, OR WITHIN 48 HOURS FOLLOWING A MAJOR STORM EVENT, BY THE CONTRACTOR - TO ENSURE THEIR CONTINUED FUNCTIONING. ASSESSMENT AS NECESSARY - TO ENSURE THEIR CONTINUED FUNCTIONING.
- STORM DRAIN INLETS (PERMISSIBLE BURNING CONSTRUCTION SHALL BE PROTECTED WITHOUT FIRST BEING FILTERED OR TREATED. ALL CATCH BASINS AND OTHER STRUCTURES SHALL BE MAINTAINED AND OPERATED AS NECESSARY TO ACCEPTANCE. THE CLEANING OPERATIONS SHALL NOT FLUSH SEDIMENT-LADEN WATER UPSTREAM WITHOUT TREATMENT.
- ROADS SHALL BE CLEARED THOROUGHLY AS NEEDED TO PROTECT DOWNSTREAM WATER RESOURCES OR STORMWATER INFRASTRUCTURE. SEDIMENT SHALL BE TRANSPORTED TO A CONTROLLED SEDIMENT DISPOSAL AREA, AND SHALL BE UNWORKED FOR MORE THAN 2 DAYS. FROM APRIL 2 TO OCTOBER 14, NO SOILS SHALL REMAIN EXPOSED AND UNWORKED FOR MORE THAN 7 DAYS. WEEDING IS NEEDED BASED ON THE WEATHER FORECAST. LINEAR ROADWAY DEVELOPMENT, FENCES, AND TRENCHING FOR UTILITIES SHALL COMPLY WITH THESE REQUIREMENTS. THESE STABILIZATION REQUIREMENTS APPLY TO ALL SOILS ON SITE, WHETHER AT PINK GRADE OR NOT.
- FROM OCTOBER 15 THROUGH APRIL 1, CLEANING, GRADING, AND OTHER STABILIZATION MEASURES SHALL BE REQUIRED TO PREVENT THE TRANSPORT OF SEDIMENT FROM THE CONSTRUCTION SITE TO RECEIVING WATERS WILL BE REQUIRED.
- SOIL STOCKPILES MUST BE STABILIZED AND PROTECTED WITH SEDIMENT-TIPPING MEASURES.
- ALL POLLUTANTS, INCLUDING WASTE MATERIALS AND DEMOLITION DEBRIS, THAT OCCUR ON THE SITE MUST BE PROPERLY STORED AND MAINTAINED TO PREVENT POLLUTION OF RECEIVING WATERS. CONTAMINATION OF STOCKPILES OF A NATURE THAT DOES NOT CAUSE CONTAMINATION OF STOCKPILES.
- MAINTENANCE AND REPAIRS OF TEMPORARY STRUCTURES AND OTHER STRUCTURES SHALL BE PERFORMED AS NECESSARY TO PREVENT POLLUTION OF THE GROUND OR INTO STORMWATER RUNOFF. MUST BE CONDUCTED USING SPILL PREVENTION MEASURES, SUCH AS DUMP PANS.

OUTFALL ABANDONMENT NOTES

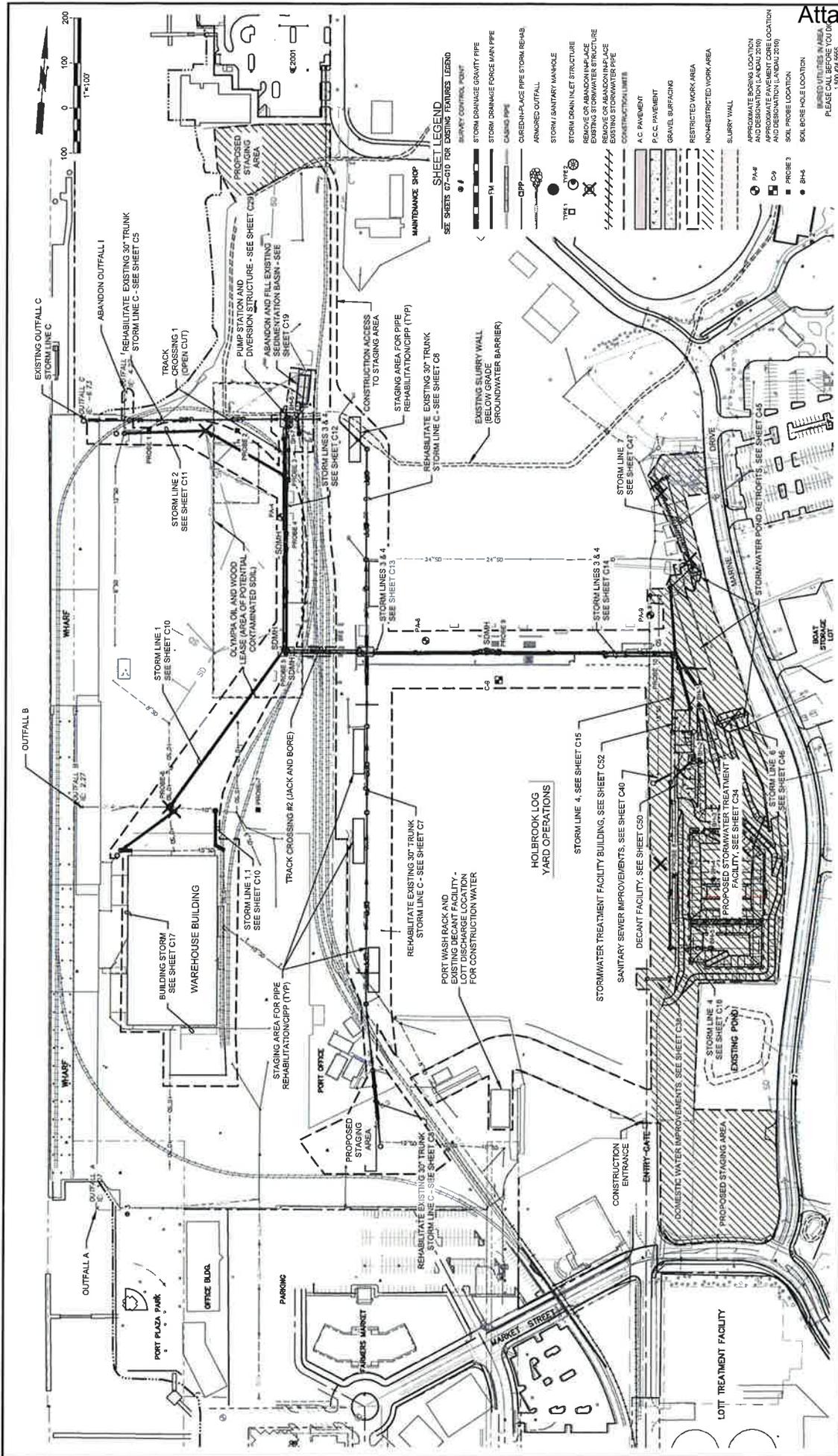
- WHERE INDICATED, EXISTING OUTFALLS SHALL BE ABANDONED BY THE CONTRACTOR.
- TO ABANDON OUTFALL, PLUG DISTAL END WITH TEMPORARY PLUG AND FILL WITH CONTROL DENSITY FILL FOR FULL LENGTH OF PIPE. SEE SECTION 03.34.00.

TRACK CROSSINGS

- CONTRACTOR SHALL COORDINATE WITH PORT PROJECT REPRESENTATIVE FOR ALL TRACK INTERFERENCES. SEE SECTION 01.14.17 FOR COORDINATION REQUIREMENTS.
- ALL TRACK CROSSINGS SHALL BE SLEEVED.
- CONTRACTOR SHALL NOT BE PERMITTED TO PLACE OR ALLOW TO REMAIN ANY PERMANENT OR TEMPORARY MATERIAL WITHIN TRACK ROLLOVER STORAGE VESSEL, ABOVE-GROUND OR UNDERGROUND TANK, OR OTHER STORAGE VESSEL, UNLESS THE MATERIAL IS PROTECTED BY A MINIMUM OF 2 FEET OF COVER ABOVE THE TRACKS OR WITHIN 24 FEET VERTICALLY FROM THE TOP OF THE RAIL OF THE TRACKS.
- SEE DRAWINGS, AND SECTION 34.11.00 FOR TRACK REPAIR REQUIREMENTS.

SECURITY AND ACCESS NOTES

- ALL WORKERS ACCESSING THE SITE SHALL BE ACCOMPANIED BY A CONTRACTOR REPRESENTATIVE WHO HAS A VALID TRANSPORTATION WORKER IDENTIFICATION CARD (TWIC) AT ALL TIMES. SEE 00.72.00.
- REFER TO THE SECTION 01.11.00 FOR ACCESS RESTRICTIONS AND NOTIFICATION REQUIREMENTS.



Attachment 5

PROJ. NO. 2013-001
 ENV. NO. 2013-001
 CONTRACT NO. 2013-001
 SHEET NO. 6 OF 12

**MARINE TERMINAL
 STORMWATER CONVEYANCE AND
 TREATMENT IMPROVEMENTS
 SITE IMPROVEMENT PLAN**

REVIEWED BY: _____ DATE: _____
 Project Manager: **HERRERA**

Port of Olympia
 ENGINEERING DEPARTMENT
 915 Washington Street NE
 Olympia, Washington



BY	DATE
Drawn	
Reviewed	
Approved	

SCALE: AS NOTED
 ONE INCH = SEVEN FEET
 DRAWN TO SCALE. SCALE SHALL NOT BE DISTORTED FROM REPRODUCTION
 These drawings conform to the Contract's construction records.
 Drawn By: _____ Date: _____
 Project Manager: _____

No.	Date	Revision

RECORD DRAWING CERTIFICATION

