



August 2023
Northport Waterfront Sediment Cleanup



Northport Waterfront Site 100% Engineering Design Report

Prepared for Toxics Cleanup Program, Washington State Department of Ecology

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Washington State Department of Ecology
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ABBREVIATIONS

ADA	Americans with Disabilities Act
bgs	below ground surface
BMP	best management practice
BNSF	Burlington Northern and Santa Fe Railway Company
CAP	<i>Final Cleanup Action Plan</i>
CUL	cleanup level
cy	cubic yard
Ecology	Washington State Department of Ecology
EDR	<i>30% Engineering Design Report</i>
EPA	U.S Environmental Protection Agency
H:V	horizontal to vertical
MA	management area
mg/kg	milligrams per kilogram
MTCA	Model Toxics Control Act
NAVD88	North American Vertical Datum of 1988
NRHP	National Register of Historic Places
psf	pound per square foot
Site	Northport Waterfront Site
TCLP	toxicity characteristic leaching procedure
Teck	Teck Metals Ltd.
TESC	temporary erosion and sediment control
UCR	Upper Columbia River
WAC	Washington Area Code

1 Introduction

This report presents the *100% Engineering Design Report* (EDR) for the Northport Waterfront Site (Site) located in Stevens County, Washington. This EDR describes the approach and criteria for the engineering design of the Site sediment and soil cleanup actions as set forth in the *Final Cleanup Action Plan* (CAP; Appendix A). The cleanup design is being led by the Washington State Department of Ecology (Ecology) under contract No. C2100057. The cleanup site ID is 14874.

1.1 Site Location and Vicinity

The Site is located along the south bank of the Upper Columbia River (UCR) in Northport, Washington. Figure 1-1 presents the Site vicinity and location features, and Figure 1-2 presents the Site boundary and location of management areas (MAs) as defined in the CAP. The Site is part of a larger Model Toxics Control Act (MTCA) cleanup that includes the former Le Roi Smelter, a rail corridor, and a current on-site smelter waste and yard soils repository. The Site consists of riverbank and nearshore sediment and upland soil along the Columbia River and borders, in part, the Northport town park used for fishing, camping, boating, and passive recreation activities. A small jetty divides the Site approximately in half, forming a protected boat launch area in the upstream portion of the Site. A broad, foot-accessible beach forms seasonally in the area downstream of the jetty. This beach platform forms during periods of low water levels, typically in the late summer, early fall, winter, and early spring. Rising from the beach, steep vegetated slopes join the adjacent uplands consisting of park facilities, a Burlington Northern and Santa Fe Railway Company (BNSF) right-of-way/active track, and the area of the demolished former Le Roi Smelter operations remediated under a 2004 U.S. Environmental Protection Agency (EPA) emergency response action.

1.2 Overview of Site Cleanup Requirements

The objective of sediment and soil cleanup actions at the Site is to protect human and ecological receptors by reducing the exposure pathways. The CAP describes specific cleanup requirements to be implemented. These actions include a combination of focused removal, capping, and institutional controls in individual MAs, summarized as follows:

- Seasonal Beach MA: a combination of removal and capping of contaminants will remove contaminated materials from areas with the greatest identified impacts from smelter waste and protect human and environmental health by capping remaining contaminated material.
- Jetty MA: the entire jetty will be capped to limit public exposure to contaminated material and ensure durability.
- Bay and Public Dock MA: the area around the dock will be excavated and capped, while the bay area will be capped to prevent exposure to contaminated sediments.
- Bayshore MA: the area will be mostly capped, with a small amount of excavation and replacement along the boat ramp to maintain level transition.

- Hillside MA: the area includes a combination of excavation and backfilling of contaminant hotspots and discouraging access to the hillside to minimize the potential for exposure.

1.3 Report Organization

This EDR is organized following MTCA requirements, as detailed in Washington Administrative Code 173-340-400, and includes the following sections:

- Section 2 summarizes the background for Site cleanup actions and overall design requirements, data used in the design, and coordination with other potential actions in the Site area.
- Section 3 summarizes design criteria used in the engineering analysis of the cleanup remedy.
- Sections 4 through 6 provide detailed discussions of key design elements, including a summary of the anticipated construction sequencing approach at the Site and the design considerations for remediation technologies and best management practices (BMPs; Section 4), Site preparation and staging (Section 5), and excavation and capping in MAs (Section 6).
- Section 7 summarizes the public access elements that will be implemented in the Hillside MA.
- Section 8 summarizes institutional controls that will be implemented as part of the cleanup project.
- Section 9 summarizes compliance monitoring to be performed during and after construction.
- Section 10 describes the anticipated implementation schedule for the cleanup project.
- Section 11 provides a list of references used to prepare this EDR.

2 Site and Design Background

2.1 Site Background

The Site is along the southern bank of the Columbia River near Northport, Washington (Figure 1-1). It is adjacent to the town park and former Le Roi Smelter on the south bank and nearshore areas of the river between Smelter Rock and the Highway 25 bridge. Slag, in the form of sand-sized particles and aggregates (clinker), has been deposited along the waterfront over time during historical operations of the Le Roi Smelter in Northport and Teck Metals Ltd. (Teck) smelter operations in Trail, British Columbia.

The UCR has been the subject of numerous investigations to assess environmental impacts of historical discharges from smelter operations, including the Le Roi Smelter and Teck smelter operations in Trail. The UCR, which extends downstream from the United States/Canadian border south to the Grand Coulee Dam, is part of an ongoing remedial investigation and feasibility study. EPA is conducting the remedial investigation and feasibility study in response to concerns about historical discharges of hazardous substances into the Columbia River by Teck and its affiliated predecessors at the smelter in Trail.

The former Le Roi Smelter operated from approximately 1896 to 1921. The smelter initially refined copper, lead, and silver ores from northeast Washington mines and copper and gold tellurium ores from British Columbia. At the peak of operation, the Le Roi Smelter processed 500 tons of ore per day. The smelter reportedly processed ores until 1909, when operations temporarily ceased. Smelter waste operations included releasing slurried and clinker slags to the Columbia River at the Site.

After a period of inactivity, the smelter reopened briefly in 1914 to process primarily lead ore. The smelter operated intermittently until 1921, when operations ceased.

Slag was the main byproduct of smelting operations at the Site. During operations, the Le Roi Smelter directly discharged slag to the Columbia River through sluices and other dumping methods. The waste slags contain metals that present known or potential risks to human health and the environment. Most smelter (furnace, roaster, crusher, and ore) buildings were demolished prior to 1953, although some foundations and one stack remained until the early 2000s.

In 2003, EPA concluded that hazardous substances (lead and arsenic) were in soil at the former Le Roi Smelter site and on surrounding properties. The upland smelter area and some town residences underwent an emergency response action overseen by EPA in 2004. Response actions included demolition of remaining structures, excavation of shallow contaminated soil, on-site consolidation, and subsequent capping of soil on the smelter site with a barrier layer and 1 foot of gravel. BNSF performed additional excavation of contaminated soil adjacent to and southeast of their right-of-way within the town park area and incorporated the contaminated soil into the EPA

on-site disposal area. However, no cleanup actions to date have addressed the nearshore sediments and the bank impacted by smelter wastes and debris, including slags deposited along the shoreline or within the river. Slag materials (as both clinker and granulated particles) are widespread on the beach. The observable nature of the exposed slag varies due to the dynamics of river flows in the area and over time.

2.2 Site Characteristics

2.2.1 *Physical Setting and Shoreline Conditions*

Topography surrounding the Site includes relatively flat valley floors rising to steep mountain terrain. The steep vegetated slope separating the shoreline and park from the river and Seasonal Beach MA generally sits above the Columbia River's ordinary high water mark. Elevations at the Site range from approximately 1,280 feet North American Vertical Datum of 1988 (NAVD88) along the shoreline to approximately 1,325 feet NAVD88 at the top of the hillside.

2.2.2 *Geology*

The geology near the Site is glacial outwash deposits. The outwash deposits are massive or thickly bedded, fine-to-coarse sand with rounded gravel, cobbles, and boulders. Local inclusions of silt and clay are also present. Surface geology along the UCR, north of the Kettle River, is gravel, sand, and clay deposited by glacial streams. Much of the waterfront is characterized by a surface layer of gravel to cobble-sized materials within the seasonally wetted portion of the Site.

2.2.3 *Hydrogeology*

Groundwater occurs in pore spaces between sand and gravel particles, and in fractures or voids of bedrock aquifers. Movement of water between the Columbia River and the adjacent geologic strata largely depends on river levels, bank storage and discharge, and regional discharge of groundwater from deeper aquifers (Thompson 1977). The local aquifer at the Site provides the water supply for the town of Northport. Northport's water supply wells are less than 0.25 mile from the Site. Static groundwater levels observed in these wells range from approximately 50 to 75 feet below ground surface (bgs).

2.2.4 *Surface Water Hydrology and Water Level Conditions*

Water levels at the Site are controlled by Columbia River flow conditions and indirectly by Lake Roosevelt, which is controlled by the Grand Coulee Dam. The Grand Coulee Dam is downstream of the Site, and Lake Roosevelt forms behind the dam. The shoreline bank and beach are exposed when river flows are low to moderate and when the water level in Lake Roosevelt is lowered. Surface water elevations during high water levels can be greater than 1,300 feet NAVD88 and, during low water levels, can be less than 1,280 feet NAVD88. In general, the ordinary high water mark as defined by the Revised Code of Washington 90.58.030(2)(c) is near 1,295 feet NAVD88.

River flows range from 76,000 to 263,000 cubic feet per second at the international boundary, and flows are assumed to be similar in the vicinity of the Site. These flows induce shear stress, a function of the flow velocity and water depth, on the riverbed. Sediment intermixed with slag particles are disturbed during periods of high river flows at lower water levels.

2.2.5 Recreational and Boating Uses

The park has upper and lower recreational areas. The upper park is approximately 20 to 30 feet in elevation above the river and includes parking, picnic tables, and several trailer hookups. The lower park includes an access road, boat launch, and dock. The boat launch at the Site is one of the few public access boat ramps in the vicinity. The dock sits on dry ground during lower water periods.

A steep, vegetated bank separates the upper and lower portions of the park; another vegetated bank separates the lower park from the river and Seasonal Beach MA. Public access from the upper bank to the beach is provided by a steep, unimproved dirt and gravel trail with a variable width (5 to 10 feet wide) and slope (10% to 12%).

2.2.6 Cultural Resources

There are both historic and precontact archaeological sites in the vicinity. There are no standing historic structures (built environment resources) in the vicinity.

There are two identified archaeological sites on the property: one near the boat ramp (45ST682) and one south of the site that encompasses the proposed staging area as shown on the construction drawings (45ST568).

- The archaeological site 45ST682 is described as an extensive historic debris scatter that has been determined not eligible for listing in the National Register of Historic Places (NRHP). It is not considered a historic property or historic resource and, therefore, does not require specific protective measures, although the capping work in this area will be offset from the brick-and-stone structure located high on the shoreline in this area.
- The archaeological site 45ST568 is the ruins of the Le Roi Smelter. As the site is associated with significant events in the history of Northeast Washington and Northport, Washington, it has been recommended NRHP eligible.

A cultural resources survey on the northeastern portion of the property was performed for a proposed boat ramp expansion and included some subsurface testing. This survey identified site 45ST682 and recommended it not NRHP eligible. The survey encountered what was interpreted as native soils beneath minimal (<1 foot of) topsoil. A cultural resources survey was also completed at the proposed staging area, which identified site 45ST568 and recommended it NRHP eligible.

To meet the requirements of applicable state and federal laws and guidelines, the following measures will be used to avoid, minimize, and mitigate impacts to NRHP-eligible archaeological sites and allow construction to proceed efficiently:

- Precautions will be taken such that no ground disturbance or modification to any surface features will occur during staging, stockpiling, or any other activities within the boundaries of site 45ST568. These precautions are described in an Archaeological Excavation Permit Application submitted to the Department of Archaeology and Historic Preservation
- Archaeological monitoring of ground disturbance will occur within the boundary of site 45ST682. Although the site is not NRHP eligible, the archaeological monitor will be able to determine eligibility of any new finds associated with the site. An Archaeological Monitoring Plan will be developed to guide monitoring activities. The Archaeological Monitoring Plan will also include inadvertent discovery protocols to guide actions if archaeological materials are encountered during unmonitored activities.

2.3 Cleanup Standards

This section describes the cleanup standards presented in the CAP that guide the engineering design of the cleanup. Cleanup standards consist of cleanup levels (CULs) and the points of compliance at which the CULs apply.

2.3.1 Site Cleanup Levels

As described in the CAP, the CULs center on metal contaminants in soil and sediment. Site investigations identified arsenic, copper, lead, and zinc as indicator hazardous substances in sediment and soil. Soil is generally limited to the Hillside MA. The Seasonal Beach, Bay and Public Dock, Bayshore, and Jetty MAs are considered sediment. The CAP provides separate CULs for the four metals identified as indicator substances for both soil and sediment.

Table 2-1 summarizes Site-specific soil and sediment CULs from the CAP.

**Table 2-1
Site-Specific Cleanup Levels**

Chemical of Concern	Site-Specific Soil Cleanup Level (mg/kg)	Site-Specific Sediment Cleanup Level (mg/kg)
Arsenic	20	12.9
Copper	100	100
Lead	220	220
Zinc	270	270

2.3.2 *Points of Compliance*

As detailed in the CAP, the soil point of compliance throughout the Site is from ground surface to 15 feet bgs. A conditional point of compliance at the biologically active soil zone extends to a depth of 6 feet. The sediment point of compliance to the extent of the biologically active zone is from ground surface to 1-foot bgs. For this site, the CAP recognizes soil CULs will not be met at the point of compliance, and the cleanup action is determined to comply with cleanup standards, provided the following are true:

- The selected remedy is permanent to the maximum extent practicable.
- The cleanup action is protective of human health.
- The cleanup action is demonstrated to be protective of terrestrial ecological receptors.
- Institutional controls are put in place that prohibit or limit activities that could interfere with the long-term integrity of the containment system.
- Compliance monitoring and periodic reviews are designed to ensure the long-term integrity of the containment system.

Sediment points of compliance will be met by the remedy described in this EDR. Compliance with soil CULs will require institutional controls and long term compliance monitoring.

2.4 **Management Areas**

The Site is divided into five geographic management subareas (Figure 1-2) referred to as MAs. MAs are described in the CAP and summarized here and were developed to allow subdividing the Site into distinct cleanup actions that will be taken based on an assessment of the distribution of contaminants and the risk posed to potential receptors. The five MAs are as follows:

- **Seasonal Beach MA:** this consists of the exposed sand and cobble shoreline and nearshore beach located between the Highway 25 bridge, hillside, main channel flow of the Columbia River, and jetty. The beach typically is underwater for most of the year.
- **Hillside MA:** this consists of the upland area south of the beach that slopes down to the river and is heavily vegetated. This area is exposed year-round. Clearings within this area show evidence of use as recreational areas.
- **Jetty MA:** this consists of the manufactured jetty constructed near the boat launch to provide calmer water for the launching and retrieval of boats.
- **Bay and Public Dock MA:** this consists of the protected area between the jetty and boat ramp.
- **Bayshore MA:** this consists of the shoreline area located northeast of the boat dock that includes exposed sediment near the shore and at the base of the riverbank.

2.5 Cleanup Action Overview

As described in the CAP, the selected cleanup action for the Site includes a combination of focused removal, capping, and institutional controls. Certain areas will require minimal construction-related activities, whereas other areas will require a more prolonged period of remedial construction.

Nearshore work will occur when water levels are lowest and, as needed, incrementally so as to not risk impacts to the Site or river due to rising flows. The major components of the Site cleanup remedy are summarized below and shown in Figure 1-2. Cap materials vary based on location and desired function; see Construction Drawings (Appendix D) and Section 31 00 00 of the Construction Specifications (Appendix E) for specifications and placements.

- The Seasonal Beach MA combines contaminant removal and capping. The cleanup actions include a combination of capping-only areas and excavation and capping areas. The capping-only areas include the strip along the main channel edge of the river that will be capped with 2 feet or more of material, and an area immediately downstream of the jetty that will be capped with approximately 6 feet of material to facilitate positive drainage of river water during periods when the water level is dropping. The excavation and capping portion of the Site includes removal of 2 feet of material and replacement with a minimum of 2 feet of cap material. Excavated material will be screened to remove boulders and cobbles for beneficial reuse with the cap material, and the remaining materials will be tested to confirm appropriate off-site disposal.
- For the Jetty MA, the top of the jetty will be capped with 2 feet of imported cap material. The slopes of the jetty will be capped with 2 feet of 12-inch loose riprap, or similar, with the armoring toe built with additional material to serve as a “self-launching” toe in event of erosion at the base of the slope.
- The Bay and Public Dock MA will be capped with 2 feet of cap material. In addition, the area around, under, and immediately adjacent to the public dock will be excavated to allow placement of 2 feet of cap material without raising the existing elevation of the public dock.
- The Bayshore MA will be capped with 2 feet of material. A small amount of excavation and replacement along the boat ramp will occur to maintain a level transition along the established concrete boat launch interface.
- Targeted areas of the Hillside MA will be excavated to remove easily accessible surface debris, including scattered demolition debris, concrete rubble and steel cables, contaminated soil, and slag debris from two identified hotspots to depths between 3 and 4 feet bgs. Additionally, the area will be excavated for visible slag and up to 2 feet bgs of contaminated soil from remaining areas that are easily accessible. Excavated areas will be backfilled with imported borrow material and completed with 1 foot of topsoil and plantings of native vegetation. Excavations will occur in a manner that does not disturb mature vegetation.

Ecology has determined these cleanup actions are protective of human health and the environment and satisfy MTCA requirements.

3 Engineering Design Criteria

This section summarizes the general engineering criteria that globally apply to the design of the sediment cleanup remedy. This section includes a discussion of the following design elements:

- Project horizontal and vertical datums
- Geotechnical engineering design criteria
- Hydrodynamic design criteria
- Construction timing
- Public access elements

3.1 Project Datums

The horizontal datum for this design is Washington State Plane North Zone, North American Datum of 1983, measured in units of U.S. survey feet. The vertical datum is NAVD88.

A topographic survey was conducted in 2018 that referenced Stevens County monument L 280 and relied on local reference points established by the surveyor. Because elevation changes could have occurred in the riverbed, an updated survey will be conducted by the selected remediation contractor prior to the start of construction. As necessary, a new benchmark and reference points will be established to support preconstruction, progress, and postconstruction surveys.

3.2 Geotechnical Design Criteria

Work in the Hillside MA will be conducted in steeply sloping areas. It is assumed these areas are stable in the long term, even if the slopes do not meet typical engineered slope factors of safety (as is common for natural slopes). For the post-cap condition, cap materials will be selected that are equally stable to the existing slope—that is, the postconstruction condition would not have an overall lower slope stability factor of safety compared to the preconstruction condition. Geotechnical evaluations will, therefore, consider the “infinite slope” case for stability and will not focus on global (i.e., deep-seated) slope stability, which is controlled by factors beyond the scope of any remedial actions conducted in the Hillside MA.

The sediment remedy will not be designed to fully resist shaking due to earthquake activity. Measures to fully resist earthquake shaking can entail substantial structural elements not compatible with the intended use of the Site and in conflict with the habitat benefits provided by natural shoreline vegetation. To manage earthquake risk, a program that includes post-earthquake inspection and maintenance, if needed, will be developed during remedial design.

3.3 Hydrodynamic Design Criteria

The cap will be designed to resist the hydraulic forces associated with a 100-year flow event consistent with other sediment remedies completed under the MTCA. While larger flows are possible,

the aggregate shape and size required to resist larger flows is typically less compatible with public access. Angular materials are sharp and could create a tripping or physical hazard for beach users accessing the Site during low-water periods. The Site long-term operations, monitoring, and maintenance plan will include measures for Site inspection and maintenance (if necessary) after river flow events that exceed the design criteria.

To support the sediment remedy design, a 100-year flow event at the Site was simulated by Blue Coast Engineering. The details of this hydraulic analysis are provided as an attachment in Appendix C.

3.4 In-Water Work Periods Construction Timing

Construction timing is important to accomplish remedial construction protectively. Excavation and capping work will be performed in the dry to the extent practicable. Because of the significant change in water elevations seasonally, requirements for timing construction to periods of low water are included in the Construction Specifications.

It is important to recognize that water levels can be unpredictable and can change relatively quickly. The remediation contractor will need to have contingency plans in place and sequence their work in a manner that recognizes this potential issue. In addition, while work is intended to be accomplished in the dry, there may be a need for limited excavation below the water surface for areas where the groundwater table is shallow or at the edge of the sediment cap, where material will need to be placed to transition from the edge of the cleanup area into the river itself.

The beach platform (located in the Seasonal Beach MA) forms during periods of low water levels, typically in the late summer, early fall period of September to November and early spring period of March to May. Construction will occur at a time of year when exposure of the main channel edge is at a minimum elevation of approximately 1,280 feet NAVD88. Historical water levels in the vicinity of the Site, as measured at the International Boundary and translated based on known data points (Figure 3-1) indicate the most likely low water periods will occur as follows:

- Fall low water: September through November
- Spring low water: February through May

3.5 Public Access Elements

The project will provide public access improvements within the Hillside and Seasonal Beach MAs, providing recreational areas to enjoy the Columbia River shoreline and water's edge. Improvements are only proposed within the project limits and do not include the adjacent parking area or other upland areas. The design criteria for the public access elements include the following:

- Improve user experience within the Hillside and Seasonal Beach MAs with improved passive recreation areas, including trails, picnicking areas, and viewing areas.

- Improve aesthetics with new public amenities and restored plantings.
- Limit access to cleanup areas, steep slopes, and restoration areas with short wooden fencing.
- Provide amenity areas that meet Americans with Disabilities Act (ADA) requirements to the greatest extent achievable. When ADA requirements are not possible to meet, follow *Outdoor Developed Areas* (USAB 2014) to maximize access and safety for users.
 - Meet ADA requirements for all proposed public access amenities within the Hillside MA.
 - Follow *Outdoor Developed Areas* for proposed trail connection between the Hillside and Seasonal Beach MAs.
- Restore the boat launch, including float, to its existing condition following construction; no improvements to the existing amenities are included.

To meet ADA requirements to the greatest extent achievable, the design will follow the ADA Accessibility Standards defined by the United Access Board in cooperation with the U.S. Departments of Justice and Transportation (DOJ 2010), including the following:

- Section 401: Accessible Routes
- Section 504: Stairways
- Section 902: Dining Surfaces and Work Surfaces
- Section 903: Benches

The project includes a trail connection between the Hillside and Seasonal Beach MAs to improve the existing over-steepened gravel trail with a more user-friendly and accessible trail. The project seeks to keep the proposed trail in the same or similar footprint as it currently exists to limit public access to the surrounding cleanup areas, limit public access to vegetation restoration areas, and reduce potential erosion. The existing trail location is steep and within a dynamic setting. Consequently, the Project's proposed trail design will not achieve ADA requirements. *Outdoor Developed Areas* (USAB 2014) was developed by the U.S. Access Board to address access limitation within the outdoor environment and provide multiple rationales for exceptions to ADA requirements, as well as guidelines on maximizing access opportunities and amenities within constrained outdoor sites. Exception 1, as excerpted in Section 3.5.1, is directly applicable to the project's proposed trail improvements:

3.5.1 Condition for Exception 1

Compliance is not practicable due to terrain. The phrase "not practicable" means not reasonably doable. For example, where a trail is constructed in a steeply sloped area, compliance with the running slope provision may not be practicable on parts of the trail where it would require extensive cuts or fills that are difficult to construct and maintain, cause drainage and erosion problems, significantly lengthen the trail, and create other adverse environmental impacts.

4 Sequencing Considerations and Remediation Technologies

This section summarizes the anticipated overall construction sequencing approach at the Site and describes the remediation technologies and BMPs that form the basis for the cleanup project design presented in this EDR.

4.1 Overall Project Sequencing

Cleanup construction activities will be sequenced to maximize overall protectiveness by accomplishing work during periods of low water, in the dry. Periods of low water are expected to be separated by periods of higher water, when the work area will be inundated by the river. Therefore, capping will be sequenced to occur shortly after excavation is completed. No excavated surfaces will remain uncapped during the intermediate periods, when higher water levels inundate the work area during construction.

4.2 General Construction Best Management Practices

A range of BMPs will be used during cleanup construction activities to minimize potential environmental impacts. These BMPs are summarized in the list below and in Sections 4.4 through 4.6. Additional BMPs required by the project permits will also be implemented.

The following BMPs will be employed to prevent the potential for spillage of excavated material or spillage from construction equipment:

- The contractor will be required to demonstrate training in hazardous material handling and spill response and will be equipped with appropriate response tools, including oil-absorbent booms.
 - If a spill occurs, spill cleanup and containment efforts will begin immediately and take precedence over normal work.
 - The National Response Center (1-800-424-8802) and Washington Emergency Management Division (1-800-258-5990 or 1-800-6457-911) will be notified immediately if a spill occurs.
- The contractor will inspect fuel hoses, oil or fuel transfer valves, and fittings on a regular basis for drips or leaks to prevent spills.
- Equipment will have properly functioning mufflers, engine-intake silencers, and engine closures according to federal standards.
- The contractor will be required to prepare a spill prevention, control, and countermeasures plan.

4.3 Temporary Dock Removal, Replacement, and Reinstallation

The public dock will be temporarily removed and relocated before construction to allow for excavation and capping of the area. The dock will be relocated to a safe place and be protected from damage by the contractor until it is reinstalled. The dock will be reinstalled following cap construction and acceptance of the remediation work in the public dock area.

4.4 Excavation

Conducting excavation during low water will reduce the potential for release of impacted soils into the water column. Excavation is expected to be accomplished using traditional track-mounted excavators equipped with a toothed bucket, although the contractor may also consider using a smooth-lipped bucket for fine grade control.

Typical low water periods occur during February to May and September to November, when the river stage is at its seasonal lowest (historically, approximately 1,280 feet NAVD88). Limiting excavation to these dry periods will have the benefit of reducing construction-related releases but may reduce efficiency and could increase the duration of this element of the work if it cannot be completed during a single low-water period.

Depending on specific location, weather, scheduling, and contractor production, it may be necessary to conduct some relatively limited excavation below water. Excavation during shallow water conditions would be subject to consultation with and review by Ecology and require specific BMPs to separate the work area from adjacent surface water. Anticipated BMPs would include portable dams (e.g., Aquadam) or supersacks filled with sand that could be used to create a temporary cofferdam. In the vicinity of the Public Dock, additional BMPs such as silt curtains may be required for any excavation that occurs below the water surface.

4.5 Material Screening, Beneficial Reuse, and Disposal

Preliminary waste characterization completed following 90% design indicated some of the excavated materials could be characterized as Ecology waste code WT02. Although all samples tested using the toxicity characteristic leaching procedure (TCLP) passed and are not considered federal hazardous waste, screening conducted in accordance with Washington Area Code (WAC) 173-303-100 suggests individual sample intervals, at several test pit locations, would be classified as WT02.

Washington regulations allow for supplemental testing to confirm whether the WT02 designation applies when the mathematic screening in WAC 173-303-100 indicates such potential. Such testing would entail sample collection and laboratory bioassays; conducting this testing during remedial design would significantly affect the project schedule. Furthermore, a mathematic composite of test pit results suggests that, although individual sample intervals may be classified as WT02 per WAC 173-303-100, composite results from the same test pits may not. Given that excavated

materials will be significantly mixed during construction, the design incorporates a post-excavation waste characterization from stockpiles to confirm appropriate disposal options.

Excavated materials will be screened¹, stockpiled, and characterized prior to transport off site for disposal. Clean materials identified as suitably large for on-site reuse will be separated and stockpiled separately. The remaining excavated material, including soil, sediment, and slag, will be temporarily stockpiled and characterized through chemical testing. Based on chemical testing results (i.e., waste characterization), a disposal facility suitability determination will be made, and the materials will be transported off site for disposal at either the Stevens County Landfill located in Kettle Falls or an alternate approved disposal facility, depending on waste characterization results and disposal facility permit requirements.

Sorting is expected to be performed using a mobile screen. The screen is assumed to sort out materials >6 inches in dimension, considering the typical size range of contaminated clinker materials, to minimize the need for hand sorting or hand removal of clinker materials that would otherwise remain on the screen following the sorting process. Any visual slag or other deleterious materials observed in the reuse stockpile must be removed by hand. The sorted material will be mixed with imported materials using conventional excavators or other approved mixing methods.

Disposal is assumed to entail loading of waste material using track-mounted excavators or similar into on-road dump trucks for off-site disposal at the Stevens County Landfill or an alternate facility, if necessary, depending on waste characterization results.

BMPs that will be employed during material sorting, beneficial reuse, stockpiling, waste characterization, and disposal include the following:

- Stockpile areas will be lined with an impervious geosynthetic (for unscreened excavated materials and off-site disposal materials) or a geotextile (for import materials and beneficial reuse materials) to prevent the mixing of project generated materials into the soils below the stockpile footprint.
- Excess or waste materials will not be disposed of or abandoned waterward or allowed to enter waters of the state.
- Erosion control measures, such as temporary silt fence, will be constructed around all stockpile areas. Unfiltered runoff from temporary material stockpile areas will not be allowed.
- When wet materials are transported, haul trucks or containers will be lined or otherwise sealed to prevent release of soils or effluent during transport.

¹ Screening entails sorting materials by passing them through a series of specifically sized mesh screens.

4.6 Cap and Armor Material Placement

After remedial excavation is completed and accepted, the plan includes placing either a clean cap, backfill, or armor based on the MA location. Cap, backfill, and armor material will be placed using conventional earthwork equipment such as excavators, front-end loaders, and bulldozers.

In areas with thick fill placement (in excess of the required 2-foot-thick cap), finer-graded backfill material may be placed to achieve an appropriate subgrade elevation before cap placement.

Cap, backfill, and armor materials will conform to the gradation requirements presented in the construction specifications (Appendix E).

BMPs for cap, backfill, and armor material placement include the following:

- Any equipment used for previous excavation work will be decontaminated using a pressure washer prior to being used for cap or armor material placement.
- Cap material placement will be sequenced closely following excavation work and prior to inundation of the work area by rising river water.
- The contractor will be required to maintain any physical BMPs (e.g., portable cofferdams as described under Section 4.4) around the work footprint until capping is complete and accepted by the Ecology representative.
- Cap materials will be handled in a manner that limits segregation or sorting of the graded cap material. If excessive sorting such that the cap material would not be properly graded after placement is observed by the Ecology representative, the contractor will be required to remix the cap material to achieve a more well-graded consistency.
- Armor rock, except when placed for bridge foundation protection, will terminate in a "self-launching toe" geometry that will protect the armor rock from being undermined by river current-induced shear stresses as depicted on the construction drawings.

5 Site Preparation and Staging Area Design

As part of cleanup construction activities, the selected contractor will be required to bring the necessary land-based equipment, including backhoes, loaders, trucks, and other equipment. This section discusses the upland areas that may be used by the contractor to stage equipment and stockpile equipment, excavated sediments, and capping/armor materials. The configuration and layout of upland staging areas will depend on the selected contractor's construction methods, sequencing, and equipment. Preapproved staging area boundaries are included on the construction drawings (Appendix D).

5.1 Staging Areas

Portions of the Site will be made available to the contractor for use in staging equipment and materials for the project and for temporary stockpiling of cap and/or excavated materials. Ecology-approved staging and stockpile areas include the following:

- A designated area south of the Site as shown on the construction drawings (Appendix D, Sheet G-5)
- Any location within the designated work areas that is appropriate, based on the requirements described in the construction specifications. For example, excavated materials will only be stockpiled in the designated area shown on the construction drawings (Appendix D, Sheet G-5), while stockpiles of clean cap material could be stored in locations closer to the beach backfill and capping work.

The contractor may propose additional staging and stockpile areas for review and approval by Ecology.

All stockpile areas will be appropriately contained to prevent uncontrolled runoff from leaving the area. Methods for containing the stockpiles will be described in the construction work plan, which will be a required contractor submittal and detail operations, including setup and breakdown, stormwater management, and maintenance and cleaning of upland work areas. An example containment scenario incorporates stacked ecology blocks, jersey barriers, or constructed berms around the perimeter of the stockpile with an impervious geosynthetic fabric beneath the stockpile and along the stockpile perimeter. The perimeter containment will be further subdivided into discrete stockpile areas, each with a capacity of approximately 1,500 cubic yards (cy) of excavated material for waste disposal characterization.

The contractor will be responsible for site security at the upland staging areas. The contractor will also be responsible for daily housekeeping and spill cleanup should any such event occur. The contractor will not be permitted to discharge solid or liquid waste from the staging area into the adjacent waterbody.

In summary, the following specific requirements will govern the operation of the upland staging area:

- The temporary staging and stockpiling area will be constructed in accordance with the construction drawings and construction specifications and include perimeter containment to prevent the release of unfiltered sediment from the temporary staging and stockpiling area.
- The upland staging area will be isolated from surface water using standard erosion and sedimentation controls, such as filter fence barriers and/or lined ecology block walls or berms.
- The contractor will be required to maintain a clean upland staging area to prevent vehicles from tracking contaminated soil or sediment off site.
- Trucks will be loaded within the established temporary staging and stockpiling areas so stockpiled materials are contained within the area. Any spilled material will be immediately picked up and deposited in the appropriate stockpile area or back into the truck.
- The contractor will be required to provide a wheel/truck cleaning area to ensure no contaminated materials are tracked off site onto public roads. The type of cleaning area (rumble plates, broom cleaning, etc.) will be selected by the contractor for approval by the Ecology representative.
- Equipment will be fueled in a designated area that separates fueling operations and protects the environment from accidental spills during fueling.
- The contractor will maintain a spill kit on site in the event an equipment leak develops. In the event of a spill, all other work will stop until the contractor has adequately cleaned the spill.

5.1.1 Stockpile Soil Management

Excavated materials will be stockpiled with clear signage and unique identification numbers after being screened and prior to reuse or transport off site for disposal. Clean rock materials excavated from the Seasonal Beach MA identified as suitable for on-site reuse will be separated prior to testing and stockpiled independently in a clearly delineated manner. Discrete stockpile areas of excavated soil and sediment will not be comingled until characterization of stockpiles has been completed.

Waste characterization sampling will consist of the following:

- One 5-point composite sample will be collected and analyzed per each approximately 1,500-cy pile. The five discrete subsamples will be collected at approximately equidistant locations within the stockpile footprint. Once collected, the samples will be mixed to create a composite that represents each stockpile.
- Composite samples will be analyzed for Resource Conservation and Recovery Act 8 metals. TCLP testing will also be conducted on the composite samples.

Based on the results of waste characterization sampling, the stockpiled materials will be transported off site for permitted off-site landfill disposal, consistent with the receiving landfill's permitting authorizations and other relevant approvals (if any), as determined by the landfill.

5.1.2 Stockpile Run-On and Runoff Water Management

Run-on and runoff water from contaminated soil stockpiles will need to be fully contained. This includes impermeable perimeter containment and subgrade containment provided by an impermeable geosynthetic underlayment. Contaminated stockpile run-on will be routed to a temporary sump created by the contractor, where it will be pumped into a temporary storage tank. Periodically, the storage tank will be emptied, and the contents will be transported off site to an approved disposal facility determined by the contractor.

5.1.3 Stormwater Management

A National Pollutant Discharge Elimination System construction stormwater general permit will be obtained for upland construction activities at the Site. Stormwater will be managed according to permit conditions. The contractor will prepare a stormwater pollution prevention plan that meets conditions of the permit and describes the BMPs that will be employed to minimize generated waters and ensure compliance with applicable water quality criteria and discharge requirements. The stormwater pollution prevention plan will do the following:

- Identify potential sources of pollution that may be reasonably expected to affect the quality of stormwater discharge from the work area.
- Describe and ensure implementation of practices that will be used to reduce the pollutants in stormwater discharge from the work area.
- Ensure compliance with terms of the State of Washington general permit for construction stormwater discharges as applicable.
- Identify applicable BMPs for stormwater management.

The contractor will not allow stormwater that contacts an exposed excavation surface to directly discharge to the Columbia River. The contractor will install and operate an appropriate system for management of construction water generated during the work, as discussed in Section 5.1.2. The contractor will use structural devices, such as haybales, silt fences, and catch basin inserts, to filter or divert stormwater as needed.

5.2 Haul Routes

The contractor will design and construct an access corridor into the work areas. It is expected such access will be accomplished from the boat ramp location and/or at the southwest extent of the Hillside MA. At the end of construction, the contractor will restore the access corridors to preconstruction conditions and repair any damage to pavement corridors used to access the Site.

Traffic impacts associated with cleanup project construction activities will be minimized to the extent possible. This will include transporting construction materials to and from the Site using designated

truck haul routes as shown on the construction drawings (Appendix D, Sheet G-5). Flaggers will be used if necessary to ensure traffic safety.

Access to and from the Site requires crossing the BNSF railroad tracks. The contractor will be required to develop a safety plan specific to operations across the railroad right-of-way. The contractor will also be required to coordinate with BNSF to understand the railroad schedule and will need to accommodate such delays caused by rail traffic in its construction schedule and bid costs.

An estimated 2,450 to 2,650 truck round trips may be required between the Site and the off-site disposal facility to transport excavated material for disposal. Delivery of clean material would potentially require additional round trips (up to 3,850 to 4,050 additional truck and trailer trips), unless the disposal of excavated material can be sequenced with the delivery of capping material to minimize empty truck trips. The actual number of trips needed will be dictated by the size of trucks used and whether additional capacity can be provided with dump trailers.

5.3 Hours of Operations

No noise ordinance has been identified for Stevens County, but according to Stevens County Code – Title 3 Environmental Performance Standards, Article 3.04.020(C), activities should meet noise standards in Washington Administrative Code 173-60-040 as enforced by Ecology.

Given the relatively short periods of low water, construction activities may require working up to 24 hours per day, 7 days per week, to meet the required project schedule. The contractor will provide its proposed construction schedule in its work plan for review and approval by the Ecology representative. It is assumed Ecology will coordinate with interested stakeholders (e.g., the Town of Northport) regarding the construction schedule and proposed work hours. If the contractor needs to work beyond the approved hours, the contractor will need to request Ecology approval.

5.4 Temporary Site Controls

Upland temporary facilities will be controlled by the contractor with respect to safety, noise, dust, security, and traffic. The construction site will be closed to the public at all times by a temporary security fence.

Temporary erosion and sediment control (TESC) BMPs will be employed to prevent pollution of air and water and control, respond to, and dispose of eroded sediment and turbid water during construction. TESC BMPs will be employed in all work areas, equipment and material storage areas, stockpiles, and haul areas. A TESC plan and details describing minimum TESC expectations are included on the construction drawings (Appendix D, Sheets G-5 and G-6).

5.5 Other Environmental Considerations

Other environmental considerations associated with upland staging and stockpiling activities include the control of fugitive dust. The contractor will be required to control fugitive dust from the stockpile and staging areas using appropriate BMPs (e.g., limited watering and use of plastic covering). The tracking of soil or dust off site will not be permitted.

Final permitting documents may require additional environmental protection requirements that will be included as part of the final design.

6 Management Areas—Cleanup Design

As discussed in Section 2.4, the Site has been subdivided into five distinct subareas referred to as MAs. The cleanup design for each MA is discussed in this section and shown on the construction drawings (Appendix D). Rationale for designating MAs and the selection of the selected cleanup elements are provided in the CAP (Appendix A). Construction Specifications are included as Appendix E.

A summary of quantities and anticipated durations for each activity by MA is presented in Table 6-1. Additional details on quantities, production rates, and durations are included in Appendix F.

Table 6-1
Quantity Summary by MA

MA	Total Excavation Volume (cy)	Material Type	Total Placement Volume (cy)	Anticipated Excavation/Material Placement Duration (Days)
Seasonal Beach	14,640	Cap material	24,180	50
--	--	Estimated on-site screened cap material (>6 inches)	6,700	
--	--	Backfill	10,200	
Jetty	--	Cap material	300	1
		Armor material	1,600	5
Bay and Public Dock	100	Cap material	3,100	5
Bayshore	--	Cap material	600	1
Hillside	3,000	Backfill	3,200	10
Total	17,800	--	43,100	72
Volume contingency (10%)	1,800	--	4,300	8
Total (including contingency, rounded)	19,600	--	47,500	80

Notes:

1. Volumes are rounded to the nearest hundredths. See Appendix F for detailed excavation and placement quantities.
2. Estimated reuse material volume is assumed to be 25% of excavated material.
3. Total excavation volume includes neatline excavation volume and 20% volume overage allowance.
4. Total placement volume includes basic placement volume and 20% overplacement volume allowance.
5. A 10% contingency is applied on excavation and material placement volumes based on consideration of uncertainty associated with volumes.

--: not applicable

6.1 Seasonal Beach MA

Remedial action in the Seasonal Beach MA will include a combination of excavation (with backfill) and capping as shown in Figure 1-2. The design of the excavation and cap in this MA will result in a postconstruction surface that is graded to promote drainage of surface water to the river, preventing accumulation of stagnant water that has historically occurred along the bank where the jetty meets the shoreline.

6.1.1 Excavation Design

Excavation will occur over most of the Seasonal Beach MA (Figure 1-2). Excavation activities will be performed using mechanical equipment, and excavated material will be screened to remove oversized material >6 inches in dimension, stockpiled, characterized, and disposed of at an off-site landfill.

The horizontal extent of the excavation prism is intended to avoid in-water material excavation to the extent practicable. The design excavation requires a minimum 2-foot cut below the surface, with additional excavation as needed to provide a smooth transition between the excavation/backfill area and cap-only areas. The excavation prism is designed with 3 horizontal to 1 vertical (3H:1V) side slopes. The contractor will be provided an allowance/tolerance for excavation work recognizing that, due to the presence of larger cobbles and armor rock, the post-excavation surface will likely not be completely smooth. This tolerance also recognizes inherent precision of this type of work. For excavation in this area, the contractor will be paid for up to 20% volume overage, and acceptance will be as follows:

- Required depth of excavation achieved over at least 95% of the surface area of the required excavation footprint
- No larger than a 30- by 30-foot area greater than the required excavation depth
- No payment for removal of material greater than 6 inches below the required excavation depth

The neatline excavation volume and assumed duration of work is included in Table 6-1. Based on similar excavation projects, the contractor is expected to be able to excavate approximately 900 cy per day. However, the contractor could propose an equipment mix and/or multiple simultaneous operations that could increase production and reduce the duration.

Beneficial reuse of oversized excavated materials >6 inches in dimension generated during excavation will be facilitated by screening. Specifically, boulders and cobbles will be screened from the excavated material to use as cap material. Due to the size of observed clinker, some hand sorting may be required to separate reusable material. The cost to sort and reuse material is substantially

lower than import and disposal costs. It is estimated that approximately 25% to 40% of the excavated material will be available for reuse and not disposed.

6.1.2 *Engineered Cap Design*

The engineered cap is designed to prevent direct contact with material through placement of a minimum of 2 feet of material. This material will be placed over the entire Seasonal Beach MA, including over the excavated portion. In some locations, additional material placement will be required to fill existing depressions and to achieve a gentle slope (minimum 1%) that minimizes the potential for ponding by providing positive drainage to the river channel.

The cap will consist of a single layer of cap material as described in Section 4.6. Cap material will be placed at a slope no steeper than 3H:1V.

The contractor will be provided an overplacement allowance equal to 20% of the neatline volume of cap material. No overplacement tolerance is assumed for the additional fill material that would be placed below the required cap thickness.

Cap placement approval will be based on the following metrics:

- Required cap thickness achieved over at least 95% of the capping footprint
- No larger than a 30- by 30-foot area is less than the required cap material thickness
- No payment for cap material placement greater than 0.5 foot above the required cap material thickness

It is assumed that cap materials can be placed at the same rate as assumed for excavation (900 cy per day).

6.2 Jetty MA

The remedy at the Jetty MA will involve placement of a cap to limit public exposure to contaminated material and involve material placement along the top path and placement of new armoring along the existing armored slopes.

6.2.1 *Engineered Cap Design*

The top of the jetty, which is accessible by the public at low water levels, will be capped with a minimum 2 feet of material to prevent direct contact with underlying material. This portion of the jetty will be capped with a single layer of cap material as described in Section 4.6. The material will be placed along the existing high point of the jetty and graded to provide a relatively flat surface. Additional material will be placed in a low point at the southern extent of the jetty to restore access to the jetty during high water levels.

The contractor will be provided an overplacement allowance equal to 20% of the neatline volume of cap material, and approval will be based on similar metrics to those described for the Seasonal Beach MA. It is assumed the production rate will be lower than that described for the Seasonal Beach MA due to the more constrained area of the Jetty MA.

6.2.2 *Jetty Armoring Design*

The slopes of the jetty will be capped with 2 feet of 12-inch loose riprap to reinforce the existing slopes and provide durability. The riprap will be placed at a slope similar to the existing one and no steeper than a 2H:1V grade. Armoring will be tied into the existing toe of the slope with a self-launching toe that would move into place following erosion at the toe of the slope (Appendix D, Sheet CM-4). The assumed production rate for armor placement is 300 cy per day.

6.3 Bay and Public Dock MA

The remedy at the Bay and Public Dock MA will include capping over the northwest portion and a combination of excavation and placement over the southeast portion near the public dock.

6.3.1 *Excavation Design*

Limited excavation will occur near and beneath the public dock to allow for placement of 2 feet of cap material, while maintaining a smooth transition from the Bay and Public Dock MAs to the boat ramp as shown on the construction drawings. Based on the elevation of the existing area and depth of cut, it is anticipated that some of this work may occur in the water. The contractor will be required to limit in-water excavation to the extent possible and have appropriate measures in place to address potential turbidity issues, including a turbidity curtain.

Acceptance criteria and production rates are assumed to be similar to excavation in the Seasonal Beach MA, which is described in Section 6.1.1.

6.3.2 *Engineered Cap Design*

Similar to the Seasonal Beach MA, a 2-foot-minimum cap will be placed over the Bay and Public Dock MA. The cap will consist of a single layer of cap material as described in Section 4.6, and material will be placed no steeper than 3H:1V. Additional material placement may be required in existing areas steeper than 3H:1V, such as the southern extent of the area, to provide a stable slope. Cap placement approval and anticipated production rates will be similar to that described for other Site MAs.

6.4 Bayshore MA

A cap will be placed at the Bayshore MA to limit exposure to contaminated material exposed at low tide.

6.4.1 *Engineered Cap Design*

The cap placed at the Bayshore MA will be similar to the cap at the bay and include placement of 2 feet of cap material (Section 4.6) on existing grade. Material will be placed at a slope no steeper than 3H:1V. Material placement is not allowed in the “brick feature area” as identified on the construction drawings or as visually observed by the contractor in the field. Cap placement approval and anticipated production rates will be similar to those described for other Site MAs.

6.5 Hillside MA

The remedy for the Hillside MA includes areas of debris removal, excavation of targeted areas of observed slag material, and backfill of the excavated areas. Public access and enhancements to recreational use, as described in Section 7, will be implemented following the remedial actions.

6.5.1 *Debris Removal*

Easily accessible surface debris over the entire Hillside MA will be removed in a manner that does not disturb mature vegetation. This material will be loaded into trucks and disposed of at Stevens County Landfill.

6.5.2 *Excavation Design*

Two areas have been identified where contaminated soil and slag will be removed to depths of 3 and 4 feet and backfilled with imported borrow material and 1 foot of topsoil. At the direction of the construction quality assurance officer, areas of visible slag in the Hillside MA (focusing generally on the southwestern portion of the MA), the slag and up to 2 feet of contaminated soil will be removed, assuming the areas are easily accessible and that excavation does not disturb mature vegetation. These areas will also be backfilled with imported borrow material and 1 foot of topsoil. All material excavated from the Hillside MA will be loaded into trucks and disposed of at Stevens County Landfill.

As shown in Table 6-1, the total anticipated removal volume of the two identified excavation areas is 2,900 cy, but overall volume of excavation from the Hillside MA will depend on whether (and how many) additional slag areas are identified. Measurement and payment and acceptance of this work will be described in the Construction Specifications (Appendix E).

In addition to removal of identified and encountered slag areas, the existing trail through the Hillside MA will be excavated, backfilled, and regraded, as discussed in Section 7.2.

7 Public Access Design

The project proposes to improve public access amenities within the Hillside and Seasonal Beach MAs while meeting the design criteria outlined in Section 3.5 of this report. The following provides details on proposed improvements.

7.1 Trail

The project proposes to reconstruct a new trail in the footprint of the Site's existing trail, improving public access from the existing parking area to the Columbia River shoreline. As discussed in Section 3.5, the reconstructed trail will remain in the existing trail footprint to limit access to surrounding cleanup area, limit access to vegetation restoration areas, and limit erosion. The reconstructed trail will be regraded to a more gradual slope, with timber steps located every 10 to 20 feet along the trail length. The trail running slope will be between 5% and 8% and consistent maximum 2% cross slope. The trail surfacing will be compacted, crushed gravel specified with fines to create a firm, stable walking surface. The trail will be 6 feet wide and 350 feet long. The trail will end at the proposed ordinary high water mark.

7.2 Picnic Area

The picnic area will be designed to meet ADA requirements and accommodate all users. Two sloped concrete pathways (6 feet wide with a maximum 5% running slope and maximum 2% cross slope) will lead from the existing edge of asphalt at the parking area (where the transition between materials is flush) and to a concrete paved pad. The eastern pathway is graded with a maximum 5% running slope and maximum 2% cross slope to meet ADA requirements. The western pathway is graded with a slope that exceeds a 5% running slope.

The paved concrete pad measures 16 by 16 feet, with a maximum 2% cross slope. A 12- by 12-foot picnic pavilion is centered and will be embedded on the concrete pad per the manufacturer's specifications. The pavilion will include 8- by 8-inch steel posts with a Hi-Rib steel roof. The pavilion will have a standard wind load as defined by American Society of Civil Engineers 7, Risk Category II, 59-pounds-per-square-foot (psf) snow load, 1,500-psf soil bearing, and 2,500-pounds-per-square-inch concrete strength.

An ADA-accessible table is provided in the pavilion. The table will be constructed with Douglas fir lumber and powder-coated steel and embedded into the concrete paving.

7.3 Viewing Areas

The project proposes two small viewing areas along the parking lot. Both will include concrete paving, set level with the adjacent parking area and sloped with a maximum 2% cross slope. Each viewing area includes one bench. Both benches will be 6 feet long with back supports and

constructed with Douglas fir lumber and powder-coated steel. They will be embedded into the concrete paving.

7.4 Fencing and Bollards

Split-rail fencing is located along the edge of the asphalt parking area, at the picnic area and viewpoints, and along both sides of the new trail. The fencing is 4 feet tall and set in concrete footings. The fencing will define access points and prevent the public from accessing the cleanup and vegetation restoration areas.

The project also includes three lockable, aluminum bollards at the shoreline trail access point. The bollards will be removable and ensure vehicles do not access the trail.

7.5 Plantings

All areas impacted by earthwork will be restored with native vegetation. All revegetation areas will be prepared with topsoil (salvaged or imported), including compost. In revegetation areas where the slopes exceed 4:1, jute matting and coir logs will be installed as a stabilization measure. Mulch will be placed in all planting areas following plant installation.

8 Institutional Controls

Prior to completion of construction, an institutional control plan will be developed to ensure the long-term integrity of the engineered capping areas. The institutional control plan, which will be prepared by Ecology, will describe restrictive covenants and other institutional controls such as fencing and seating/picnic areas in the Hillside MA. Fencing and seating/picnic areas will provide opportunities for the public to use remediated areas, limit access to areas outside the remediated areas, and reduce the potential for exposure to contaminants at the Site. Institutional controls will include inspection and repair of capped areas and measures, such as signage to educate the public about site contamination.

9 Compliance Monitoring

Monitoring and contingency response actions are an integral part of the cleanup. Compliance monitoring and contingency responses (as needed) will be implemented in accordance with Washington Administrative Code 173-340-410, Compliance Monitoring Requirements. Detailed requirements will be stated in the Construction Quality Assurance Plan (Appendix G). The objective of these plans is to confirm that cleanup standards have been achieved and to confirm the long-term effectiveness of cleanup actions at the Site. The plans detail the duration and frequency of monitoring, the trigger for contingency response actions, and the rationale for terminating monitoring. The four types of compliance monitoring to be conducted are as follows:

- Protection monitoring to confirm human health and the environment are adequately protected during the construction period of the cleanup action
- Performance monitoring to confirm the cleanup action has attained cleanup standards and other performance standards
- Confirmation monitoring to confirm the long-term effectiveness of the cleanup action once performance standards have been attained construction materials
- Placement of cap, backfill, and armoring material

Detailed monitoring requirements for the cleanup project are included in the Construction Quality Assurance Plan (Appendix G).

10 Implementation Schedule

This section provides an overview of the anticipated implementation schedule for cleanup construction activities at the Site, including associated monitoring and institutional controls. The preliminary cleanup project construction schedule is presented in Table 10-1.

The excavation, backfill, and capping activities described in this EDR are anticipated to be completed within a 1-year period and may require two mobilization/demobilization events. The targeted start date for construction is during February 2024, subject to final permitting approvals. Work will begin in the public beach area, with excavation occurring in the dry, followed by placement of backfill and the engineered cap layer. Construction activities will be conducted in a manner that achieves the following goals:

- Provides for a safe work environment
- Protects existing facilities from damage
- Minimizes the potential for recontamination
- Accomplishes the work in a timely manner
- Accomplishes the in-water work during low water periods
- Accomplishes the work in a cost-effective manner

**Table 10-1
Project Construction Schedule**

Anticipated Construction Season	Task Name	Estimated Duration (Days)
Spring 2024	Mobilization and Site Preparation	5–10
	Pre-Construction Survey	5
	Seasonal Beach Excavation/Placement	50–60
	Jetty Placement	6–8
	Bay and Public Dock Excavation/Placement	3–7
	Bayshore Placement	1–3
	Hillside Excavation/Placement/Public Amenities	8–12
	As-Built Survey	5
	Demobilization	5

Note:

1. Durations depend on contractor selection of equipment and crew.

Some work within the Site may be appropriately initiated prior to the lowest water periods. Likewise, some work activities may continue at intermediate water levels. Activities not subject to in-water work restrictions may include some or all the following:

- Preparation or removal of upland staging and stockpile areas
- Temporary removal and relocation of nearshore structures (i.e., dock) located within project work areas.
- Removal of nearshore vegetation, debris, or structures during low water level conditions, subject to applicable permit conditions
- Upland excavations and backfill, including preparatory activities for the development of the upland containment area
- Upland staging or transportation and disposal of dredged materials, soil, debris, and other construction materials

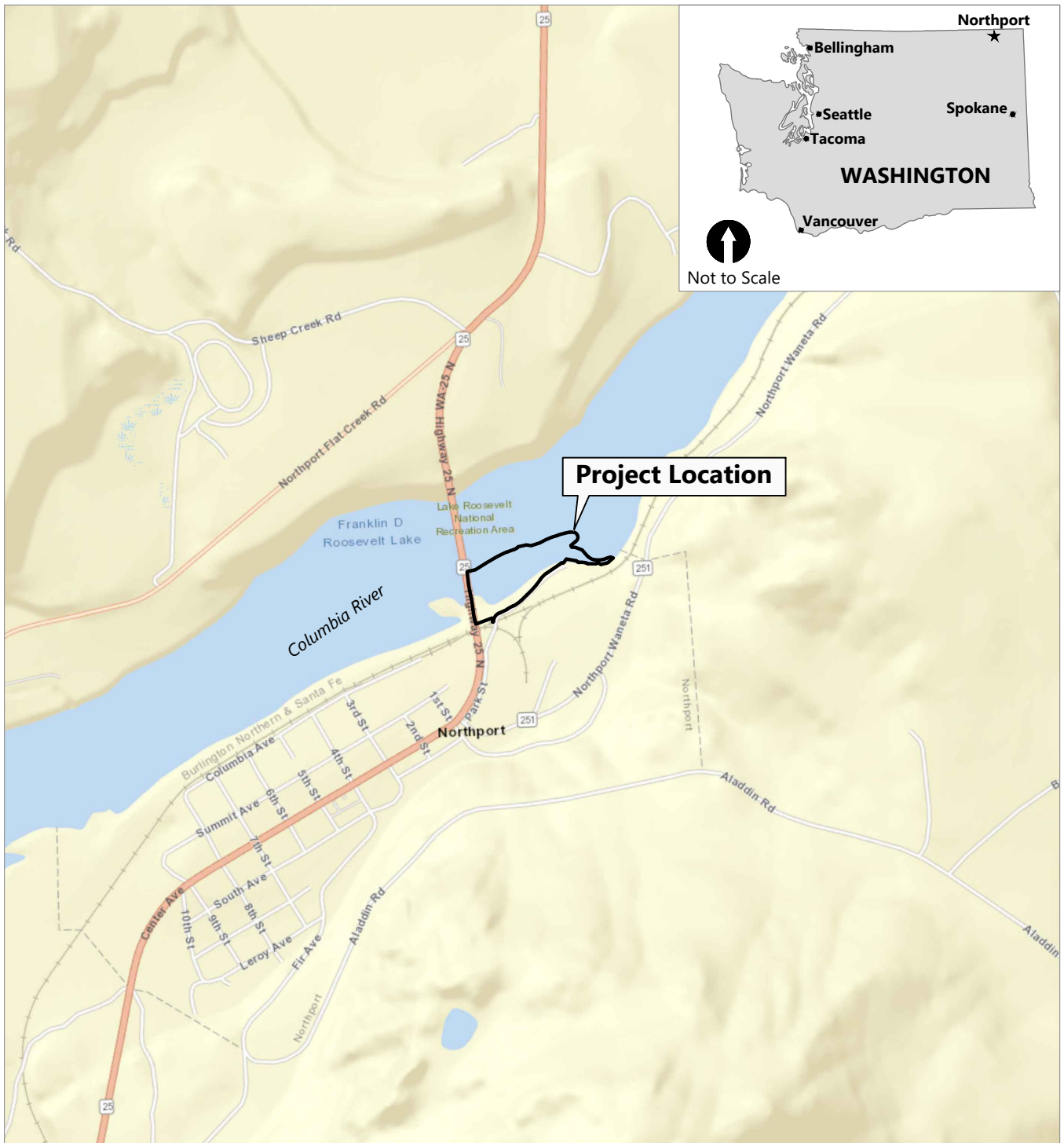
11 References

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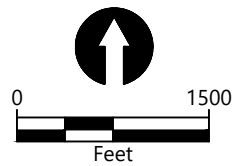
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Figures



SOURCE: ESRI
HORIZONTAL DATUM: Washington
 State Plane South Zone, NAD83 (2011),
 U.S. Survey Feet

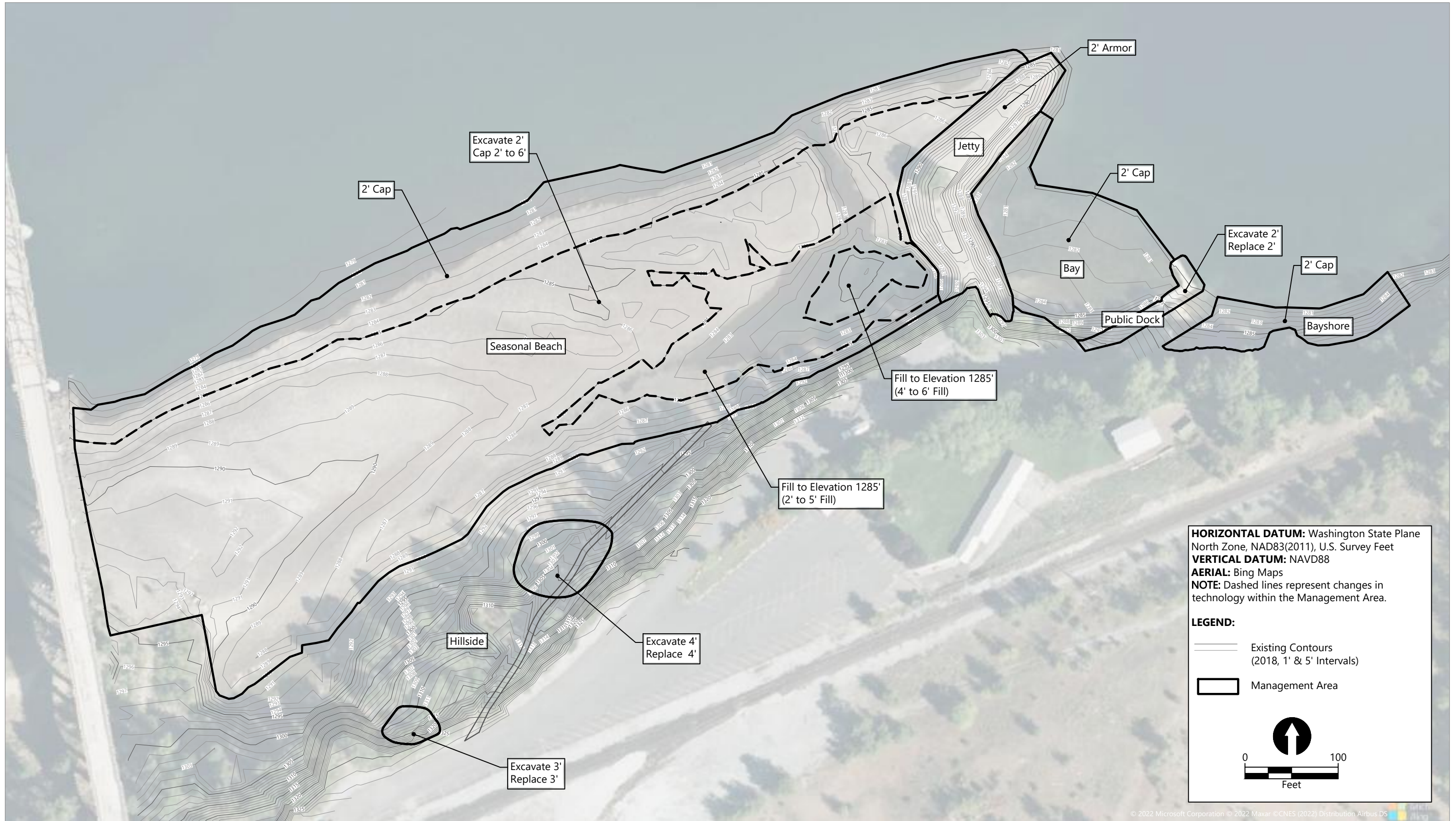


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Figure 1-1
Vicinity Map

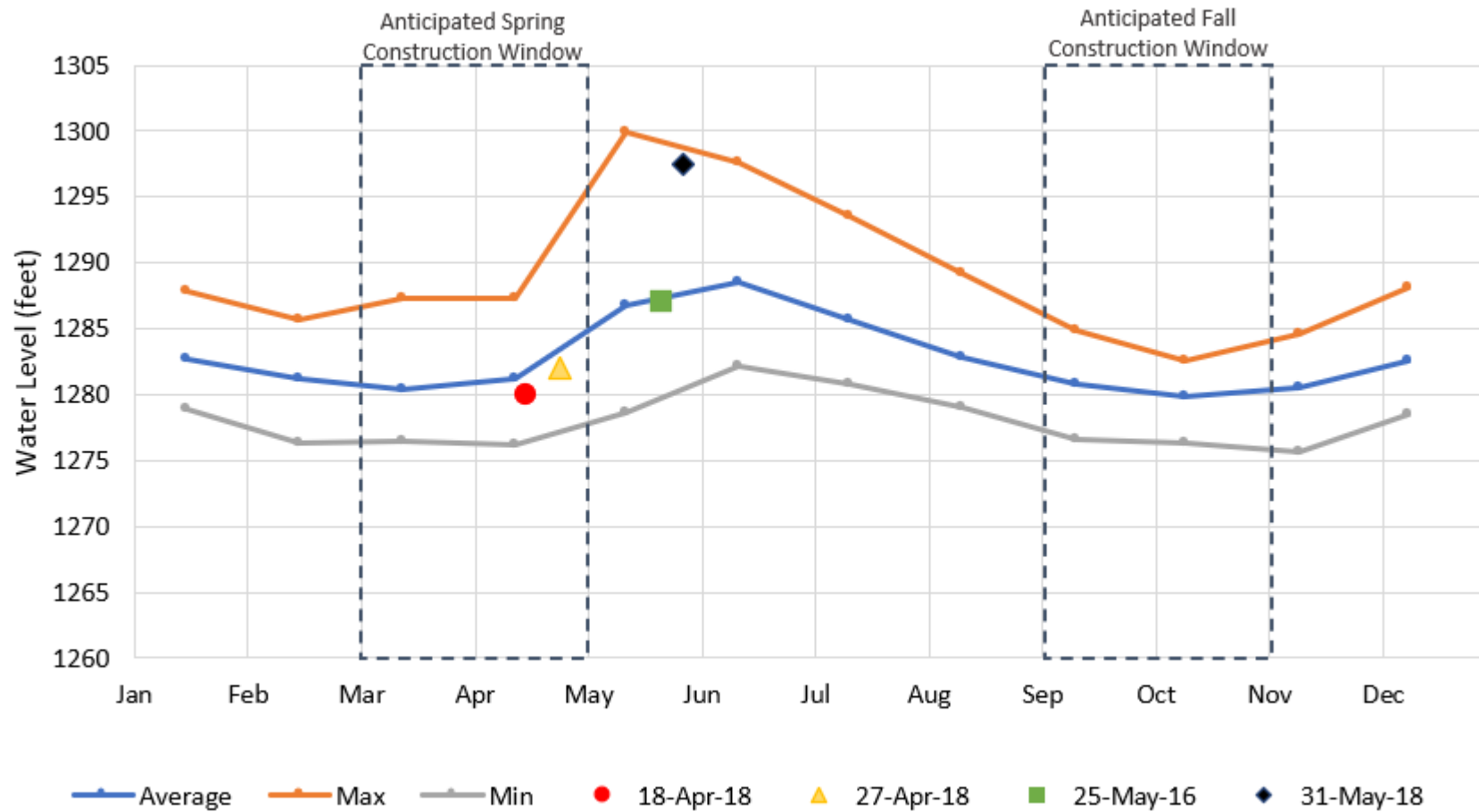
Northport Waterfront Site 90% Engineering Design Report
 Northport Waterfront Sediment Cleanup



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Figure 1-2
Management Areas



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Figure 3-1
Extrapolated Water Level for Northport Using Discharge at International Border

Northport Waterfront Site 90% Engineering Design Report
 Northport Waterfront Sediment Cleanup

Appendix A

Cleanup Action Plan



Cleanup Action Plan Northport Waterfront

**Intersection of Hwy 25 and Park Rd, Northport, WA
Facility Site ID 96239, Cleanup Site ID 14874**

Toxics Cleanup Program

Washington State Department of Ecology
Spokane, Washington

April 2022

Document Information

This document is available in the Department of Ecology's [Northport Waterfront cleanup site webpage](#)¹.

Related Information

- Cleanup site ID: 14874
- Facility site ID: 96239

Contact Information

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Phone: 509-329-3516

Website²: [Washington State Department of Ecology – Toxics Cleanup Program](#)

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¹ <https://apps.ecology.wa.gov/cleanupsearch/site/14874>

² <https://ecology.wa.gov/About-us/Who-we-are/Our-Programs/Toxics-Cleanup>

³ <https://ecology.wa.gov/About-us/Accountability-transparency/Our-website/Accessibility>

Department of Ecology's Regional Offices

Map of Counties Served



Southwest Region 360-407-6300	Northwest Region 206-594-0000	Central Region 509-575-2490	Eastern Region 509-329-3400
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Region	Counties served	Mailing Address	Phone
Southwest	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	PO Box 47775 Olympia, WA 98504	360-407-6300
Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	PO Box 330316 Shoreline, WA 98133	206-594-0000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
Headquarters	Across Washington	PO Box 46700 Olympia, WA 98504	360-407-6000

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1. Introduction

This report presents the Washington State Department of Ecology's (Ecology) proposed cleanup action for the Northport Waterfront cleanup site (Site). The Site is along the southern bank of the Columbia River near Northport, Washington. See Figure A.1. Vicinity Map in Appendix A.

Ecology is responsible for selecting the cleanup action and completing the Cleanup Action Plan (CAP). The selected cleanup action is intended to fulfill the requirements of the Model Toxics Control Act (MTCA) and is a required part of the cleanup process under the following regulations and statute:

- MTCA, Chapter 70A.305 Revised Code of Washington (RCW).
- MTCA Cleanup Regulation, Chapter 173-340 of the Washington Administrative Code (WAC).

The purpose of the CAP is identifying the proposed cleanup action for the Site and providing an explanatory document for public review that:

- Describes the history of operations, ownership, and activities at the Site.
- Summarizes nature and extent of contamination.
- Summarizes the cleanup action alternatives considered in the remedy selection process.
- Identifies Site-specific cleanup levels (CULs) and points of compliance for each hazardous substance and medium of concern for the proposed cleanup action.
- Identifies applicable state and federal laws for the proposed cleanup action.
- Describes the selected cleanup action for the Site and the rationale for selecting this alternative.
- Identifies residual contamination remaining on the Site after cleanup and restrictions on future uses and activities at the Site to ensure continued protection of human health and the environment.
- Discusses any required compliance monitoring and institutional controls.
- Presents the schedule for implementing the CAP.

Ecology developed the proposed cleanup action for the Site based on findings discussed in the Remedial Investigation/Focused Feasibility Study (RI/FFS), as well as other relevant documents in the administrative record. Ecology is conducting these actions under the authorities of MTCA and Sediment Management Standards (SMS), Chapter 173-204 WAC.

1.1. Declaration

Ecology has selected the remedy described in this CAP because it will be protective of human health and the environment. Furthermore, the selected remedy is consistent with the State of

Washington's preference for permanent solutions, as stated in RCW 70A.305.030(1)(b). However, we will consider all public input before making the CAP final.

1.2. Applicability

Cleanup standards specified in this CAP are applicable only to the Northport Waterfront Site. Ecology developed these cleanup standards as a part of an overall remediation process under Ecology oversight using the authority of MTCA and SMS, which should not be considered as setting precedents for other sites.

1.3. Administrative record

The documents used to make the decisions discussed in this CAP are on file in the administrative record for the Site. The References section lists relevant documents. The entire administrative record for the Site is available for public review by appointment at Ecology's Eastern Regional Office, located at 4601 N. Monroe Street, Spokane, Washington, 99205-1295. Results from applicable studies and reports provide background information pertinent to the CAP. These studies and reports include:

- *Establishment of Site-Specific SMS Metals Cleanup Objectives for Contaminated Sediments*, April 2019
- *Remedial Investigation*, October 2019
- *Focused Feasibility Study Report*, April 2021

1.4. Cleanup process

Cleanup conducted under the MTCA process requires the potentially liable persons (PLPs) or Ecology to prepare specific documents. The following list provides a brief description of procedural tasks and the resulting documents, along with the MTCA section requiring their completion.

- Public Participation Plan (WAC 173-340-600) — summarizes the methods that will be implemented to encourage coordinated and effective public involvement. Ecology prepares this document.
- RI/FS (WAC 173-340-350) — documents the investigations and evaluations conducted at the Site from the discovery phase to the RI/FS document. The RI collects and presents information on the nature and extent of contamination and the risks posed by the contamination. The FS presents and evaluates Site cleanup alternatives and may propose a preferred cleanup alternative. PLPs typically prepare these documents. Ecology reviews and accepts these documents and then they undergo public comment.
- CAP (WAC 173-340-380) — sets cleanup standards for the Site, and selects the cleanup actions intended to achieve the cleanup standards. Ecology issues the document, and it undergoes public comment.

- Engineering Design Report, Construction Plans and Specifications (WAC 173-340-400) — outlines details of the selected cleanup action, including any engineered systems and design components from the CAP. These may include construction plans and specifications with technical drawings. The PLPs usually prepare the document, and Ecology approves it. Public comment is optional.
- Operation and Maintenance Plan(s) (WAC 173-340-400) — summarizes the requirements for inspection and maintenance of remediation operations. They include any actions required to operate and maintain equipment, structures, or other remedial systems. The PLPs usually prepare the document, and Ecology approves it.
- Cleanup Action Report (WAC 173-340-400) — provides details on the cleanup activities along with documentation of adherence to or variance from the CAP following implementation of the cleanup action. The PLPs usually prepare the document, and Ecology approves it.
- Compliance Monitoring Plan (WAC 173-340-410) — details the monitoring activities required to ensure the cleanup action is performing as intended. The PLPs usually prepare the document, and Ecology approves it.

2. Site Background

This section summarizes the Site’s history, contamination investigations, and physical characteristics.

2.1. General site setting and history

The Site is within the Northport town limits along the southern bank of the Upper Columbia River (UCR). Figure A.2. Site Plan shows key Site features.

The Site includes all permanently and seasonally exposed areas of the riverbank, shore, and hillside next to the Northport City Park and boat launch. The park has upper and lower recreational areas. The upper park is about 20 to 30 feet in elevation above the river and includes parking, picnic tables, and several trailer hook-ups. The lower park includes an access road, boat launch, and dock. A steep, vegetated bank separates the upper and lower portions of the park; another vegetated bank separates the lower park from the river and a seasonal beach area.

The UCR has been the subject of numerous investigations to assess environmental impacts of historical discharges from smelter operations including the Le Roi Smelter and Teck Metals Ltd. (Teck) smelter operations in Trail, British Columbia. The UCR, which extends downstream from the United States and Canadian border south to the Grand Coulee Dam, is part of an ongoing remedial investigation and feasibility study (RI/FS). The U.S. Environmental Protection Agency (EPA) is conducting the RI/FS in response to concerns about historical discharges of hazardous substances into the Columbia River by Teck and its affiliated predecessors at the smelter in Trail, British Columbia.

The Le Roi Smelter (also known as the Northport Smelter) operated from about 1896 to 1921 and refined various ores, primarily copper, gold, and lead. The facility began smelting copper and gold tellurium ores using heap roasting, which involves open burning of the ore prior to placing it in a furnace. At the peak of operation, the Le Roi Smelter processed 500 tons of ore per day using the heap roasting process until operations were temporarily suspended in 1909. In 1914, the Le Roi Smelter reopened to process lead ore. Lead smelting continued intermittently until operations ceased permanently in 1921. Slag was the main byproduct of smelting operations at the Site. During operations, the Le Roi Smelter directly discharged slag to the Columbia River through sluices and other dumping methods. The waste slags contain metals that present known or potential risks to human health and the environment.

In 2003, the EPA concluded that hazardous substances (lead and arsenic) were in soil at the former Le Roi Smelter site and on surrounding properties. The EPA oversaw an emergency response action at the upland smelter area in 2004. Response actions included demolishing remaining structures, excavating shallow contaminated soil, and consolidating and capping soil with a barrier layer and 1 foot of gravel on the site. BNSF Railway, owner of the Northport City Park property, completed an independent cleanup action at the park to address arsenic- and lead-contaminated soil associated with the former smelter. However, cleanup actions to date have not addressed the nearshore sediments and the riverbank affected by smelter waste and debris.

2.2. Investigations

Environmental studies completed at the Site include:

- *Preliminary Assessments and Site Inspections*, 2002: Ecology & Environment (E&E) assessment and inspection included collecting nine near-shore sediment samples.
- *Beach Sediment Study Filed Sampling and Data Summary Report*, 2014: Teck, operating under Teck American, Inc., collected sediment samples from 34 recreational beach locations along the upper Columbia River and Lake Roosevelt. Samples included composite surface sediment samples and coring samples.
- *Remedial Investigation*, 2019: GeoEngineers, Inc. (GeoEngineers) conducted RI activities. Section 3 describes the RI.
- *Focused Feasibility Study*, 2021: GeoEngineers completed an FFS that presented potential remedial actions.
- *Response to Comments: Draft Remedial Investigation and Feasibility Study*, 2021: Ecology held a comment period May 3 through June 2, 2021, for the draft RI/FFS. We also held an online public meeting on May 19, 2021.

2.3. Physical characteristics

In accordance with MTCA and Part V of the SMS, and for the purpose of this CAP, material from the Site includes both soil and sediment potentially impacted by smelter waste. The steep vegetated slope separating the shoreline and park from the river and seasonal beach generally

sits above the Columbia River's ordinary high water mark. As such, MTCA 173-340-200 defines the material on this hillside as soil. Part V of the SMS defines sediment as particulate matter at or below the ordinary high water mark (OHWM) where the water is present for a minimum of six consecutive weeks and biota, including benthic infauna, or humans may be exposed. For this Site, the material near the shoreline classifies as sediment.

Columbia River flow conditions influence surface water levels at the Site. The Grand Coulee Dam is downstream of the Site, and Lake Roosevelt forms behind the dam. Water levels at Lake Roosevelt indirectly influence water levels at the Site as well. When water levels in Lake Roosevelt are high and river flows are low, the Site takes on a low-velocity, lake-like appearance with most of the Site submerged underwater. Surface water elevations during high water levels can be greater than 1,300 feet above mean sea level (AMSL). When river flows are low to moderate, or water levels in Lake Roosevelt are low, the shoreline bank and beach areas are generally exposed. Surface water elevations during low water levels can be less than 1,280 feet AMSL. In general, the OHWM as defined by RCW 90.58.030(2)(c) is near 1,295 feet AMSL. Sediment intermixed with slag particles are disturbed during periods of high river flows. Although rates of accretion and erosion across the Site have not been quantified, observations indicate that sediment at the Site is generally stable with localized erosion and deposition.

2.3.1. Topography and climate

Topography surrounding the Site includes relatively flat valley floors rising to steep mountain terrain. Elevations at the Site range from approximately 1,280 AMSL along the shoreline to about 1,325 feet AMSL at the top of the hillside.

The Site is in a semi-arid region of the Okanogan Highlands. The Northport climate station (Service Station USC00455946) provides local, continuous weather data and is three miles from the Site. The average precipitation near the Site from 1899 to 2016 is 19.40 inches. Precipitation primarily occurs from late fall to spring.

2.3.2. Regional hydrogeology

Surface geology along the UCR, north of the Kettle River, is gravel, sand, and clay deposited by glacial streams. Groundwater occurs in pore spaces between sand and gravel particles, and in fractures or voids of bedrock aquifers. Movement of water between the Columbia River and the adjacent geologic strata largely depends on river levels, bank storage and discharge, and regional discharge of groundwater from deeper aquifers (Thompson 1977).

The geology near the Site is glacial outwash deposits. The outwash deposits are massive or thickly bedded, fine-to-coarse sand with rounded gravel, cobbles, and boulders. Local inclusions of silt and clay are also present. Limited local aquifers are within the glacial outwash deposit, and the coarse nature of the deposits generally results in high permeability. The local aquifer at the Site provides the water supply for the Town of Northport. Northport's water supply wells are less than a quarter mile from the Site. Static groundwater levels observed in these wells range from about 50 to 75 feet below ground surface (bgs).

3. Remedial Investigation

Under Ecology’s oversight, GeoEngineers completed an RI at the Site to assess the nature and extent of smelter waste. Ecology determined the investigation would not have a probable significant adverse impact on the environment. As a result, Ecology issued a Determination of Non-Significance under WAC 197-11-340(2). Ecology submitted a request to the Department of Archaeological and Historical Preservation (DAHP) to evaluate historic features associated with the former smelter in 2018. DAHP’s evaluation noted that pre-contact cultural resources were not recorded inside the project area. The RI included collecting sediment and soil samples from 26 test pits excavated to 4 feet bgs, three hand samples dug to 2 feet bgs, and 109 surface samples collected from about 0 to 0.5 feet bgs. In total, GeoEngineers screened 329 samples in the field using a hand-held x-ray fluorescence (XRF) instrument.

In addition to XRF screening, Eurofins TestAmerica (TestAmerica) analyzed 61 soil samples for Target Analyte List (TAL) metals:

- Aluminum
- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Calcium
- Chromium
- Cobalt
- Copper
- Iron
- Lead
- Magnesium
- Manganese
- Mercury
- Nickel
- Potassium
- Selenium
- Silver
- Sodium
- Thallium
- Vanadium
- Zinc

The RI reviewed statistical correlations for the metals frequently detected (arsenic, barium, chromium, copper, iron, lead, manganese, and zinc) to evaluate how well the XRF estimated the magnitude of a metal in a given sample and how well it predicted an exceedance of the screening level. Correlation coefficients for paired XRF and lab data are provided in Table III of the RI. Based on the RI results, XRF screening results are appropriate to use to evaluate the extent of copper, iron, lead, manganese and zinc. For other metals, laboratory data should be used.

The RI identified screening levels for a subset of the TAL metals, listed in Table B.1 in Appendix B. Screening levels used in the RI are derived from MTCA Method A cleanup levels, MTCA Method B cleanup levels where there is no Method A value, SMS freshwater sediment cleanup objectives, and the Upper River Basin risk-based screening levels Ecology developed (Ecology 2019). Metals that were not carried forward in the data evaluation process were either not detected in any samples, not identified as primary river sediment contaminants of concern, or serve as essential nutrients.

Although a number of metals are in soil and sediment at the Site, the RI showed that copper, lead, and zinc are the most widespread at elevated concentrations. The RI investigation detected arsenic in 33 percent of samples, copper in 82 percent of samples, lead in 99 percent of samples, and zinc in 93 percent of samples field screened. The RI used the distribution of

copper, lead, and zinc to evaluate the nature and extent of contamination from smelter waste. The summaries below provide a generalized overview of contamination findings from the investigation.

3.1. Metals contamination

The RI divided the Site into five geographic areas to aid in the discussion and analysis of the distribution of metals (Seasonal Beach, Jetty, Bay and Public Dock, Bayshore, and Hillside). Figure A.2 shows the areas, which are generally described as follows:

1. Seasonal Beach – the exposed sand and cobble sediment between the Highway 25 Bridge, the hillside, the main channel flow of the Columbia River and the Jetty.
2. Jetty – the manmade jetty near the boat launch.
3. Bay and Public Dock – sediments in the area between the jetty and boat launch.
4. Bayshore – exposed sediment northeast of the boat dock that includes sediment near the shore and at the riverbank.
5. Hillside – the upland soil south of the Seasonal Beach.

The following sections discuss RI activities and findings for each area.

3.1.1. Seasonal Beach

RI activities included collecting sediment samples from 18 test pits and 70 surface locations in the Seasonal Beach area. The Seasonal Beach has the largest area with the greatest metal contaminant impacts. Based on sample results observed at 4 feet bgs during investigations, metal contaminants likely extend beyond this depth to depths greater than the 4 feet bgs observed during investigations. The upper 2 feet of material have the highest contaminant concentrations from apparent smelter waste.

A summary of arsenic, copper, lead, and zinc concentrations detected in samples collected from the Seasonal Beach follows:

- **Arsenic:** Detected at concentrations greater than the screening level of 12.9 milligrams per kilogram (mg/kg) in 16 out of the 42 samples TestAmerica analyzed. The mean arsenic concentration detected was 14.6 mg/kg, and the median concentration detected was 10 mg/kg. The maximum and minimum concentrations detected were 67 mg/kg and 2.4 mg/kg, respectively.
- **Copper:** Detected at concentrations greater than the screening level of 143 mg/kg in 160 out of the 214 samples analyzed in the field using the XRF. The mean copper concentration detected was 628 mg/kg, and the median concentration detected was 274 mg/kg. The maximum and minimum concentrations detected were 2,872 mg/kg and 22 mg/kg, respectively.
- **Lead:** Detected at concentrations greater than the screening level of 250 mg/kg in 107 of the 214 samples analyzed in the field using the XRF. The mean lead concentration detected was 1,117 mg/kg, and the median concentration detected was 189 mg/kg. The

maximum and minimum concentrations detected were 60,200 mg/kg and 11 mg/kg, respectively.

- **Zinc:** Detected at concentrations greater than the screening level of 3,200 mg/kg in 88 out of the 214 samples analyzed in the field using the XRF. The mean zinc concentration detected was 5,596 mg/kg, and the median concentration detected was 1,218 mg/kg. The maximum and minimum concentrations detected were 54,500 mg/kg and 21 mg/kg, respectively.

3.1.2. Jetty

RI activities included collecting eight surface samples from the Jetty area. A summary of arsenic, copper, lead, and zinc concentrations detected in samples collected from the Jetty follows:

- **Arsenic:** Detected at concentrations greater than the screening level of 12.9 mg/kg in two out of the three samples TestAmerica analyzed. The mean arsenic concentration detected was 18 mg/kg, and the median concentration detected was 13 mg/kg. The maximum and minimum concentrations detected were 31 mg/kg and 10 mg/kg, respectively.
- **Copper:** Detected at concentrations greater than the screening level of 143 mg/kg in eight out of the eight samples analyzed in the field using the XRF. The mean copper concentration detected was 796 mg/kg, and the median concentration detected was 652 mg/kg. The maximum and minimum concentrations detected were 1,378 mg/kg and 355 mg/kg, respectively.
- **Lead:** Detected at concentrations greater than the screening level of 250 mg/kg in one out of the eight samples analyzed in the field using the XRF. The mean lead concentration detected was 168 mg/kg, and the median concentration detected was 164 mg/kg. The maximum and minimum concentrations detected were 292 mg/kg and 79 mg/kg, respectively.
- **Zinc:** Detected at concentrations greater than screening level of 3,200 mg/kg in five out of the eight samples analyzed in the field using the XRF. The mean zinc concentration detected was 4,361 mg/kg, and the median concentration detected was 3,331 mg/kg. The maximum and minimum concentrations detected were 7,891 mg/kg and 1,413 mg/kg, respectively.

RI activities did not include test pit excavations in the Jetty area to avoid creating stability issues. Because the jetty was constructed of material sourced from the Seasonal Beach area, the RI concluded that contamination extends to greater depths.

3.1.3. Bay and Public Dock

RI activities included collecting sediment samples from four test pits and three surface locations in the Bay and Public Dock area. Sediments within the Bay and Public Dock area exhibit metal contamination to at least 4 feet bgs.

A summary of arsenic, copper, lead, and zinc concentrations detected in samples collected from the Bay and Public Dock area follows:

- **Arsenic:** Detected at concentrations greater than the screening level of 12.9 mg/kg in three out of the nine samples TestAmerica analyzed. The mean arsenic concentration detected was 19.2 mg/kg, and the median concentration detected was 11 mg/kg. The maximum and minimum concentrations detected were 58 mg/kg and 5.8 mg/kg, respectively.
- **Copper:** Detected at concentrations greater than the screening level of 143 mg/kg in 18 out of the 35 samples analyzed in the field using the XRF. The mean copper concentration detected was 329 mg/kg, and the median concentration detected was 387 mg/kg. The maximum and minimum concentrations detected were 2,966 mg/kg and 19 mg/kg, respectively.
- **Lead:** Detected at concentrations greater than the screening level of 250 mg/kg in nine of the 35 samples analyzed in the field using the XRF. The mean lead concentration detected was 1,150 mg/kg, and the median concentration detected was 236 mg/kg. The maximum and minimum concentrations detected were 22,800 mg/kg and 10 mg/kg, respectively.
- **Zinc:** Detected at concentrations greater than the screening level of 3,200 mg/kg in nine out of the 35 samples analyzed in the field using the XRF. The mean zinc concentration detected was 4,492 mg/kg, and the median concentration detected was 3,250 mg/kg. The maximum and minimum concentrations detected were 58,700 mg/kg and 37 mg/kg, respectively.

3.1.4. Bayshore

RI activities included collecting sediment samples from two test pit excavations, five surface locations, and three hand dug excavations in the Bayshore area. Based on sample results, sediments within the Bayshore exhibit metal contamination to the excavation bottom of at least 4 feet bgs.

A summary of arsenic, copper, lead, and zinc concentrations detected in samples collected from the Bayshore follows:

- **Arsenic:** Detected at concentrations greater than the screening level of 12.9 mg/kg in two out of the 10 samples TestAmerica analyzed. The mean arsenic concentration detected was 11.8 mg/kg, and the median concentration detected was 10 mg/kg. The maximum and minimum concentrations detected were 43 mg/kg and 5.7 mg/kg, respectively.
- **Copper:** Detected at concentrations greater than the screening level of 143 mg/kg in 13 out of the 34 samples analyzed in the field using the XRF. The mean copper concentration detected was 126 mg/kg, and the median concentration detected was 259 mg/kg. The maximum and minimum concentrations detected were 690 mg/kg and 15 mg/kg, respectively.

- **Lead:** Detected at concentrations greater than the screening level of 250 mg/kg in 10 of the 34 samples analyzed in the field using XRF technology. The mean lead concentration detected was 344 mg/kg, and the median concentration detected was 188 mg/kg. The maximum and minimum concentrations detected were 2,410 mg/kg and 12 mg/kg, respectively.
- **Zinc:** Detected at concentrations greater than the screening level of 3,200 mg/kg in five out of the 34 samples analyzed in the field using XRF technology. The mean zinc concentration detected was 1,541 mg/kg, and the median concentration detected was 1,218 mg/kg. The maximum and minimum concentrations detected were 7,008 mg/kg and 33 mg/kg, respectively.

3.1.5. Hillside

RI activities included collecting soil samples from two test pits and 22 surface locations. The Hillside area exhibits mature vegetation, and as such, investigation in this area was limited to not disturb the vegetation. The known extent of impacted soils within the Hillside is limited to high-use areas and areas where visible slag is present.

A summary of concentrations of metals contamination (arsenic, copper, lead, and zinc) detected in samples collected from the Hillside follows:

- **Arsenic:** Concentrations greater than the screening level of 12.9 mg/kg were not detected in samples TestAmerica analyzed. The mean arsenic concentration detected was 5.1 mg/kg, and the median concentration detected was 11 mg/kg. The maximum and minimum concentrations detected were 11 mg/kg and 4.2 mg/kg, respectively.
- **Copper:** Detected at concentrations greater than the screening level of 143 mg/kg in 21 out of the 38 samples analyzed in the field using XRF technology. The mean copper concentrations detected was 419 mg/kg, and the median concentration detected was 411 mg/kg. The maximum and minimum concentrations detected were 4,057 mg/kg and 58 mg/kg, respectively.
- **Lead:** Detected at concentrations greater than screening level of 250 mg/kg in 13 of the 38 samples analyzed in the field using XRF technology. The mean lead concentration detected was 845 mg/kg and the median concentration detected was 251 mg/kg. The maximum and minimum concentrations detected were 23,100 mg/kg and 14 mg/kg, respectively.
- **Zinc:** Detected at concentrations greater than screening level of 3,200 mg/kg in two out of the 38 samples analyzed in the field using XRF technology. The mean zinc concentration detected was 2,197 mg/kg, and the median concentration detected was 2,366 mg/kg. The maximum and minimum concentrations detected were 48,900 mg/kg and 41 mg/kg, respectively.

3.2. Risks to human health and environment

Smelter waste contains a number of metals that are the contaminants of concern for the Site. Previous investigations found that arsenic, chromium, copper, lead, and zinc were elevated above risk-based screening levels in sediment and soil at the Site. In addition, benthic bioassay testing results in the UCR project area and surrounding reaches demonstrate that metals in sediments are bioavailable and create human health and aquatic ecological risks. Previous studies that demonstrate the metal's bioavailability in sediments at the Site and UCR project area are summarized in Ecology's Upper River Basin risk-based screening levels memo (Ecology 2019) and include:

- *Beach Sediment Study Field Sampling and Data Summary Report* (Teck 2014)
- *Summary and evaluation of Phase 1 (2005) sediment toxicity tests Upper Columbia River site* (CH2M Hill 2012)
- *Evaluation and interpretation of the sediment chemistry and sediment toxicity data for the Upper Columbia River* (MacDonald et al 2012)
- *Characterizing toxicity of meta-contaminated sediments from the Upper Columbia River, Washington USA, to benthic invertebrates* (Besser, et al 2018)

Potential receptors to Site contaminants include park visitors, park maintenance workers, wildlife, and terrestrial and aquatic organisms. Potential exposure routes include:

1. Direct human contact with exposed or near-surface contaminated soil, sediment, and surface water by visitors and park workers.
2. Aquatic life exposure to sediments or associated surface and pore water.
3. Incidental ingestion of soil, sediment, or surface water by higher trophic order ecological receptors.
4. Bioaccumulation from consumption of contaminated food or prey.

The RI includes a conceptual site model (CSM) to describe surface and subsurface conditions, define the nature and extent of known contamination, and identify potential exposure pathways from site sources of contaminants to potential receptors. Figure A.3 presents the CSM for the Site.

4. Cleanup Standards

MTCA requires the establishment of cleanup standards for individual sites. SMS requires the establishment of cleanup standards for sediments that are consistent with MTCA. The two primary components of cleanup standards are CULs and points of compliance. CULs determine the concentration at which a substance does not threaten human health or the environment. A cleanup remedy addresses all media exceeding a CUL to prevent exposure to the contaminated material. Points of compliance represent the locations on the site where CULs must be met.

4.1. Overview

MTCA and SMS provide the process for establishing soil and sediment cleanup values, respectively.

4.1.1. Soil cleanup levels

The process for establishing soil CULs involves the following:

- Determining if methods A, B, or C are applicable;
- Developing CULs for individual contaminants in each media;
- Determining which contaminants contribute the majority of the overall risk in each media (indicators); and
- Adjusting the CULs downward for carcinogenic substances based on total site risk of 1×10^{-5} , and for a hazard index of 1 for non-carcinogenic substances, if necessary.

MTCA provides three options for establishing CULs: methods A, B, and C.

- Method A may be used to establish CULs at routine sites or sites with relatively few hazardous substances.
- Method B is the standard method for establishing CULs and may be used to establish CULs at any site.
- Method C is a conditional method used when a cleanup level under Method A or B is technically impossible to achieve or may cause significantly greater environmental harm. Method C also may be applied to qualifying industrial properties.

MTCA defines the factors used to determine whether a substance should be retained as an indicator hazardous substance for the Site. When defining CULs at a site contaminated with several hazardous substances, Ecology may eliminate those contaminants contributing a small percentage of the overall threat to human health and the environment. WAC 173-340-703(2) provides a substance may be eliminated from further consideration based on:

- The toxicological characteristics of the substance which govern its ability to adversely affect human health or the environment relative to the concentration of the substance;
- The chemical and physical characteristics of the substance which govern its tendency to persist in the environment;
- The chemical and physical characteristics of the substance which govern its tendency to move into and through the environment;
- The natural background concentration of the substance;
- The thoroughness of testing for the substance;
- The frequency of detection; and
- The degradation by-products of the substance.

4.1.2. Sediment cleanup levels

SMS provides numerical chemical criteria as well as methods to determine sediment CULs that include protecting the benthic community in freshwater sediment (WAC 173-204-563) and

higher trophic-level species (WAC 173-204-564). Ecology, when promulgating the SMS, determined the numerical chemical criteria values established as a part of the rule did not reliably predict benthic community toxicity for metals mining-, milling-, or smelting-impacted sediment sites. The SMS established that for freshwater sediment sites impacted by metals smelting, such as this Site, the chemical numerical criteria would not apply and that chemical site-specific numerical criteria would need to be developed using site-specific bioassays (WAC 173-204-563(2)(o)(iii)).

To identify sites of potential concern and to develop site-specific numerical chemical criteria, the SMS uses two main benthic invertebrate species (*Hyaella azteca* and *Chironomus dilutus*) to conduct bioassays with endpoints of growth and mortality. SMS identifies performance standards and criteria for assigning toxic response for each endpoint. In addition, SMS recognizes the application of biomass as a third biological endpoint (WAC 173-204-56(3)(g)).

4.2. Site use

Evaluating CULs and ecological exposures depends on the Site use. Options under MTCA are an unrestricted property or an industrial property. The Site is next to the Northport City Park that includes public parking, picnic tables, shelters, and several recreational vehicle hook-ups. Considering the existing land uses and that recreational activities will likely continue to be the main use well into the future, unrestricted land use is applicable for the Site.

4.3. Terrestrial ecological evaluation

WAC 173-340-7490 requires that site managers perform a terrestrial ecological evaluation (TEE) to determine the potential effects of soil contamination on ecological receptors. MTCA excludes a site from a TEE if it meets any of the following criteria:

- All contaminated soil is or will be located below the point of compliance;
- All contaminated soil is or will be covered by physical barriers such as buildings or pavement;
- The site meets certain requirements related to the nature of on-site and surrounding undeveloped land; or
- Concentrations of hazardous substances in soil do not exceed natural background levels.

This Site does not meet any of the exclusionary criteria. MTCA requires sites that do not qualify for a TEE exclusion complete a site-specific TEE if any of the following criteria apply:

- The site is located on, or directly adjacent to, an area where management or land use plans will maintain or restore native or semi-native vegetation.
- The site is used by a threatened or endangered species; a wildlife species classified by the Washington state department of fish and wildlife as a “priority species” or “species of concern” under Title 77 RCW; or a plant species classified by the Washington state department of natural resources heritage program as “endangered,” “threatened,” or “sensitive” under Title 79 RCW. For plants, “used” means that a plant species grows at the site or has been found growing at the site. For animals, “used” means that individual of a species have been observed to live, feed, or breed at the site.

- The site is located on a property that contains at least ten acres of native vegetation within 500 feet of the site, not including vegetation beyond the property boundaries.
- The department determines that the site may present a risk to significant wildlife populations.

This Site does not meet any of the criteria for a site-specific TEE. As such, a simplified terrestrial ecological evaluation as described under WAC 173-340-7492 is applicable. The simplified TEE process provides several options, including chemical concentrations the site can use as CULs. MTCA Table 749-2 provides concentration levels for priority contaminants of ecological concern for sites that qualify for the simplified TEE procedure.

4.4. Site cleanup levels

For this Site, CUL development centers on metal contaminants in soil and sediment. Site investigations identified arsenic, copper, lead, and zinc as indicator hazardous substances in sediment and soil. As discussed in Section 2.3, soil is generally limited to the Hillside area. The Seasonal Beach, Bay and Public Dock, Bayshore, and Jetty areas are sediment. This CAP develops separate CULs for the four metals identified as indicator substances for both Site soil and sediment.

This CAP uses MTCA Method B to develop soil CULs at the Site with the exception of lead. Cleanup values for lead cannot be calculated using the equations in MTCA; therefore, MTCA Method A soil CULs for lead are used. Initial Site CULs are then adjusted downward using the simplified TEE table values found in MTCA Table 749-2. Table B.2 summarizes soil CULs for the Site.

Using data from sediment toxicity studies conducted in the direct vicinity of the Site, Ecology developed preliminary Site-specific sediment CULs using the Floating Percentile Model (FPM) as described in Ecology Publication No. 11-09-054. Ecology used the FPM process to develop freshwater sediment CULs. As noted previously, the numerical criteria are not applicable to the Site; therefore, Site-specific sediment CULs were developed. The Site-specific CULs are based on known or suspected primary toxicity drivers to the benthic macroinvertebrates at the Site. Ecology memorandum, “Establishment of Site-Specific SMS Metals Cleanup Objectives for Contaminated Sediments – Northport Waterfront and Nearshore State Cleanup Site,” describes the process Ecology used to create the Site-specific sediment CULs (Ecology 2019).

This CAP establishes sediment CULs using the Site-specific sediment cleanup values calculated using the FPM as described above, with the exception of zinc. Ecology adjusted copper, lead, and zinc concentrations downward to establish a value protective of human health and terrestrial ecological receptors. Table B.3 summarizes sediment CULs for the Site.

4.5. Point of compliance

MTCA defines the point of compliance as the points or point where CULs established in accordance with WAC 173-340-720 through 173-340-760 shall be attained (WAC 173-340-200). For soil, WAC 173-340-740(6) governs the definition of the point of compliance. For soil cleanup levels based on human exposure via direct contact or other pathways where contact with the

soil is required to complete the pathway, the general point of compliance is throughout the site, from ground surface to 15 feet bgs. For any terrestrial remedy, a conditional point of compliance may be set at the biologically active soil zone. Ecology assumes this zone extends to a depth of 6 feet. However, Ecology recognizes that for cleanup actions that involve containing hazardous substances, soil CULs will typically not be met at the point of compliance. In these cases, the cleanup action may be determined to comply with cleanup standards, provided:

- The selected remedy is permanent to the maximum extent practicable using the procedures in WAC 173-340-360;
- The cleanup action is protective of human health;
- The cleanup action is demonstrated to be protective of terrestrial ecological receptors under WAC 173-340-7490 through 173-340-7494;
- Institutional controls are put in place under WAC 173-340-440 that prohibit or limit activities that could interfere with the long-term integrity of the containment system;
- Compliance monitoring under WAC 173-340-410 and periodic reviews under WAC 173-340-430 are designed to ensure the long-term integrity of the containment system; and
- The types, levels and amount of hazardous substances remaining on-site and the measures that will be used to prevent migration and contact with those substances are specified in the CAP.

For this Site, the soil point of compliance will be throughout the site from ground surface to 15 feet bgs.

SMS specifies that Ecology develop the point of compliance for sediment at a location that protects aquatic life and human health. Ecology generally applies the point of compliance for sediment to the extent of the biologically active zone, generally 6 to 12 inches bgs. For this Site, the sediment point of compliance is from ground surface to 1-foot bgs.

5. Cleanup Action Selection

5.1. Remedial action objectives

Remedial action objectives (RAOs) describe the actions necessary to protect human health and the environment by eliminating, reducing, or otherwise controlling risks posed through each exposure pathway and migration route. RAOs consider the characteristics of the contaminated media, the characteristics of the hazardous substances present, migration and exposure pathways, and potential receptor points.

Potential exposure pathways based on Site use include direct human contact with exposed or near-surface contaminated soil and sediments via dermal contact and inhalation/ingestion of dust and contaminants. Given the identified potential exposure pathways, preventing direct contact, ingestion, or inhalation of contaminated soil and sediment by humans and ecological receptors are the RAOs for the Site.

5.2. Cleanup action alternatives

The FFS evaluated potential cleanup action alternatives to meet Site RAOs (GeoEngineers 2021). Cleanup alternatives focused on the Seasonal Beach area. As demonstrated in the RI, a significant portion of smelter waste contamination is on the Seasonal Beach. The FFS considered three cleanup alternatives for the Seasonal Beach and one remedial action for each of the other areas (Hillside, Jetty, Bay and Public Dock, and Bayshore). A summary for the alternatives follows.

5.2.1. Alternative 1

This alternative combines capping the portion of the Seasonal Beach near the main river channel edge and excavating contaminated material to 2 feet bgs in the areas not capped, which are closer to the shoreline. This alternative also proposes to address up to six select areas to be excavated an additional 4 feet to remove deeper pockets of contaminated material.

The excavated area will be backfilled with about 2 feet of imported fill material to its current elevation. The fill will consist of an 80/20 mixture of 12-inch stream-bed-consistent sediment material. This alternative includes capping the main channel edge from approximate elevation of 1,280 to 1,285 feet AMSL with 2 feet of the 80/20 mixture material. This alternative includes grading the boundary between the capped and excavated/backfilled areas to transition the change in elevation.

The excavation area assumed under this alternative is 222,100 square feet (sf), and the capping-only area is 63,500 sf. About 17,600 cubic yards (cy) of contaminated material would be removed from the excavation area.

5.2.2. Alternative 2

Like Alternative 1, this alternative is a combination of capping and excavation. Relative to Alternative 1, capping expands to the longitudinal crest of the outer bar in the downstream half of the sub-area and the northeast portion of the Seasonal Beach. This alternative also considers removing contaminated soil to construct a more prominent side channel through the area. The FFS assumed the minimum flowing elevation of the channel to be 1,275 feet AMSL, requiring up to 10 feet of excavation from current conditions. The channel edges would be sloped back to provide stability and channel form. This alternative also caps the area between the side channel and main river channel.

This alternative considered removing contaminated soil to 2 feet bgs from areas not capped and in six select areas excavating an additional 4 feet. Backfill and capping occurs as described in Alternative 1.

The approximated excavation area under this alternative is 163,300 sf, and the approximate capping-only area is 130,000 sf. About 21,800 cy of contaminated material would be removed from the excavation area.

5.2.3. Alternative 3

This alternative combines capping and excavating contaminated material similar to Alternative 1 with the modifications of no action in an area near the main river channel at the downstream end of the beach and a larger capped area near the downstream end of the beach. Excavation and capping occurs as described in the previous alternatives. This alternative also includes excavating up to six select areas to 6 feet bgs. The excavation area assumed under this alternative is 153,500 sf, and the approximate capping-only area is 98,400 sf. About 12,500 cy of contaminated material would be removed from the excavation area.

5.2.4. Jetty, Bay and Public Dock, Bayshore and Hillside area alternatives

The following is a summary of the remedial actions considered in the FFS for the Jetty, Bay and Public Dock, Bayshore, and Hillside areas.

- **Jetty:** Capping with imported fill to limit public exposure to the contaminated material and assure durability. The FFS assumed capping the Jetty with 2 feet of 12-inch loose riprap armoring keyed into the toe of the slope. The FFS includes capping the top of the Jetty with 2 feet of the 80/20 mixture used in the Seasonal Beach area.
- **Bay and Public Dock:** Capping with 1.5 feet of imported streambed sediment and excavating the area around the dock to 6 feet below existing grade.
- **Bayshore:** Capping with 1.5 feet of imported fill.
- **Hillside:** A combination of removal, capping, and trail enhancements to limit direct contact with contaminated soil. The FFS focused removal and capping to select areas and along the existing trail to avoid impacts to the well-established vegetation. The remedial action included removing easily accessible surface debris and contaminated soil and slag debris from select areas. The FFS assumed contaminated soil excavation depths between 2 and 4 feet bgs. Excavated areas will be backfilled with common borrow. The FFS includes new infill planting and rail fencing along the trail and picnic areas to discourage public use off the established trails and picnic areas. The FFS also presented enhanced recreational elements to the Hillside remedial action.

5.3. Regulatory requirements

MTCA sets forth the minimum requirements and procedures for selecting a cleanup action. A cleanup action must meet each of the minimum requirements specified in WAC 173-340-360(2), including certain threshold and other requirements. The following sections outline these requirements.

5.3.1. Threshold requirements

WAC 173-340-360(2)(a) requires that the cleanup action shall:

- Protect human health and the environment;
- Comply with cleanup standards (see Section 4);

- Comply with applicable state and federal laws (see Section 5.3.4); and
- Provide for compliance monitoring.

5.3.2. Other requirements

In addition, WAC 173-340-360(2)(b) states the cleanup action shall:

- Use permanent solutions to the maximum extent practicable;
- Provide for a reasonable restoration time frame; and
- Consider public concerns.

WAC 173-340-360(3) describes the specific requirements and procedures for determining whether a cleanup action uses permanent solutions to the maximum extent practicable. MTCA defines a permanent solution as one that meets CULs without further action being required at the Site other than the disposal of residue from the treatment of hazardous substances. A disproportionate cost analysis (DCA) determines whether a cleanup action uses permanent solutions to the maximum extent practicable. This analysis compares the costs and benefits of the cleanup action alternatives and involves the consideration of several factors, including:

- Protectiveness;
- Permanent reduction of toxicity, mobility, and volume;
- Cost;
- Long-term effectiveness;
- Short-term risk;
- Implementability; and
- Consideration of public concerns.

The comparison of benefits and costs may be quantitative, but will often be qualitative and require the use of best professional judgment.

WAC 173-340-360(4) describes the specific requirements and procedures for determining whether a cleanup action provides for a reasonable restoration time frame.

5.3.3. Cleanup action expectations

WAC 173-340-370 sets forth the following expectations for the development of cleanup action alternatives and the selection of cleanup actions. These expectations represent the types of cleanup actions Ecology considers likely results of the remedy selection process; however, Ecology recognizes that there may be some sites where cleanup actions conforming to these expectations are not appropriate.

- Treatment technologies will be emphasized at sites with liquid wastes, areas with high concentrations of hazardous substances, or with highly mobile and/or highly treatable contaminants;
- To minimize the need for long-term management of contaminated materials, hazardous substances will be destroyed, detoxified, and/or removed to concentrations below CULs throughout sites with small volumes of hazardous substances;

- Engineering controls, such as containment, may need to be used at sites with large volumes of materials with relatively low levels of hazardous substances where treatment is impracticable;
- To minimize the potential for migration of hazardous substances, active measures will be taken to prevent precipitation and runoff from coming into contact with contaminated soil or waste materials;
- When hazardous substances remain on-site at concentrations which exceed CULs, they will be consolidated to the maximum extent practicable where needed to minimize the potential for direct contact and migration of hazardous substances;
- For sites adjacent to surface water, active measures will be taken to prevent/minimize releases to that water; dilution will not be the sole method for demonstrating compliance;
- Natural attenuation of hazardous substances may be appropriate at sites under certain specified conditions (see WAC 173-340-370(7)); and
- Cleanup actions will not result in a significantly greater overall threat to human health and the environment than other alternatives.

5.3.4. Applicable, relevant, and appropriate state and federal laws, and local requirements

WAC 173-340-710(1) requires that all cleanup actions comply with all applicable local, state, and federal law. It further states the term “applicable state and federal laws” shall include legally applicable requirements and those requirements that the department determines “...are relevant and appropriate requirements.” This section discusses applicable state and federal law, relevant and appropriate requirements, and local permitting requirements considered and were of primary importance in selecting cleanup requirements. If Ecology identifies other requirements later, Ecology will apply those requirements to the cleanup actions at that time.

MTCA provides an exemption from the procedural requirements of several state laws and from any laws authorizing local government permits or approvals for remedial actions conducted under a consent decree, order, or agreed order (RCW 70A.305.090). However, the substantive requirements of a required permit must be met. The procedural requirements of the following state laws are exempted:

- Ch. 70.94 RCW, Washington Clean Air Act;
- Ch. 70.95 RCW, Solid Waste Management, Reduction, and Recycling;
- Ch. 70.105 RCW, Hazardous Waste Management;
- Ch. 75.20 RCW, Construction Projects in State Waters;
- Ch. 90.48 RCW, Water Pollution Control; and
- Ch. 90.58 RCW, Shoreline Management Act of 1971.

WAC 173-340-710(4) sets forth the criteria Ecology evaluates when determining whether certain requirements are relevant and appropriate for a cleanup action. Table B.4 lists the local, state, and federal laws likely containing the applicable or relevant and appropriate

requirements that apply to the cleanup action at the Site. Local laws, which may be more stringent than specified state and federal laws, will govern where applicable.

5.4. Evaluation of cleanup action alternatives

The requirements outlined in this section are used to conduct a comparative evaluation of the cleanup action alternatives and to select a cleanup action from those alternatives. FFS Table 1 summarizes each cleanup action alternative.

5.4.1. Threshold requirements

The following sections describe how the proposed alternatives meet MTCA threshold requirements.

Protection of human health and the environment

The remedial alternatives combine removal and capping to protect human health and the environment. Removal and capping would reduce potential human and ecological receptors by reducing the exposure pathways. As such, alternatives 1 and 2 would protect human health and the environment. Alternative 3 does not provide protection of human health and the environment in the proposed no action area of the Seasonal Beach area.

Compliance with cleanup standards

Alternatives 1 and 2 will meet cleanup standards by combining removal and capping. Alternative 3 does not meet cleanup standards because of the proposed no action area on the Seasonal Beach.

Compliance with state and federal laws

Alternatives 1 and 2 can meet regulatory requirements, as discussed in Section 5.3.4. Local laws, which can be more stringent, will govern actions when they are applicable. The design phase of this project establishes state and federal laws. Alternative 3 does not comply with MTCA regulations.

Provide for compliance monitoring

There are three types of compliance monitoring: protection, performance, and confirmational. Protection monitoring protects human health and the environment during the construction and operation and maintenance phases of the cleanup action. Performance monitoring confirms the cleanup action has met cleanup and/or performance standards. Confirmational monitoring confirms the long-term effectiveness of the cleanup action after meeting cleanup standards or other performance standards.

Each remedial alternative requires varying levels of all three types of compliance monitoring. Performance monitoring will track the effectiveness of the cleanup action and determine if it achieved cleanup standards. The Operating and Maintenance (O&M) plan will describe these monitoring activities. Health and safety plans will include protection monitoring requirements for remedial construction and final remedy O&M. All three alternatives satisfy this provision.

5.4.2. Other requirements

Use of permanent solutions to the maximum extent practicable

As discussed previously, to determine whether a cleanup action uses permanent solutions to the maximum extent practicable, the DCA specified in the regulation is used. The analysis compares the costs and benefits of the cleanup action alternatives and involves the consideration of several factors. The comparison of costs and benefits may be quantitative, but will often be qualitative and require the use of best professional judgment.

- Protectiveness measures the degree to which the cleanup action reduces existing risks, time required to reduce risk and attain cleanup standards, on- and off-site risks resulting from implementing the alternative, and improvement of overall environmental quality.

Alternatives 1 and 2 are protective of human health and the environment. Alternative 1 will provide for the greatest long-term protectiveness by removing site contaminants from the largest area of the Seasonal Beach. The no action area proposed in Alternative 3 is not protective of human health and the environment. Alternative 3 offers the lowest improvement in environmental quality and the highest likelihood of not attaining cleanup standards.

- Permanent reduction of toxicity, mobility, and volume measures the adequacy of the alternative in destroying the hazardous substance(s), the reduction or elimination of releases or sources of releases, the degree of irreversibility of any treatment process, and the characteristics and quantity of any treatment residuals.

Alternatives 1 through 3 rely on capping and institutional controls on multiple portions of the Site that could be undone by human and ecological activities. In addition, the Site is downstream from Teck's smelter operations in Trail, British Columbia. Teck's smelter operations previously included discharging granulated slag, liquid effluent, and other discharges into the Columbia River. The Columbia River can mobilize slag-impacted sediments from upstream sources and redeposit them across the beach and shoreline area over time.

- Cleanup costs are estimated based on design assumptions for each alternative. Costs are estimates based on design assumptions that might change. For a detailed description of the costs involved with each alternative, please refer to the FFS. The FFS presented a range of costs as shown in Table B.5.
- Long-term effectiveness measures the degree of success, the reliability of the alternative during the period that hazardous substances will remain above cleanup levels, the magnitude of residual risk after implementation, and the effectiveness of controls required to manage remaining wastes.

Alternative 1 ranks the highest because it removes contamination from the largest area. Alternative 3 ranks lower than alternatives 1 and 2 because it removes the least amount of contamination and includes an area of no action.

- Short-term risk measures the risks related to an alternative during construction and implementation, and the effectiveness of measures that will be taken to manage such risks.

Each alternative poses similar short-term risks as each require excavation and transporting material on public roadways. Alternative 2 would have the most risk because it removes the most contamination, and therefore, transports the most contaminated material over public roadways. Construction will occur in a manner not to create contaminated sediment movement during or after construction. Ecology anticipates construction will occur almost entirely with land-based equipment operating above the water line.

- Implementability considers whether the alternative is technically possible, the availability of necessary off-site facilities, services, and materials, administrative and regulatory requirements, scheduling, size, complexity, monitoring requirements, access for operations and monitoring, and integrations with existing facility operations.

All three alternatives are implementable at the Site. Remedial actions proposed for several areas will rely on short construction windows when river flows are low and sediments are exposed. As previously mentioned, lowering of Lake Roosevelt generally exposes sediment along the shoreline and Seasonal Beach. Lake Roosevelt is lowered to prepare for spring runoff, water flows, or other pool management purposes.

- To understand and consider public concerns, Ecology presented the draft RI/FS for public review and comment May 3 to June 2, 2021. We held an online public meeting on May 19, 2021. This CAP will also undergo public review and comment.

Ecology published our [Response to Comments](#)⁴ in June 2021. We received comments from three individuals and one organization. You can learn more by reading the document.

Disproportionate cost analysis results

Costs are disproportionate to the benefits if the incremental costs of an alternative are disproportionate to the incremental benefits of that alternative. Based on an analysis of the factors listed above, the additional costs of Alternative 2 is disproportionate to its incremental benefit. Table B.6 provides a summary of the relative ranking of each alternative in the decision process. Figure A.4 summarizes the DCA.

Provide for a reasonable restoration time frame

WAC 173-340-360(4) describes the requirements and procedures for determining whether a cleanup action provides for a reasonable restoration time frame, as required under subsection (2)(b)(ii). The factors used to determine whether a cleanup action provides a reasonable restoration time frame are in WAC 173-340-360(4)(b).

⁴<https://apps.ecology.wa.gov/cleanupsearch/document/102526>

The three alternatives have similar restoration time frames. Each alternative is consistent with the factors in WAC 173-340-360(4)(b) and provide for a reasonable time frame.

5.4.3. Cleanup action expectations

WAC 173-340-370 outlines cleanup action expectations. Section 5.3.3 describes these expectations. The alternatives would address applicable expectations in the following manner:

- Alternatives 1 and 2 combine removal and capping to eliminate exposure to contaminated material in the Seasonal Beach area.
- Alternative 3 includes a no action area, and therefore, does not meet cleanup expectations.
- Remedial actions proposed for the Beach, Jetty, Bay and Public Dock, and Bayshore areas combine removal, capping, and institutional controls to eliminate or reduce exposure to contaminants.

5.5. Decision

Based on the above analysis, Ecology selects a combination of the FFS presented alternatives, with some additional modifications outlined in Section 6.0, as the proposed remedial action for the Site. The modifications outlined in Section 6.0 include capping the proposed no action area defined in Alternative 3 and re-grading the Seasonal Beach area to flow toward the main river channel. These modifications are protective of human health and the environment and satisfy MTCA requirements. Capping additional portions of the Seasonal Beach area will also reduce the volume of contaminated sediment transported offsite, thereby alleviating some short-term risk associated with hauling material on public roads. The additional cost of the selected remedy is not disproportionate to its incremental benefit. Table B.6 describes the comparative ranking of the selected cleanup action. Figure A.5 summarizes the DCA of the selected cleanup action compared to the FFS alternatives.

The cost of the selected cleanup action includes an additional 7,000 cubic yards of imported material, when compared to Alternative 3. This increase is to regrade and cap portions of the Seasonal Beach area. Based on the values and assumptions provided in the FFS, the increase in fill and cap area results in a total cost estimate of \$4,918,000 to \$5,436,000 for the selected cleanup action.

6. Selected Cleanup Action

The selected cleanup action for the Site includes a combination of focused removal, capping, and institutional controls. Ecology recognizes that certain areas will require minimal construction-related activities, whereas other areas will require a more prolonged period of remedial construction. Near-shore work will occur when water levels are lowest and in increments as to not risk impacts to the Site or river due to rising flows.

Excavation and capping might result in substantial alterations of the riverbed configuration and modified river flow characteristics. The final engineering design for the cleanup action will incorporate Site-specific hydraulic modeling to develop final Site grades and cap materials.

Excavated soil, sediment, and slag will be transported offsite to a permitted landfill for disposal.

6.1. Seasonal Beach

The selected cleanup action for the Seasonal Beach area combines contaminant removal and capping. These actions remove contaminated materials from areas displaying the greatest impacts from smelter waste and protects human and environmental health by capping remaining contaminated material. The cleanup action includes:

- Capping the sub-area with 2 feet or more of imported stream-bed-consistent sediment material. The final engineering design for the cleanup action will incorporate site-specific hydraulic modeling to select the composition of the cap material such that the material can accommodate river dynamics. Capping includes portions of the beach near the main channel edge of the river and the prominent gravel bar along the downstream portion of the beach. As part of the Site re-grading action, portions of the Seasonal Beach (primarily adjacent to the jetty) are capped with up to 6 feet of material.
- Excavating contaminated material from the areas not capped and backfilling with 2 feet of cap material. As appropriate, the cleanup action will screen boulders and cobbles from the excavation to include with the cap material.
- Re-grading portions of the area to promote drainage of surface water back into the river. This action prevents stagnant water, and potentially smelter waste from upstream sources, from accumulating in depressions. In general, the cleanup action will fill the topographic depressions on the beach next to the jetty with cap material to an approximate elevation of 1,285 feet AMSL resulting in a bench profile that gently slopes toward the main river channel.

Figure A.6 shows the modifications to excavation and capping areas. The actual area of excavation and capping will depend on river conditions at the time of construction; however, construction will occur at a time of year when exposure of the main channel edge is at a minimum elevation of about 1,280 feet AMSL.

6.2. Jetty

The remedial action proposed in the FFS is the selected cleanup action for the Jetty sub-area. The selected action entails capping the entire jetty with imported fill to limit public exposure to the contaminated material and assure durability. The cleanup action caps the slopes of the jetty with 2 feet of 12-inch loose riprap, or similar, armoring keyed into the toe of the slope. The armoring incorporates cobbles and boulders from the Beach sub-area to give a natural appearance. The cap at the top of the jetty consists of 2 feet of the cap material used in the Beach sub-area and will tapered into the riprap.

6.3. Bay and Public Dock

The remedial action proposed in the FFS is the selected cleanup action for the Bay and Public Dock area, with modifications. The cleanup action consists of placing 2 feet of cap material used in other areas to prevent exposure to contaminated sediments. The action also includes excavating the area around the dock to 4 feet bgs and replacing with 2 feet of the cap material to prevent exposure to contaminated sediment left in-place.

6.4. Bayshore

The remedial action proposed in the FFS is the selected cleanup action for the Bayshore area, with modifications. The cleanup action consists of placing 2 feet of cap material used in the other areas to prevent exposure to contaminated sediments. A small amount of excavation and replacement along the boat ramp will occur to maintain a level transition along the established concrete boat launch interface.

Figure A.6 shows the approximate limits of the selected cleanup actions for the Seasonal Beach, Jetty, Bay and Public Dock, and Bayshore areas.

6.5. Hillside

The FFS proposed remedial action for the Hillside area is the selected cleanup action, with modifications. The cleanup action includes excavating and capping known contaminant hot spots and discouraging access to the Hillside to minimize exposure. The cleanup action includes the following:

- Removing easily accessible surface debris.
- Removing contaminated soil and slag debris from two exposure areas to depths between 3 and 4 feet bgs. Excavations will be backfilled with imported borrow material and completed with 6 inches of topsoil and plantings of native vegetation.
- Re-establishing/stabilizing the existing defined trail that leads from the parking area to the bottom of the hillside. Stabilizing the existing trail includes excavating 1 foot of existing soil and replacing with common borrow to reduce exposure to contaminated soil left in-place. Additional measures include limiting vehicle access and erosion controls to stabilize the trail.
- Excavating visible slag and up to two feet of contaminated soil from remaining areas of the hillside that are easily accessible and can be completed in a manner that does not disturb mature vegetation. Excavations will generally focus on the southwestern portion of the Hillside area. Excavation areas will be backfilled with imported borrow material and completed with topsoil and plantings of native vegetation.
- Establishing select bench seating and picnic shelter areas along the top of the Hillside to provided recreational activities in areas that have been remediated thereby reducing the potential for recreational activities on other areas of the Hillside.

- Placing rail fencing and new infill plantings of native vegetation along the trail to discourage public use off the established trail.
- Placing rail fencing along the top of the hill and proposed seating/picnic areas to discourage public use off the established areas.

Figure A.7 shows the approximate limits of selected cleanup action for the Hillside area.

6.6. Institutional controls

Institutional controls are measures undertaken to limit or prohibit activities that may interfere with the integrity of a cleanup action or result in exposure to hazardous substances at the Site. Such measures are required to assure the continued protection of human health, the environment, and the integrity of the cleanup action whenever hazardous substances remain at the Site at concentrations exceeding CULs. Institutional controls can include physical measures and legal and administrative mechanisms. WAC 173-340-440 provides information on institutional controls and the conditions under which they may be removed.

Ecology will record an environmental covenant for the Site in accordance with the Uniform Environmental Covenants Act (Chapter 64.70 RCW). This cleanup action includes institutional controls such as fencing and seating/picnic areas in the Hillside area. Fencing and seating/picnic areas will provide opportunities for the public to use remediated areas, limit access to areas outside the remediated areas, and reduce the potential for exposure to contaminants at the Site. Institutional controls will include inspection and repair of capped areas and measures such as signage to educate the public about site contamination.

6.7. Periodic review

As long as CULs have not been achieved, WAC 173-340-420 states that at sites where a cleanup action requires an institutional control, a periodic review shall be completed no less frequently than every five years after the initiation of a cleanup action. Additionally, periodic reviews are required at sites that rely on institutional controls as part of the cleanup action. Periodic reviews will be required at this Site because institutional controls are part of the remedy.

7. References

Besser, J.M, et. al. 2018. *Characterizing toxicity of meta-contaminated sediments from the Upper Columbia River, Washington USA, to benthic invertebrates*. USGS Manuscript accepted and published by Environmental Toxicology and Chemistry.

CH2M Hill, 2012. *Summary and evaluation of Phase 1 (2005) sediment toxicity tests Upper Columbia River site*. Prepared for USEPA, Region 10, Seattle, WA.

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MacDonald DD, Sinclair J, Crawford MA, Principe H, Coady M. 2012. *Evaluation and interpretation of the sediment chemistry and sediment toxicity data for the Upper Columbia River*. Prepared for Washington Department of Ecology Toxic Cleanup Program through Science Applications International Corporation. Bothell, Washington. Prepared by MacDonald Environmental Sciences Ltd., Nanaimo, BC.

Teck. 2014. *Beach Sediment Study Field Sampling and Data Summary Report*. Prepared by Integral Consulting, Inc. for Teck American Inc.

Washington State Department of Ecology, 2019, *Establishment of Site-Specific SMS Metals Cleanup Objectives for Contaminated Sediments – Northport Waterfront and Nearshore State Cleanup Site*.

Washington State Model Toxics Control Act, 2007, WAC 173-340.

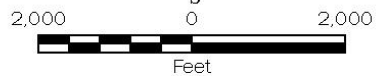
Washington State Sediment Management Standards, 2013, WAC 173-204.

Appendix A. Figures

A.1. Vicinity map



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Vicinity Map

Northport Waterfront Cleanup Action Plan
Northport, Washington



Figure A.1

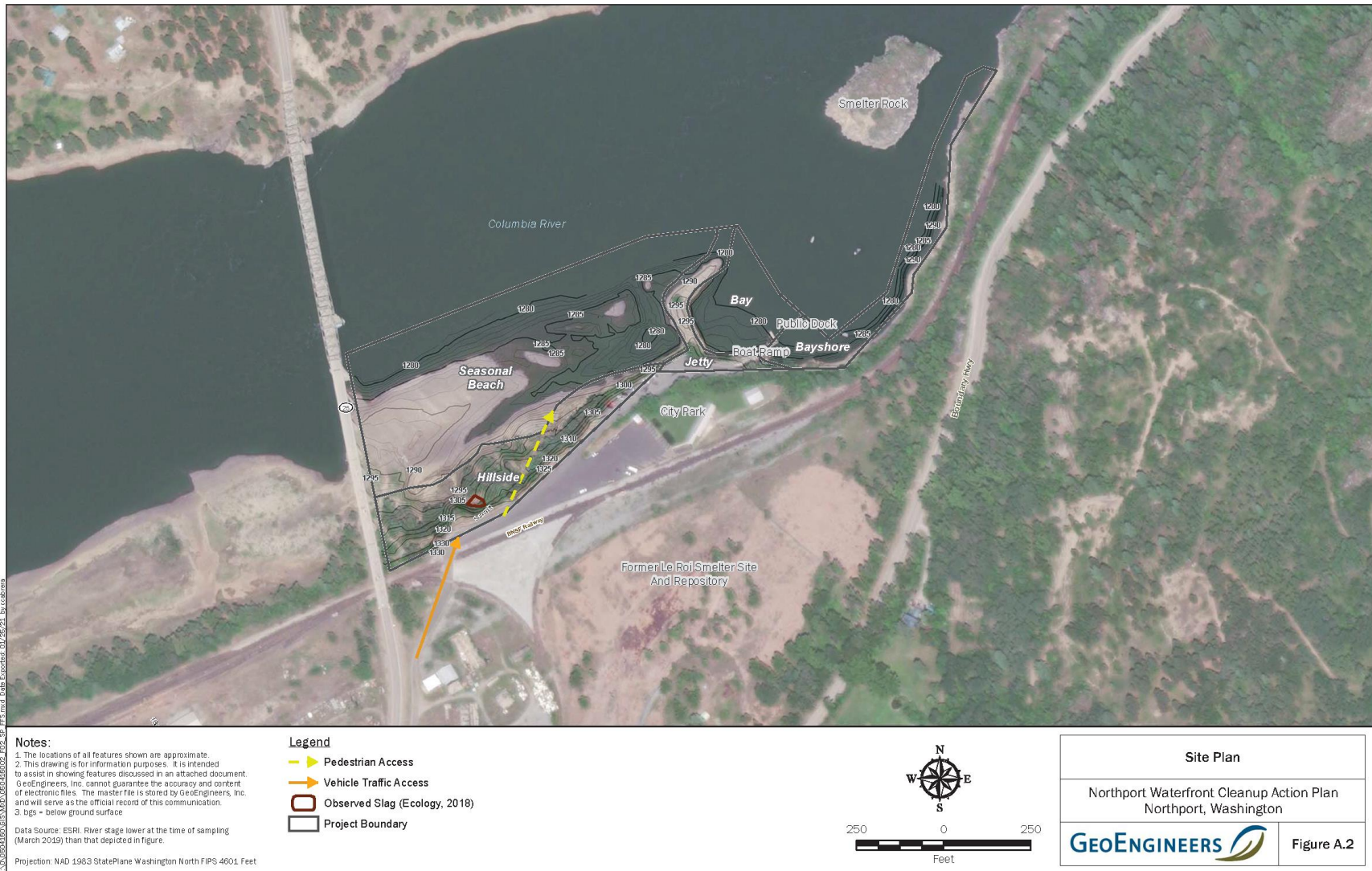
Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

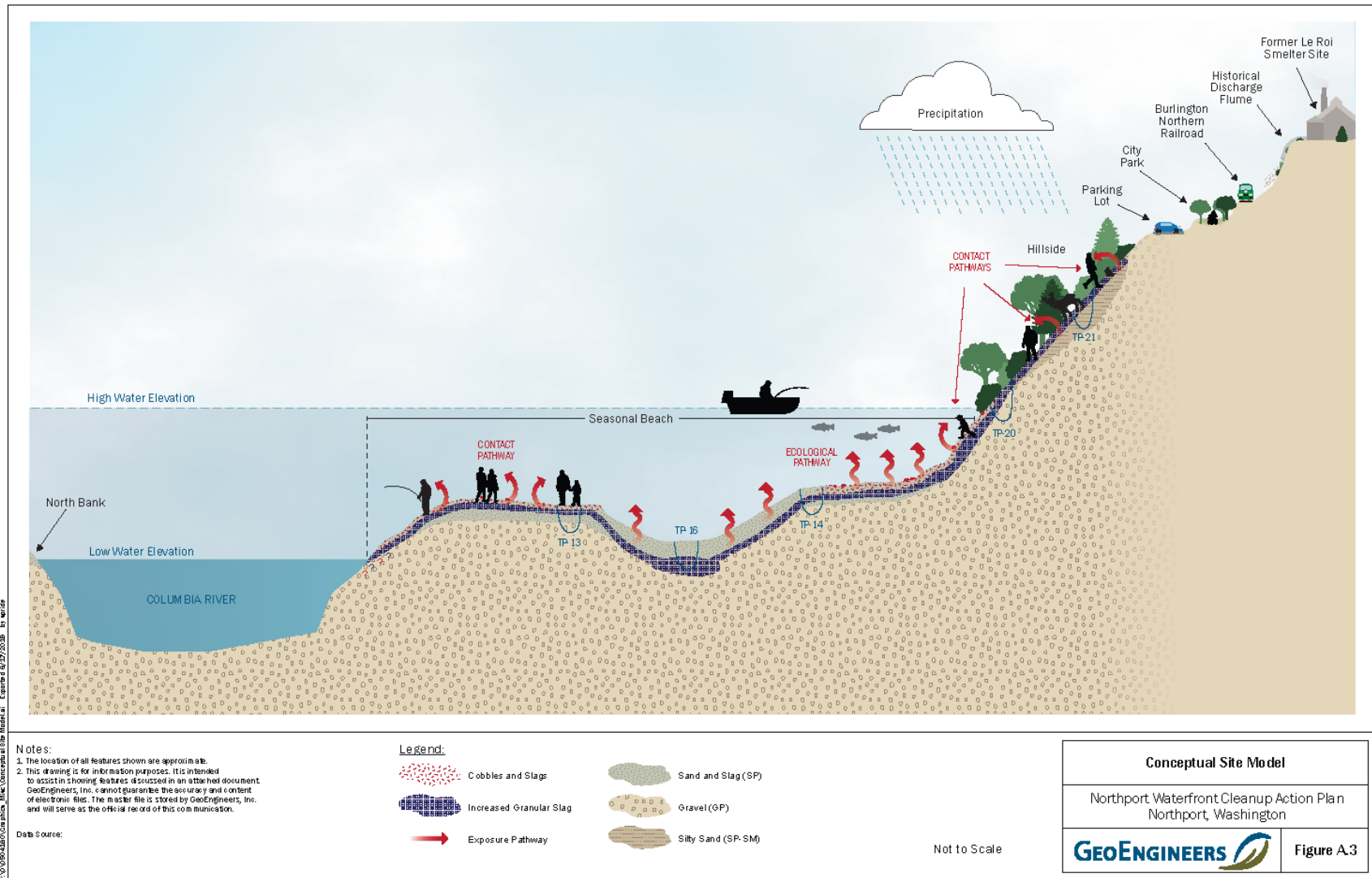
Data Source: Mapbox Open Street Map, 2016
ESRI World Street Map.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet.

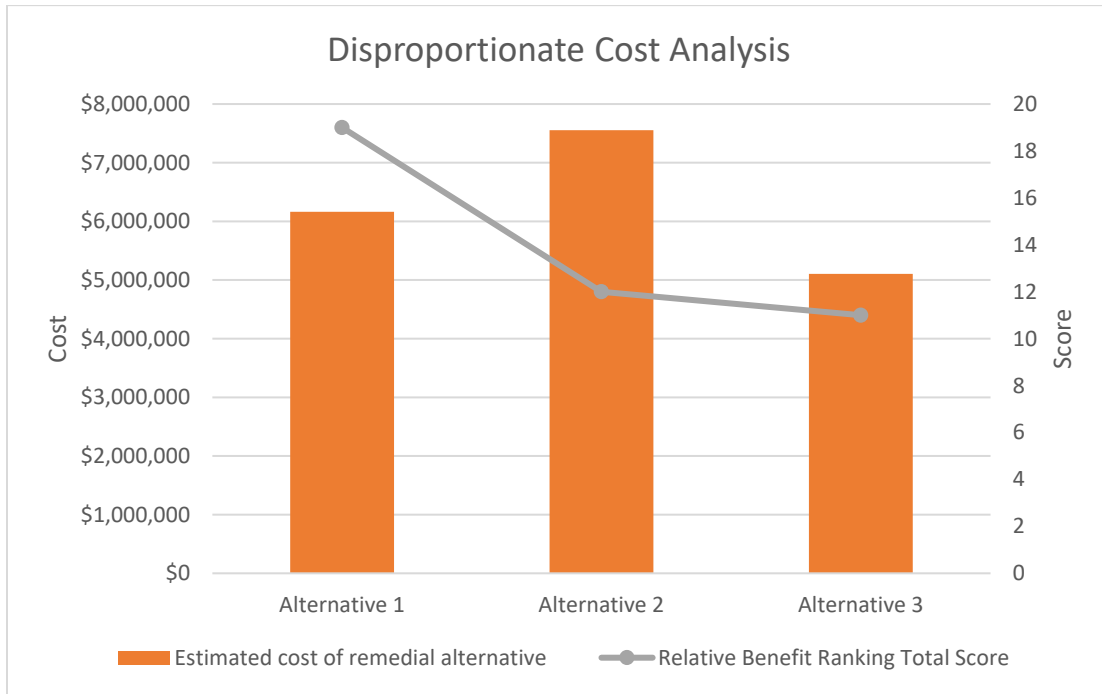
A.2. Site plan



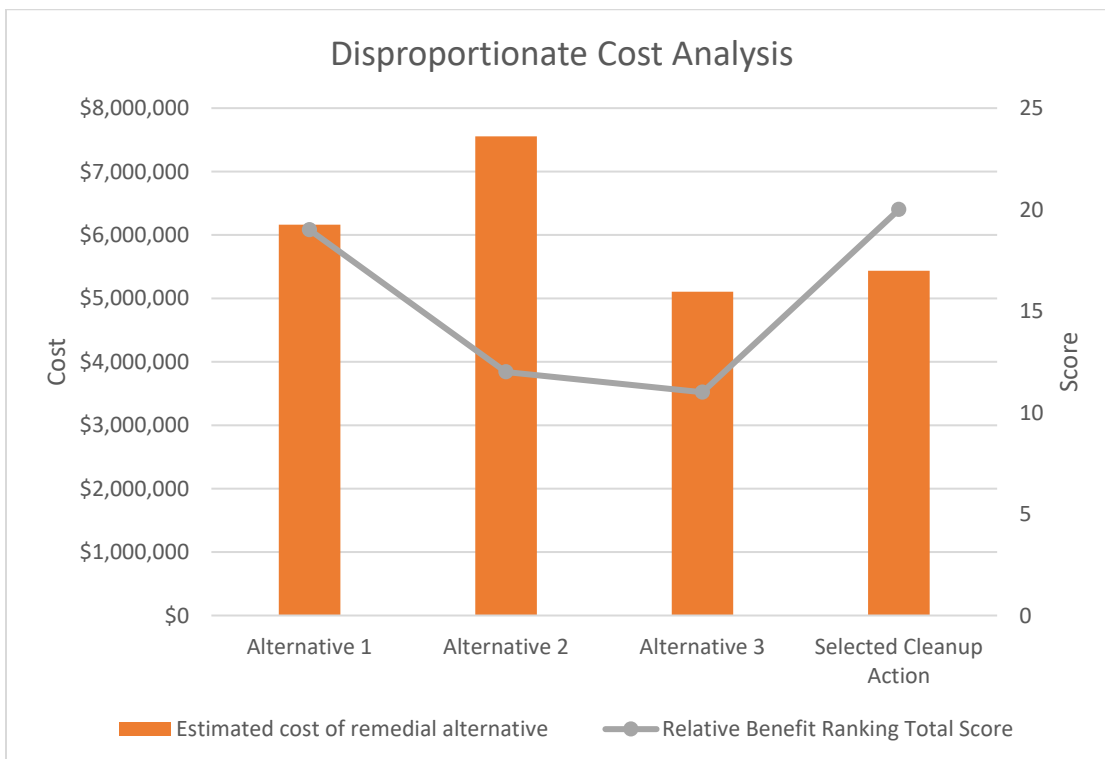
A.3. Conceptual site model



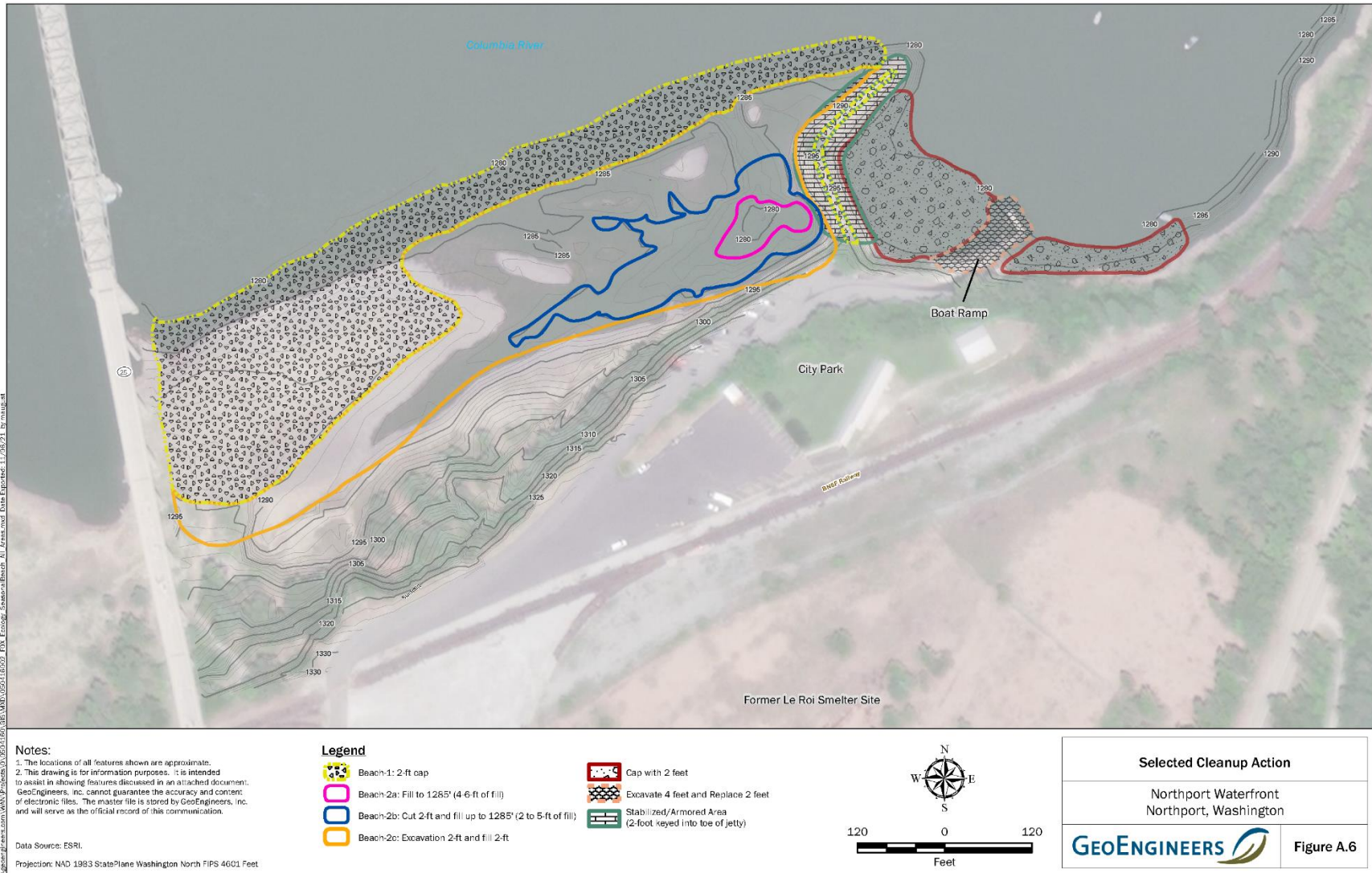
A.4. Summary of disproportionate cost analysis of FFS alternatives



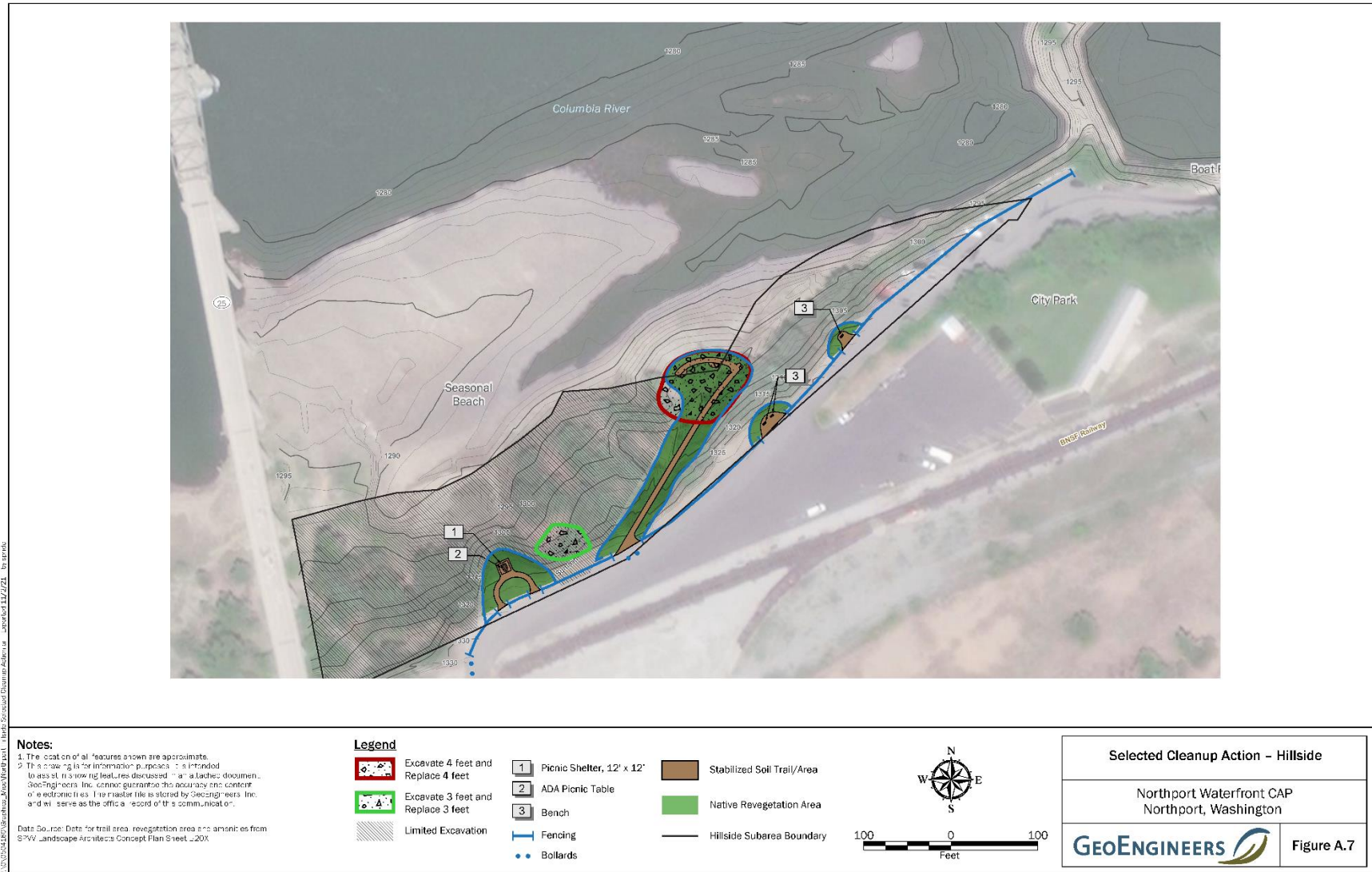
A.5. Summary of disproportionate cost analysis including selected cleanup action



A.6. Selected cleanup action for Seasonal Beach, Jetty, Bay and Public Dock, and Bayshore areas



A.7. Selected cleanup action for Hillside area



Appendix B. Tables

B.1. Screening levels used in the Remedial Investigation

Metals	Screening level (milligram per kilogram [mg/kg])	Source
Arsenic	12.9	Ecology 2019
Barium	16,000	MTCA Method B
Cadmium	2	MTCA Method A
Chromium	131	Ecology 2019
Copper	143	Ecology 2019
Iron	56,000	MTCA Method B
Lead	250	MTCA Method A
Manganese	11,200	MTCA Method B
Mercury	1.46	Ecology 2019
Nickel	39	Ecology 2019
Zinc	3,200	SMS
MTCA = Model Toxics Control Act SMS = Sediment Management Standards		

B.2. Soil cleanup levels

Chemical of concern	MTCA Method A (mg/kg)	MTCA Method B CUL (Non-cancer) (mg/kg)	Simplified TEE CUL (mg/kg)
Arsenic	20	24	20
Copper	–	3,200	100
Lead	250	–	220
Zinc	–	24,000	270
<p>Bold values selected for cleanup level. CUL = cleanup level mg/kg = milligrams per kilogram TEE = terrestrial ecological evaluation</p>			

B.3. Sediment cleanup levels

Chemical of concern	Floating Percentile Model (Ecology 2019) (mg/kg)	MTCA Method B CUL (Non-cancer) (mg/kg)	Simplified TEE CUL (mg/kg)
Arsenic	12.9	24	20
Copper	143	3,200	100
Lead	338	--	220
Zinc	3,200	24,000	270
<p>Bold values selected for cleanup level. CUL = cleanup level mg/kg = milligrams per kilogram TEE = terrestrial ecological evaluation</p>			

B.4. Summary of Applicable or Relevant and Appropriate Requirements (ARARs)

ARAR	Regulated Activity	Evaluation
Stevens County Codes		
Ordinance 2008-4	Waste Disposal	Flow control ordinance that prohibits taking disposal materials to another county.
Oversized/Overweight Vehicle Permit	Hauling a load in excess of legal weight or size limitations to use a County road.	Might apply depending on haul routes and load size.
Building Permit	Any structure that can be for commercial/public use requires a building permit.	Might apply to Hillside features.
Shoreline Master Program	Development within Stevens County Partnership shorelines	Remedial action will comply with Shoreline Master Program guidelines.
Washington State		
Washington Administrative Code 173-27. Shoreline Management Permit and Enforcement Procedures	Use and development of state shorelines	Remedial action will comply with Shoreline Management Act.
Washington Administrative Code 173-60. Maximum Environmental Noise Level	Noise Levels	Maximum noise levels are applicable during construction activities.
Washington Administrative Code 173-204. Sediment Management Standards	Contaminated sediment	Remedial action will comply with SMS regulations.
Washington Administrative Code 173-340. Model Toxics Control Act (MTCA)	Toxic waste cleanup	Remedial action will be conducted under MTCA. Remedial alternatives will comply with MTCA regulations.
Washington Administrative Code 173-400. General Regulations for Air Pollution Sources	Fugitive emissions	Requires owner to take reasonable precautions to prevent fugitive emissions.
Washington Administrative Code 197-11 and 173-802. State and Environmental Policy Act	Construction activities with the potential for adverse environmental impacts	A SEPA review is required for projects with potential significant environmental impacts
Washington Administrative Code 220-660. Hydraulic Code Rules	Construction that will use, divert, obstruct, or change the natural flow or bed of the salt or fresh water of the state	A hydraulic project approval (HPA) construction permit applicable during construction.
Washington Administrative Code 296-155. Safety Standards for Construction Work	Construction worker safety	Applicable during construction activities.

ARAR	Regulated Activity	Evaluation
Washington State (continued)		
Washington Administrative Code 296-62. General Occupational Health Standards	Employee health and safety	Applicable during construction activities.
Chapter 79.105 RCW. Aquatic Lands	Work in state-owned aquatic land.	Applicable during construction activities.
Chapter 90.48 RCW. Water Pollution Control	Discharge stormwater to surface water of the state.	Construction Stormwater General Permit applicable during construction activities.
401 Water Quality Certification	Required for activity that might result in any discharge or excavation in water	Applicable during construction activities.
Federal Regulations		
Title 29 Code of Federal Regulations. Occupational Safety and Health Act	Employee health and safety	Applicable during construction activities.
Title 33 Code of Federal Regulations Part 330. Navigation and Navigable Waters. Nationwide Permit Program	Work in navigable waters of the United States	MTCA requires cleanup actions comply with applicable regulations.
Title 40 Code of Federal Regulations 50. Clean Air Act	Air emissions from construction activities	MTCA requires cleanup actions comply with applicable regulations.
Title 40 Code of Federal Regulations 260-268. Resource Conservation and Recovery Act	Management of hazardous and non-hazardous waste	MTCA requires cleanup actions comply with applicable regulations.
Title 33 of United States Code, Chapter 26. Clean Water Act	Regulates discharges of pollutants into U.S. waters	MTCA requires cleanup actions comply with applicable regulations.
Title 33 of United States Code, Clean Water Act Section 401 Certification	Required for activity that might result in any discharge or excavation in water	MTCA requires cleanup actions comply with applicable regulations.
36 CFR 800.16, Section 106. National Historic Preservation Act	Policy for preserving American heritage.	MTCA requires cleanup actions comply with applicable regulations

B.5. FFS alternatives cost estimates

Alternative	Total estimated cleanup cost	
	Low	High
1	\$5,436,000	\$6,163,000
2	\$6,514,000	\$7,555,000
3	\$4,588,000	\$5,106,000

B.6. Summary of alternative ranking

Alternative numbers	Alternative 1	Alternative 2	Alternative 3	Selected cleanup action
Protectiveness	Score = 4	Score = 2	Score = 1	Score = 3
	Removes the greatest quantity of contaminated sediment.	Removes the greatest volume of sediment; however, significant portion is from side channel construction.	Achieves low level of protectiveness. Does not remove contaminants from no action area of Seasonal Beach.	Removes smaller volume of contaminated sediment compared to Alternative 1; however, capping provides protection from contaminants left in place.
Permanence	Score = 4	Score = 2	Score = 1	Score = 3
	Greatest reduction in contaminated soil. Capping and institutional controls that can be undone. Potential for recontamination from upriver sources.	Capping and institutional controls that can be undone. Potential for recontamination from upriver sources. Side channel enhancement promotes surface water drainage and reduces potential for recontamination on Seasonal Beach.	Capping and institutional controls that can be undone. Potential for recontamination from upriver sources.	Capping and institutional controls that can be undone. Potential for recontamination from upriver sources. Removes greater volume of contaminated sediment from Seasonal Beach sub-area compared to Alternatives 2 and 3. Site regrading promotes surface water drainage and reduces potential for recontamination on Seasonal Beach.

Alternative numbers	Alternative 1	Alternative 2	Alternative 3	Selected cleanup action
Long-term effectiveness	Score = 2	Score = 3	Score = 1	Score = 4
	Long-term effectiveness rely on cover and potential for recontamination from upriver sources.	Long-term effectiveness rely on cover and potential for recontamination from upriver sources. Side channel, in part, mitigates recontamination by reducing ponding/deposition.	Long-term effectiveness rely on cover and potential for recontamination from upriver sources. No action area reduces effectiveness.	Long-term effectiveness rely on cover and potential for recontamination from upriver sources. Re-grading Seasonal Beach, in part, mitigates recontamination by reducing ponding/deposition.
Short-term risk	Score = 2	Score = 1	Score = 4	Score = 3
	All cleanup actions rely on construction activities including transporting contaminated material and clean fill over public roads.	Alternative 2 removes the greatest volume of contaminants, and therefore, hauls the most contaminated material over public roadways.	Alternative 3 removes the smallest volume of contaminants, and therefore, hauls the least contaminated material over public roadways.	Selected cleanup action removes less volume of sediment than Alternatives 1 and 2, and therefore, hauls less material over public roadways.

Alternative numbers	Alternative 1	Alternative 2	Alternative 3	Selected cleanup action
Implementability	Score = 2	Score = 1	Score = 4	Score = 3
	All cleanup actions utilize common remediation practices such as excavation, off-site disposal and capping. Construction on Beach sub-area to occur when river level at seasonal low. Duration of construction activities generally less than Alternative 2 and greater than Alternative 3.	All cleanup actions utilize common remediation practices such as excavation, off-site disposal and capping. Construction on Beach sub-area to occur when river level at seasonal low. Added complexity of side channel enhancement.	All cleanup actions utilize common remediation practices such as excavation, off-site disposal and capping. Construction on Beach sub-area to occur when river level at seasonal low. Alternative 3 is the least complex because of the no action area described on the Season Beach.	All cleanup actions utilize common remediation practices such as excavation, off-site disposal and capping. Construction on Beach sub-area to occur when river level at seasonal low. Duration of construction activities generally less than Alternative 2 and greater than Alternative 3.
Public concerns	Score = 3	Score = 2	Score = 1	Score = 4
	Addresses comments regarding removing most contaminants.	Greatest impact to roads/public.	Doesn't address contaminants in portion of Season Beach.	Protective of human health and the environment. Addresses comments regarding impacts to roads/public.
Total score	19	11	12	20
Notes: Relative benefits ranking (scored from 1 = lowest to 4 = highest)				

Appendix B
Inadvertent Discovery Plan



INADVERTENT DISCOVERY PLAN

PLAN AND PROCEDURES FOR THE DISCOVERY OF CULTURAL RESOURCES AND HUMAN SKELETAL REMAINS

To request ADA accommodation, including materials in a format for the visually impaired, call Ecology at 360-407-6000 or visit <https://ecology.wa.gov/accessibility>. People with impaired hearing may call Washington Relay Service at 711. People with a speech disability may call TTY at 877-833-6341.

Site Name(s):

Location:

Project Lead/Organization:

County:

If this Inadvertent Discovery Plan (IDP) is for multiple (batched) projects, ensure the location information covers all project areas.

1. INTRODUCTION

The IDP outlines procedures to perform in the event of a discovery of archaeological materials or human remains, in accordance with applicable state and federal laws. An IDP is required, as part of Agency Terms and Conditions for all grants and loans, for any project that creates disturbance above or below the ground. An IDP is not a substitute for a formal cultural resource review (Executive 21-02 or Section 106).

Once completed, **the IDP should always be kept at the project site** during all project activities. All staff, contractors, and volunteers should be familiar with its contents and know where to find it.

2. CULTURAL RESOURCE DISCOVERIES

A cultural resource discovery could be prehistoric or historic. Examples include (see images for further examples):

- An accumulation of shell, burned rocks, or other food related materials.
- Bones, intact or in small pieces.
- An area of charcoal or very dark stained soil with artifacts.
- Stone tools or waste flakes (for example, an arrowhead or stone chips).
- Modified or stripped trees, often cedar or aspen, or other modified natural features, such as rock drawings.
- Agricultural or logging materials that appear older than 50 years. These could include equipment, fencing, canals, spillways, chutes, derelict sawmills, tools, and many other items.
- Clusters of tin cans or bottles, or other debris that appear older than 50 years.
- Old munitions casings. **Always assume these are live and never touch or move.**
- Buried railroad tracks, decking, foundations, or other industrial materials.
- Remnants of homesteading. These could include bricks, nails, household items, toys, food containers, and other items associated with homes or farming sites.

The above list does not cover every possible cultural resource. When in doubt, assume the material is a cultural resource.

3. ON-SITE RESPONSIBILITIES

If any employee, contractor, or subcontractor believes that they have uncovered cultural resources or human remains at any point in the project, take the following steps to ***Stop-Protect-Notify***. **If you suspect that the discovery includes human remains, also follow Sections 5 and 6.**

STEP A: Stop Work.

All work must stop immediately in the vicinity of the discovery.

STEP B: Protect the Discovery.

Leave the discovery and the surrounding area untouched and create a clear, identifiable, and wide boundary (30 feet or larger) with temporary fencing, flagging, stakes, or other clear markings. Provide protection and ensure integrity of the discovery until cleared by the Department of Archaeological and Historical Preservation (DAHP) or a licensed, professional archaeologist.

Do not permit vehicles, equipment, or unauthorized personnel to traverse the discovery site. Do not allow work to resume within the boundary until the requirements of this IDP are met.

STEP C: Notify Project Archaeologist (if applicable).

If the project has an archaeologist, notify that person. If there is a monitoring plan in place, the archaeologist will follow the outlined procedure.

STEP D: Notify Project and Washington Department of Ecology (Ecology) contacts.

Project Lead Contacts

Primary Contact

Name:

Organization:

Phone:

Email:

Alternate Contact

Name:

Organization:

Phone:

Email:

Ecology Contacts (completed by Ecology Project Manager)

Ecology Project Manager

Name:

Program:

Phone:

Email:

Alternate or Cultural Resource Contact

Name:

Program:

Phone:

Email:

STEP E: Ecology will notify DAHP.

Once notified, the Ecology Cultural Resource Contact or the Ecology Project Manager will contact DAHP to report and confirm the discovery. To avoid delay, the Project Lead/Organization will contact DAHP if they are not able to reach Ecology.

DAHP will provide the steps to assist with identification. DAHP, Ecology, and Tribal representatives may coordinate a site visit following any necessary safety protocols. DAHP may also inform the Project Lead/Organization and Ecology of additional steps to further protect the site.

Do not continue work until DAHP has issued an approval for work to proceed in the area of, or near, the discovery.

DAHP Contacts:

Name: Rob Whitlam, PhD
Title: State Archaeologist
Cell: 360-890-2615
Email: Rob.Whitlam@dahp.wa.gov
Main Office: 360-586-3065

Human Remains/Bones:

Name: Guy Tasa, PhD
Title: State Anthropologist
Cell: 360-790-1633 (24/7)
Email: Guy.Tasa@dahp.wa.gov

4. TRIBAL CONTACTS

In the event cultural resources are discovered, the following tribes will be contacted. See Section 10 for Additional Resources.

Tribe:	Tribe:
Name:	Name:
Title:	Title:
Phone:	Phone:
Email:	Email:
Tribe:	Tribe:
Name:	Name:
Title:	Title:
Phone:	Phone:
Email:	Email:

Please provide contact information for additional tribes within your project area, if needed, in Section 11.

5. FURTHER CONTACTS (if applicable)

If the discovery is confirmed by DAHP as a cultural or archaeological resource, or as human remains, and there is a partnering federal or state agency, Ecology or the Project Lead/Organization will ensure the partnering agency is immediately notified.

Federal Agency:

Agency:

Name:

Title:

Phone:

Email:

State Agency:

Agency:

Name:

Title:

Phone:

Email:

6. SPECIAL PROCEDURES FOR THE DISCOVERY OF HUMAN SKELETAL MATERIAL

Any human skeletal remains, regardless of antiquity or ethnic origin, will at all times be treated with dignity and respect. Follow the steps under **Stop-Protect-Notify**. For specific instructions on how to handle a human remains discovery, see: [RCW 68.50.645: Skeletal human remains—Duty to notify—Ground disturbing activities—Coroner determination—Definitions](#).

Suggestion: If you are unsure whether the discovery is human bone or not, contact Guy Tasa with DAHP, for identification and next steps. Do not pick up the discovery.

Guy Tasa, PhD State Physical Anthropologist

Guy.Tasa@dahp.wa.gov

(360) 790-1633 (Cell/Office)

For discoveries that are confirmed or suspected human remains, follow these steps:

1. Notify law enforcement and the Medical Examiner/Coroner using the contacts below. **Do not call 911** unless it is the only number available to you.

Enter contact information below (required):

- Local Medical Examiner or Coroner name and phone:
 - Local Law Enforcement main name and phone:
 - Local Non-Emergency phone number (911 if without a non-emergency number):
2. The Medical Examiner/Coroner (with assistance of law enforcement personnel) will determine if the remains are human or if the discovery site constitutes a crime scene and will notify DAHP.
 3. **DO NOT speak with the media, allow photography or disturbance of the remains, or release any information about the discovery on social media.**
 4. If the remains are determined to be non-forensic, Cover the remains with a tarp or other materials (not soil or rocks) for temporary protection and to shield them from being photographed by others or disturbed.

Further activities:

- Per [RCW 27.44.055](#), [RCW 68.50](#), and [RCW 68.60](#), DAHP will have jurisdiction over non-forensic human remains. Ecology staff will participate in consultation. Organizations may also participate in consultation.
- Documentation of human skeletal remains and funerary objects will be agreed upon through the consultation process described in [RCW 27.44.055](#), [RCW 68.50](#), and [RCW 68.60](#).
- When consultation and documentation activities are complete, work in the discovery area may resume as described in Section 8.

If the project occurs on federal lands (such as a national forest or park or a military reservation) the provisions of the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) apply and the responsible federal agency will follow its provisions. Note that state highways that cross federal lands are on an easement and are not owned by the state.

If the project occurs on non-federal lands, the Project Lead/Organization will comply with applicable state and federal laws, and the above protocol.

7. DOCUMENTATION OF ARCHAEOLOGICAL MATERIALS

Archaeological resources discovered during construction are protected by state law [RCW 27.53](#) and assumed eligible for inclusion in the National Register of Historic Places under Criterion D until a formal Determination of Eligibility is made.

The Project Lead/Organization must ensure that proper documentation and field assessment are made of all discovered cultural resources in cooperation with all parties: the federal agencies (if any), DAHP, Ecology, affected tribes, and the archaeologist.

The archaeologist will record all prehistoric and historic cultural material discovered during project construction on a standard DAHP archaeological site or isolate inventory form. They will photograph site overviews, features, and artifacts and prepare stratigraphic profiles and soil/sediment descriptions for minimal subsurface exposures. They will document discovery locations on scaled site plans and site location maps.

Cultural features, horizons, and artifacts detected in buried sediments may require the archaeologist to conduct further evaluation using hand-dug test units. They will excavate units in a controlled fashion to expose features, collect samples from undisturbed contexts, or to interpret complex stratigraphy. They may also use a test unit or trench excavation to determine if an intact occupation surface is present. They will only use test units when necessary to gather information on the nature, extent, and integrity of subsurface cultural deposits to evaluate the site's significance. They will conduct excavations using standard archaeological techniques to precisely document the location of cultural deposits, artifacts, and features.

The archaeologist will record spatial information, depth of excavation levels, natural and cultural stratigraphy, presence or absence of cultural material, and depth to sterile soil, regolith, or bedrock for each unit on a standard form. They will complete test excavation unit level forms, which will include plan maps for each excavation level and artifact counts and material types, number, and vertical provenience (depth below

surface and stratum association where applicable) for all recovered artifacts. They will draw a stratigraphic profile for at least one wall of each test excavation unit.

The archaeologist will screen sediments excavated for purposes of cultural resources investigation through 1/8-inch mesh, unless soil conditions warrant 1/4-inch mesh.

The archaeologist will analyze, catalogue, and temporarily curate all prehistoric and historic artifacts collected from the surface and from probes and excavation units. The ultimate disposition of cultural materials will be determined in consultation with the federal agencies (if any), DAHP, Ecology, and the affected tribe(s).

Within 90 days of concluding fieldwork, the archaeologist will provide a technical report describing any and all monitoring and resultant archaeological excavations to the Project Lead/Organization, who will forward the report to Ecology, the federal agencies (if any), DAHP, and the affected tribe(s) for review and comment.

If assessment activities expose human remains (burials, isolated teeth, or bones), the archaeologist and Project Lead/Organization will follow the process described in **Section 6**.

8. PROCEEDING WITH WORK

The Project Lead/Organization shall work with the archaeologist, DAHP, and affected tribe(s) to determine the appropriate discovery boundary and where work can continue.

Work may continue at the discovery location only after the process outlined in this plan is followed and the Project Lead/Organization, DAHP, any affected tribe(s), Ecology, and the federal agencies (if any) determine that compliance with state and federal laws is complete.

9. ORGANIZATION RESPONSIBILITY

The Project Lead/Organization is responsible for ensuring:

- This IDP has complete and accurate information.
- This IDP is immediately available to all field staff at the sites and available by request to any party.
- This IDP is implemented to address any discovery at the site.
- That all field staff, contractors, and volunteers are instructed on how to implement this IDP.

10. ADDITIONAL RESOURCES

Informative Video

Ecology recommends that all project staff, contractors, and volunteers view this informative video explaining the value of IDP protocol and what to do in the event of a discovery. The target audience is anyone working on the project who could unexpectedly find cultural resources or human remains while excavating or digging. The video is also posted on DAHP's inadvertent discovery language website.

[Ecology's IDP Video](https://www.youtube.com/watch?v=ioX-4cXfbDY) (<https://www.youtube.com/watch?v=ioX-4cXfbDY>)

Informational Resources

[DAH P \(https://dahp.wa.gov\)](https://dahp.wa.gov)

[Washington State Archeology \(DAH P 2003\)](https://dahp.wa.gov/sites/default/files/Field%20Guide%20to%20WA%20Arch_0.pdf)

[\(https://dahp.wa.gov/sites/default/files/Field%20Guide%20to%20WA%20Arch_0.pdf\)](https://dahp.wa.gov/sites/default/files/Field%20Guide%20to%20WA%20Arch_0.pdf)

[Association of Washington Archaeologists \(https://www.archaeologyinwashington.com\)](https://www.archaeologyinwashington.com)

Potentially Interested Tribes

[Interactive Map of Tribes by Area](https://dahp.wa.gov/archaeology/tribal-consultation-information)

[\(https://dahp.wa.gov/archaeology/tribal-consultation-information\)](https://dahp.wa.gov/archaeology/tribal-consultation-information)

[WSDOT Tribal Contact Website](https://wsdot.wa.gov/tribal/TribalContacts.htm)

[\(https://wsdot.wa.gov/tribal/TribalContacts.htm\)](https://wsdot.wa.gov/tribal/TribalContacts.htm)

11. ADDITIONAL INFORMATION

Please add any additional contact information or other information needed within this IDP.

Implement the IDP if you see...

Chipped stone artifacts.

Examples are:

- Glass-like material.
- Angular material.
- “Unusual” material or shape for the area.
- Regularity of flaking.
- Variability of size.



Stone artifacts from Oregon.



Stone artifacts from Washington.



Biface-knife, scraper, or pre-form found in NE Washington. Thought to be a well knapped object of great antiquity. Courtesy of Methow Salmon Rec. Foundation.

Implement the IDP if you see...

Ground stone artifacts.

Examples are:

- Unusual or unnatural shapes or unusual stone.
- Striations or scratching.
- Etching, perforations, or pecking.
- Regularity in modifications.
- Variability of size, function, or complexity.



Above: Fishing Weight - credit [CRITFC Treaty Fishing Rights website](#).



Artifacts from unknown locations (left and right images).



Implement the IDP if you see...

Bone or shell artifacts, tools, or beads.

Examples are:

- Smooth or carved materials.
- Unusual shape.
- Pointed as if used as a tool.
- Wedge shaped like a “shoehorn”.
- Variability of size.
- Beads from shell (‘dentalium’) or tusk.



Upper Left: *Bone Awls from Oregon.*

Upper Center: *Bone Wedge from California.*

Upper Right: *Plateau dentalium choker and bracelet, from Nez Perce National Historical Park, 19th century, made using Antalis pretiosa shells Credit: Nez Perce - Nez Perce National Historical Park, NEPE 8762, Public Domain.*

Above: *Tooth Pendants. Right: Bone Pendants. Both from Oregon and Washington.*



Implement the IDP if you see...

Culturally modified trees, fiber, or wood artifacts.

Examples are:

- Trees with bark stripped or peeled, carvings, axe cuts, de-limbing, wood removal, and other human modifications.
- Fiber or wood artifacts in a wet environment.
- Variability of size, function, and complexity.



Left and Below: *Culturally modified tree and an old carving on an aspen (Courtesy of DAHP).*

Right, Top to Bottom: *Artifacts from Mud Bay, Olympia: Toy war club, two strand cedar rope, wet basketry.*



Implement the IDP if you see...

Strange, different, or interesting looking dirt, rocks, or shells.

Human activities leave traces in the ground that may or may not have artifacts associated with them. Examples are:

- “Unusual” accumulations of rock (especially fire-cracked rock).
- “Unusual” shaped accumulations of rock (such as a shape similar to a fire ring).
- Charcoal or charcoal-stained soils, burnt-looking soils, or soil that has a “layer cake” appearance.
- Accumulations of shell, bones, or artifacts. Shells may be crushed.
- Look for the “unusual” or out of place (for example, rock piles in areas with otherwise few rocks).



Shell Midden pocket in modern fill discovered in sewer trench.



Underground oven. Courtesy of DAHP.

Shell midden with fire cracked rock.



Hearth excavated near Hamilton, WA.

Implement the IDP if you see...

Historic period artifacts (historic archaeology considered older than 50 years).

Examples are:

- Agricultural or logging equipment. May include equipment, fencing, canals, spillways, chutes, derelict sawmills, tools, etc.
- Domestic items including square or wire nails, amethyst colored glass, or painted stoneware.



Left: Top to Bottom: *Willow pattern serving bowl and slip joint pocket knife discovered during Seattle Smith Cove shantytown (45-KI-1200) excavation.*

Right: *Collections of historic artifacts discovered during excavations in eastern Washington cities.*



Implement the IDP if you see...

Historic period artifacts (historic archaeology considered older than 50 years).

Examples are:

- Railway tokens, coins, and buttons.
- Spectacles, toys, clothing, and personal items.
- Items helping to understand a culture or identity.
- Food containers and dishware.



Main Image: *Dishes, bottles, workboot found at the North Shore Japanese bath house (ofuro) site, Courtesy Bob Muckle, Archaeologist, Capilano University, B.C. This is an example of an above ground resource.*



Right, from Top to Bottom:
Coins, token, spectacles and Montgomery Ward pitchfork toy discovered during Seattle Smith Cove shantytown (45-KI-1200) excavation.



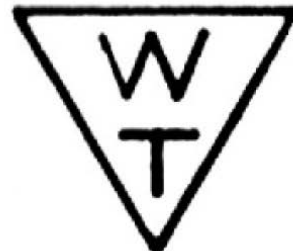
Implement the IDP if you see...

- Old munition casings – if you see ammunition of any type – ***always assume they are live and never touch or move!***
- Tin cans or glass bottles with an older manufacturer's technique – maker's mark, distinct colors such as turquoise, or an older method of opening the container.



Far Left: .303 British cartridge found by a WCC planting crew on Skagit River. Don't ever touch something like this!
Left: Maker's mark on bottom of old bottle.

Right: Old beer can found in Oregon. ACME was owned by Olympia Brewery. Courtesy of Heather Simmons.



Logo employed by Whithall Tatum & Co. between 1924 to 1938 (Lockhart et al. 2016).



Can opening dates, courtesy of W.M. Schroeder.

Implement the IDP if you see...

You see historic foundations or buried structures.

Examples are:

- Foundations.
- Railroad and trolley tracks.
- Remnants of structures.



Counter Clockwise, Left to Right: *Historic structure 45KI924, in WSDOT right of way for SR99 tunnel. Remnants of Smith Cove shantytown (45-KI-1200) discovered during Ecology CSO excavation, City of Spokane historic trolley tracks uncovered during stormwater project, intact foundation of historic home that survived the Great Ellensburg Fire of July 4, 1889, uncovered beneath parking lot in Ellensburg.*

Implement the IDP if you see...

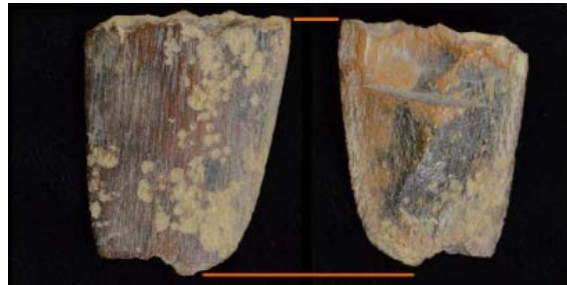
Potential human remains.

Examples are:

- Grave headstones that appear to be older than 50 years.
- Bones or bone tools--intact or in small pieces. It can be difficult to differentiate animal from human so they must be identified by an expert.
- These are all examples of animal bones and are not human.

Center: *Bone wedge tool, courtesy of Smith Cove Shantytown excavation (45KI1200).*

Other images (Top Right, Bottom Left, and Bottom) Center: Courtesy of DAHP.



Directly Above: This is a real discovery at an Ecology sewer project site.

What would you do if you found these items at a site? Who would be the first person you would call?

Hint: Read the plan!

Appendix C

Initial Hydraulic Analysis

MEMORANDUM

Date: February 7, 2022
To: John Laplante and Katy Gross, Anchor QEA
From: Eduardo Sierra and Kathy Ketteridge, PhD, PE
Project: Northport Waterfront Cleanup Project
Subject: Initial Hydraulic Analysis

This memorandum summarizes the initial hydrodynamic modeling work completed by Blue Coast Engineering, LLC (Blue Coast) in support of the Northport Waterfront Cleanup Project (Project). The role of Blue Coast on this Project is to develop a project-scale hydrodynamic model of the Columbia River at the project location to evaluate changes, if any, to hydrodynamic conditions based on the proposed project design, completed by the Anchor QEA design team. Blue Coast will also develop hydraulic design criteria for in-water elements (i.e., in-water caps) based on final hydrodynamic modeling results.

This memorandum focuses on the initial modeling effort which includes model development and calibration for existing conditions. During a subsequent phase of the Project, the model will be used to evaluate hydraulic conditions at the project site for different proposed alternatives associated with the cleanup effort. The results of that work will be documented in a separate memorandum completed by Blue Coast.

1 DATA USED IN ANALYSIS

This section of the report summarizes data used to develop the hydrodynamic model grid, define, and develop boundary conditions for use in the model, and data used to calibrate and validate the model predictions.

Bathymetry and Topography

An upper Columbia River elevation dataset, including LiDAR (OCM Partners, 2021) and hydrographic surveys (EPA, 2021) was used to construct the digital elevation model (DEM) used for the hydrodynamic model. Elevation data covered the Columbia River and adjacent upland areas from river mile (RM) 734, located approximately 1 river mile south of the Project site to the International Border, approximately 10 river miles north from Northport at RM 745 (see Figure 1). A topographic survey, performed by RFK Land Surveying for the Project site on April 18, 2018, and the upper Columbia River DEM were compiled into a single dataset that was used to develop the hydrodynamic model (see Figure 2).

Changes in jetty elevation and river bathymetry

Bathymetry (riverbed elevations) are not static in the main stem of the Columbia River adjacent to the Project location. In addition, the jetty located at the Project site (see Figure 1) has lowered in elevation over time. This was confirmed through comparison of multiple bathymetry and topography data sets available at and near the Project location.

The existing jetty (see Figure 2) functions as a barrier to upstream flows and minimizes flow velocities on the downstream side of the jetty even when overtopped during high flows. A 2007 LiDAR elevation dataset, downloaded from (PSLC, 2022), was compared to the most recent topographic survey performed in April 2018 to evaluate changes in elevation of the jetty over time. This comparison is shown in Figure 3. A decrease in elevation of approximately 2 feet was observed along the top of the jetty. The lowering in elevation along the jetty is due to erosion during high flow events when the jetty submerged and the river flow directly over the top of the jetty. Changes to the jetty elevation (increase or decrease), will have significant effects on the hydrodynamics across the project site, especially during higher flow periods.

Bathymetric datasets for 2015 and 2018 (see Figures 4a and 4b, respectively) between RM 734 and RM 736 were provided to Blue Coast Engineering by the Washington Department of Ecology (Ecology). These data sets were compared to each other to evaluate changes in riverbed elevation over time. A difference plot between the two datasets, presented in Figure 5, highlights elevation changes in the adjacent riverbed between 2015 and 2019. Two areas exhibited significant riverbed elevation changes of approximately ± 8 feet: (1) upstream of the Project site near Smelter Rock and (2) downstream along the Highway 25 North bridge piers (Northport Bridge). The changes observed upstream are likely caused by dynamic eddy currents downstream of Smelter Rock during high flow conditions. The changes in elevation observed along Northport Bridge piers are most likely local erosion patterns typically observed near in-water piles and piers and are caused by the interaction of the river flow and the structures.

Current Velocity Data

Current velocity data in the Columbia River at and near the Project location are available for May 25, 2016 (river cross-sections) and May 31, 2018 (transects at the project site). These data were collected using a boat mounted Acoustic Doppler Current Profiler (ADCP).

ADCP measurements were collected on May 25, 2016, by Confederated Tribes of the Colville Reservation (CTCR). These data included several transects across the Columbia River spaced approximately 2.5 miles apart. Transects near the project location, upstream of Smelter Rock and downstream of the Northport Bridge (between RM 734 and 740) were used in the calibration effort. Depth average velocities derived from these ADCP velocity transects were used for comparison with model results during calibration. The ADCP data was averaged over depth for comparison with

model results because the hydrodynamic model used for the project is a two-dimensional depth-averaged model.

ADCP current information was collected at the Project site by the Department of US Geological Survey (USGS) on May 31, 2018, during a large flow event in the Columbia River (see Table 1). Depth average velocities were also derived from the USGS velocity data for use in calibration and validation of the hydrodynamic model.

River Flows (Hydrology) and Water Levels

Hydrologic data (river flows) and water levels were used as boundary conditions for the initial modeling effort, including calibration simulations. Model calibration scenarios were selected based on the dates that current velocity data was collected. Preliminary model simulations, post-calibration, focused on the 100-year flow event in the Columbia River as defined at the International Boundary upstream of the project site.

Calibration flows and water levels

Flow data from USGS Columbia River Gauge #12399500 at the International Boundary (USGS, 2022) was used to establish flows in the Columbia River upstream of the project site at the time when current velocity data were collected (May 25, 2016, and May 31, 2018).

The daily average flow at the International Boundary on May 31st, 2018, was 263,000 cubic feet per second (cfs). Historical data observations reported at the International Boundary gage indicate that discharges above 250,000 cfs are infrequent, only 6 events exceeded this discharge value in 35 years of recorded data (see Figure 6). The water surface elevation surveyed on site by Ecology on May 31, 2018 (USGS, 2019) was 1297.5 feet, NAVD 88, and was also used in the calibration effort.

The daily average flow on May 25, 2016, when velocity transect data was collected by CTCR near the project site, was 145,800 cfs. This information was used to validate model results in the mainstem of the river.

Table 1 summarize the hydrologic values used during the calibration effort.

Extreme Flow events and water levels

The FEMA Flood Insurance Study (FIS) (FEMA, 1996) provides information on extreme flows and water surface elevations for the 10-, 50-, 100- and 500-year within the Columbia River at and near the project location. Extreme flows identified in the FIS are also taken from the International Boundary gage and are summarized in Table 1.

The water surface elevations in the vicinity of the project site and downstream of the project site during extreme flow events were taken from flood profiles provided in the FIS (FEMA, 1996). Estimated water levels at the Northport location (RM 735) for different return periods are presented

in Table 1. These water surface elevations were used as downstream boundary conditions for the model runs (following calibration).

Table 1. Calibration and Extreme Flows at International Boundary and Water Levels at Northport [USGS (2019; 2022), FEMA (1996)]

	Location	Flow Event	High Flow Event	Return Period			
		25 MAY 2016	31 MAY 2018 (USGS, 2019)	10-year	50-year	100-year	500-year
Discharge (cfs)	International Boundary (USGS gauge)	146,802	263,000	310,000	350,000	370,000	410,000
Water Level (ft, NAVD88)	Northport	*1287	1297.5	1303.5	1306	1307	1309.75

*Water level extrapolated from International Boundary using known water levels at Northport.

Tributary Flows

Flow from small tributaries including Sheep Creek, Deep Creek, Goodeve Creek, Scriver Creek and Mathews Creek located between the International Boundary gauge and Northport (see Figure 1) contribute to the flows in the Columbia River and will increase flows at Northport compared to flows at the International Boundary gage. These creeks are not gaged, and discharge data or rating curves were not available for these creeks. Consequently, the amount of tributary flow added to the system between the International Boundary and Northport was used as a calibration parameter for the model.

2 HYDRODYNAMIC MODEL DEVELOPMENT AND CALIBRATION

The HEC-RAS-2D unsteady model platform (USACE, 2021) was used by Blue Coast to develop the hydrodynamic model of the Columbia River and the Project site for the Project. Development of the model grid and model calibration are described in the following subsections.

Model Grid

The model domain extends approximately 11 miles upstream of the Project site (RM 734) to the International Boundary (RM 745). The model grid was developed using the combined bathymetry/topography DEM developed by Blue Coast for the project and consists of 133,538 cells with a variable resolution. In order to accurately capture the small-scale topographic and bathymetric features in the Project area, the model resolution (i.e., grid cell size) at within the Project areas is 5 feet. As the model extends away from the Project site, the model resolution increases to 50 feet.

Figure 7 shows the extent of the model domain, location of 50 foot and 5-foot model resolution and the model grid at the Project site.

Boundary Conditions

The hydrodynamic model is driven by two boundary conditions, inflow at the upstream extent of the model and water surface elevation at the downstream extent of the model (see Figure 7). Inflows at the upstream extent of the model were taken from flow data at the International Boundary (RM 745) as described above in this memorandum. Water surface elevations at the downstream extent of the model (RM 734) were taken from various sources as described above and summarized in Table 1.

Calibration Parameters

The model was calibrated using adjustments to downstream water surface elevation, manning's coefficient (model roughness parameters), flow input from tributaries, jetty elevations, and two hydrodynamic solving methods available within the Hec-Ras model platform. A brief discussion on how each of these parameters were utilized in model calibration is provided below.

Downstream water surface elevations

No explicit measurements of water surface elevations were available for the time periods when current velocity data were collected (May 25, 2016, and May 25, 2018). Therefore, water surface elevations used in the calibration simulations were estimated from various data sources as described above. Since there is uncertainty in these measurements, slight changes were made to the downstream water surface elevations, as needed, to improve model predictions of water surface elevation and velocities at the Project site.

Model Roughness

Model roughness is a model parameter that takes into account the substrate type and size within the river, sinuosity of the river, vegetation, and other characteristics of the channel that can impact flow in the river. For example, a channel with the same geometry will have different flow velocities if the riverbed is mud or if the riverbed consists of large boulders. For this modeling effort, Manning's roughness coefficient was used to define roughness in a model (Chow, 1959). The model was developed with variable roughness values initially, to represent the variability in bed substrate and channel configuration within the Columbia River and the Project site. The values ranged from 0.02 in the deeper areas of the Columbia River to 0.06 in areas of the project site characterized by ineffective flow areas (i.e., backwater areas) and larger cobble substrate (USGS, 1989). The calibration effort included modifying the Manning's roughness coefficient within discrete areas in the model as well as setting Manning's roughness coefficient to a constant value through the entire model domain.

Tributary flows

As part of the calibration effort, discharge data from small tributaries shown in Figure 1 were estimated and varied over several simulations to improve agreement between observed and

simulated depth averaged velocities. Several simulations were performed varying the additional discharge from the tributaries as a percentage to the total discharge input at the International Boundary. Good agreement between observed and simulated depth averaged velocities at the Project site was found by adding 10 percent to the total flow at the International Boundary as tributary flow upstream of the Project site.

Jetty elevations

Topographic data showed that the elevation along the jetty alignment lowered approximately 2 feet between 2007 and April 2018 (see Figure 3). It is possible that flow events prior to and during the velocity data collection effort on May 31, 2018, could have further lowered the jetty and influenced the measured current velocities. Therefore, the jetty elevation in the model was lowered incrementally to obtain improved agreement between model simulations and measured data.

Hydrodynamic solving method

The HEC-RAS model uses two solving methods, diffusion wave and full momentum equations, to numerically evaluate hydrodynamics within the model. Both methods were used during the calibration effort, and the full momentum equation provided the best agreement with measured velocity magnitudes and directions within the project site.

Calibration Results

During the calibration, predicted depth averaged velocities and water surface elevations from the model were compared with measured current velocities and available water surface elevation information.

Numerous model simulations were conducted using different iterations of the various calibration parameters described above until the best agreement between the model predictions and measured data was achieved. The final calibration parameters for the model, which will be used to conduct model simulation in support of the design work are summarized below:

- Downstream water surface elevations – see Table 1
- Manning’s roughness coefficient – constant across model at 0.02, which is in-line with suggestions in USGS, 1989, for stable channels with sand/gravel substrate. ¹.
- Tributary flows (combined) – 10% of flow in Columbia River at International Boundary added to flow at International Boundary
- Jetty Elevations – lowered 2 feet from 2018 survey data
- Hydrodynamic solving method – full momentum method

¹ The Manning’s roughness coefficient selected as part of this calibration effort is appropriate for high flows in the river, such as the calibration flows used in this study and the 100-year flow event in the Columbia River and may not be appropriate for low flow simulations.

No changes to the DEM elevations at the project site or in the Columbia River other than the jetty elevations were modified during calibration. Comparison of measured depth-averaged velocities with model predictions for the calibrated model are shown in Figure 8 for the ADCP transects collected across the Columbia River on May 25, 2016, and in Figure 9 for ADCP transects collected at the Project location on May 31, 2018.

As illustrated in Figures 8 and 9, the model is able to reasonable predict hydrodynamic conditions in the Columbia River near the Project site and at the Project site. The model was not able to represent all the velocity fluctuations captured in the measured data. This is most likely due to local changes in bathymetry between the survey and ADCP data collection timeframes and uncertainties in tributary input. However, the model can reasonably replicate the shape of the velocity distributions and ranges of velocity magnitudes (minimum, maximum and mean). The small differences between the measured and modeled velocities are well within the precision of the ADCP data and the model itself given the complex riverbed geometry in the vicinity of the Project site.

3 PRELIMINARY MODEL RESULTS – EXISTING CONDITIONS

The calibrated hydrodynamic model was used to simulate the 100-year event at the Project site. The 100-year flow used included the predicted 100-year flow in the Columbia River at the International Boundary (370,000 cfs) and an additional flow equal to 10% of the flow in the Columbia River to account for tributary input between the International Boundary and the project site (based on the calibration work). The total inflow at the upstream boundary of the model was therefore 407,000 cfs. Predicted depth-averaged velocities from the model at the project site for this 100-year flow are shown in Figure 10.

For the 100-year flow simulation, maximum depth average velocities of 12 feet per second (fps) across the deepest areas of the Project site and downstream from the jetty. In general, maximum velocities were lower, less than 9 fps closer to the jetty. Depth average velocities decreased gradually near the shoreline in shallower areas. Depth average maximum velocities for the 100-year event are 20-30% higher than the depth average velocities measured within the Project site during the high flood event on May 31st, 2018.

The water surface elevation during the modeled 100-year flow event is expected to exceed the maximum jetty elevation (1298 ft) by approximately 9 feet. During the 100-year flood event, the maximum depth average flow velocity predicted at the jetty is 8 fps.

REFERENCES

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- NOAA-NOS 2013: F00613: NOS Hydrographic Survey, 2013-05-31 [Available online at <https://www.ngdc.noaa.gov/nos/F00001-F02000/F00613.html>]
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- USACE. 2021. Hydrologic Engineering Center: Hydrologic Engineering Center’s River Analysis System (HEC-RAS) Computer Program, Version 5.0.7.
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- USGS. 2019. Velocity and Bathymetry Surveys of the Columbia River near Northport, Washington, May 2018, [Available online at <https://www.sciencebase.gov/catalog/item/5ba12393e4b08583a5c428cc>.]
- USGS. 2022. [Available online at https://waterdata.usgs.gov/nwis/uv?site_no=12399500.]

FIGURES

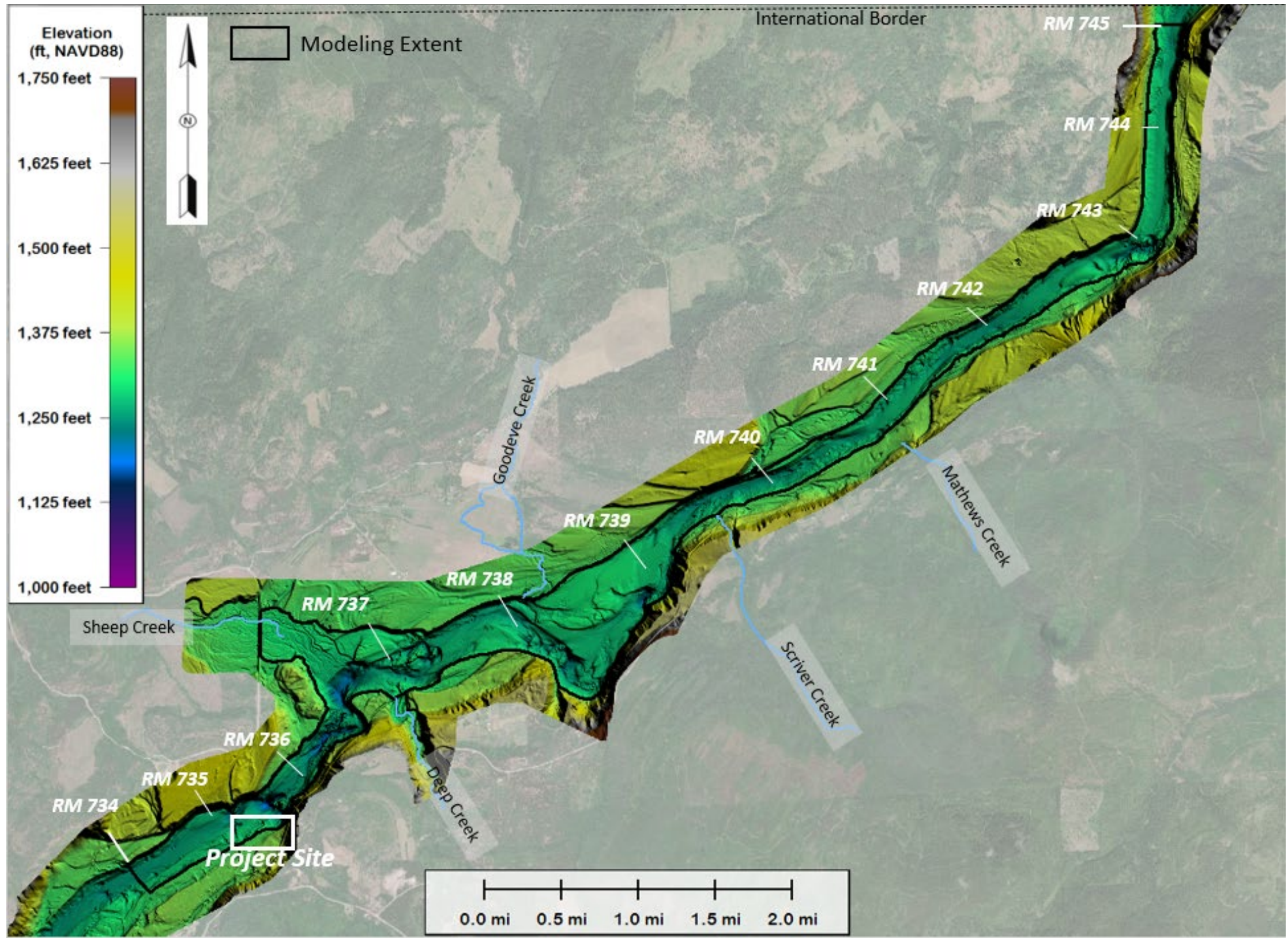


Figure 1: Regional Topography and Bathymetry Elevation Model.

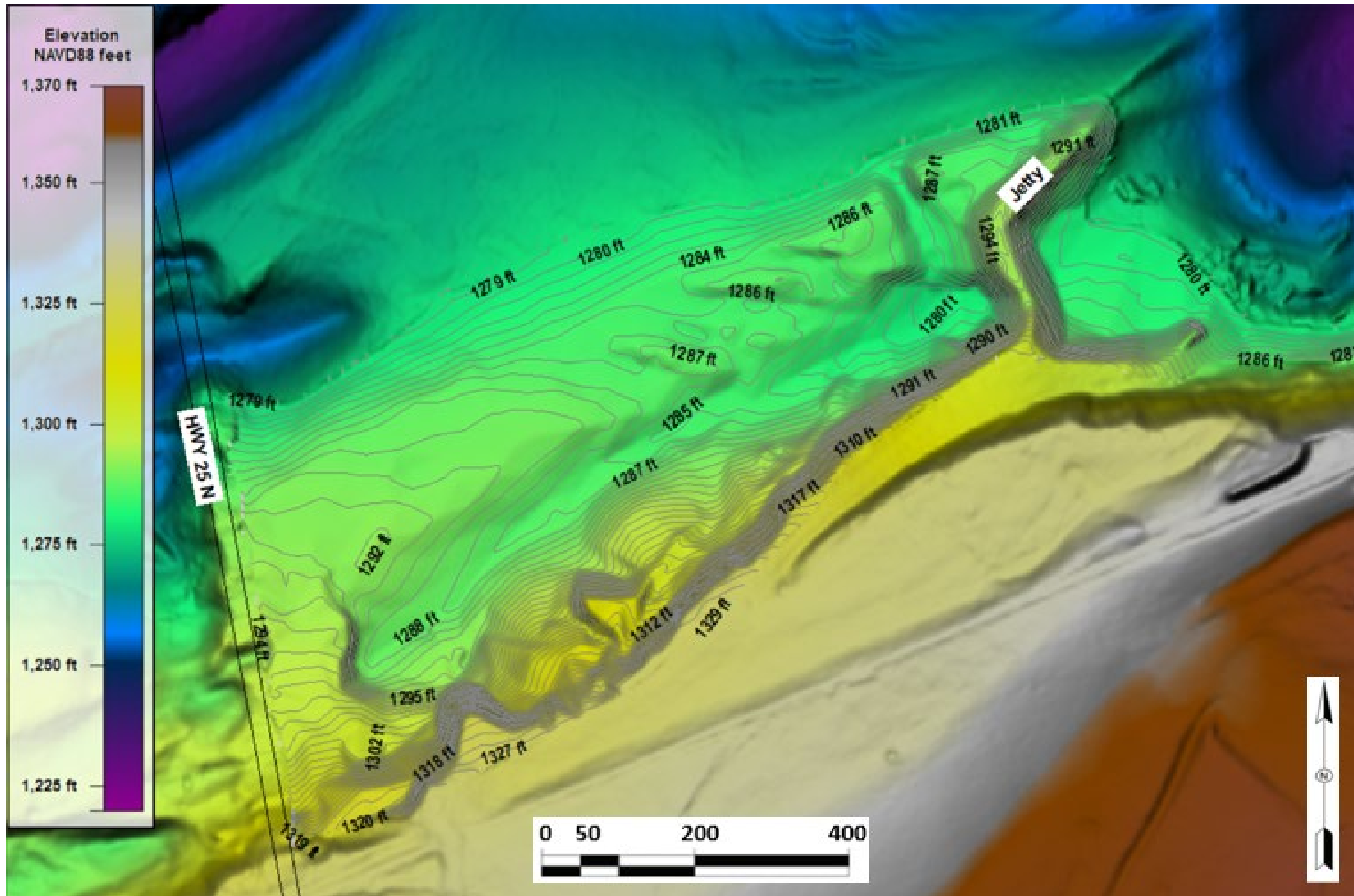


Figure 2: Topography and Bathymetry at the Project Site and Vicinity

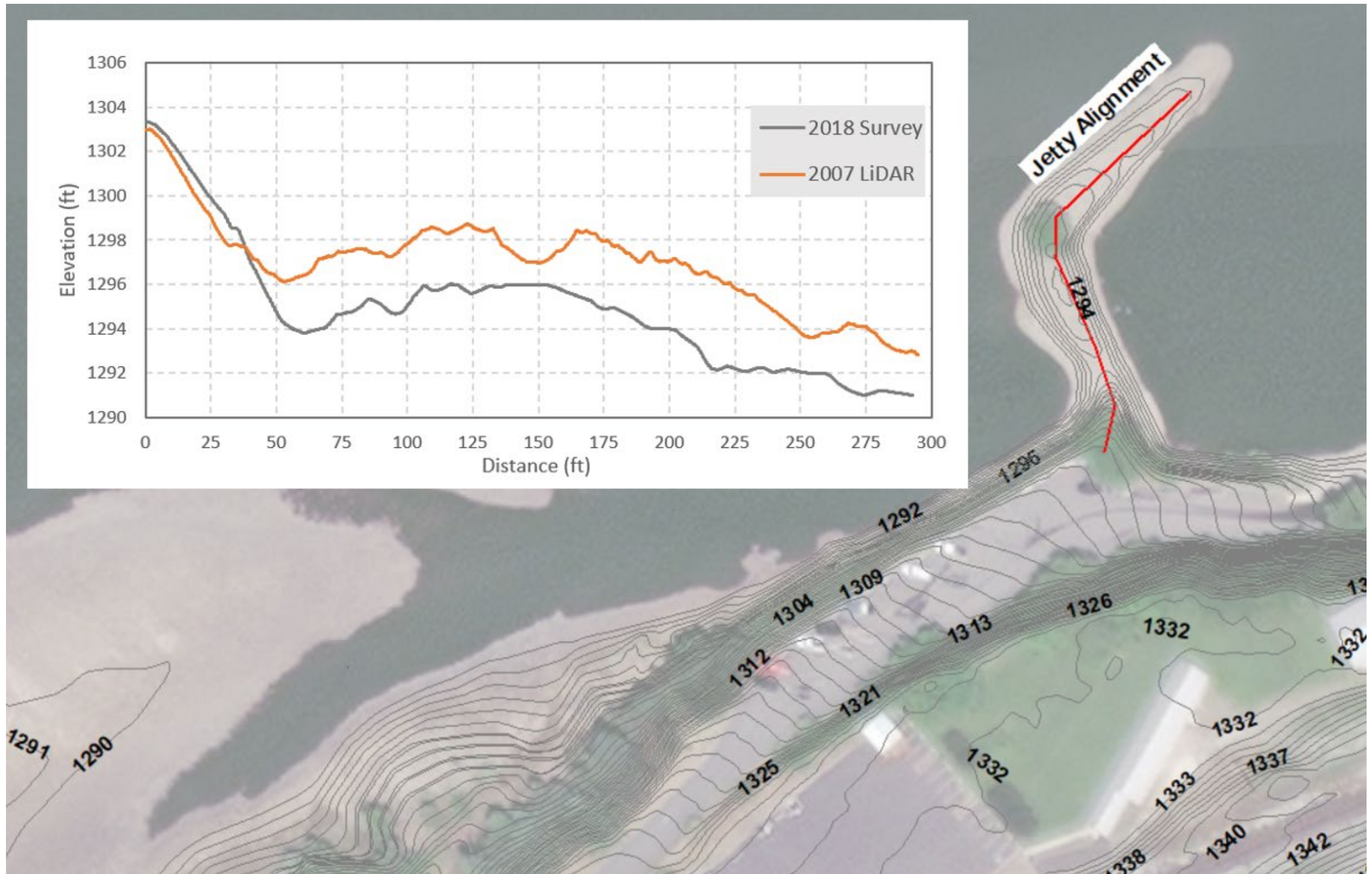


Figure 3: Cross-section Along the Jetty Showing Elevations from LiDAR, 2007 (yellow) and from April, 2018 (blue) Survey.

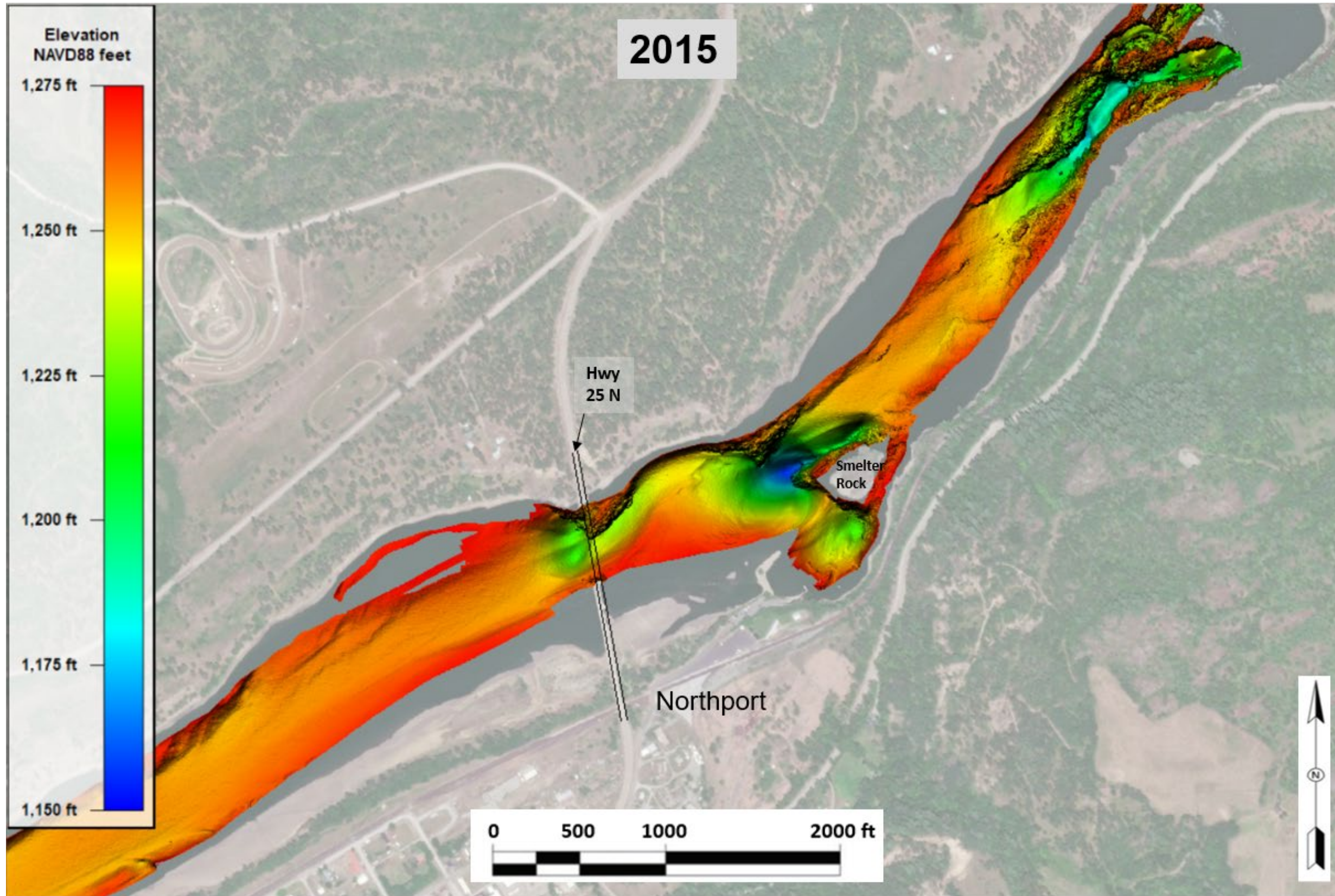


Figure 4a: 2015 Bathymetry in Columbia River in Vicinity of Northport.

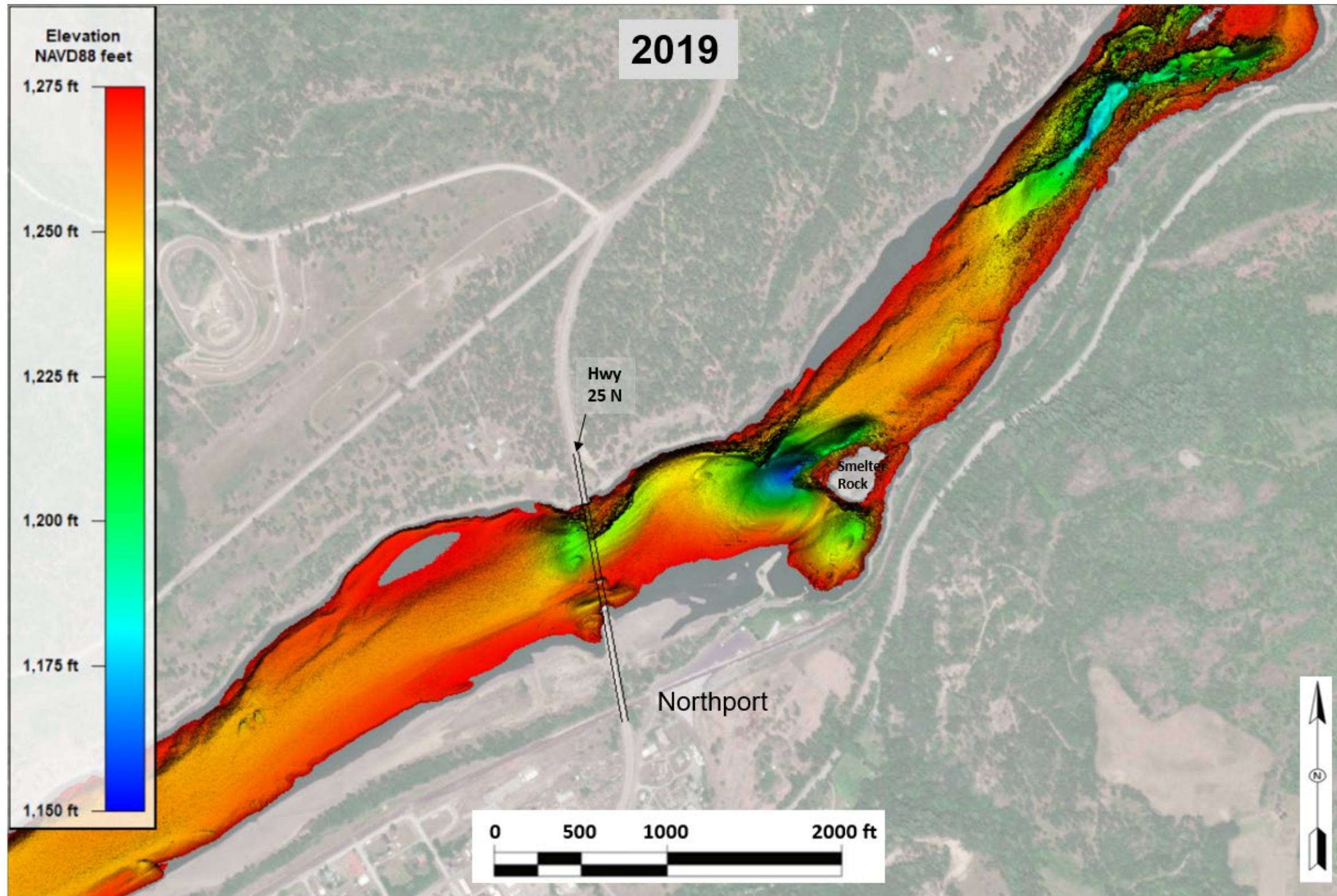


Figure 4b: 2019 Bathymetry in Columbia River in Vicinity of Northport.

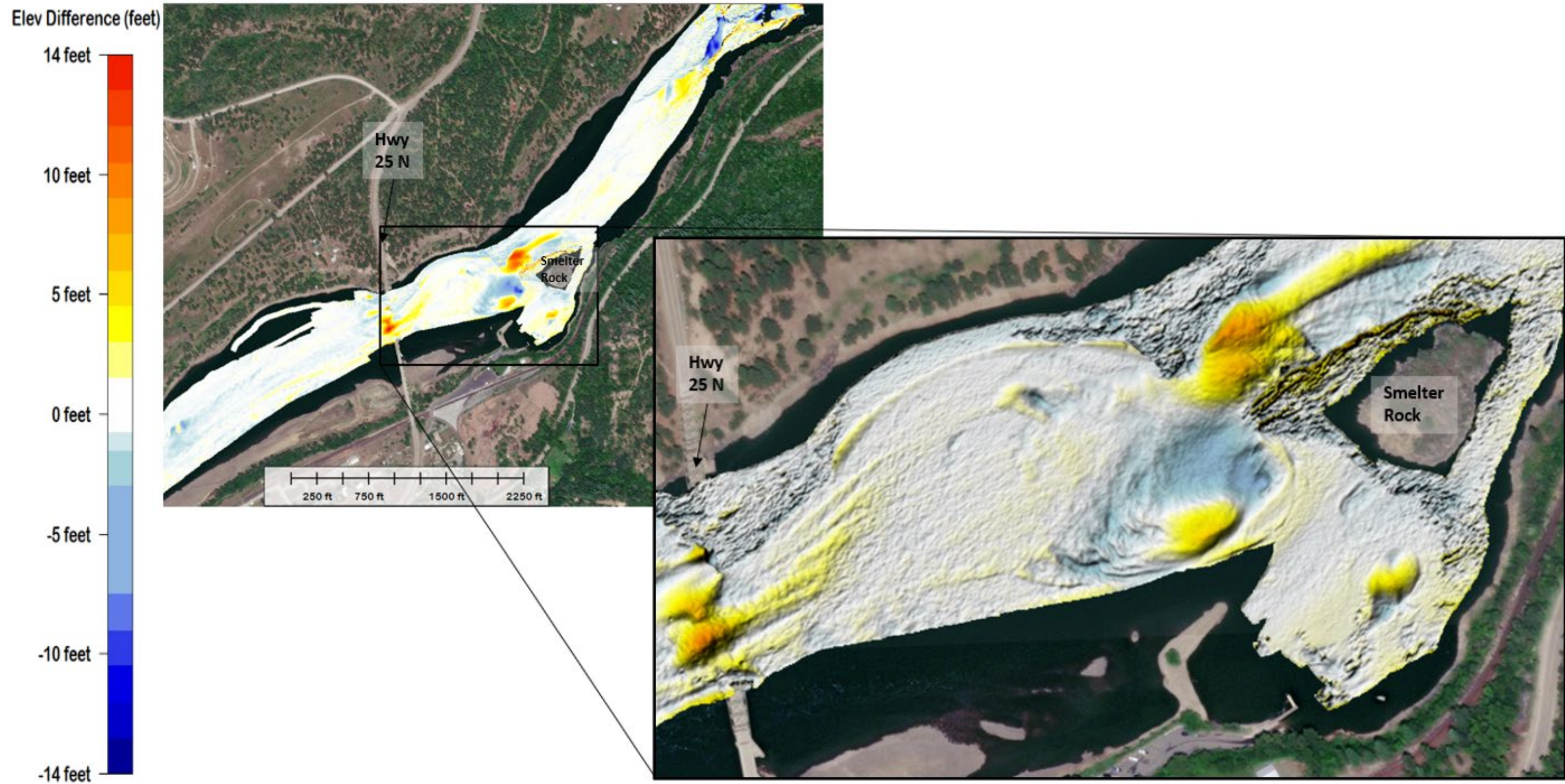


Figure 5: Bathymetry Change between 2019 and 2015 Surveys

USGS 12399500 COLUMBIA RIVER AT INTERNATIONAL BOUNDARY

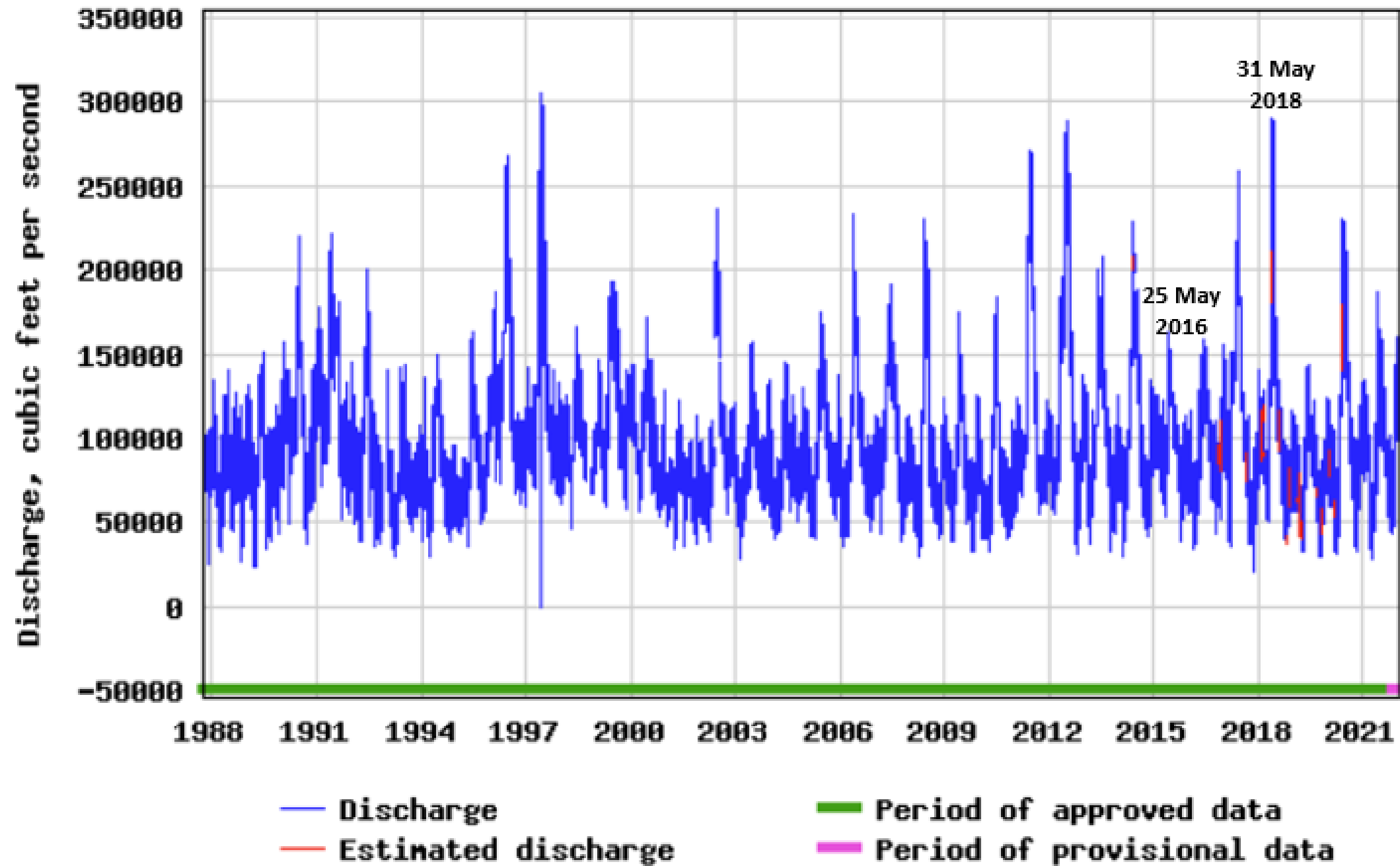


Figure 6: Historical Discharge recorded between 1987 and 2022 at International Boundary by USGS (2022).

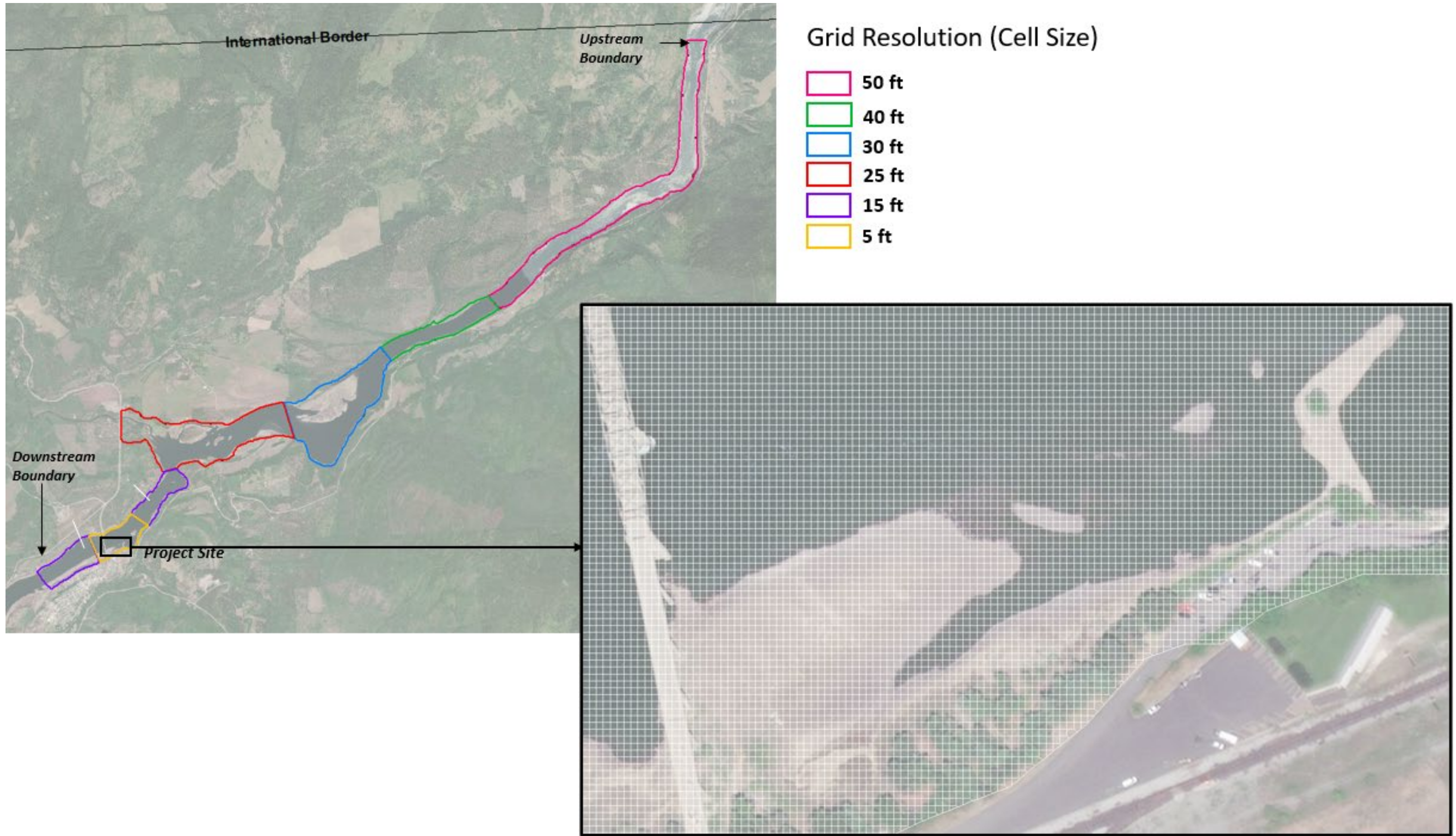


Figure 7. Nearfield extent of the Hydrodynamic Model Grid.

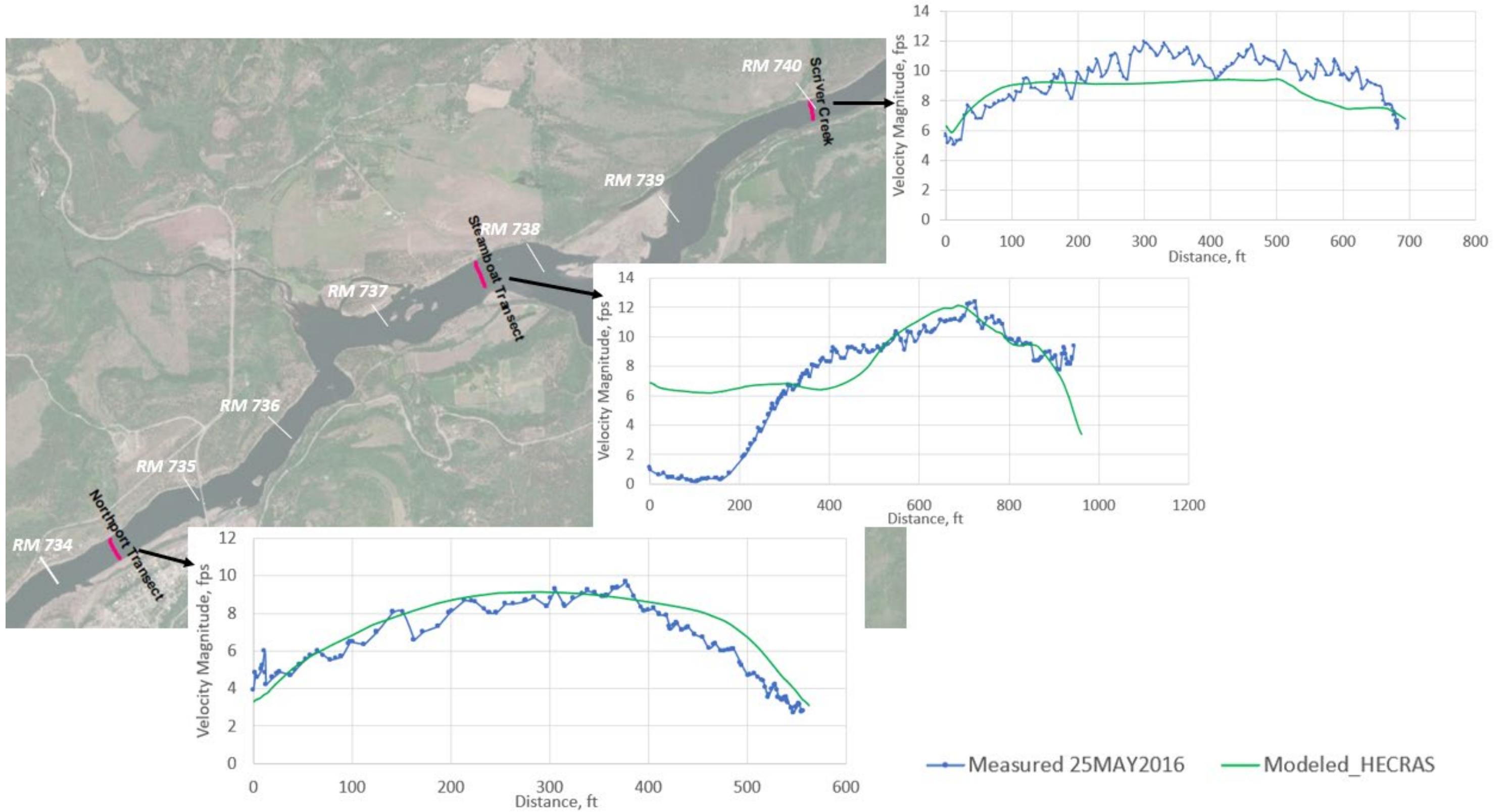


Figure 8: Measured and Modeled Velocity Comparison at ADCP Cross-sections Performed on May, 2016 by CTCR.

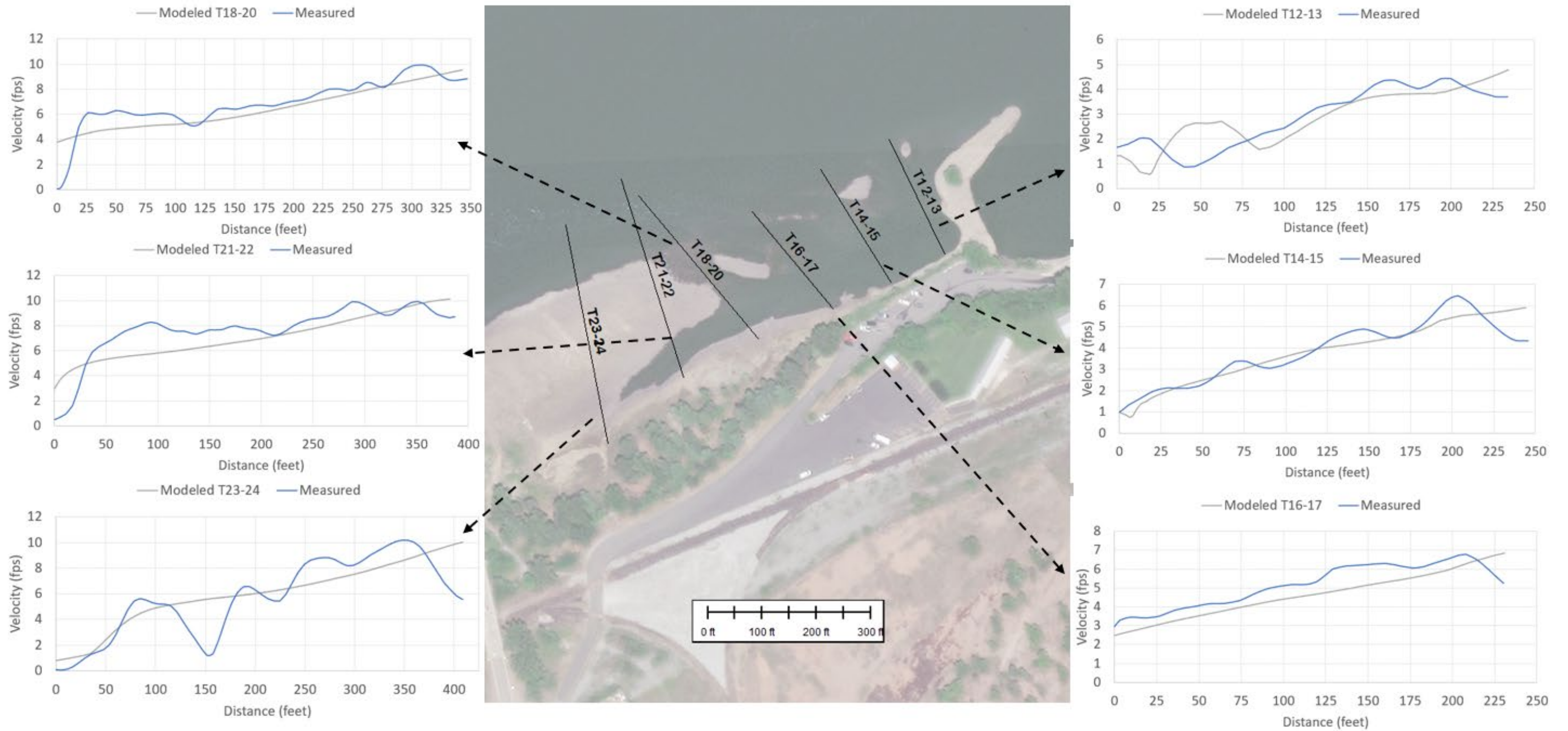


Figure 9: Depth Average Velocity Comparison of Measured ADCP Profile Transects (USGS, 2019) on 31 May 2018 (in blue) and Predicted Depth Average Velocities (in Gray).

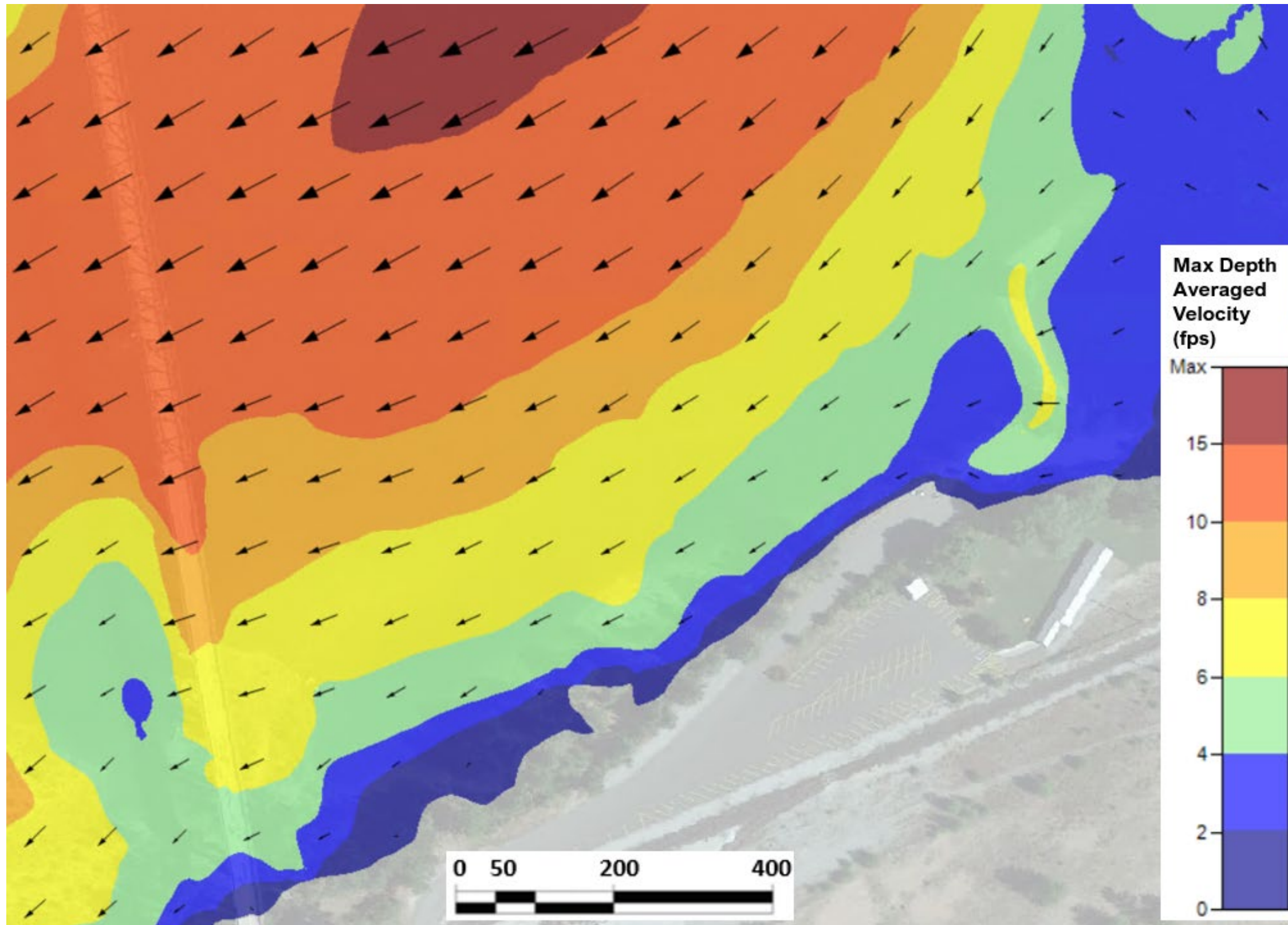


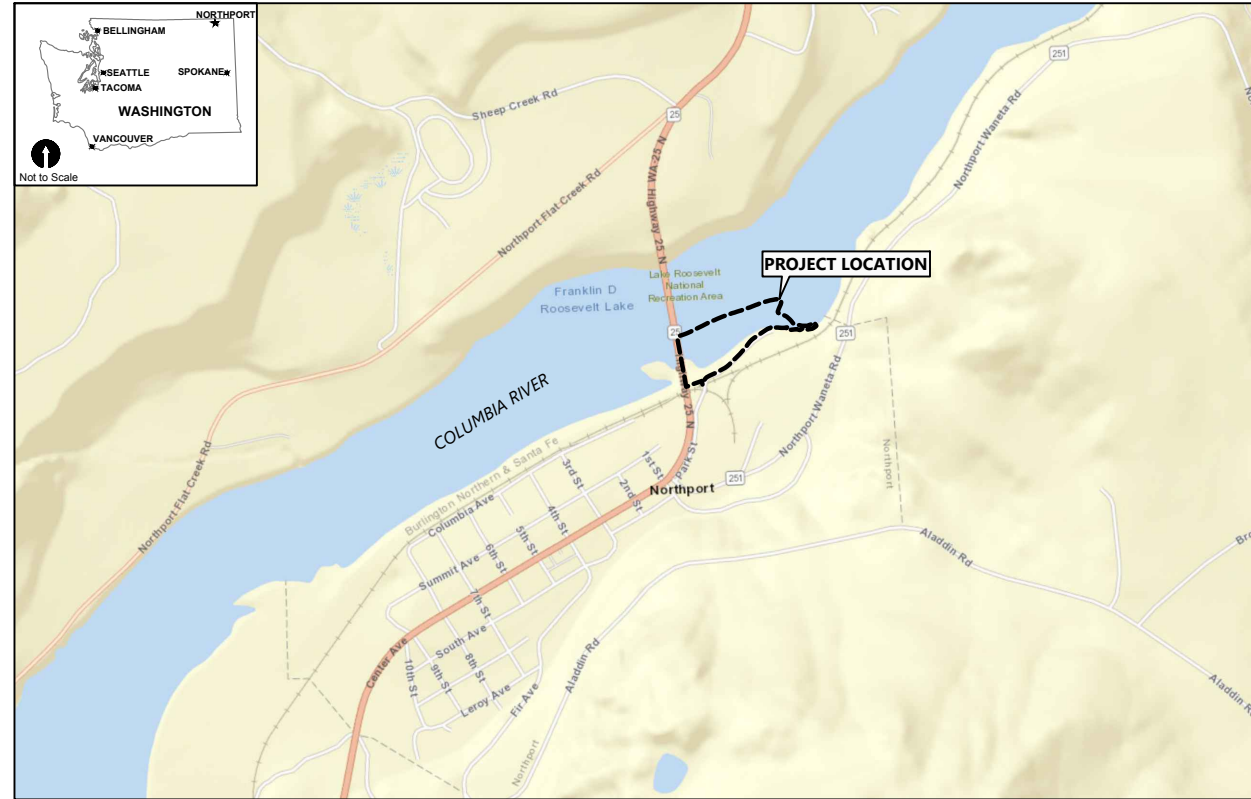
Figure 10: Plan View of Maximum Velocity in the vicinity of the Project Site during a 100-year flood event.

Appendix D
Construction Drawings

100% DESIGN SUBMITTAL

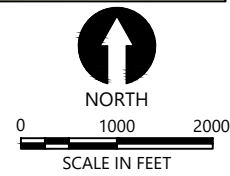
NORTHPORT WATERFRONT SEDIMENT CLEANUP

WASHINGTON STATE DEPARTMENT OF ECOLOGY



SOURCE: ESRI

VICINITY MAP

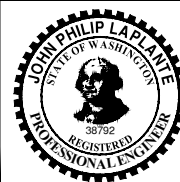


DRAWING INDEX		
SHT #	DWG #	TITLE
1	G-1	COVER SHEET
2	G-2	GENERAL NOTES, ABBREVIATIONS, AND CONTROL POINTS
3	G-3	COMPOSITE SITE PLAN
4	G-4	ACCESS, STAGING, AND TESC PLAN
5	G-5	TESC DETAILS
6	EC-1	EXISTING CONDITIONS (1 OF 3)
7	EC-2	EXISTING CONDITIONS (2 OF 3)
8	EC-3	EXISTING CONDITIONS (3 OF 3)
9	D-1	SITE PREPARATION AND CLEARING PLAN (1 OF 3)
10	D-2	SITE PREPARATION AND CLEARING PLAN (2 OF 3)
11	D-3	SITE PREPARATION AND CLEARING PLAN (3 OF 3)
12	EXC-1	EXCAVATION PLAN
13	C-1	GRADING PLAN (1 OF 3)
14	C-2	GRADING PLAN (2 OF 3)
15	C-3	GRADING PLAN (3 OF 3)
16	C-4	GRADING SECTIONS (1 OF 5)
17	C-5	GRADING SECTIONS (2 OF 5)
18	C-6	GRADING SECTIONS (3 OF 5)
19	C-7	GRADING SECTIONS (4 OF 5)
20	C-8	GRADING SECTIONS (5 OF 5)
21	CM-1	MATERIALS PLAN (1 OF 3)
22	CM-2	MATERIALS PLAN (2 OF 3)
23	CM-3	MATERIALS PLAN (3 OF 3)
24	CM-4	CONSTRUCTION MATERIALS DETAILS (1 OF 4)
25	CM-5	CONSTRUCTION MATERIALS DETAILS (2 OF 4)
26	CM-6	CONSTRUCTION MATERIALS DETAILS (3 OF 4)
27	CM-7	CONSTRUCTION MATERIALS DETAILS (4 OF 4)
28	L-1	PLANTING PLAN
29	L-2	PLANTING DETAILS

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Aug 15, 2023 2:42pm rpetie

PLAN INTENDED TO BE VIEWED
IN COLOR. ADJACENT BLOCK IS
"BLUE"
ONE INCH
AT FULL SIZE IF NOT ONE
INCH SCALE ACCORDINGLY

100% DESIGN: NOT FOR CONSTRUCTION



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: L. ORR
 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

**NORTHPORT WATERFRONT
SEDIMENT CLEANUP**

COVER SHEET

G-1

SHEET # 1 OF 29

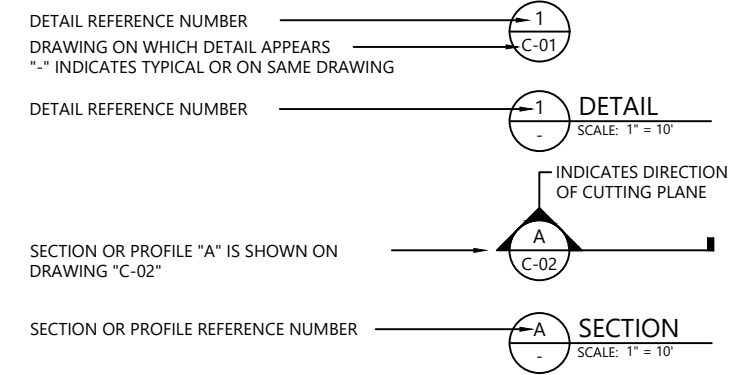
GENERAL NOTES

1. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES, AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT.
2. THE CONTRACTOR MUST ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY AND PROTECTION OF THE ENVIRONMENT. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND IS NOT LIMITED TO NORMAL WORKING HOURS.
3. THE CONTRACTOR MUST NOT DISTURB OR DESTROY ANY EXISTING SURVEY MONUMENT OR BENCHMARK. ANY SURVEY MONUMENT OR BENCHMARK DISTURBED OR DESTROYED BY THE CONTRACTOR MUST BE REPLACED AS DIRECTED BY ECOLOGY AT THE CONTRACTOR'S SOLE EXPENSE.
4. WORK IS TO BE CONDUCTED IN THE DRY DURING LOW WATER PERIODS. THE CONTRACTOR SHALL MONITOR DISCHARGE RATE AT THE COLUMBIA RIVER INTERNATIONAL BOUNDARY (USGS MONITORING LOCATION 12399500) AND THE RESERVOIR ELEVATION AT THE GRAND COULEE DAM (USGS MONITORING LOCATION 12436000). FULL EXPOSURE OF THE PROJECT AREA TYPICALLY OCCURS WHEN RIVER FLOW IS APPROXIMATELY BELOW 100,000 CFS AND RESERVOIR ELEVATION IS BELOW 1,265 FEET NAVD88. THE MAJOR LOW WATER WINDOW IS LIKELY TO OCCUR FROM EARLY FEBRUARY THROUGH MID-MAY. IT IS ANTICIPATED THAT THERE WILL BE SEVERAL HIGH-WATER WINDOWS WHERE CONTRACTOR WILL NOT BE ABLE TO WORK ON THE BEACH. CONTRACTOR MAY CHOOSE TO DEMOBILIZE DURING HIGH-WATER PERIODS. THE CONTRACTOR SHALL BE AWARE THAT DAILY CHANGES IN WATER LEVEL ON THE ORDER OF +/- 2 FEET HAVE BEEN OBSERVED AT THE SITE. THE CONTRACTOR SHALL INCLUDE PHYSICAL AND/OR OPERATIONAL MEASURES TO PROTECT THE WORK FROM CHANGING WATER LEVELS.

GENERAL SURVEY NOTES

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD 83 (2011), U.S. FEET
2. VERTICAL DATUM: NAVD88
3. EXISTING TOPOGRAPHY BUILT FROM COORDINATE POINT FILE "COORDINATES.TXT" FILE ASSOCIATED WITH AN APRIL 2018 SURVEY PERFORMED BY RFK LAND SURVEYING INC. AERIAL IMAGERY FROM BING MAPS.
4. THE ABOVE SURVEYS WERE MERGED BY ANCHOR QEA TO PROVIDE A CONTINUOUS EXISTING ELEVATIONS DATA SET.
5. THE EXISTING CONDITION SURVEY AND DESIGN ASSUMES A CONSTANT WATER LEVEL (1,295 NAVD88) TO DEFINE ORDINARY HIGH WATER MARK (SOURCE: CLEANUP ACTION PLAN, ECOLOGY 2022).
6. CONTRACTOR RESPONSIBLE FOR CONFIRMING LOCATION OF ALL UTILITIES AND EXISTING SITE CONDITIONS PRIOR TO THE START OF EXCAVATION (SEE SPECIFICATIONS).

DETAIL AND SECTION REFERENCING:

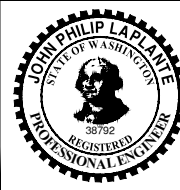


ABBREVIATIONS

ABBRV	ABBREVIATION
APPROX.	APPROXIMATE/APPROXIMATELY
BMP	BEST MANAGEMENT PRACTICES
CP	CONTROL POINT
CY	CUBIC YARD
DWG	DRAWING
E	EAST
EL, ELEV	ELEVATION
FT	FOOT OR FEET
GAL	GALLON
IN	INCH OR INCHES
MAX	MAXIMUM
MIN	MINIMUM
MISC	MISCELLANEOUS
N	NORTH
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NO.	NUMBER
OC	ON CENTER
S	SOUTH
SF	SQUARE FOOT OR FEET
SHT	SHEET
SPEC	SPECIFICATION
STA	STATION
STD	STANDARD
TESC	TEMPORARY EROSION AND SEDIMENT CONTROL
TYP	TYPICAL
W	WEST

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Aug 15, 2023 2:42pm rpetrie

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DESIGNED BY: T. GRIGA
 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

**NORTHPORT WATERFRONT
 SEDIMENT CLEANUP**

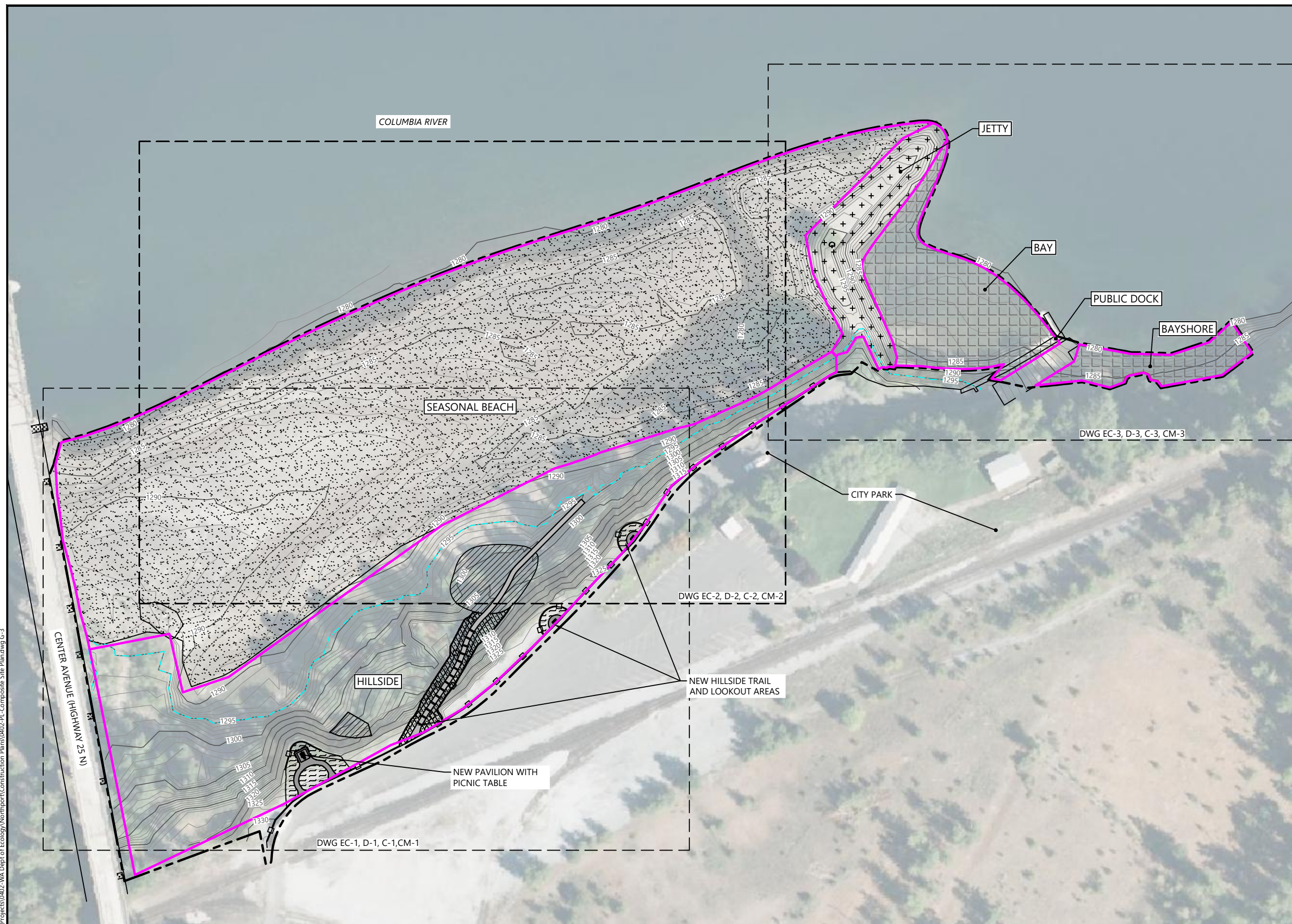
**GENERAL NOTES, ABBREVIATIONS, AND
 CONTROL POINTS**

G-2

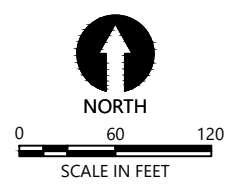
SHEET # **2** OF **29**

PLAN INTENDED TO BE VIEWED
 IN COLOR. ADJACENT BLOCK IS
 "BLUE"
 ONE INCH
 AT FULL SIZE. IF NOT ONE
 INCH SCALE ACCORDINGLY

Aug 15, 2023 5:00pm rpettie
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- LEGEND:**
- EXISTING CONTOURS (1' & 5' INTERVALS)
 - APPROXIMATE OHWM (CLEANUP ACTION PLAN; ECOLOGY 2022)
 - LIMITS OF WORK
 - CAP TYPE 1 MATERIAL
 - CAP TYPE 2 MATERIAL
 - BACKFILL MATERIAL
 - ARMOR ROCK
 - GRAVEL PATHWAY
 - CONCRETE PAVING
 - PLANTING AREA
 - SPLIT RAIL FENCE
 - BOLLARDS
 - MANAGEMENT AREA



- NOTES:**
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD83, U.S. SURVEY FEET
 2. VERTICAL DATUM: NAVD88
 3. EXISTING TOPOGRAPHY BUILT FROM COORDINATE POINT FILE "COORDINATES.TXT" ASSOCIATED WITH AN APRIL 2018 SURVEY PERFORMED BY RFK LAND SURVEYING INC. AERIAL IMAGERY FROM BING MAP.
 4. THIS SHEET FOR REFERENCE ONLY AND NOT FOR CONSTRUCTION.

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PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE" INCH SCALE ACCORDINGLY



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

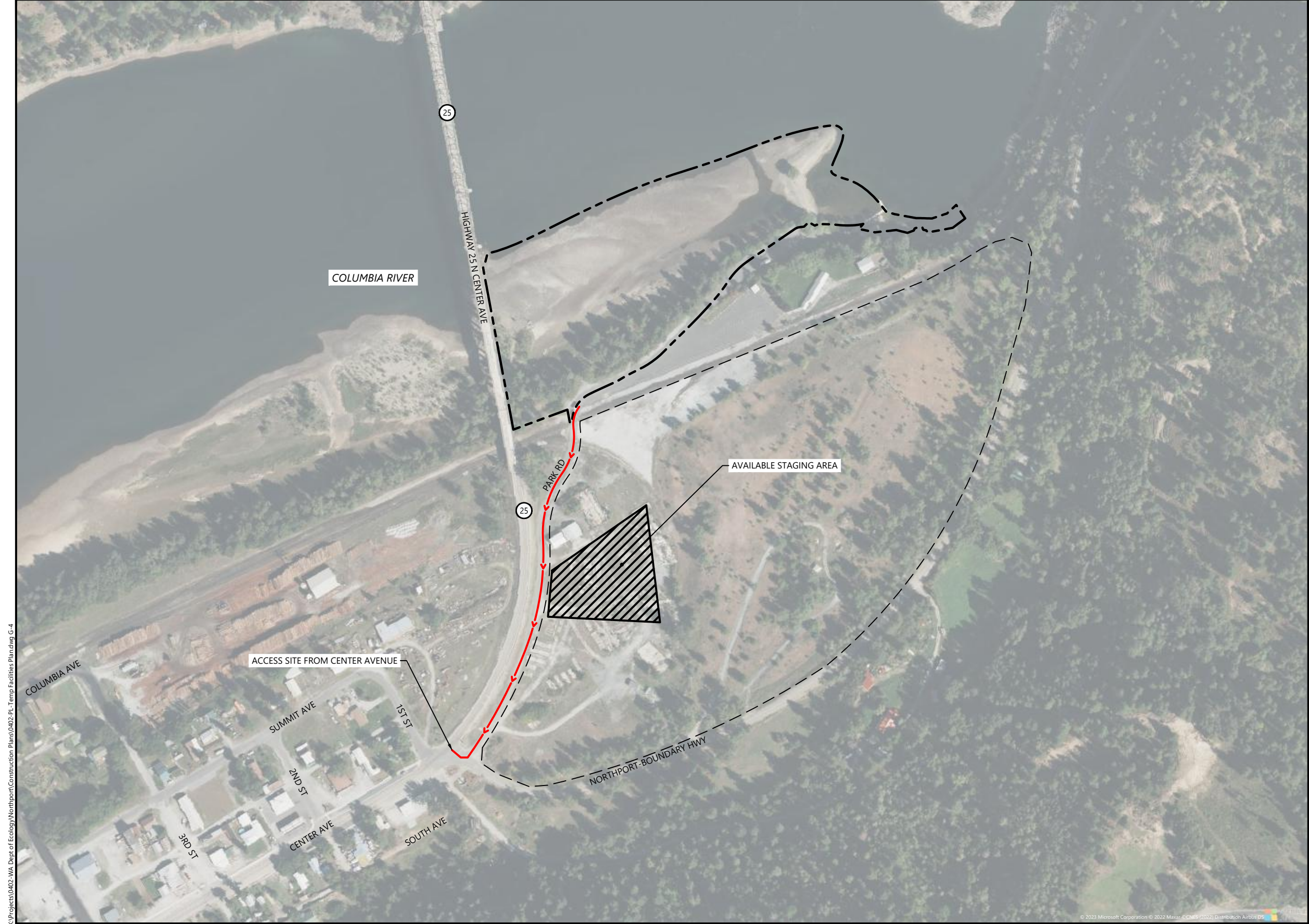
DESIGNED BY: L. ORR
 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

NORTHPORT WATERFRONT
 SEDIMENT CLEANUP

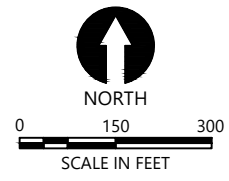
 COMPOSITE SITE PLAN

G-3

SHEET # 3 OF 29



- LEGEND:
- LIMITS OF WORK
 - ▨ POTENTIAL STAGING AREA
 - ACCESS ROUTE
 - - - - APPROXIMATE LIMITS OF LE ROI SMELTER SITE



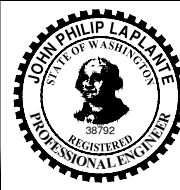
- NOTES:
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD83, U.S. SURVEY FEET
 2. AERIAL BY BING MAPS.
 3. CONTRACTOR TO ACCESS WORK AREA AS NEEDED VIA ESTABLISHED ROUTES ON SITE AND RESTORE ACCESS AREAS TO PRE-CONSTRUCTION CONDITIONS PER SPECIFICATION SECTION 01 50 00 TEMPORARY FACILITIES AND CONTROLS.
 4. CONTRACTOR TO PROVIDE STAGING AREA DESIGN IN ACCORDANCE WITH SPECIFICATION SECTION 01 57 13 TEMPORARY EROSION AND SEDIMENT CONTROLS.
 5. AVAILABLE STAGING AREA IS A GENERAL DEPICTION OF THE LOCATION AVAILABLE. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BID AND DEFINE, FOR PRICING PURPOSES, THE AREA NEEDED AND THE LAYOUT OF THE STAGING AREA WITHIN THE BOUNDARIES SHOWN. NOTE THAT THE AREA SHOWN INCLUDES A HISTORIC CULTURAL SITE AND CONTRACTOR WORK IN THIS AREA IS SUBJECT TO SPECIFIC PERMIT REQUIREMENTS FOR WHICH THE CONTRACTOR MUST MAKE THEMSELVES AWARE. THESE REQUIREMENTS INCLUDE PROTECTING THE HISTORIC ELEMENTS WITHIN THESE BOUNDARIES.
 6. CONTRACTOR SHALL PROPOSE ALTERNATE LOCATION OR SIZE FOR STAGING AREA IF A PREFERRED OPTION IS NOT DEPICTED ON THESE DRAWINGS. CONTRACTOR ALTERNATE LOCATION IS SUBJECT TO REVIEW AND APPROVAL BY ECOLOGY, AND THERE IS THE POTENTIAL THAT THE CONTRACTOR PROPOSED ALTERNATE LOCATION MIGHT NOT BE APPROVED.
 7. CONTRACTOR SHALL PROPOSE HIGH VISIBILITY AND SECURITY FENCE BOUNDARIES BASED ON PROPOSED STAGING AREAS, TEMPORARY FACILITIES, AND WORK ZONES TO ECOLOGY FOR REVIEW AND APPROVAL.

100% DESIGN: NOT FOR CONSTRUCTION

PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE".

ONE INCH AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY

Aug 15, 2023 2:42pm rpetrie
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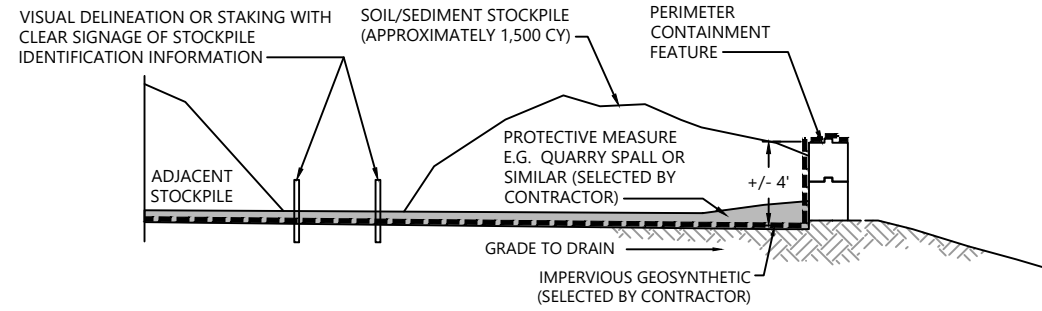
DESIGNED BY: L. ORR
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 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

**NORTHPORT WATERFRONT
 SEDIMENT CLEANUP**

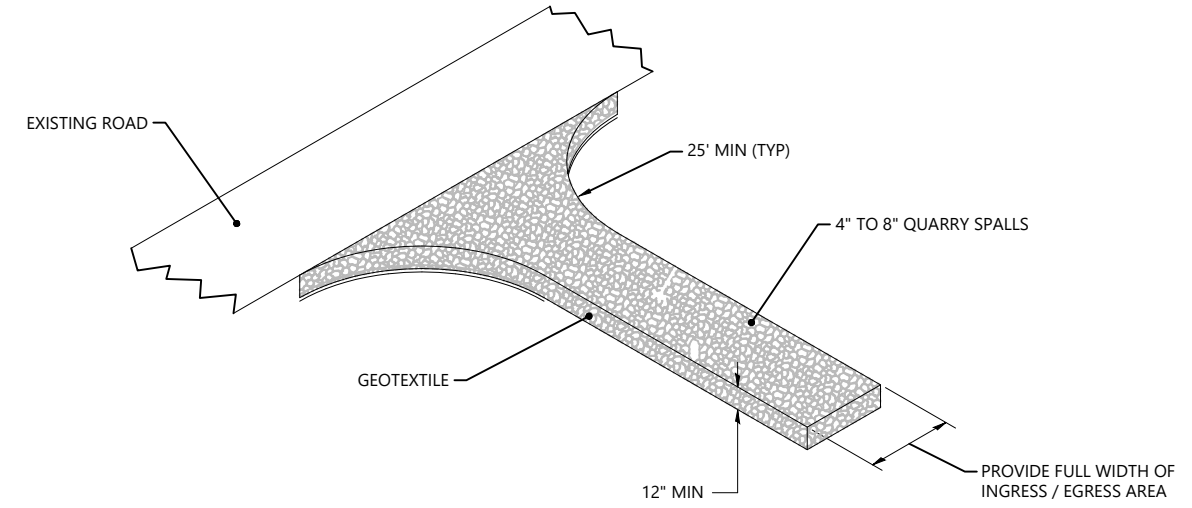
ACCESS, STAGING, AND TESC PLAN

G-4

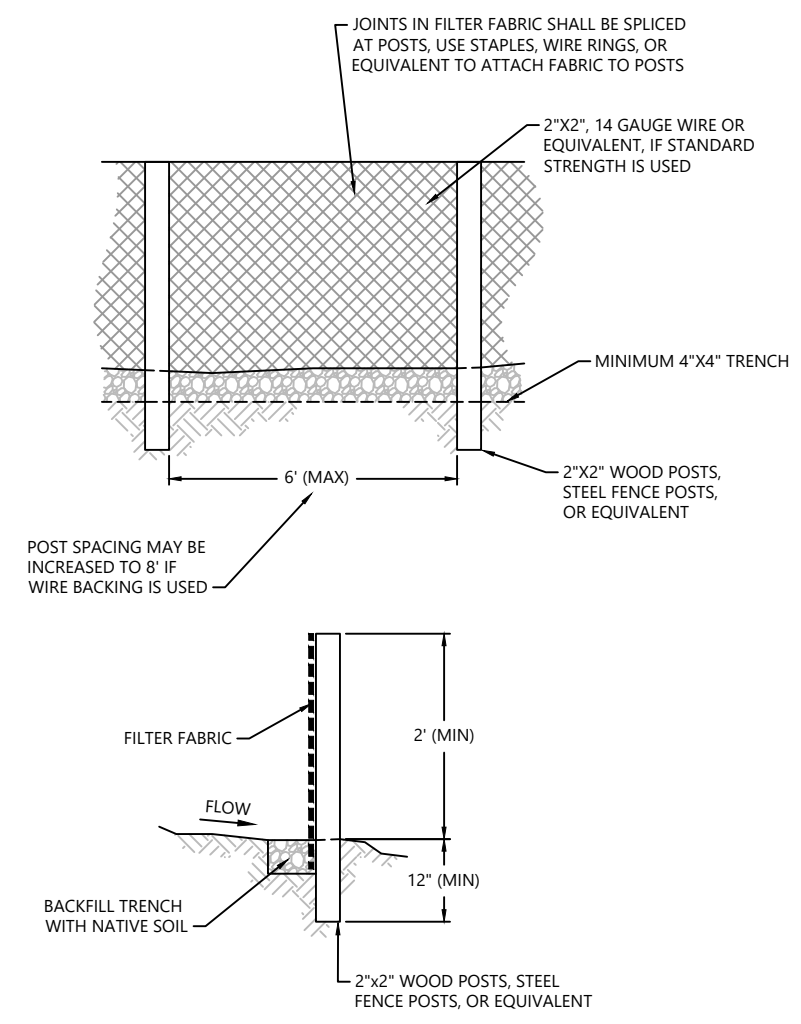
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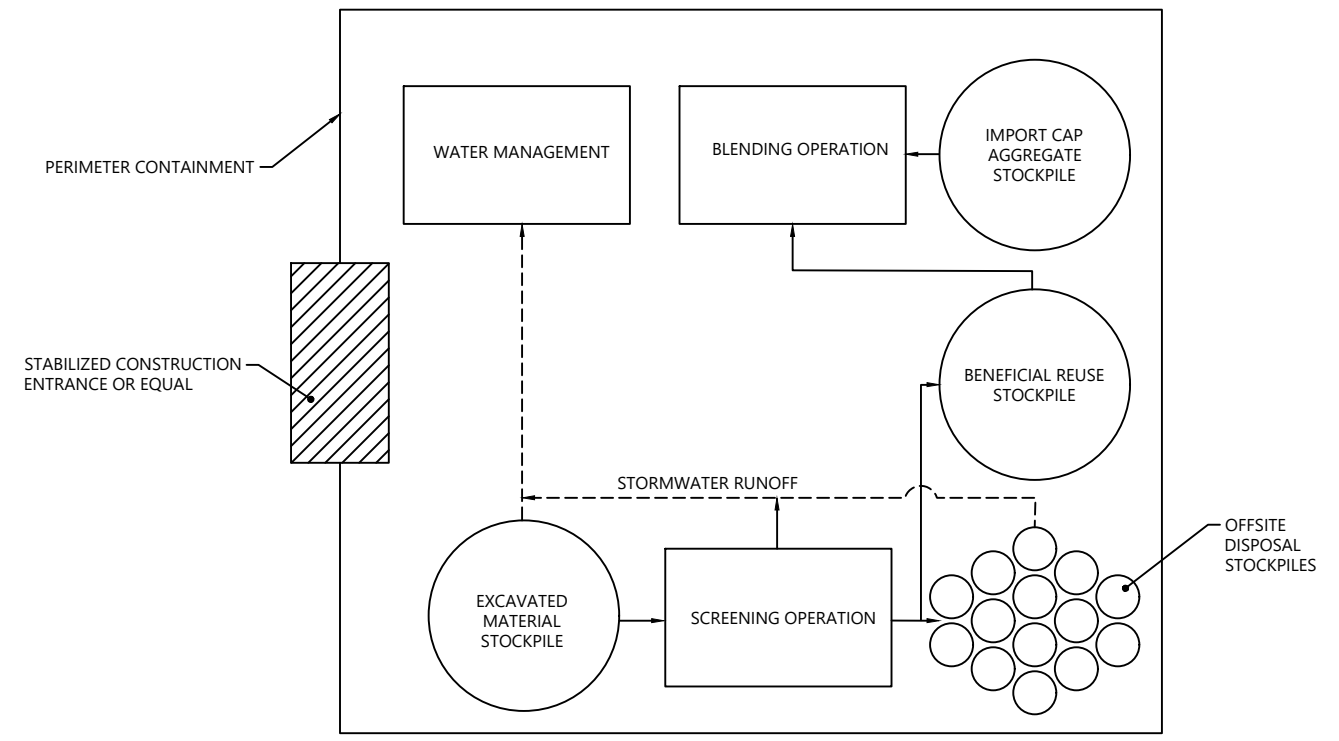
1 STOCKPILE CONTAINMENT AND STAGING AREA PERIMETER DETAIL FOR EXCAVATED MATERIAL (UNSCREENED) AND OFFSITE DISPOSAL STOCKPILES (TYPICAL)
 SCALE: NOT TO SCALE



3 STABILIZED CONSTRUCTION ENTRANCE
 SCALE: NOT TO SCALE



2 SILT FENCE (TYPICAL)
 SCALE: NOT TO SCALE



NOTE:
 LAYOUT SHOWN AS CONCEPT FOR ILLUSTRATIVE PURPOSES ONLY TO DEPICT THE MAJOR PROCESSING STEPS ANTICIPATED WITHIN THE STAGING AREA. CONTRACTOR TO LAYOUT AND SIZE ALL STAGING AREA USES INCLUDING OFFICES, PARKING, LOADING, AND UNLOADING.

4 STAGING AREA PLAN VIEW BOX DIAGRAM
 SCALE: NOT TO SCALE

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 SCALE: AS NOTED
 DATE: AUGUST 2023

**NORTHPORT WATERFRONT
 SEDIMENT CLEANUP**

TESC DETAILS

G-5

SHEET # **5** OF **29**

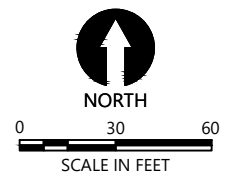
100% DESIGN: NOT FOR CONSTRUCTION

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 ONE INCH AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY



- LEGEND:**
- EXISTING CONTOURS (1' & 5' INTERVALS)
 - APPROXIMATE OHWM (CLEANUP ACTION PLAN; ECOLOGY 2022)
 - LIMITS OF WORK
 - MANAGEMENT AREA

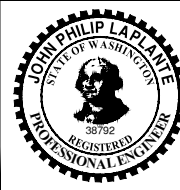
- NOTES:**
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD83, U.S. SURVEY FEET
 2. VERTICAL DATUM: NAVD88
 3. CONTRACTOR TO PRESERVE EXISTING MATURE VEGETATION AND TREES.
 4. SURVEY FOR INVASIVE SPECIES ON SITE TO BE PROVIDED BY CONTRACTOR. INVASIVE SPECIES TO BE REMOVED.
 5. UTILITY INFORMATION TO BE SURVEYED BY CONTRACTOR.
 6. CONTRACTOR TO COORDINATE WITH ECOLOGY TO FLAG TREES TO REMAIN.



100% DESIGN: NOT FOR CONSTRUCTION

PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE" INCH SCALE ACCORDINGLY

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Aug 15, 2023 2:43pm rpetrie



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DESIGNED BY: _____
 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

**NORTHPORT WATERFRONT
SEDIMENT CLEANUP**

EXISTING CONDITIONS (1 OF 3)

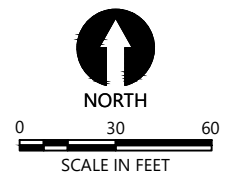
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SHEET # 6 OF 29



- LEGEND:
- EXISTING CONTOURS (1' & 5' INTERVALS)
 - APPROXIMATE OHWM (CLEANUP ACTION PLAN; ECOLOGY 2022)
 - LIMITS OF WORK
 - MANAGEMENT AREA

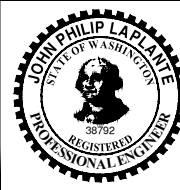
- NOTES:
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD83, U.S. SURVEY FEET
 2. VERTICAL DATUM: NAVD88
 3. CONTRACTOR TO PRESERVE EXISTING MATURE VEGETATION AND TREES.
 4. SURVEY FOR INVASIVE SPECIES ON SITE TO BE PROVIDED BY CONTRACTOR. INVASIVE SPECIES TO BE REMOVED.
 5. UTILITY INFORMATION TO BE SURVEYED BY CONTRACTOR.
 6. CONTRACTOR TO COORDINATE WITH ECOLOGY TO FLAG TREES TO REMAIN.



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 SCALE: AS NOTED
 DATE: AUGUST 2023

**NORTHPORT WATERFRONT
 SEDIMENT CLEANUP**

EXISTING CONDITIONS (2 OF 3)

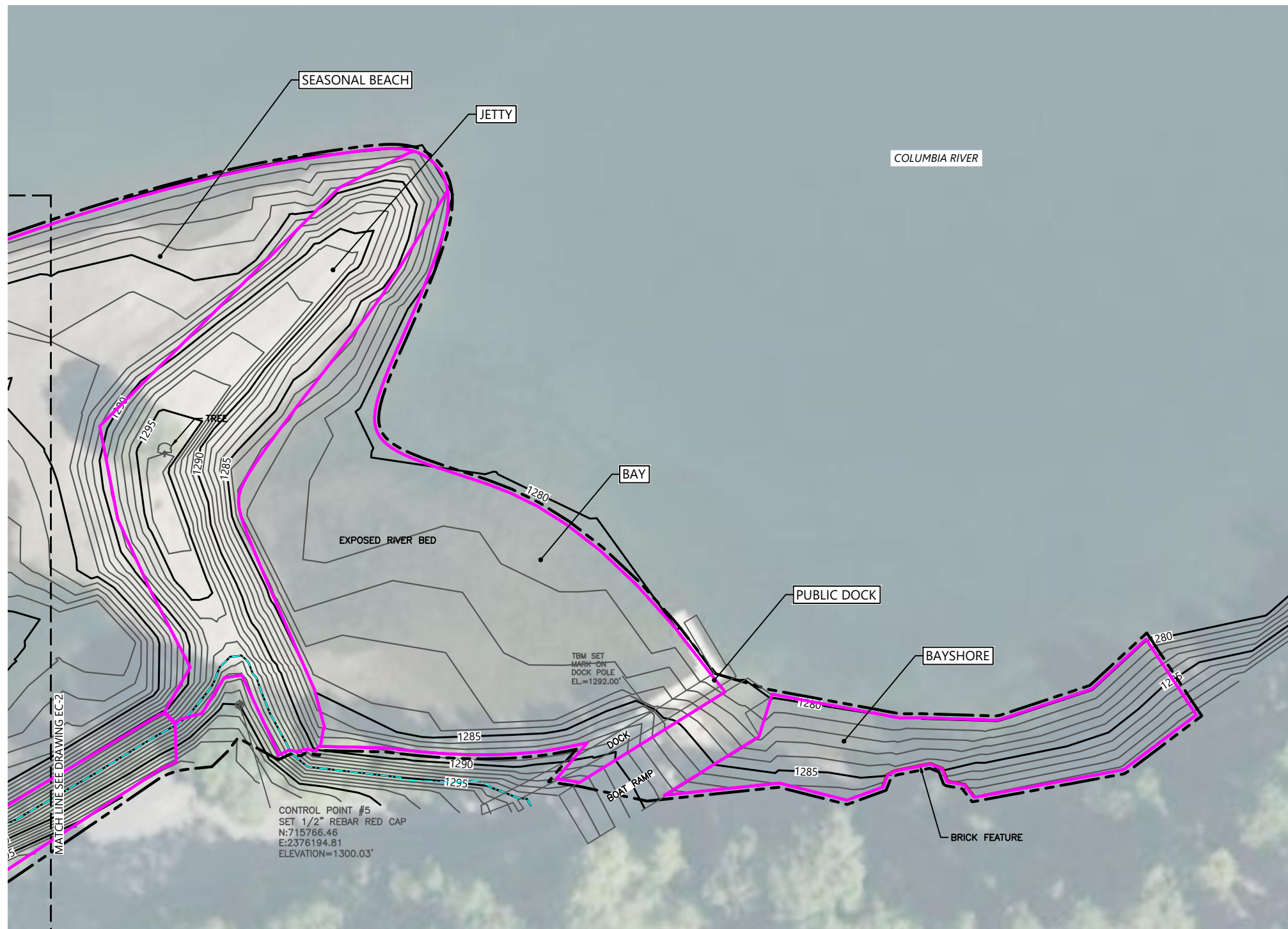
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SHEET # 7 OF 29

PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE" INCH SCALE ACCORDINGLY

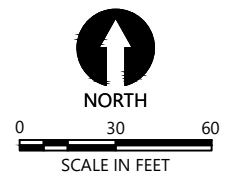
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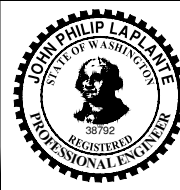
- LEGEND:**
- EXISTING CONTOURS (1' & 5' INTERVALS)
 - APPROXIMATE OHWM (CLEANUP ACTION PLAN; ECOLOGY 2022)
 - LIMITS OF WORK
 - MANAGEMENT AREA

- NOTES:**
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD83, U.S. SURVEY FEET
 2. VERTICAL DATUM: NAVD88
 3. CONTRACTOR TO PRESERVE EXISTING MATURE VEGETATION AND TREES.
 4. SURVEY FOR INVASIVE SPECIES ON SITE TO BE PROVIDED BY CONTRACTOR. INVASIVE SPECIES TO BE REMOVED.
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 6. CONTRACTOR TO COORDINATE WITH ECOLOGY TO FLAG TREES TO REMAIN.



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PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE" SCALE ACCORDINGLY



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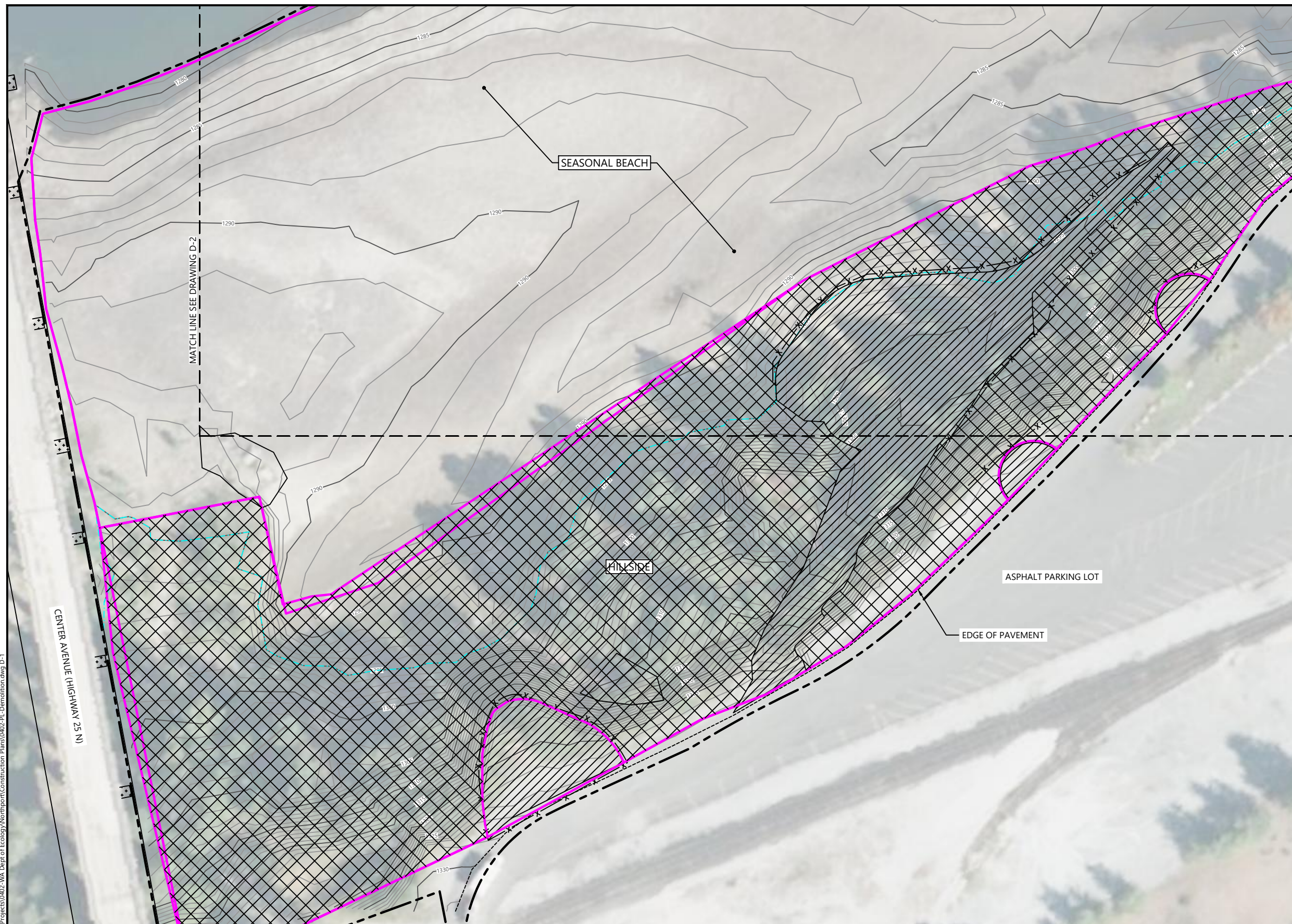
**NORTHPORT WATERFRONT
 SEDIMENT CLEANUP**

EXISTING CONDITIONS (3 OF 3)

EC-3

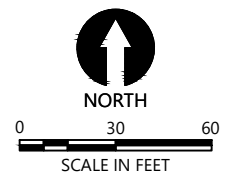
SHEET # 8 OF 29

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- LEGEND:**
- EXISTING CONTOURS (1' & 5' INTERVALS)
 - APPROXIMATE OHWM (CLEANUP ACTION PLAN; ECOLOGY 2022)
 - LIMITS OF WORK
 - CLEAR AND GRUB
 - LIMITED EXCAVATION AREA/ SURFACE DEBRIS REMOVAL (AS DIRECTED)
 - APPROXIMATE EDGE OF PAVEMENT
 - HIGH VISIBILITY FENCE
 - MANAGEMENT AREA

- NOTES:**
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD83, U.S. SURVEY FEET
 2. VERTICAL DATUM: NAVD88
 3. AERIAL IMAGERY FROM BING MAPS.
 4. CONTRACTOR TO REMOVE AREAS OF VISIBLE SLAG ENCOUNTERED DURING CONSTRUCTION IN THE LIMITED EXCAVATION AREA, AS DIRECTED BY ECOLOGY'S REPRESENTATIVE.
 5. CONTRACTOR TO VERIFY EXISTING UTILITY LOCATIONS AND ELEVATIONS AND PROVIDE TO ECOLOGY BEFORE ANY ONSITE WORK BEGINS.



100% DESIGN: NOT FOR CONSTRUCTION

PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE" INCH SCALE ACCORDINGLY



REVISIONS				
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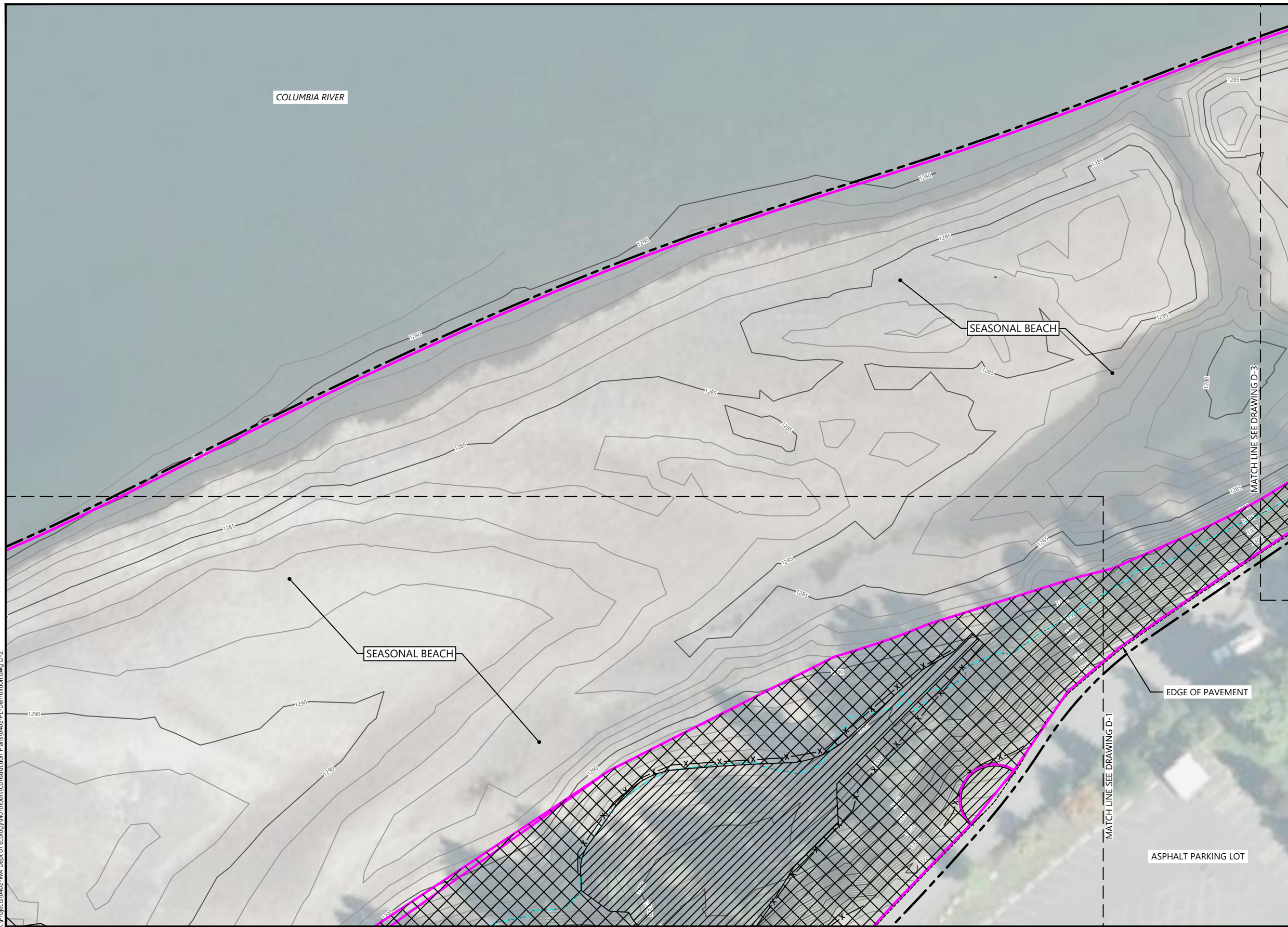
DESIGNED BY: L. ORR
 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

**NORTHPORT WATERFRONT
 SEDIMENT CLEANUP**
**SITE PREPARATION AND CLEARING PLAN
 (1 OF 3)**

D-1
 SHEET # **9** OF **29**

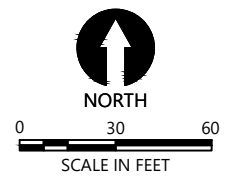
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Aug 15, 2023 2:43pm rperle



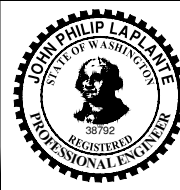
- LEGEND:**
- EXISTING CONTOURS (1' & 5' INTERVALS)
 - APPROXIMATE OHWM (CLEANUP ACTION PLAN; ECOLOGY 2022)
 - LIMITS OF WORK
 - CLEAR AND GRUB
 - LIMITED EXCAVATION AREA/ SURFACE DEBRIS REMOVAL (AS DIRECTED)
 - APPROXIMATE EDGE OF PAVEMENT
 - HIGH VISIBILITY FENCE
 - MANAGEMENT AREA

- NOTES:**
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD83, U.S. SURVEY FEET
 2. VERTICAL DATUM: NAVD88
 3. AERIAL IMAGERY FROM BING MAPS.
 4. CONTRACTOR TO REMOVE AREAS OF VISIBLE SLAG ENCOUNTERED DURING CONSTRUCTION IN THE LIMITED EXCAVATION AREA.
 5. CONTRACTOR TO VERIFY EXISTING UTILITY LOCATIONS AND ELEVATIONS AND PROVIDE TO ECOLOGY BEFORE ANY ONSITE WORK BEGINS.



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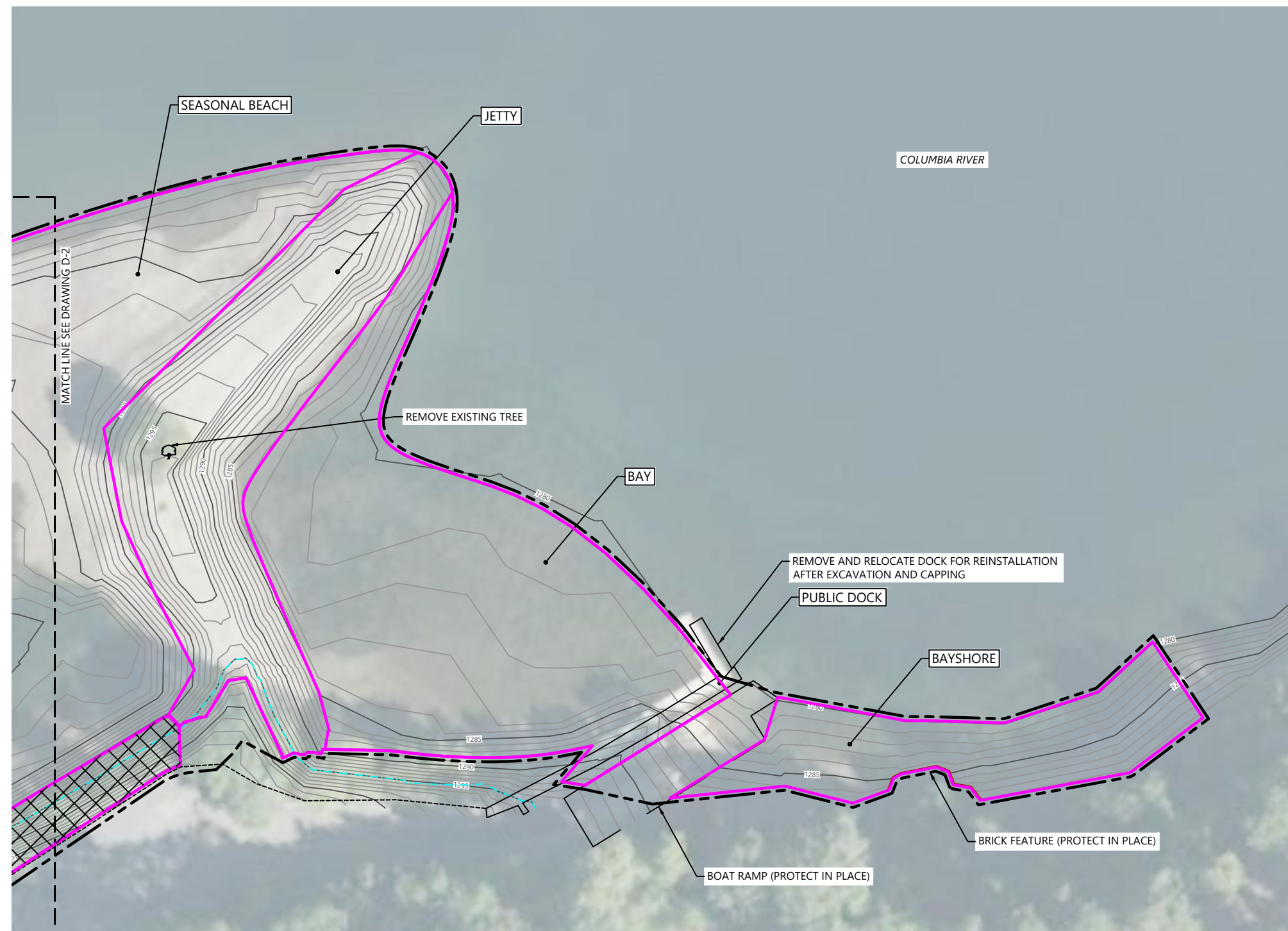
**NORTHPORT WATERFRONT
 SEDIMENT CLEANUP**

**SITE PREPARATION AND CLEARING PLAN
 (2 OF 3)**

D-2

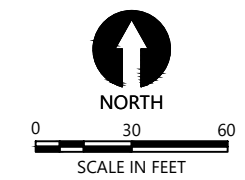
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Aug 15, 2023 2:43pm rpetrie



- LEGEND:**
- EXISTING CONTOURS (1' & 5' INTERVALS)
 - APPROXIMATE OHWM (CLEANUP ACTION PLAN; ECOLOGY 2022)
 - LIMITS OF WORK
 - CLEAR AND GRUB
 - LIMITED EXCAVATION AREA/SURFACE DEBRIS REMOVAL (AS DIRECTED)
 - APPROXIMATE EDGE OF PAVEMENT
 - HIGH VISIBILITY FENCE
 - MANAGEMENT AREA

- NOTES:**
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD83, U.S. SURVEY FEET
 2. VERTICAL DATUM: NAVD88
 3. AERIAL IMAGERY FROM BING MAPS.
 4. CONTRACTOR TO REMOVE AREAS OF VISIBLE SLAG ENCOUNTERED DURING CONSTRUCTION IN THE LIMITED EXCAVATION AREA.
 5. CONTRACTOR TO VERIFY EXISTING UTILITY LOCATIONS AND ELEVATIONS AND PROVIDE TO ECOLOGY BEFORE ANY ONSITE WORK BEGINS.



100% DESIGN: NOT FOR CONSTRUCTION

PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE" ONE INCH AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: L. ORR
 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

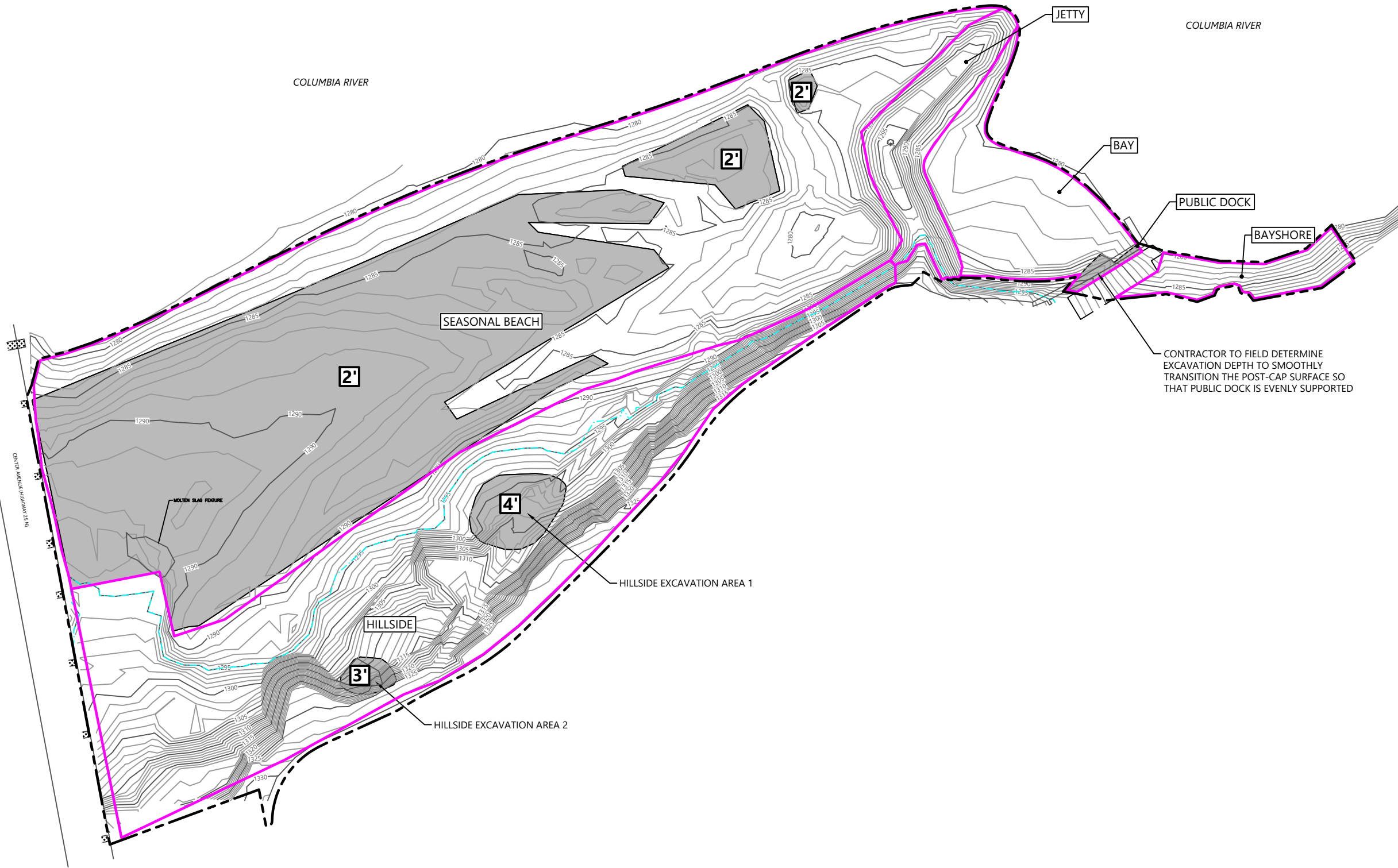
**NORTHPORT WATERFRONT
 SEDIMENT CLEANUP**

**SITE PREPARATION AND CLEARING PLAN
 (3 OF 3)**

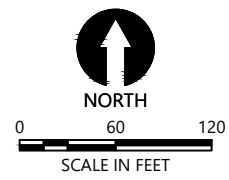
D-3

SHEET # **11** OF **29**

Aug 15, 2023 2:46pm rperle
 K:\Projects\0402-WA_Dept of Ecology\Northport\Construction Plans\0402-PL-Excavation Plan.dwg EXC-1

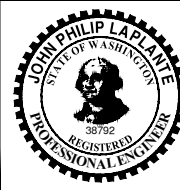


- LEGEND:**
- EXISTING CONTOURS (1' & 5' INTERVALS)
 - APPROXIMATE OHWM (CLEANUP ACTION PLAN; ECOLOGY 2022)
 - LIMITS OF WORK
 - MANAGEMENT AREA
 - EXCAVATION AREA
 - REQUIRED EXCAVATION THICKNESS



100% DESIGN: NOT FOR CONSTRUCTION

PLAN INTENDED TO BE VIEWED
 IN COLOR. ADJACENT BLOCK IS
 "BLUE"
 ONE INCH
 AT FULL SIZE IF NOT ONE
 INCH SCALE ACCORDINGLY



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

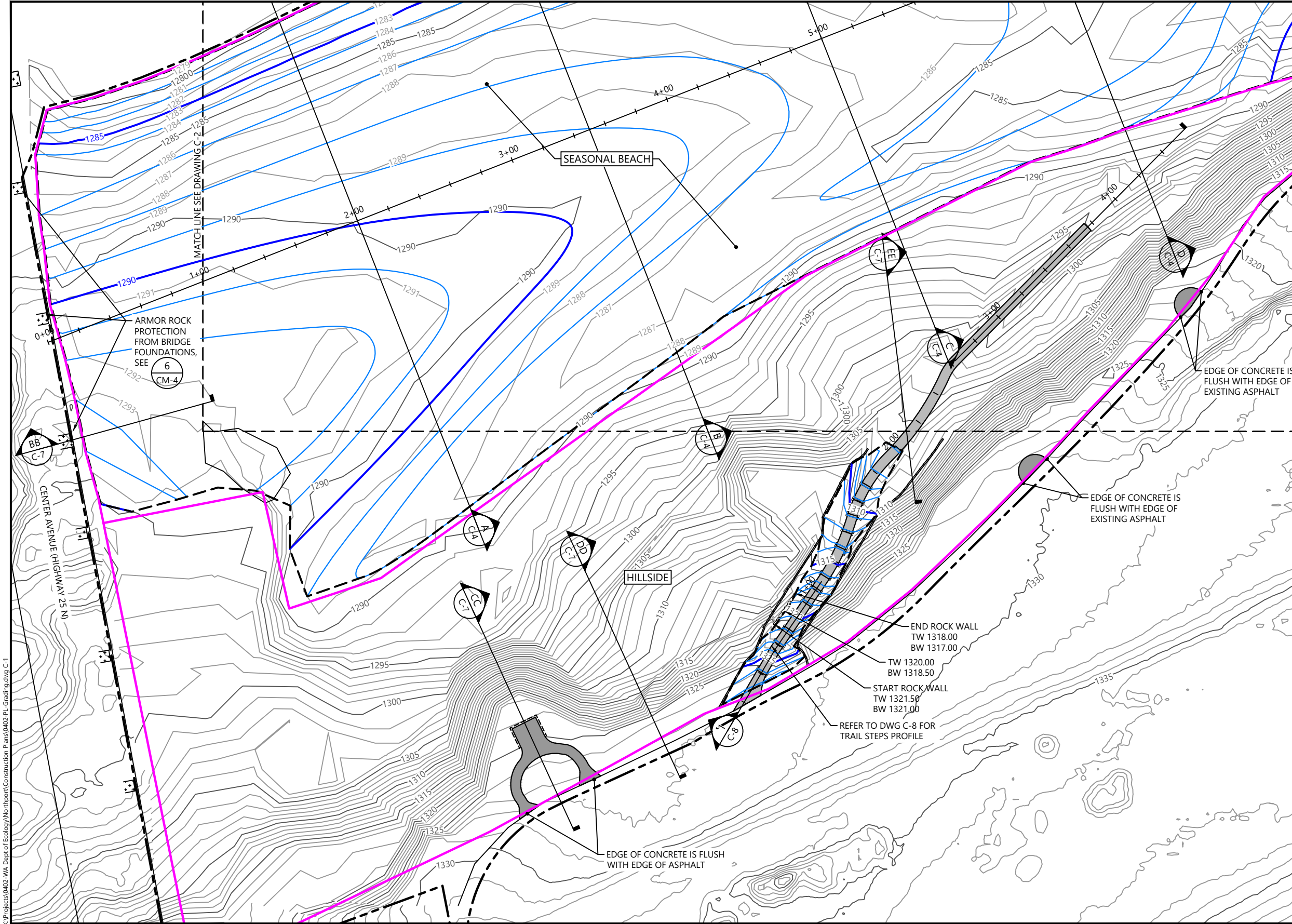
DESIGNED BY: L. ORR
 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

**NORTHPORT WATERFRONT
SEDIMENT CLEANUP**

EXCAVATION PLAN

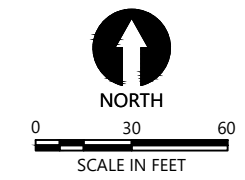
EXC-1

SHEET # **12** OF **29**



- LEGEND:**
- EXISTING CONTOURS (1' & 5' INTERVALS)
 - FINISHED GRADE CONTOURS (1' & 5' INTERVALS)
 - APPROXIMATE OHWM (CLEANUP ACTION PLAN; ECOLOGY 2022)
 - LIMITS OF WORK
 - GRADING LIMITS
 - CROSS SECTION OR PROFILE LOCATION AND DESIGNATION
 - MANAGEMENT AREA
 - TW TOP OF WALL
 - BW BOTTOM OF WALL

- NOTES:**
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD83, U.S. SURVEY FEET
 2. VERTICAL DATUM: NAVD88



100% DESIGN: NOT FOR CONSTRUCTION

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Aug 15, 2023 2:40pm rperle



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: T. GRIGA
 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

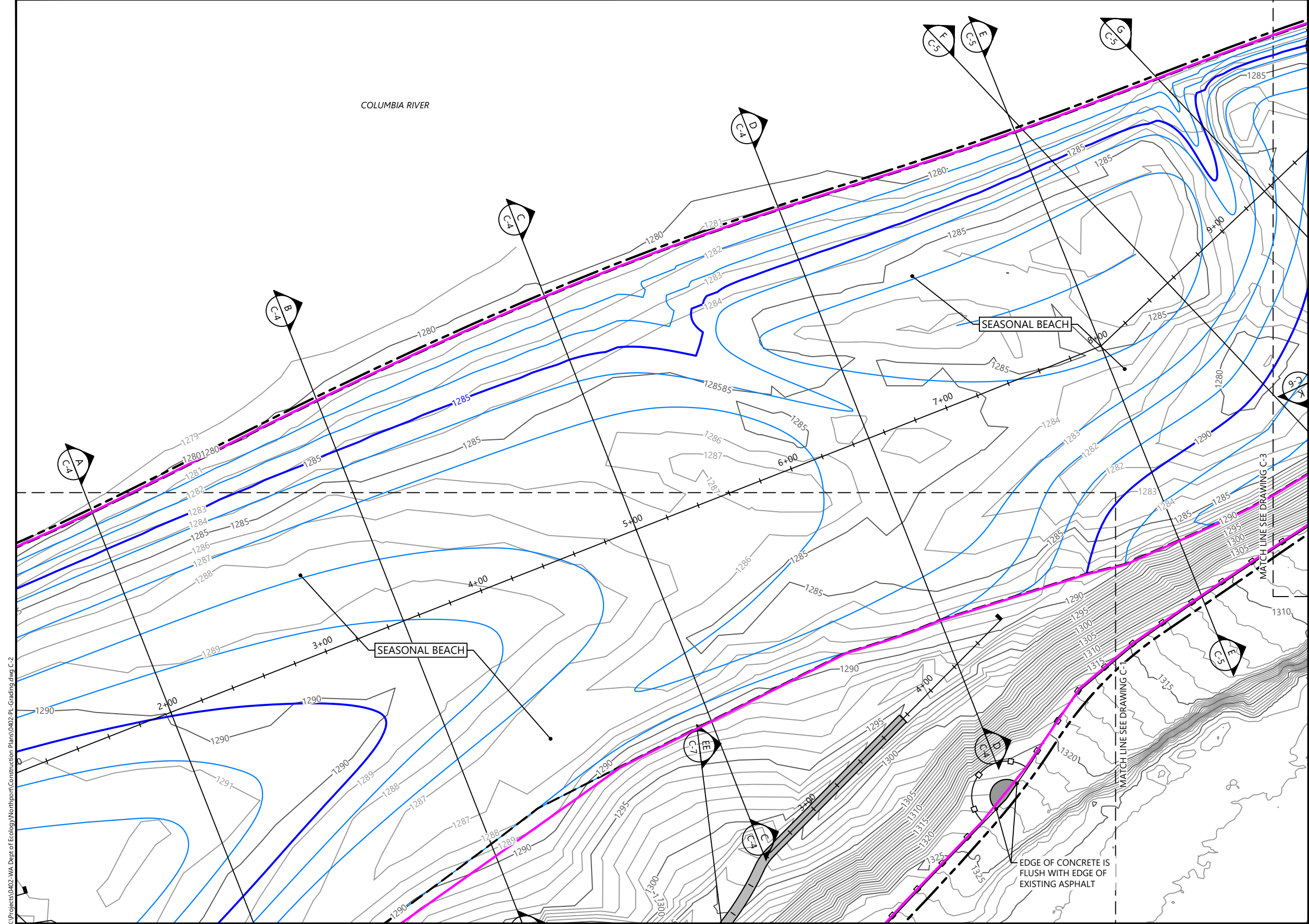
**NORTHPORT WATERFRONT
 SEDIMENT CLEANUP**

GRADING PLAN (1 OF 3)

C-1

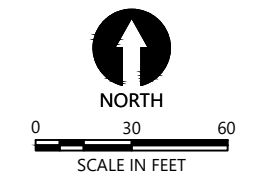
SHEET # 13 OF 29

PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE" INCH SCALE ACCORDINGLY



- LEGEND:**
- EXISTING CONTOURS (1' & 5' INTERVALS)
 - FINISHED GRADE CONTOURS (1' & 5' INTERVALS)
 - APPROXIMATE OHWM (CLEANUP ACTION PLAN; ECOLOGY 2022)
 - LIMITS OF WORK
 - GRADING LIMITS
 - CROSS SECTION OR PROFILE LOCATION AND DESIGNATION
 - MANAGEMENT AREA

- NOTES:**
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD83, U.S. SURVEY FEET
 2. VERTICAL DATUM: NAVD88



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Aug 15, 2023 2:46pm rperle



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: T. GRIGA
 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

**NORTHPORT WATERFRONT
 SEDIMENT CLEANUP**

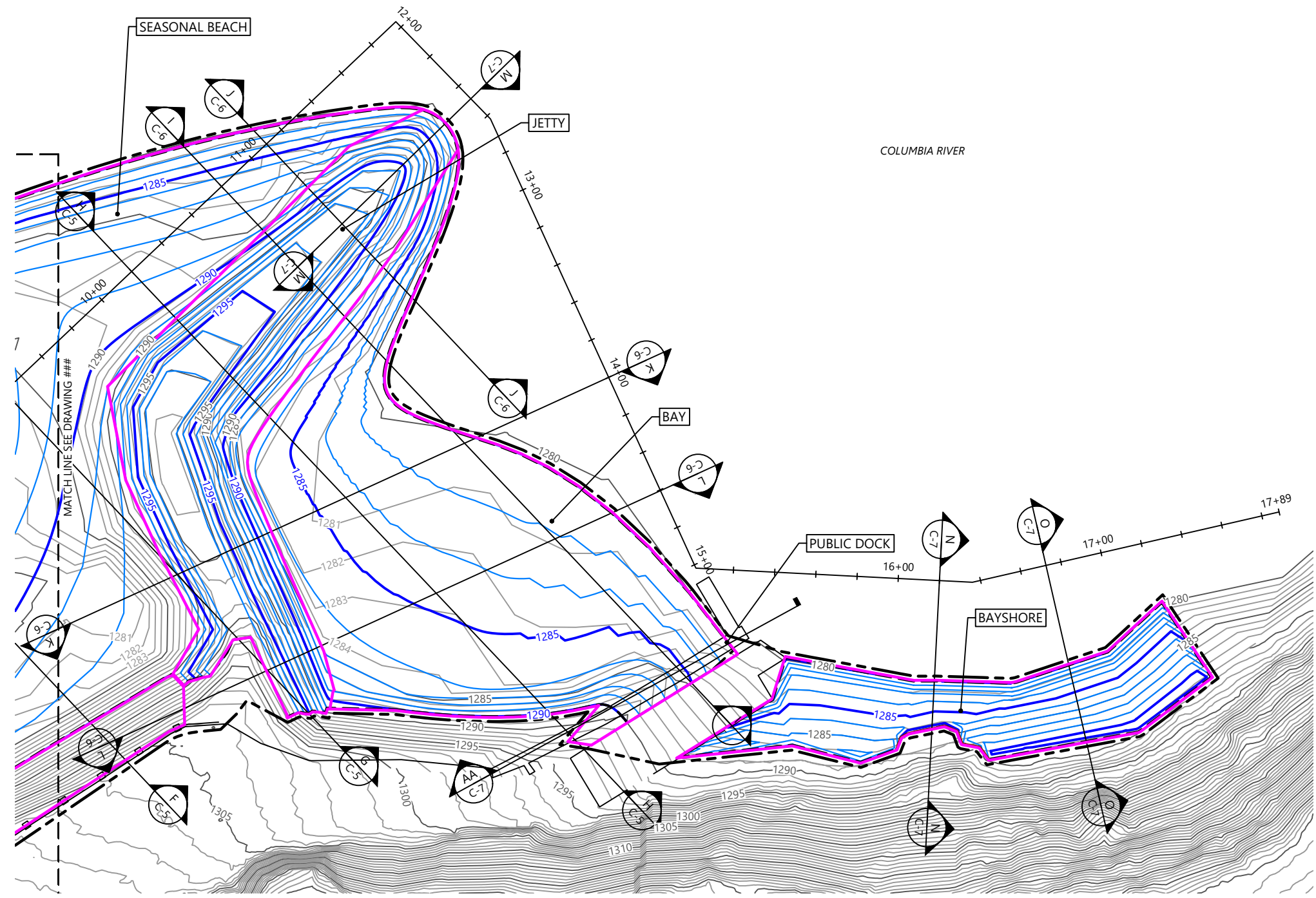
GRADING PLAN (2 OF 3)

C-2

SHEET # **14** OF **29**

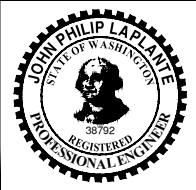
PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE" INCH SCALE ACCORDINGLY

K:\Projects\0402-WA_Dept of Ecology\Northport\Construction Plans\0402-PL-Grading.dwg C-3
Aug 15, 2023 2:46pm rperle



- LEGEND:**
- EXISTING CONTOURS (1' & 5' INTERVALS)
 - FINISHED GRADE CONTOURS (1' & 5' INTERVALS)
 - APPROXIMATE OHWM (CLEANUP ACTION PLAN; ECOLOGY 2022)
 - LIMITS OF WORK
 - GRADING LIMITS
 - CROSS SECTION OR PROFILE LOCATION AND DESIGNATION
 - MANAGEMENT AREA
- NOTES:**
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD83, U.S. SURVEY FEET
 2. VERTICAL DATUM: NAVD88

100% DESIGN: NOT FOR CONSTRUCTION



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: T. GRIGA
 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

**NORTHPORT WATERFRONT
SEDIMENT CLEANUP**

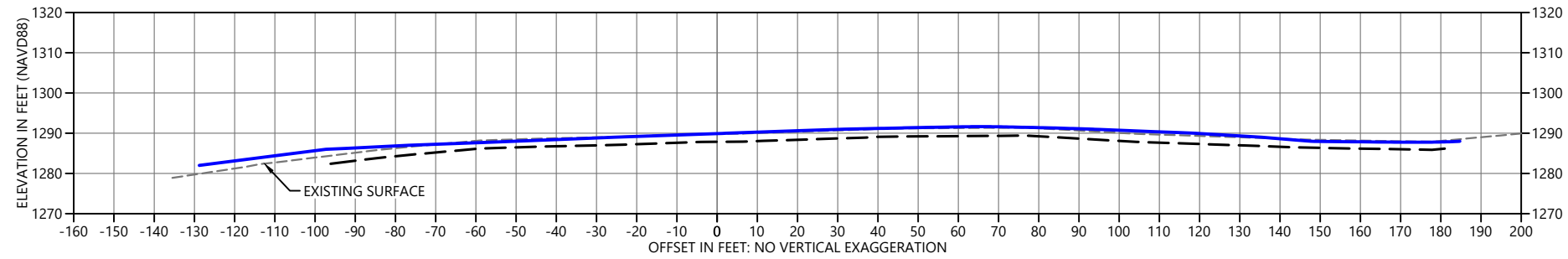
GRADING PLAN (3 OF 3)

C-3

SHEET # 15 OF 29

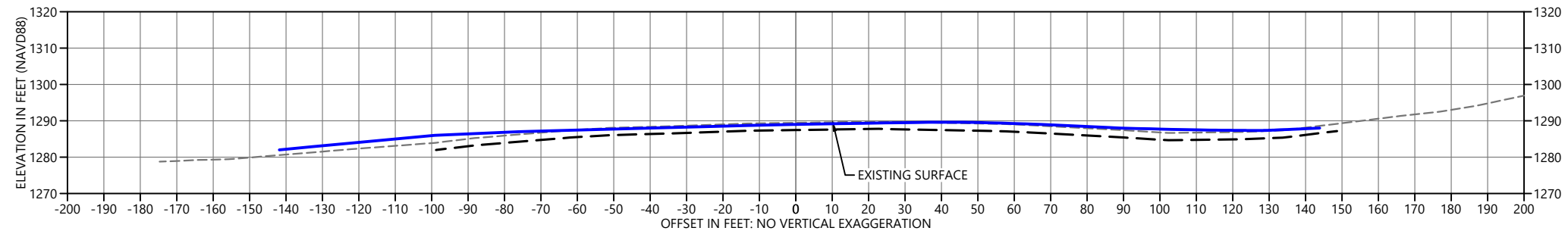
PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE" INCH SCALE ACCORDINGLY

K:\Projects\0402-WA_Dept of Ecology\Northport\Construction Plans\0402-PL-Sections.dwg C-4
Aug 15, 2023 2:45pm rpetrie

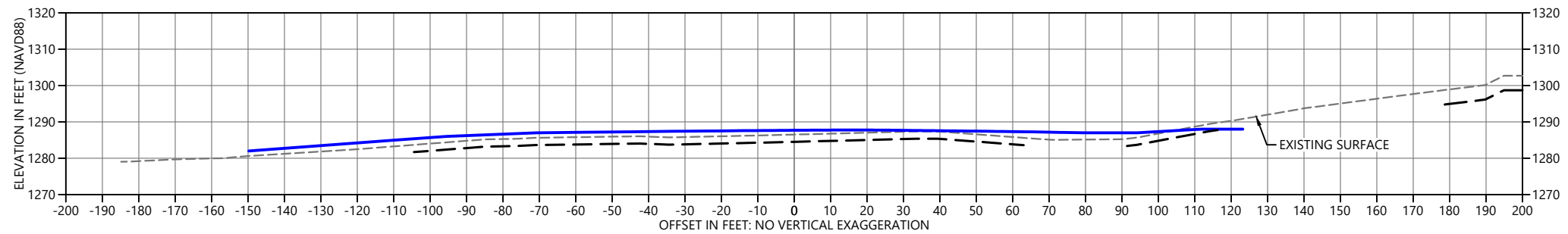


A SECTION
C-1, C-2 SCALE: 1" = 20'

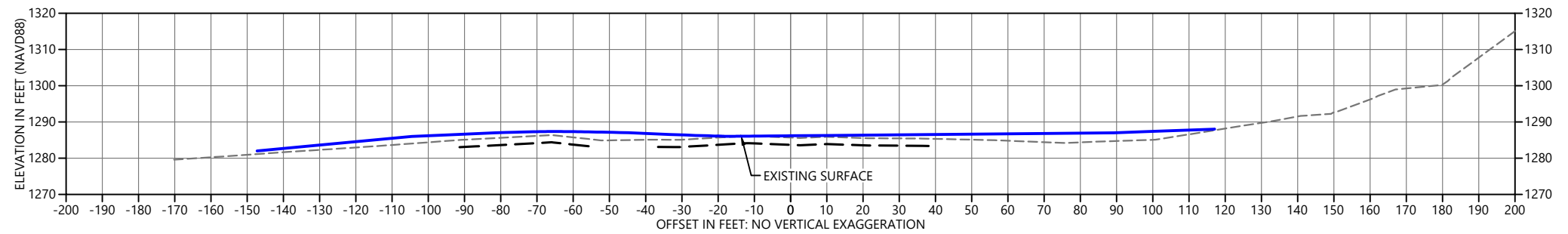
- LEGEND:
- - - EXISTING GRADE
 - - - EXCAVATION GRADE
 - FINISHED GRADE



B SECTION
C-1, C-2 SCALE: 1" = 20'



C SECTION
C-1 SCALE: 1" = 20'



D SECTION
C-2 SCALE: 1" = 20'

ONE INCH
↑
AT FULL SIZE IF NOT ONE
INCH SCALE ACCORDINGLY
PLAN INTENDED TO BE VIEWED
IN COLOR. ADJACENT BLOCK IS
"BLUE"

100% DESIGN: NOT FOR CONSTRUCTION



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

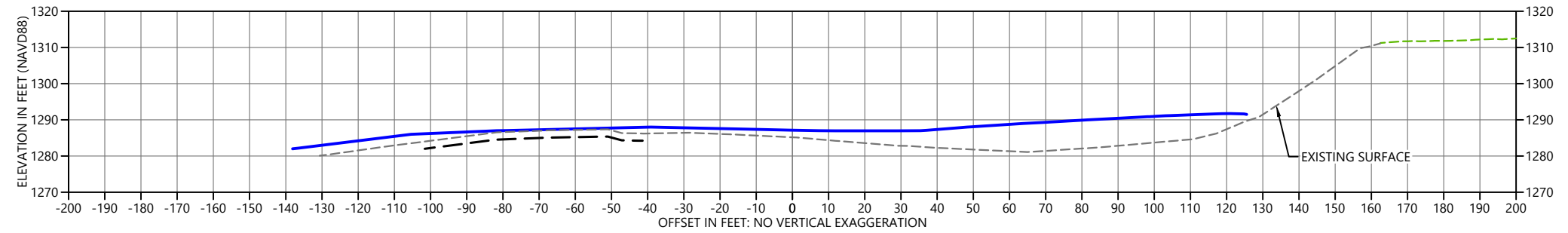
DESIGNED BY: T. GRIGA
 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

**NORTHPORT WATERFRONT
SEDIMENT CLEANUP**

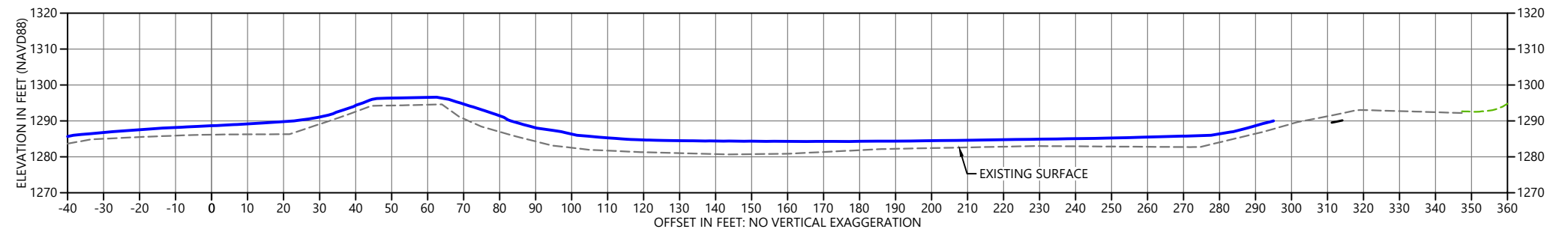
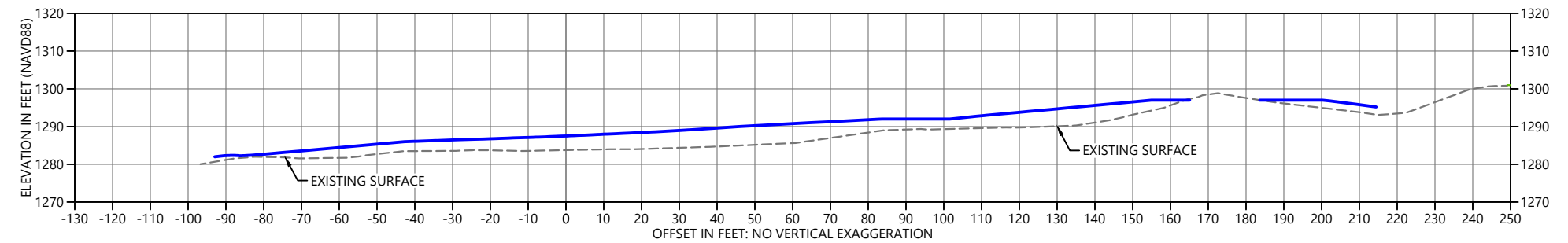
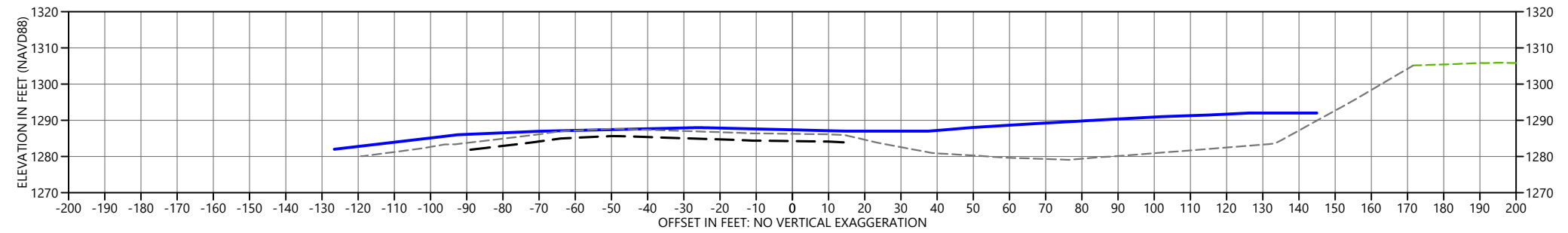
GRADING SECTIONS (1 OF 5)

C-4

SHEET # **16** OF **29**



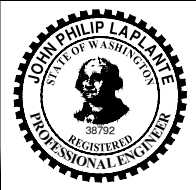
- LEGEND:
- EXISTING GRADE
 - - - EXCAVATION GRADE
 - FINISHED GRADE



PLAN INTENDED TO BE VIEWED
IN COLOR. ADJACENT BLOCK IS
"BLUE"
ONE INCH
AT FULL SIZE IF NOT ONE
INCH SCALE ACCORDINGLY

100% DESIGN: NOT FOR CONSTRUCTION

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Aug 15, 2023 2:45pm rperle



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: T. GRIGA
 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

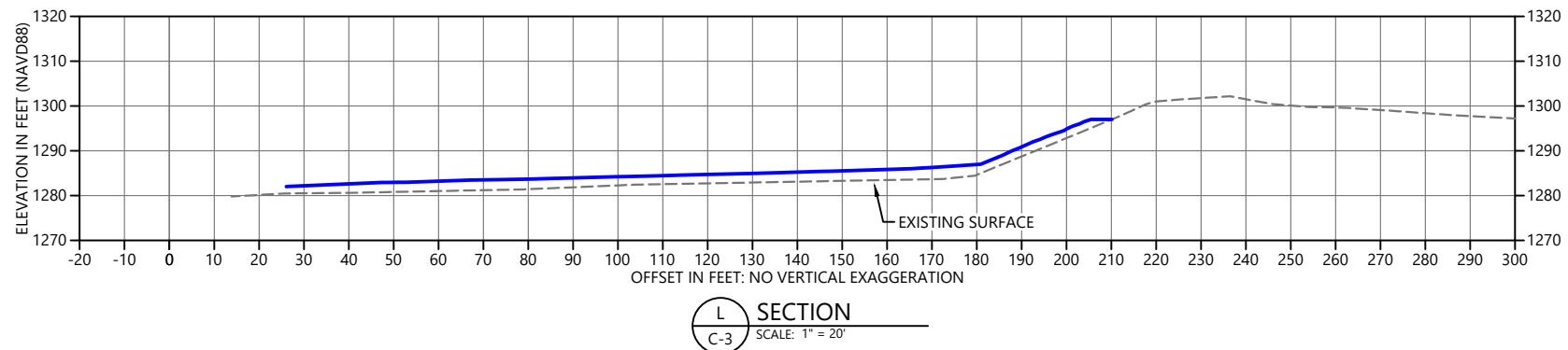
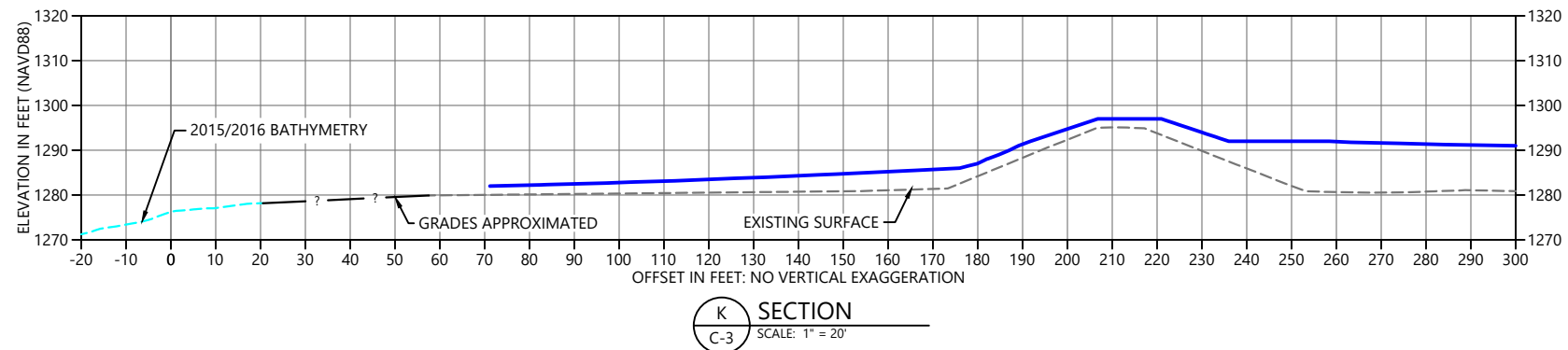
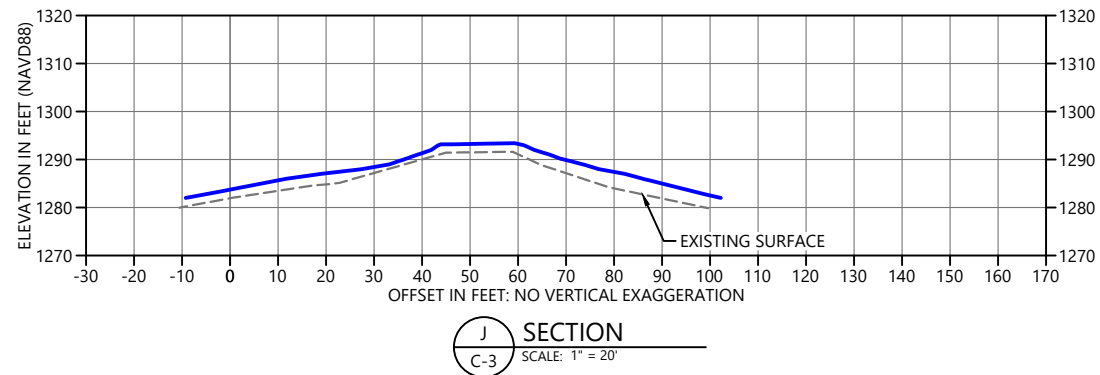
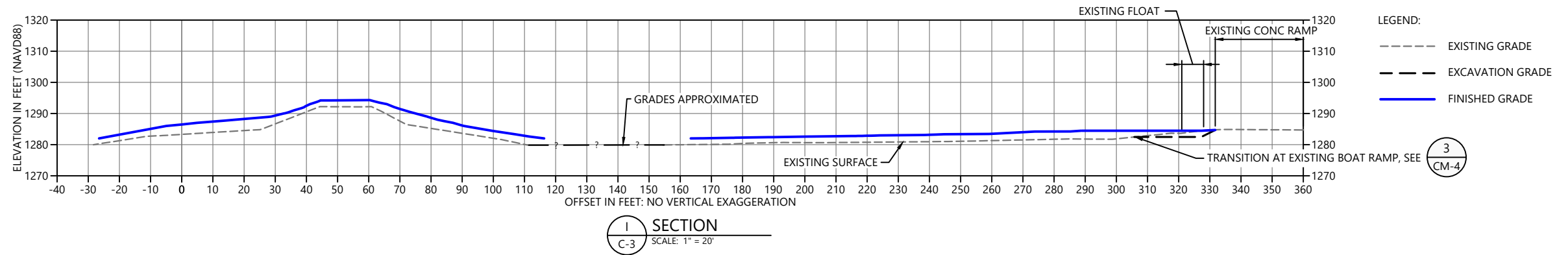
**NORTHPORT WATERFRONT
SEDIMENT CLEANUP**

GRADING SECTIONS (2 OF 5)

C-5

SHEET # **17** OF **29**

Aug 15, 2023 2:45pm rperle K:\Projects\0402-WA_Dept of Ecology\Northport\Construction Plans\0402-PL-Sections.dwg C-6



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REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

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 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

**NORTHPORT WATERFRONT
SEDIMENT CLEANUP**

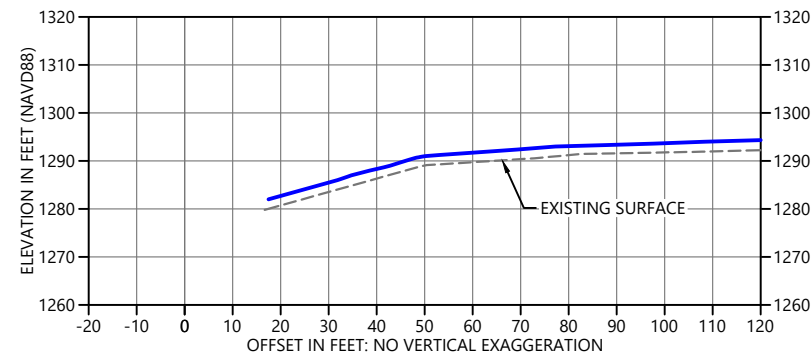
GRADING SECTIONS (3 OF 5)

C-6

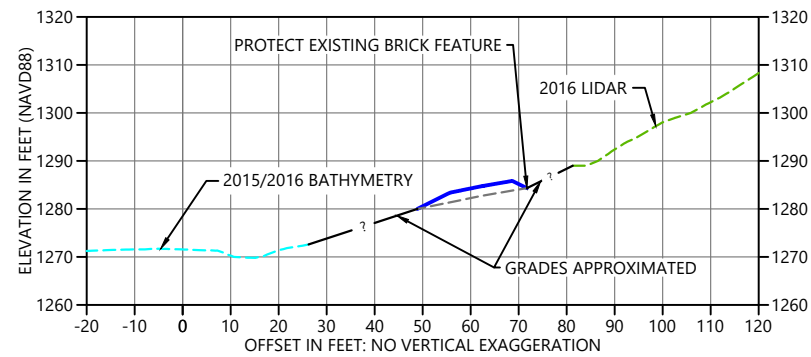
SHEET # **18** OF **29**

PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE"
 ONE INCH AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY

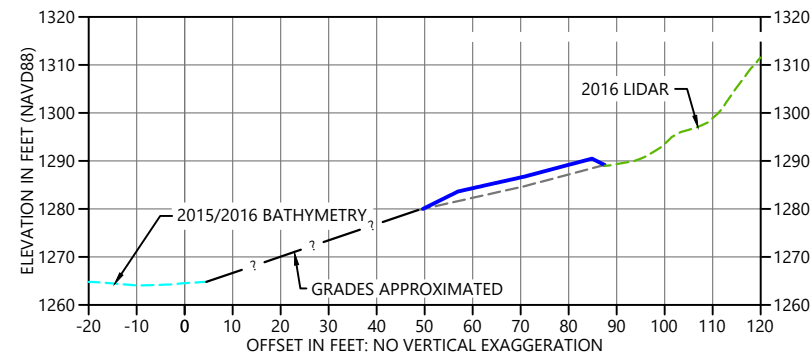
K:\Projects\0402-WA_Dept of Ecology\Northport\Construction Plans\0402-PL-Sections.dwg C-7
Aug 15, 2023 2:45pm rpetrie



M SECTION
C-3 SCALE: 1" = 20'

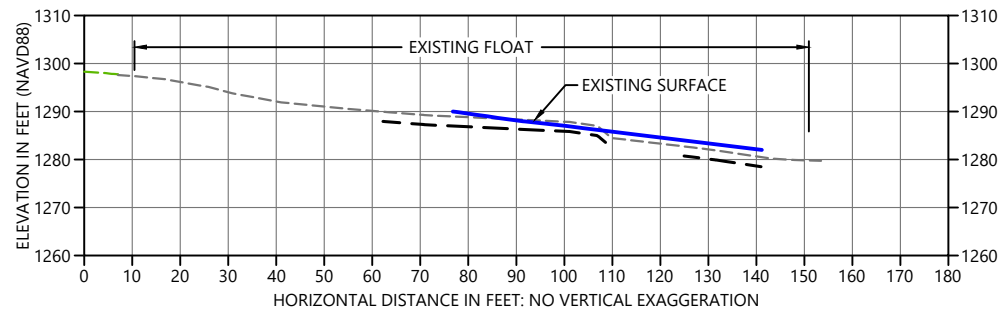


N SECTION
C-3 SCALE: 1" = 20'

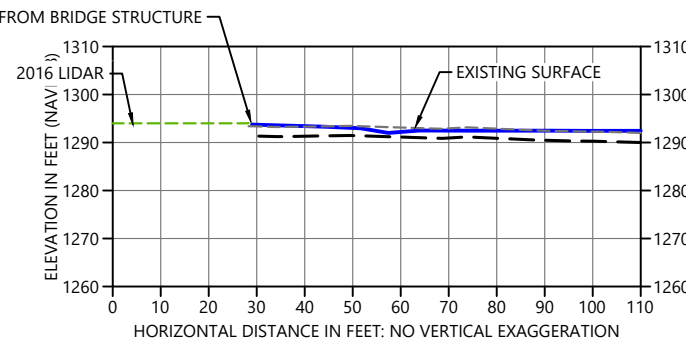


O SECTION
C-3 SCALE: 1" = 20'

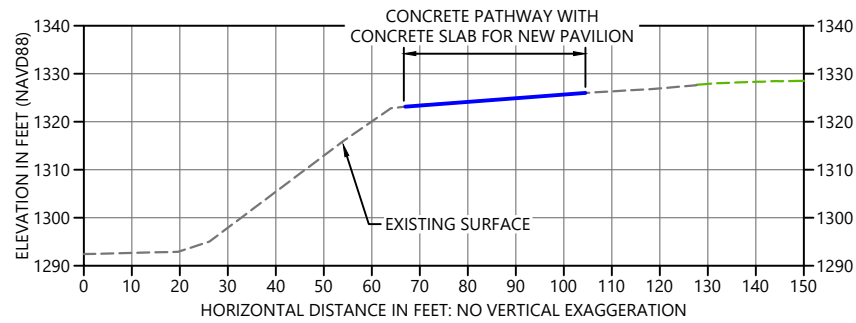
- LEGEND:**
- EXISTING GRADE
 - - - EXCAVATION GRADE
 - FINISHED GRADE
 - - - 2015/2016 BATHYMETRY
 - - - 2016 LIDAR



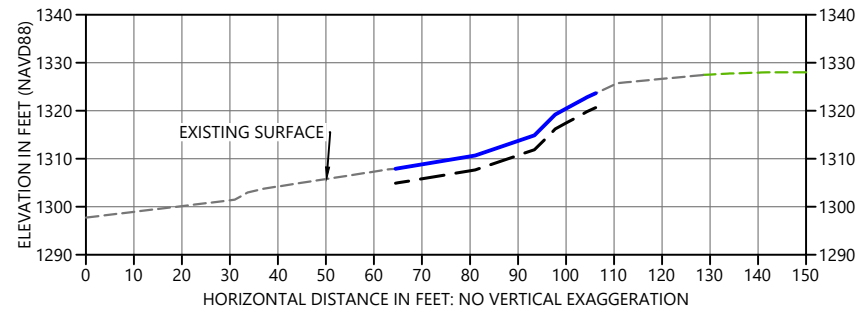
AA SECTION
C-3 SCALE: 1" = 20'



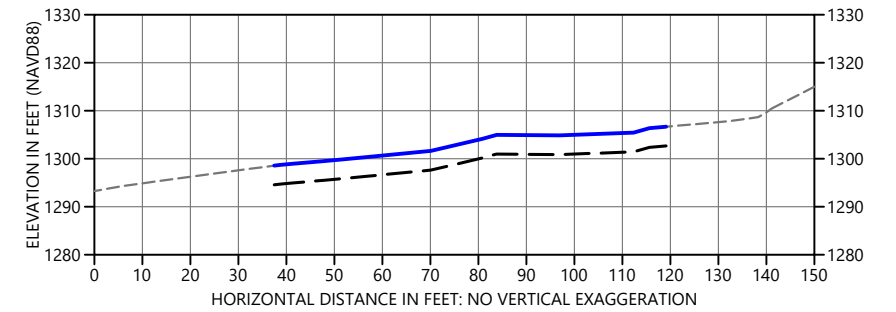
BB SECTION
C-1 SCALE: 1" = 20'



CC SECTION
C-1 SCALE: 1" = 20'



DD SECTION
C-1 SCALE: 1" = 20'



EE SECTION
C-1 SCALE: 1" = 20'

PLAN INTENDED TO BE VIEWED
IN COLOR. ADJACENT BLOCK IS
"BLUE"
ONE INCH
AT FULL SIZE. IF NOT ONE
INCH SCALE ACCORDINGLY

100% DESIGN: NOT FOR CONSTRUCTION



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

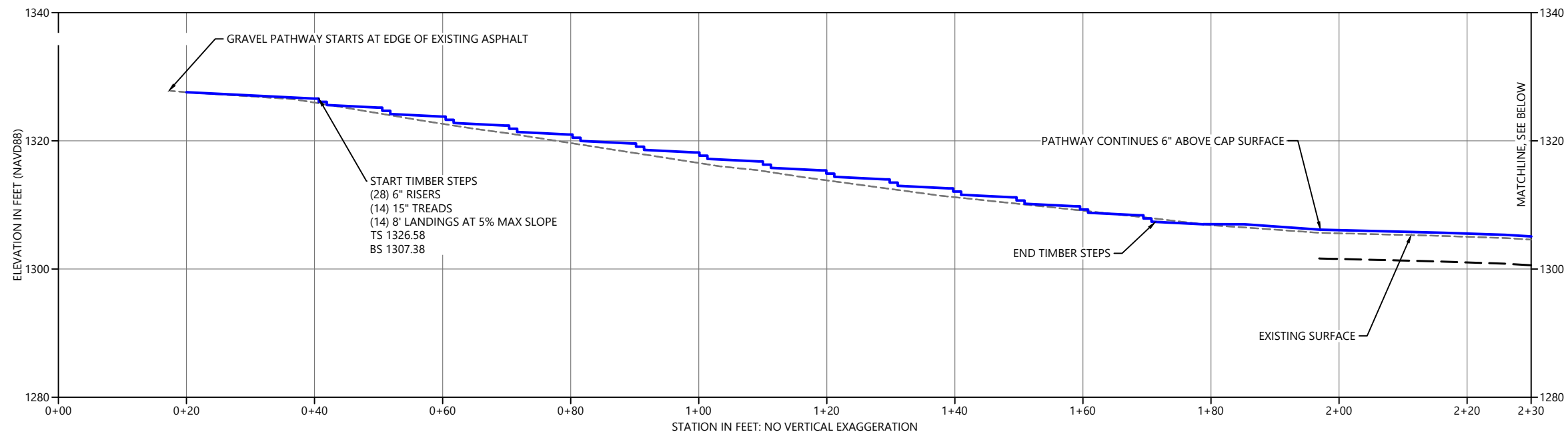
DESIGNED BY: J. GRIGA
 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

**NORTHPORT WATERFRONT
SEDIMENT CLEANUP**

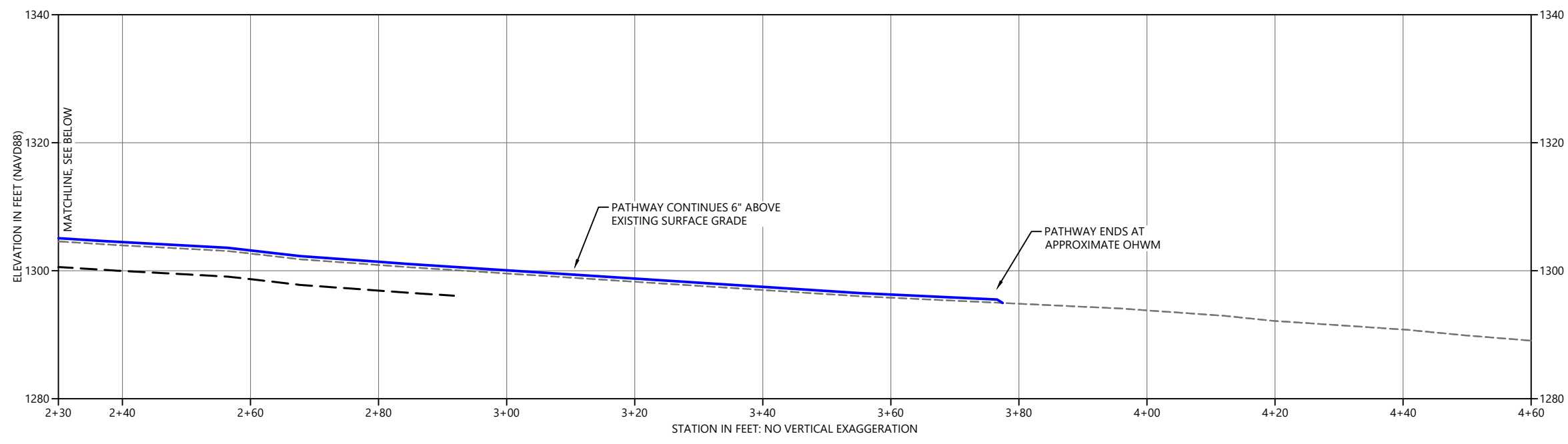
GRADING SECTIONS (4 OF 5)

C-7

SHEET # **19** OF **29**



- LEGEND:
- EXISTING GRADE
 - EXCAVATION GRADE
 - FINISHED GRADE

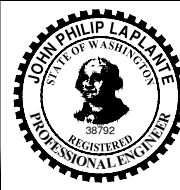


1 PATH PROFILE
C-1 SCALE: 1" = 10'

PLAN INTENDED TO BE VIEWED
IN COLOR. ADJACENT BLOCK IS
"BLUE"
ONE INCH
AT FULL SIZE IF NOT ONE
INCH SCALE ACCORDINGLY

100% DESIGN: NOT FOR CONSTRUCTION

K:\Projects\0402-WA_Dept of Ecology\Northport\Construction Plans\0402-PL-Sections.dwg C-8
Aug 15, 2023 2:45pm rperle



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

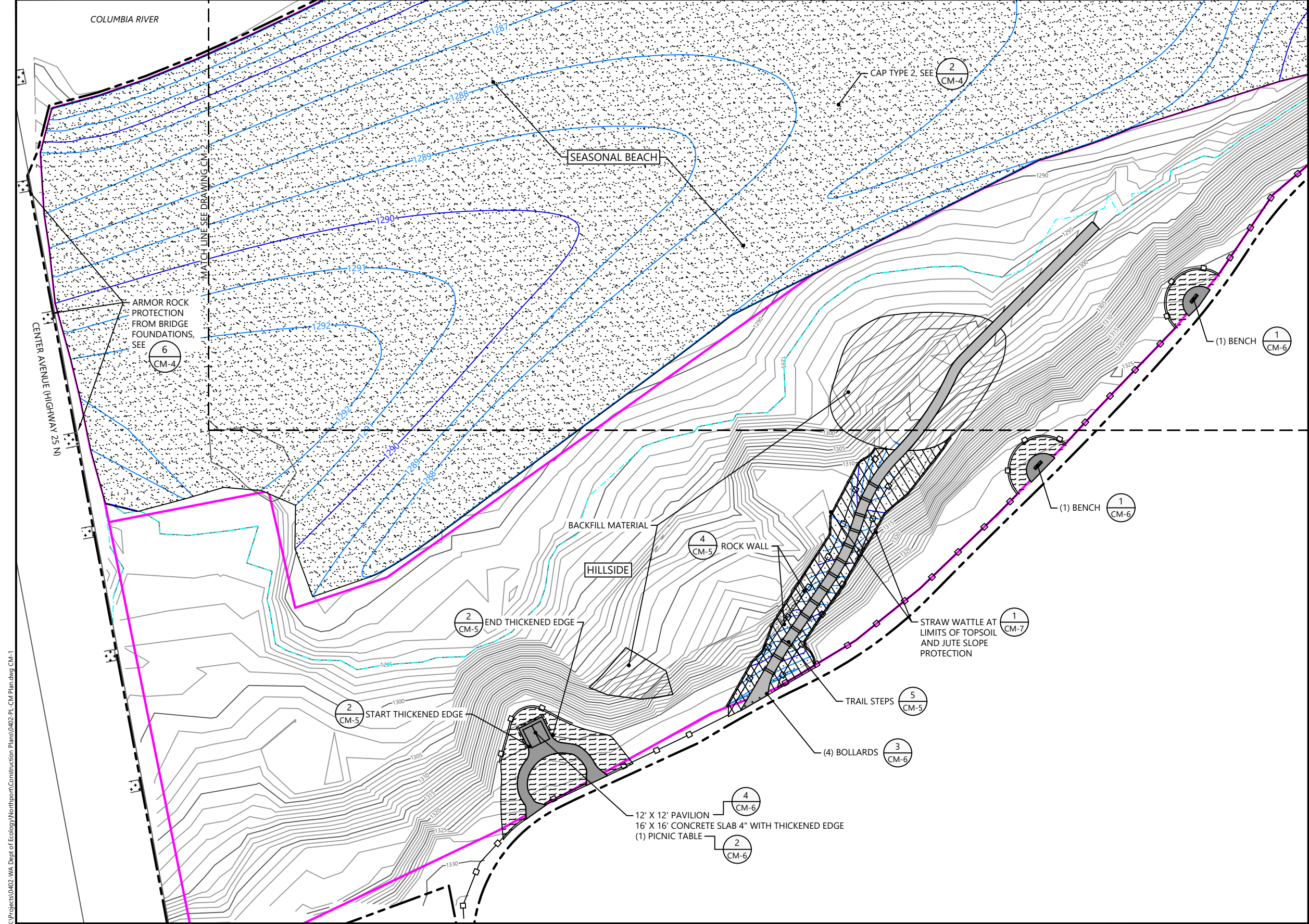
DESIGNED BY: C. WEE
 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

**NORTHPORT WATERFRONT
SEDIMENT CLEANUP**

GRADING SECTIONS (5 OF 5)

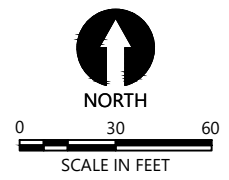
C-8

SHEET # 20 OF 29



- LEGEND:**
- 1280— EXISTING CONTOURS (1' & 5' INTERVALS)
 - 1280— FINISHED GRADE CONTOURS (1' & 5' INTERVALS)
 - - - - - APPROXIMATE OHWM (CLEANUP ACTION PLAN; ECOLOGY 2022)
 - LIMITS OF WORK
 - [Pattern] BACKFILL MATERIAL (7 CM-4)
 - [Pattern] CAP TYPE 2 MATERIAL
 - [Pattern] CONCRETE PAVING (1 CM-5)
 - [Pattern] GRAVEL PATHWAY (3 CM-5)
 - [Pattern] TOPSOIL (4 CM-7)
 - [Pattern] TOPSOIL WITH SLOPE PROTECTION (2 CM-7)
 - [Pattern] ARMOR ROCK
 - [Symbol] SPLIT RAIL FENCE (3 CM-7)
 - [Symbol] BOLLARDS
 - [Line] MANAGEMENT AREA

- NOTES:**
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD83, U.S. SURVEY FEET
 2. VERTICAL DATUM: NAVD88
 3. CONTRACTOR TO BACKFILL LIMITED EXCAVATION AREA TO RESTORE TO GRADE, AS DIRECTED BY ECOLOGY'S REPRESENTATIVE.



100% DESIGN: NOT FOR CONSTRUCTION

PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE" INCH SCALE ACCORDINGLY

K:\Projects\0402-WA_Dept of Ecology\Northport\Construction Plans\0402-PL-CM-Plan.dwg CM-1



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

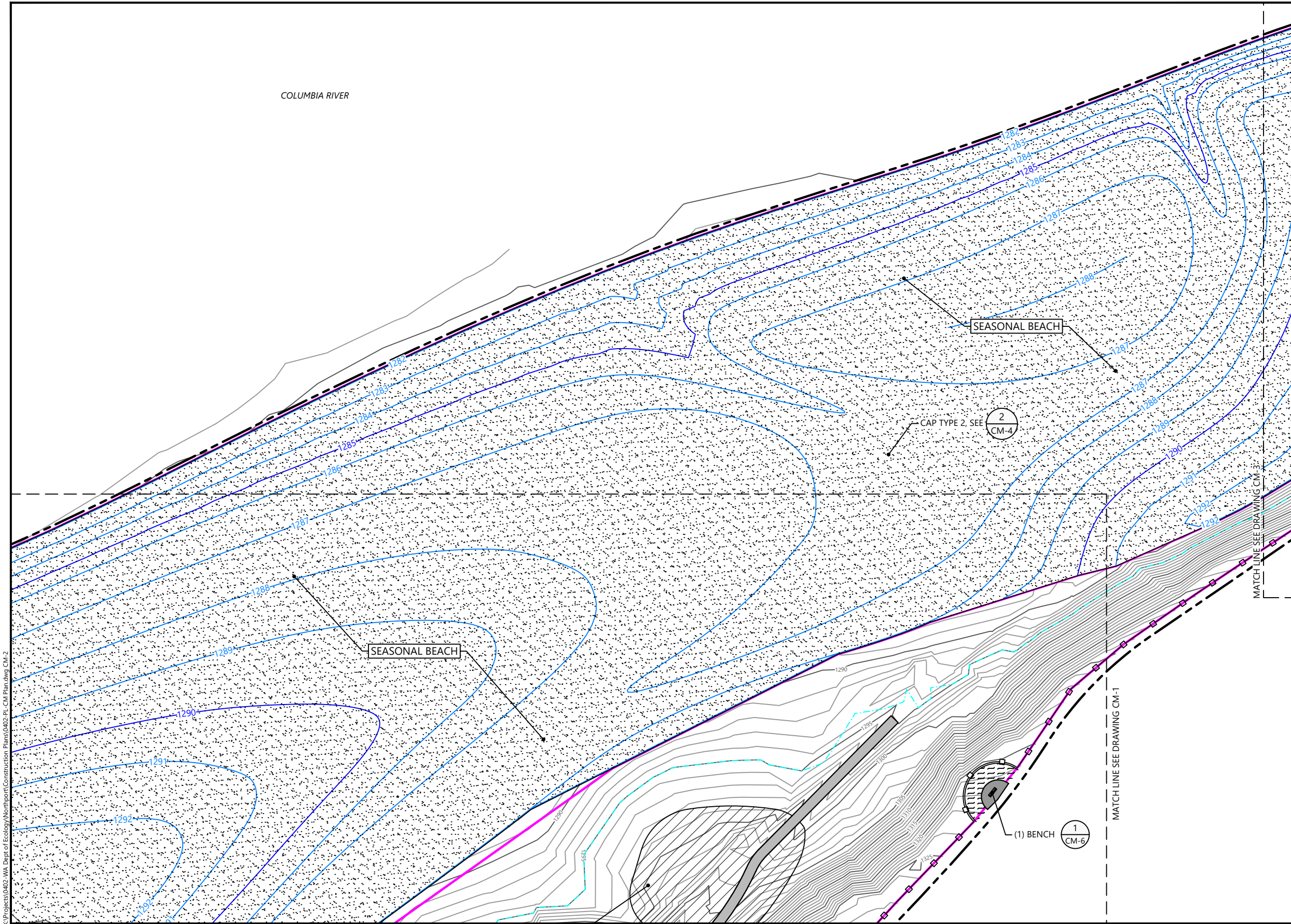
DESIGNED BY: C. WEE
 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

**NORTHPORT WATERFRONT
 SEDIMENT CLEANUP**

MATERIALS PLAN (1 OF 3)

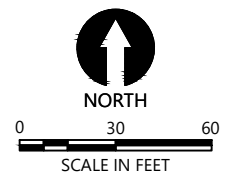
CM-1

SHEET # 21 OF 29



- LEGEND:**
- EXISTING CONTOURS (1' & 5' INTERVALS)
 - FINISHED GRADE CONTOURS (1' & 5' INTERVALS)
 - APPROXIMATE OHWM (CLEANUP ACTION PLAN; ECOLOGY 2022)
 - LIMITS OF WORK
 - CAP TYPE 2 MATERIAL
 - CONCRETE PAVING (1 CM-5)
 - GRAVEL PATHWAY (3 CM-5)
 - TOPSOIL (4 CM-7)
 - SPLIT RAIL FENCE (3 CM-7)
 - MANAGEMENT AREA

- NOTES:**
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD83, U.S. SURVEY FEET
 2. VERTICAL DATUM: NAVD88



100% DESIGN: NOT FOR CONSTRUCTION

K:\Projects\0402-1WA Dept of Ecology\Northport Construction Plans\0402-PL-CM-Plan.dwg CM-2

Aug 15, 2023 2:45pm rperle



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: C. WEE
 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

**NORTHPORT WATERFRONT
SEDIMENT CLEANUP**

MATERIALS PLAN (2 OF 3)

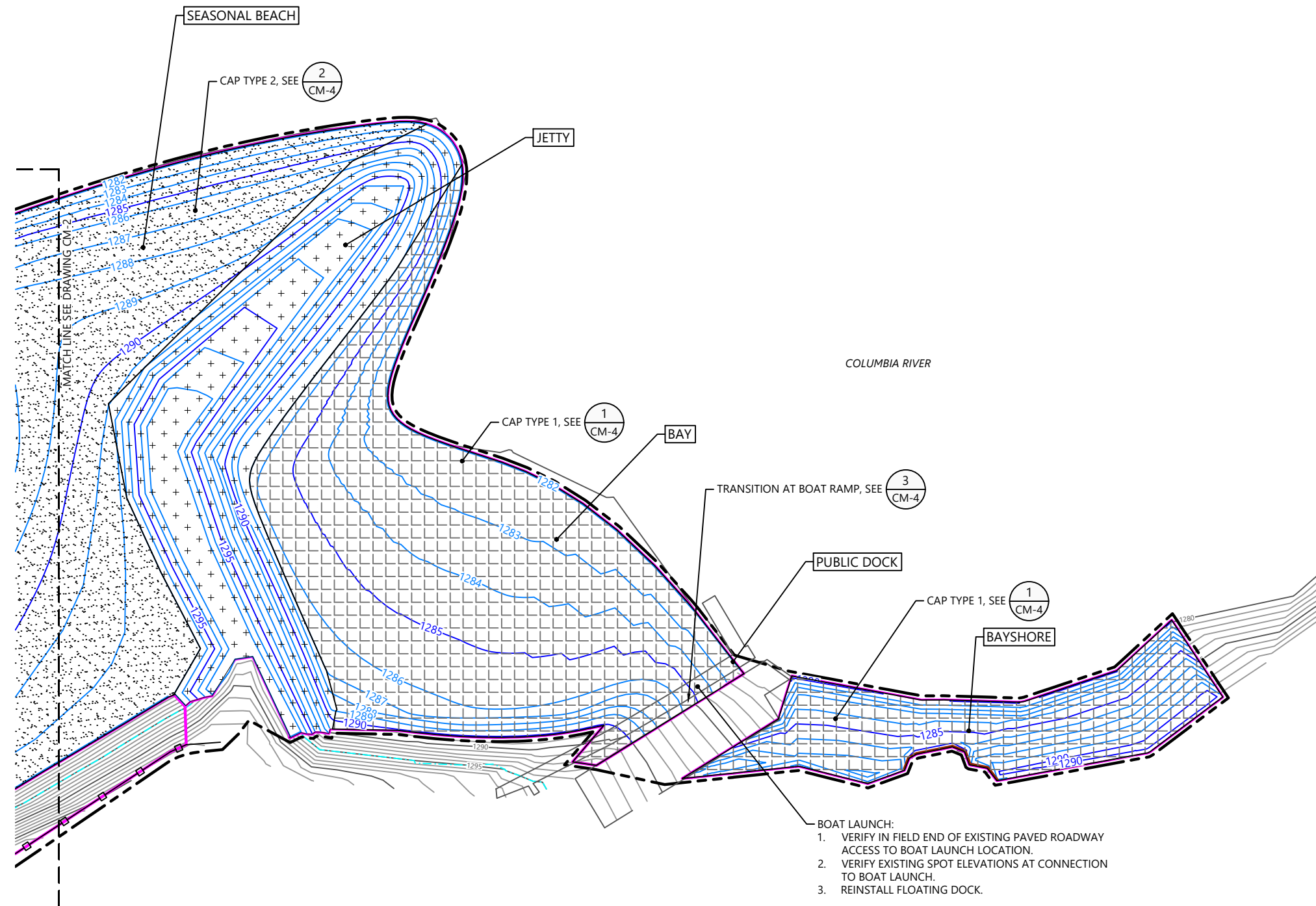
CM-2

SHEET # **22** OF **29**

PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE" INCH SCALE ACCORDINGLY

K:\Projects\0402-WA_Dept of Ecology\Northport\Construction Plans\0402-PL-CM-Plan.dwg CM-3

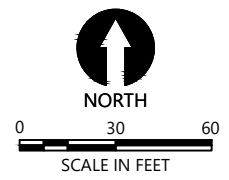
Aug 15, 2023 2:45pm rperle



- LEGEND:**
- 1280 EXISTING CONTOURS (1' & 5' INTERVALS)
 - 1280 FINISHED GRADE CONTOURS (1' & 5' INTERVALS)
 - APPROXIMATE OHWM (CLEANUP ACTION PLAN; ECOLOGY 2022)
 - LIMITS OF WORK
 - CAP TYPE 1 MATERIAL
 - CAP TYPE 2 MATERIAL
 - ARMOR ROCK (5 CM-4)
 - MANAGEMENT AREA

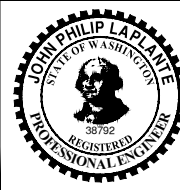
- NOTES:**
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD83, U.S. SURVEY FEET
 2. VERTICAL DATUM: NAVD88

- BOAT LAUNCH:**
1. VERIFY IN FIELD END OF EXISTING PAVED ROADWAY ACCESS TO BOAT LAUNCH LOCATION.
 2. VERIFY EXISTING SPOT ELEVATIONS AT CONNECTION TO BOAT LAUNCH.
 3. REINSTALL FLOATING DOCK.



100% DESIGN: NOT FOR CONSTRUCTION

PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE" INCH SCALE ACCORDINGLY



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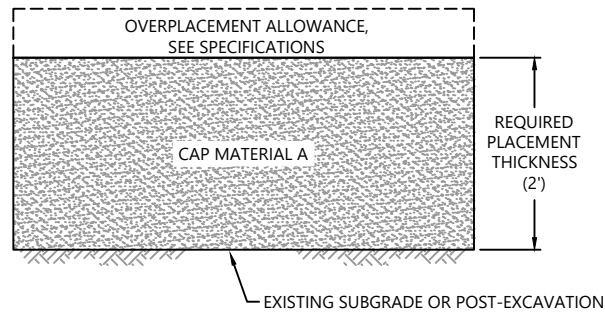
DESIGNED BY: C. WEE
 DRAWN BY: C. WEE/T. GRIGA
 CHECKED BY: K. GROSS
 APPROVED BY: J. LAPLANTE
 SCALE: AS NOTED
 DATE: AUGUST 2023

**NORTHPORT WATERFRONT
SEDIMENT CLEANUP**

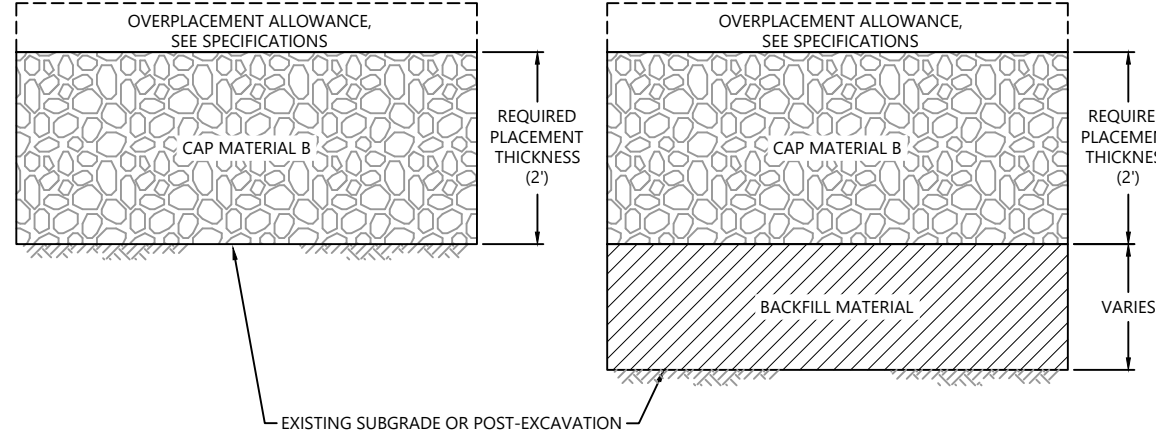
MATERIALS PLAN (3 OF 3)

CM-3

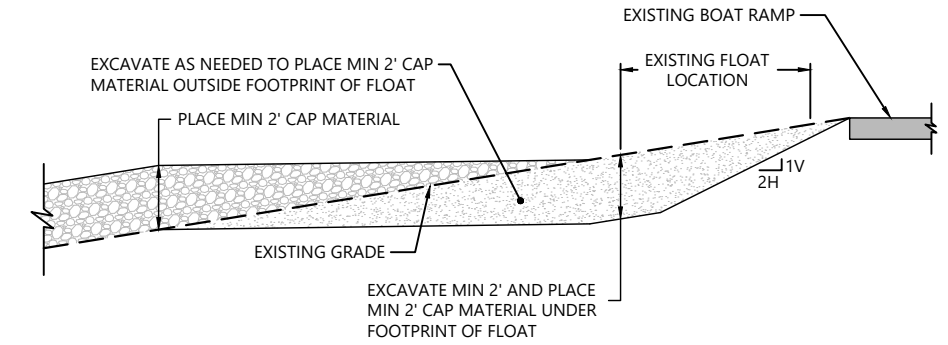
SHEET # **23** OF **29**



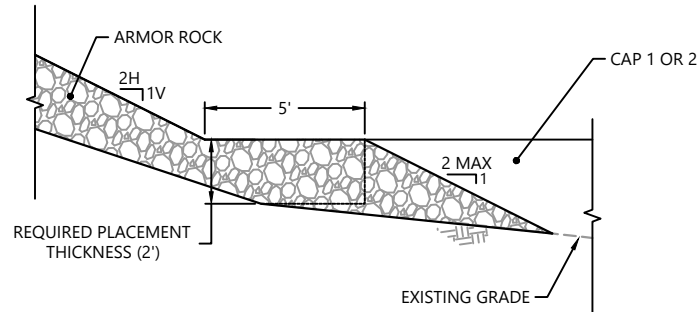
1 CAP TYPE 1 DETAIL
CM-3 SCALE: NTS



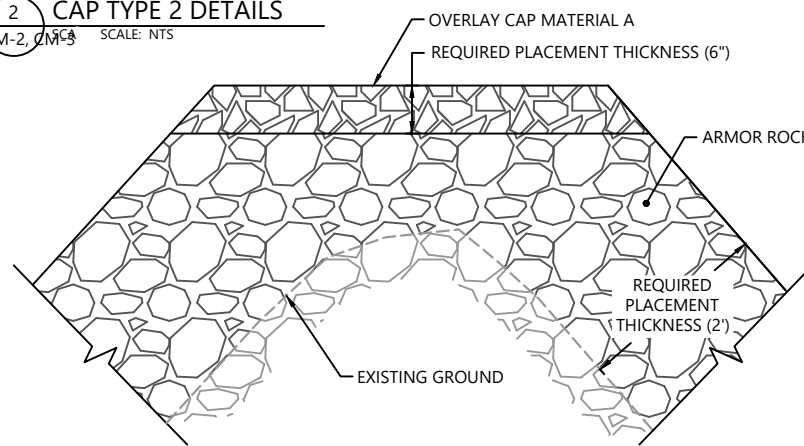
2 CAP TYPE 2 DETAILS
CM-1, CM-2, CM-3 SCALE: NTS



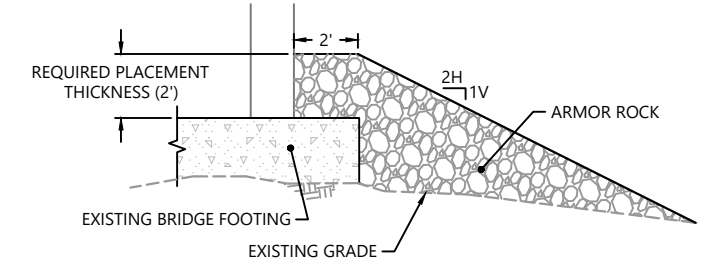
3 TRANSITION AT EXISTING BOAT RAMP
CM-3 SCALE: NTS



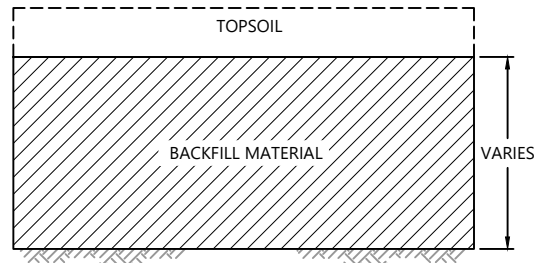
4 SELF-LAUNCHING TOE (TYPICAL)
CM-1 SCALE: NOT TO SCALE



5 JETTY DETAIL
SCALE: NTS



6 ARMOR ROCK PROTECTION FOR BRIDGE FOUNDATIONS
SCALE: NOT TO SCALE



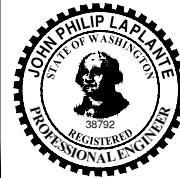
7 BACKFILL DETAIL
SCALE: NTS

NOTE:
SEE DWG CM-7 FOR TOPSOIL DETAIL.

PLAN INTENDED TO BE VIEWED
IN COLOR. ADJACENT BLOCK IS
"BLUE"
ONE INCH
AT FULL SIZE IF NOT ONE
INCH SCALE ACCORDINGLY

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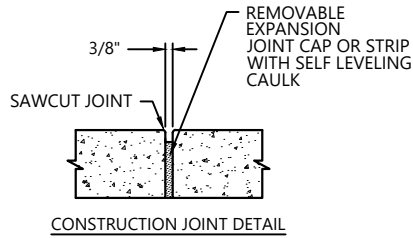
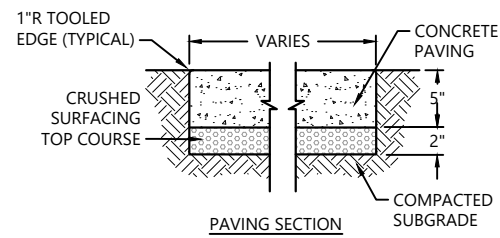
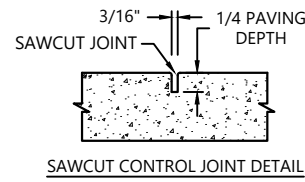
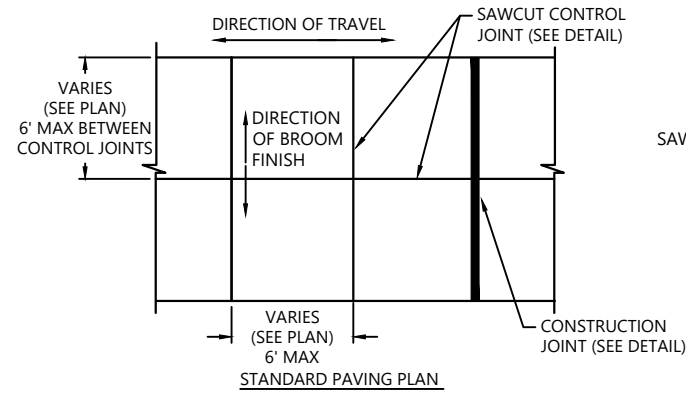


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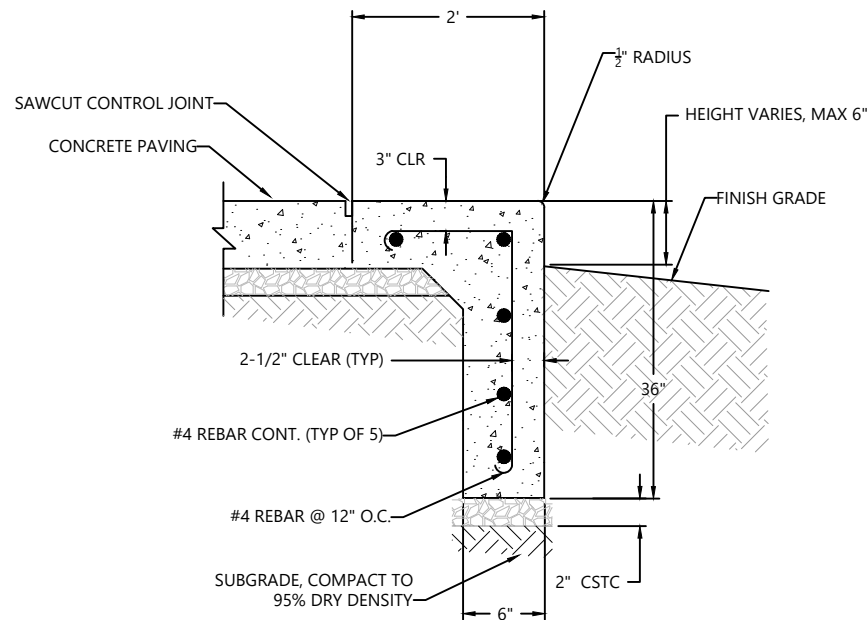
**NORTHPORT WATERFRONT
SEDIMENT CLEANUP**
CONSTRUCTION MATERIALS DETAILS (1 OF 4)

CM-4
SHEET # 24 OF 29

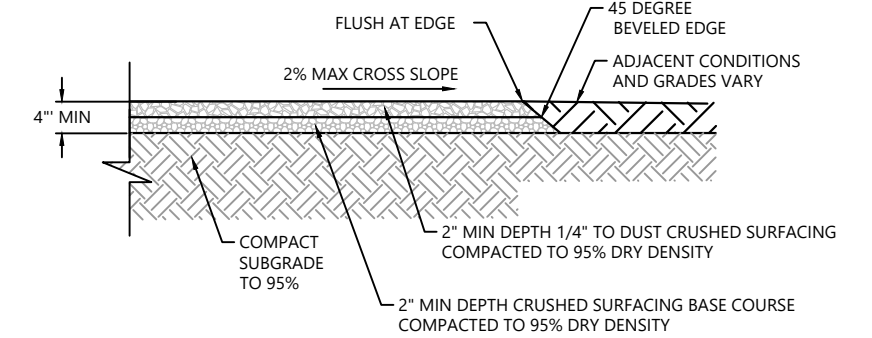


NOTE: CONCRETE PAVING SHALL INCLUDE FIBERMESH PER SPECIFICATIONS.

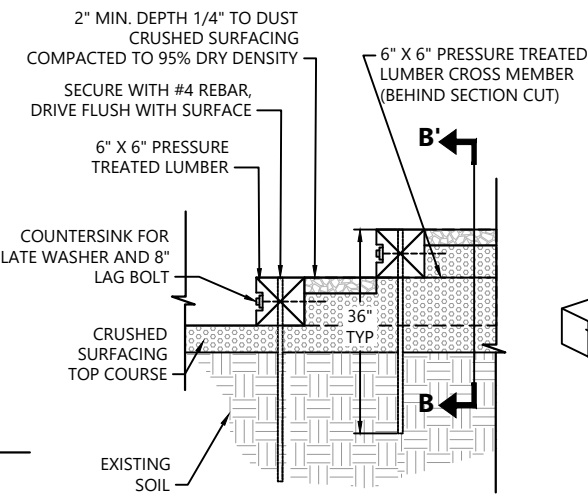
1 CONCRETE PAVING
CM-1, CM-2 SCALE: 1"=1"



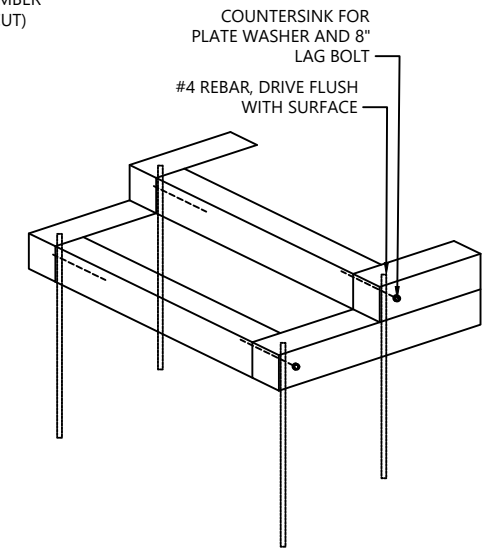
2 CONCRETE THICKENED EDGE
CM-1 SCALE: NOT TO SCALE



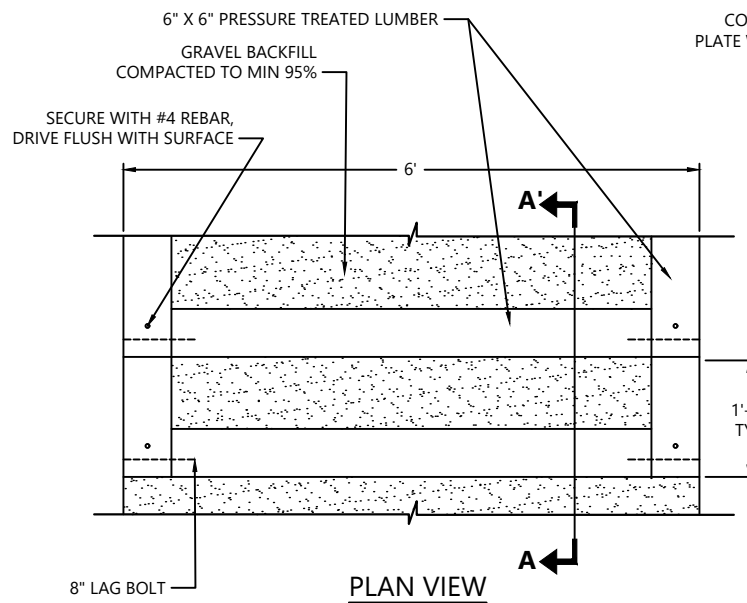
3 CRUSHED ROCK GRAVEL PATHWAY
CM-1, CM-2 SCALE: NOT TO SCALE



TYPICAL SECTION A-A'

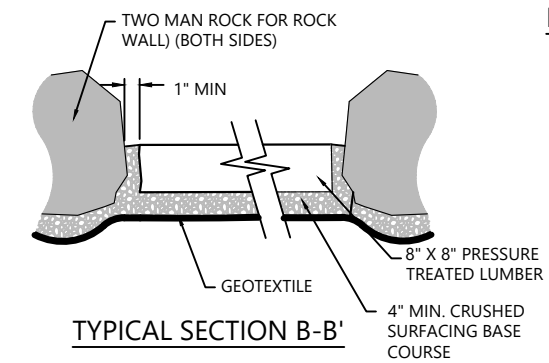


ISOMETRIC VIEW

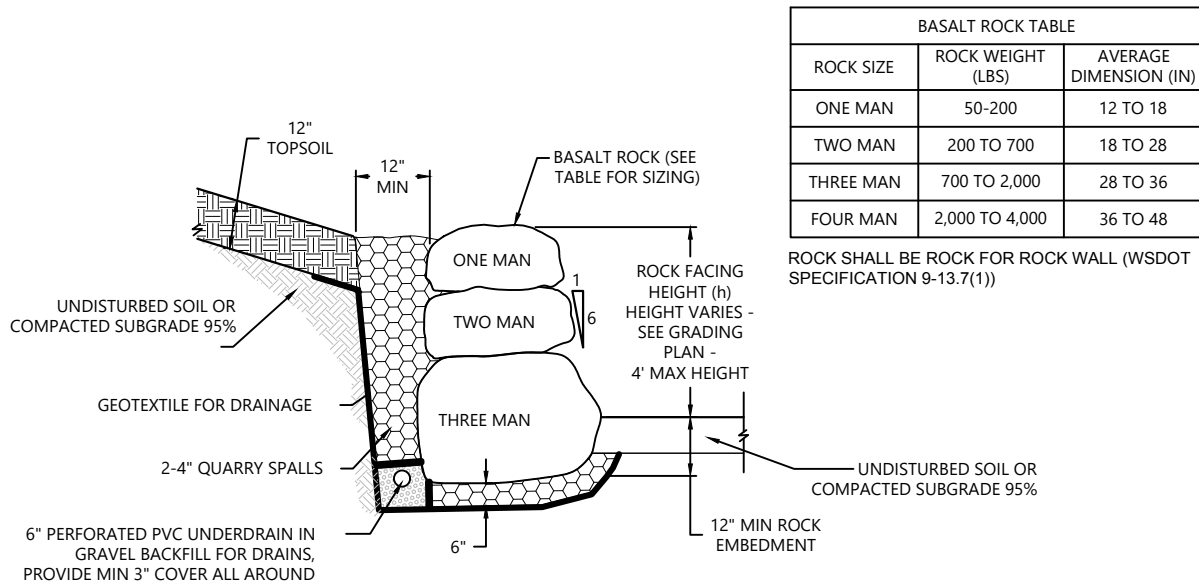


5 TRAIL STEPS
CM-1 SCALE: NOT TO SCALE

- NOTES:
- SEE DWG C-8 FOR TOP OF STAIR AND BOTTOM OF STAIR ELEVATION AND TREAD AND RISER COUNT
 - PLACE TWO-MAN ROCK AT 1" MIN AND 4" MAX ALONG STEPS IN ALL OTHER AREAS.



TYPICAL SECTION B-B'



4 BASALT ROCK WALL
CM-1 SCALE: NOT TO SCALE

BASALT ROCK TABLE		
ROCK SIZE	ROCK WEIGHT (LBS)	AVERAGE DIMENSION (IN)
ONE MAN	50-200	12 TO 18
TWO MAN	200 TO 700	18 TO 28
THREE MAN	700 TO 2,000	28 TO 36
FOUR MAN	2,000 TO 4,000	36 TO 48

ROCK SHALL BE ROCK FOR ROCK WALL (WSDOT SPECIFICATION 9-13.7(1))

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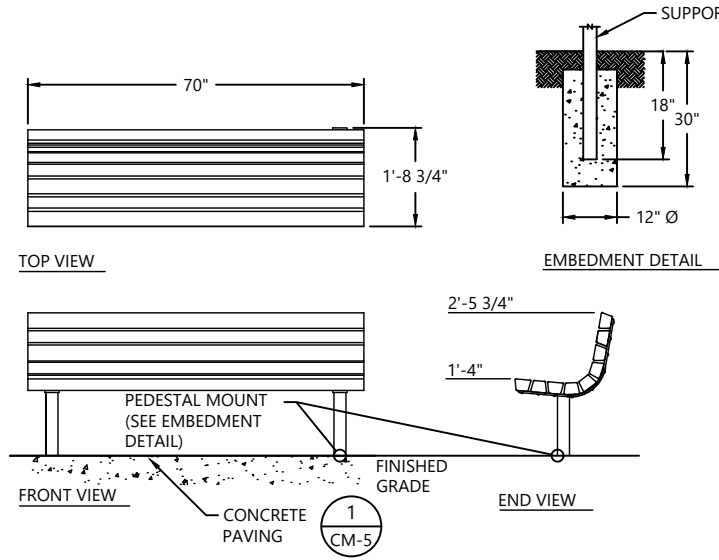
**NORTHPORT WATERFRONT
SEDIMENT CLEANUP**

CONSTRUCTION MATERIALS DETAILS (2 OF 4)

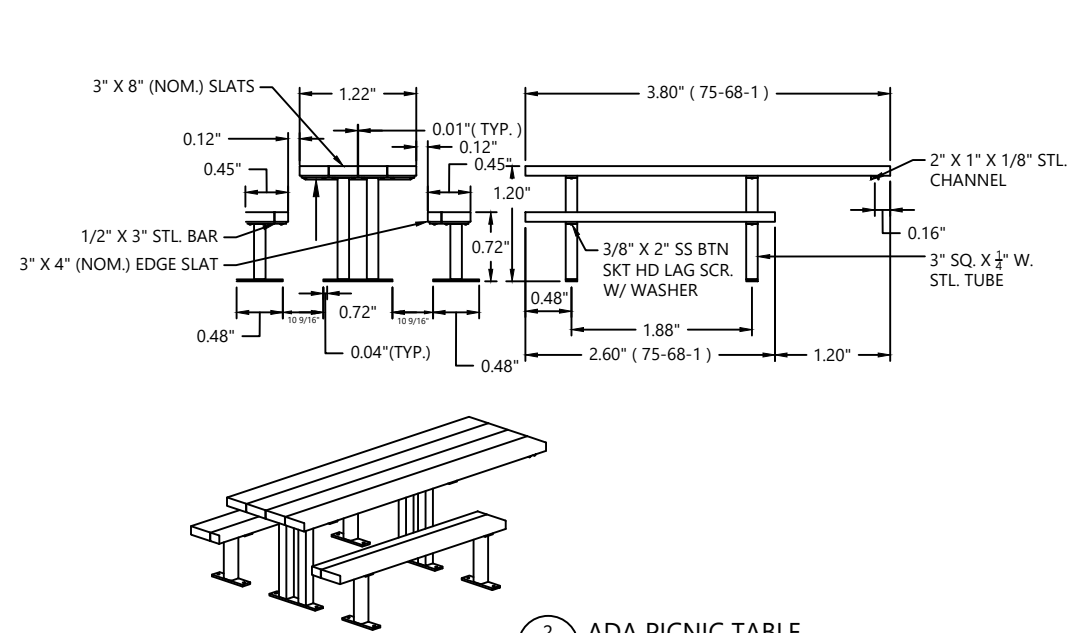
CM-5

SHEET # 25 OF 29

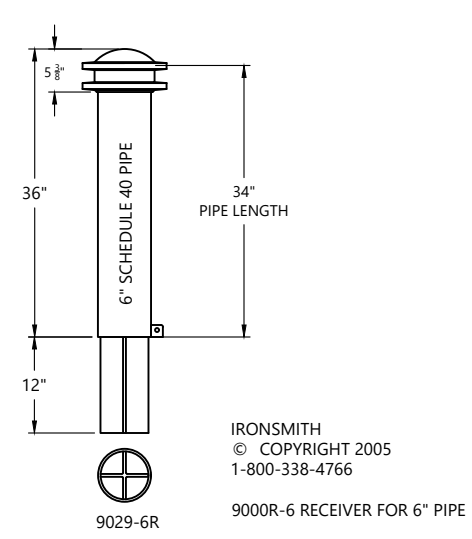
PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE" INCH SCALE ACCORDINGLY



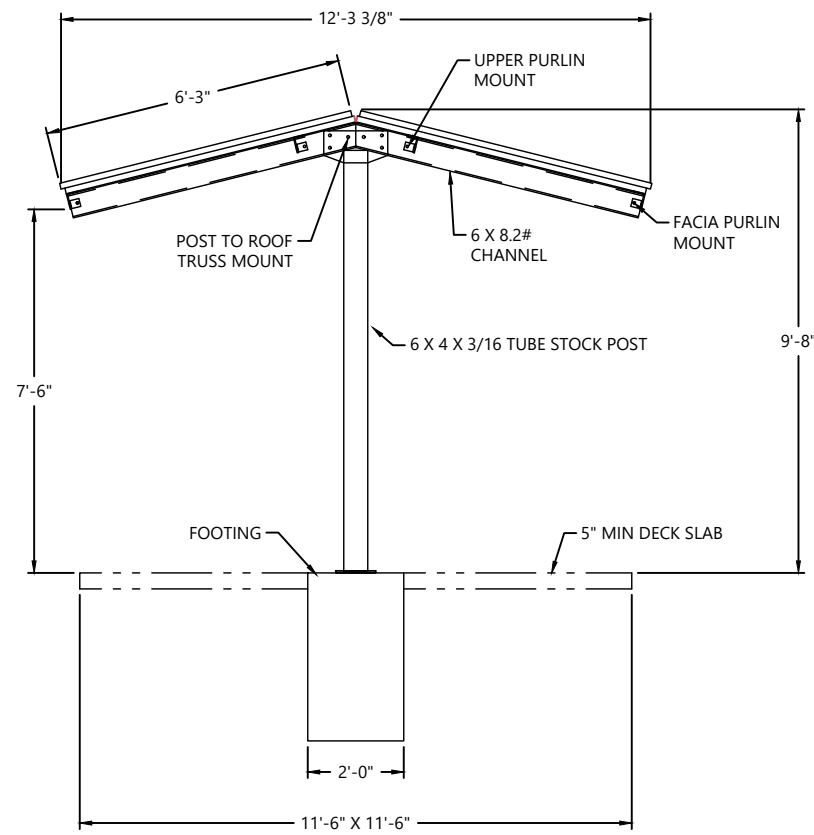
1 BENCH
CM-1, CM-5 SCALE: NOT TO SCALE



2 ADA PICNIC TABLE
CM-1 SCALE: NOT TO SCALE

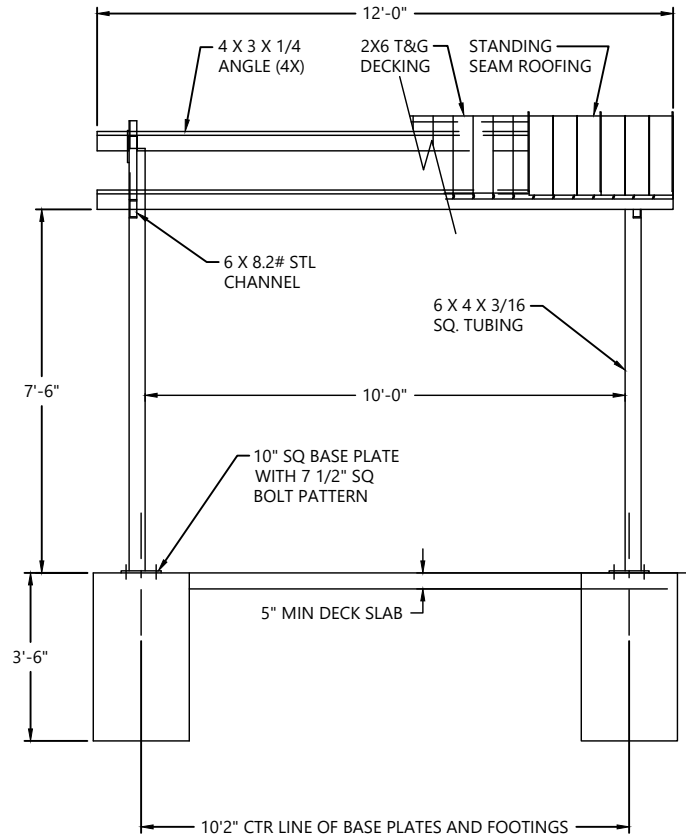


3 REMOVABLE BOLLARD
CM-1 SCALE: NOT TO SCALE



4 PAVILION
CM-1 SCALE: NOT TO SCALE

NOTE:
REFER TO SPECIFICATIONS FOR PRODUCT AND INSTALLATION DETAILS.



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IN COLOR. ADJACENT BLOCK IS
"BLUE"
ONE INCH
AT FULL SIZE IF NOT ONE
INCH SCALE ACCORDINGLY

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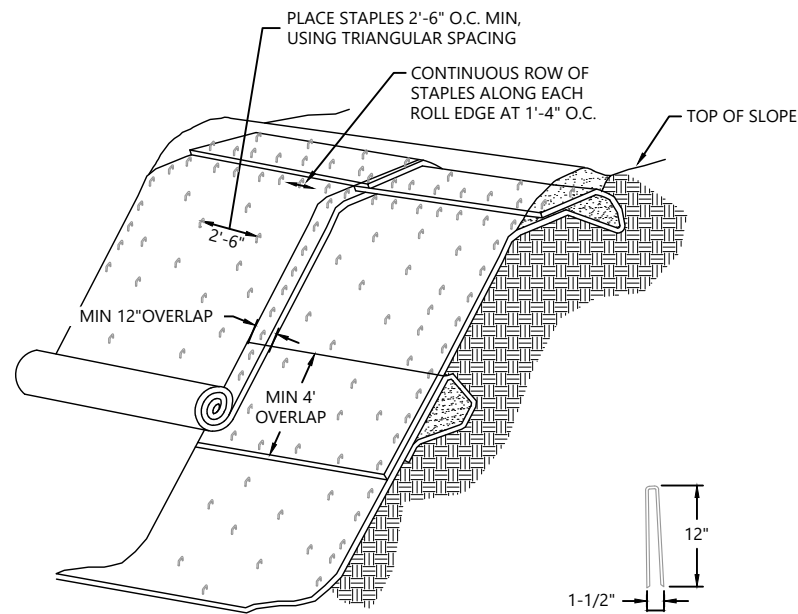
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**NORTHPORT WATERFRONT
SEDIMENT CLEANUP**

CONSTRUCTION MATERIALS DETAILS (3 OF 4)

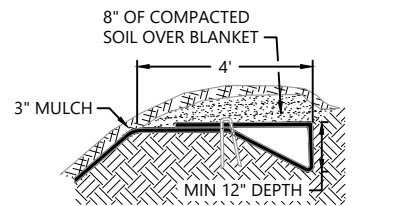
CM-6
SHEET # 26 OF 29

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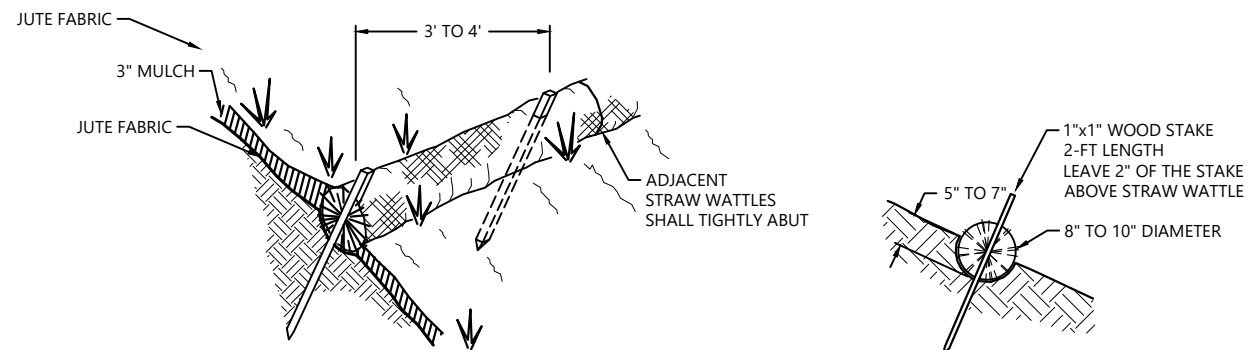


JUTE FABRIC INSTALLATION, TOP OF SLOPE ISOMETRIC VIEW
NOT TO SCALE

STAPLES



TOP OF SLOPE JUTE ANCHOR DETAIL



1 STRAW WATTLE DETAIL
CM-1 SCALE: NOT TO SCALE

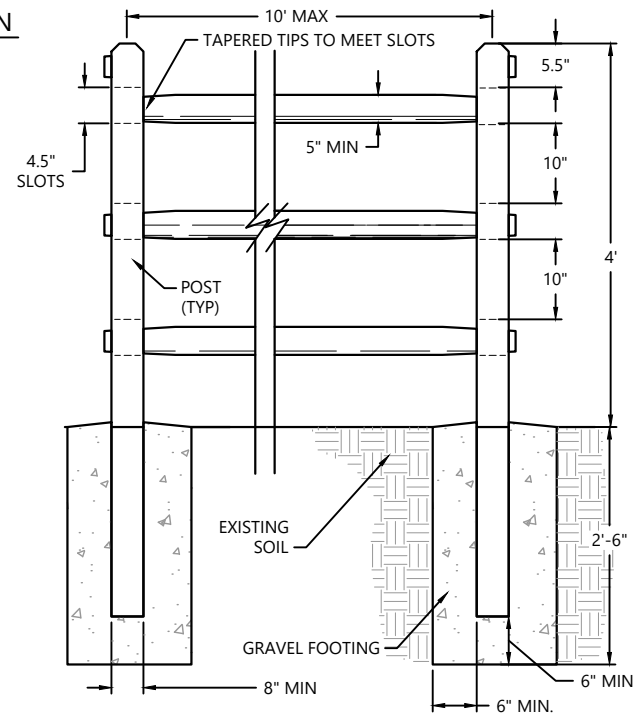
JUTE FABRIC NOTES:

1. SEE DWG CM-1 FOR JUTE MAT LOCATIONS.
2. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
4. MATS/BLANKETS SHOULD BE INSTALLED VERTICALLY DOWNSLOPE.
5. AVOID EXISTING TREES AND EXISTING STUMPS.
6. JUTE FABRIC SHALL BE ROLLED IN A CONTROLLED FASHION. INSTALL STAPLES AS MAT IS UNROLLED. FABRIC SHALL NOT BE ALLOWED TO ROLL DOWN THE SLOPE ON ITS OWN.

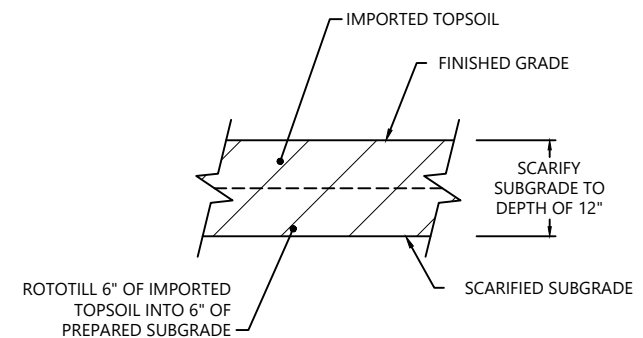
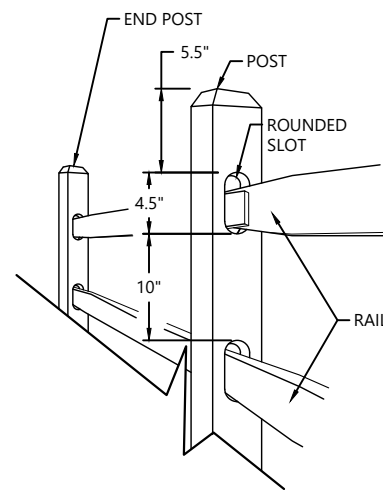
NOTES:

1. INSTALL STRAW WATTLES AT TERMINUS OF TOPSOIL AND SOIL PROTECTION AREAS SHOWN ON DWG CM-1.
2. RUN-OFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND INSTALLED STRAW WATTLE ROLL.
3. PLACE STRAW WATTLES OVER JUTE FABRIC.
4. EXCAVATE TRENCH FOR STRAW WATTLES INTO SLOPE PRIOR TO JUTE FABRIC INSTALLATION. TRENCH SHOULD BE 1/3 TO 2/3 THE DIAMETER OF THE WATTLE OR 5 TO 7 INCHES IN DEPTH.
5. DRIVE STAKES PERPENDICULARLY INTO SLOPE.
6. INSTALL WATTLES FROM BOTTOM OF SLOPE AND WORK UPWARD.

2 JUTE FABRIC SLOPE PROTECTION INSTALLATION
CM-1 SCALE: NOT TO SCALE



3 SPLIT RAIL FENCE
CM-1, CM-2 SCALE: NOT TO SCALE



4 TOPSOIL
CM-1 SCALE: 1"=1'

PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE"
ONE INCH AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY

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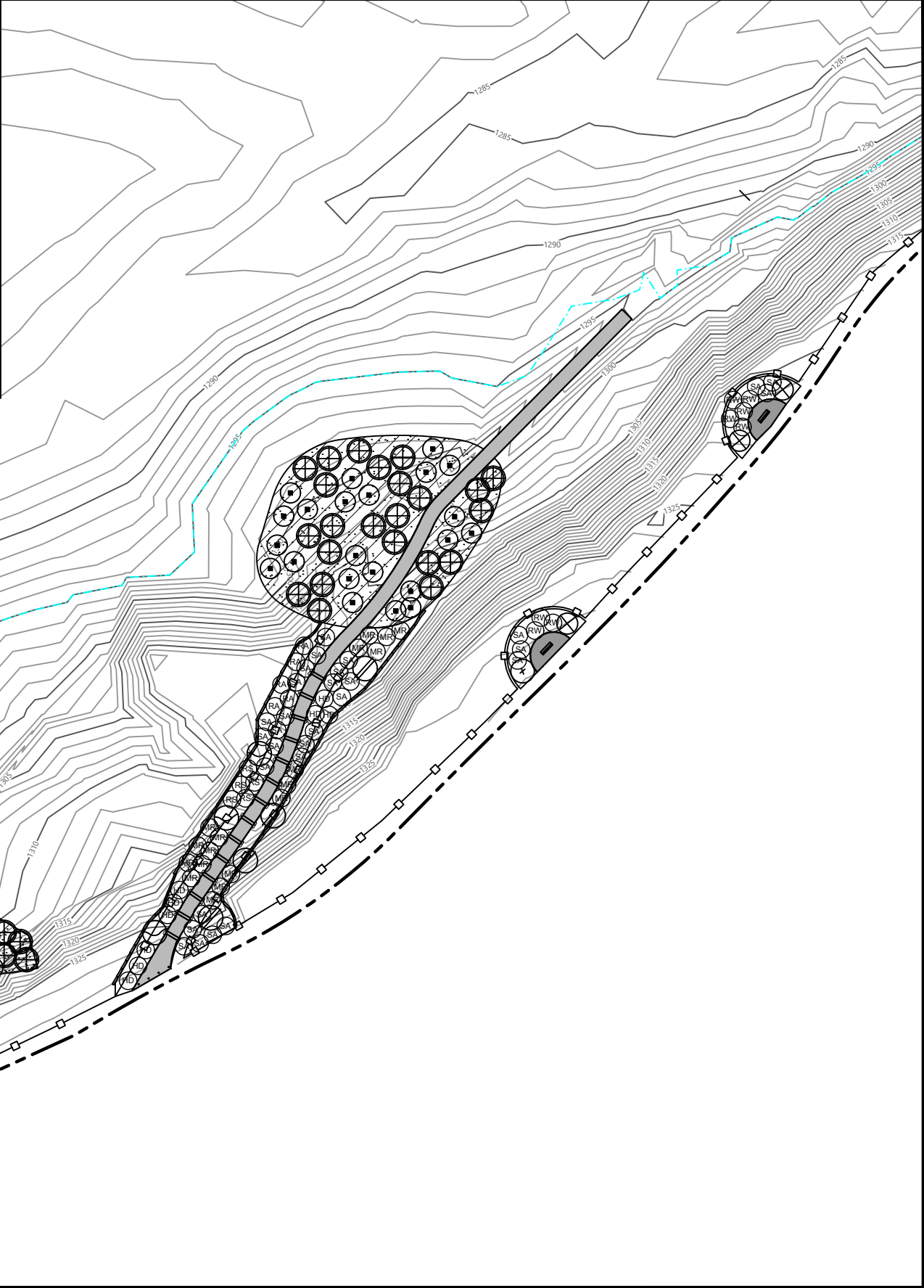
**NORTHPORT WATERFRONT
SEDIMENT CLEANUP**

CONSTRUCTION MATERIALS DETAILS (4 OF 4)

CM-7

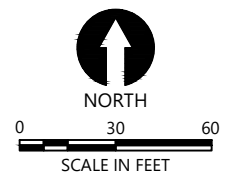
SHEET # 27 OF 29

PLANT SCHEDULE						
SPECIES NAME	COMMON NAME	SIZE	SPACING	QUANTITY	REMARKS	
UPLAND TREE						
	<i>Crataegus douglasii</i>	BLACK HAWTHORN	1" CALIPER	AS SHOWN	7	
	<i>Pinus ponderosa</i>	PONDEROSA PINE	5-6' HEIGHT	AS SHOWN	6	
	<i>Populus tremuloides</i>	QUAKING ASPEN	1-1/2" CALIPER	AS SHOWN	7	
	<i>Tsuga heterophylla</i>	WESTERN HEMLOCK	5-6' HEIGHT	AS SHOWN	8	
UPLAND SHRUBS						
	<i>Holodiscus discolor</i>	OCEANSPRAY	1 GAL	5' O.C.	30	
	<i>Ribes aureum</i>	GOLDEN CURRANT	1 GAL	5' O.C.	30	
	<i>Ribes sanguineum</i>	RED FLOWERING CURRANT	1 GAL	5' O.C.	30	
	<i>Rosa woodsii sanguineum</i>	PRAIRIE ROSE	1 GAL	5' O.C.	21	
	<i>Philadelphus lewisii</i>	MOCK ORANGE	1 GAL	5' O.C.	30	
	<i>Rhus glabra</i>	SMOOTH SUMAC	1 GAL	5' O.C.	28	
	<i>Symphoricarpos albus</i>	COMMON SNOWBERRY	1 GAL	5' O.C.	32	
	<i>Mahonia repens</i>	CREEPING OREGON GRAPE	1 GAL	5' O.C.	32	
CAP AREA PLANTING						
	<i>Populus trichocarpa</i>	BLACK COTTONWOOD	POLE	AS SHOWN	34	
	<i>Arbutus menziesii</i>	PACIFIC MADRONE	1 GAL	AS SHOWN	35	



- LEGEND:**
- EXISTING CONTOURS (1' & 5' INTERVALS)
 - PROPOSED CONTOURS (1' & 5' INTERVALS)
 - APPROXIMATE OHWM (CLEANUP ACTION PLAN; ECOLOGY 2022)
 - LIMITS OF WORK
 - CAP MATERIAL
 - CONCRETE PAVING
 - GRAVEL PATHWAY
 - SPLIT RAIL FENCE

- NOTES:**
1. HORIZONTAL DATUM: WASHINGTON STATE PLANE NORTH ZONE, NAD83, U.S. SURVEY FEET
 2. VERTICAL DATUM: NAVD88



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CENTER AVENUE (HIGHWAY 25 N)

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**NORTHPORT WATERFRONT
SEDIMENT CLEANUP**

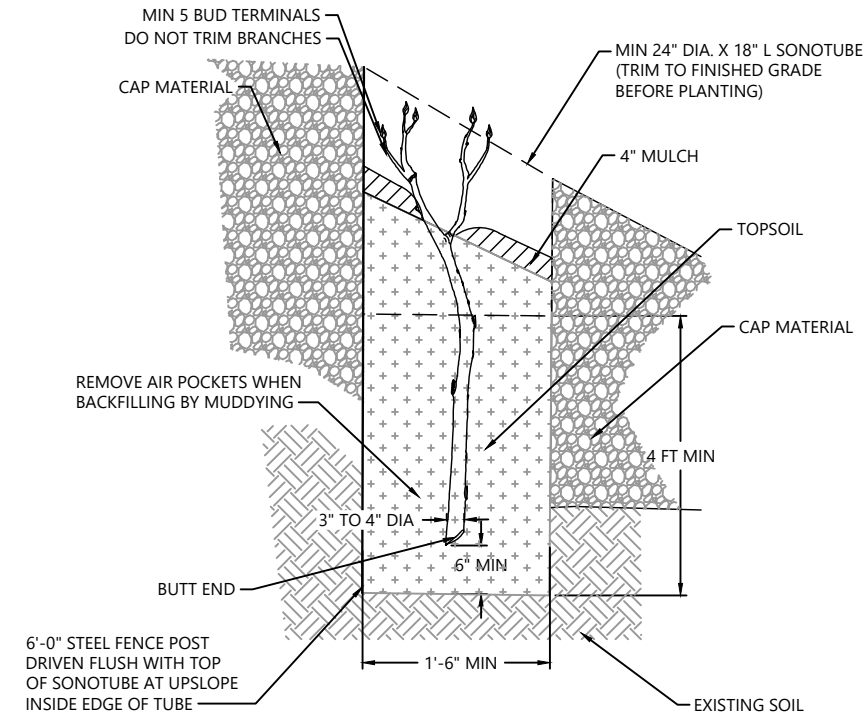
PLANTING PLAN

L-1

SHEET # **28** OF **29**

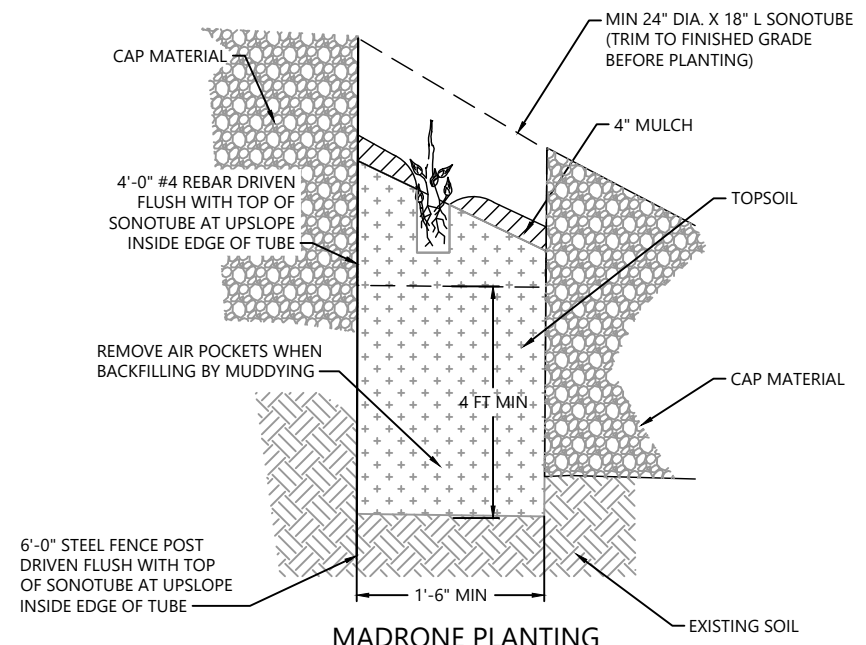
PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE" INCH SCALE ACCORDINGLY

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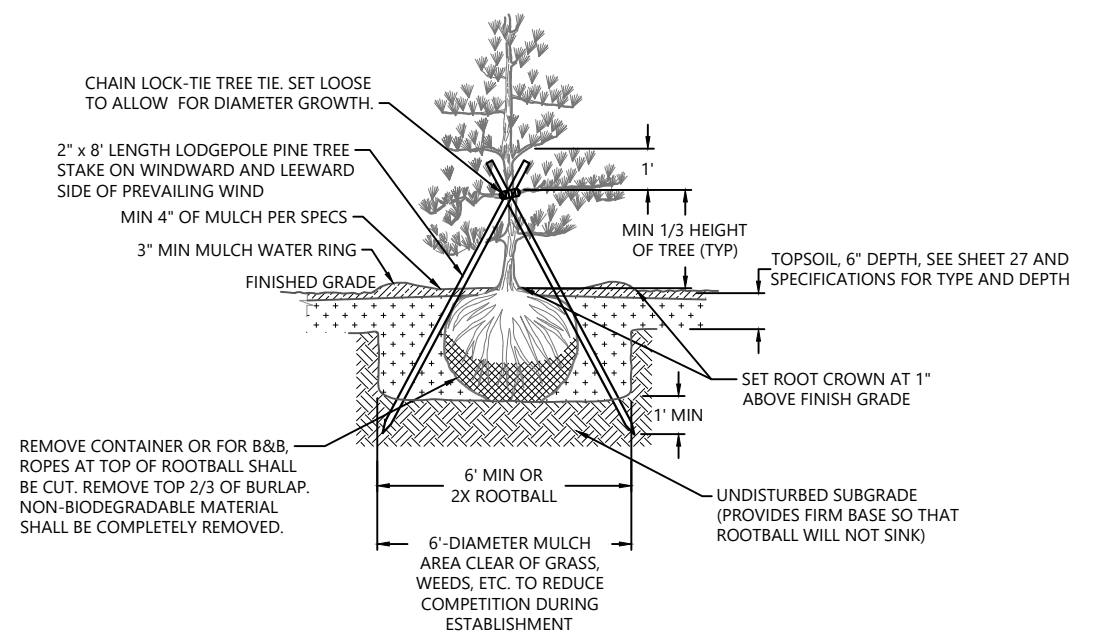


COTTONWOOD PLANTING
1 SONOTUBE PLANTING FOUNDATION
 SCALE: NOT TO SCALE

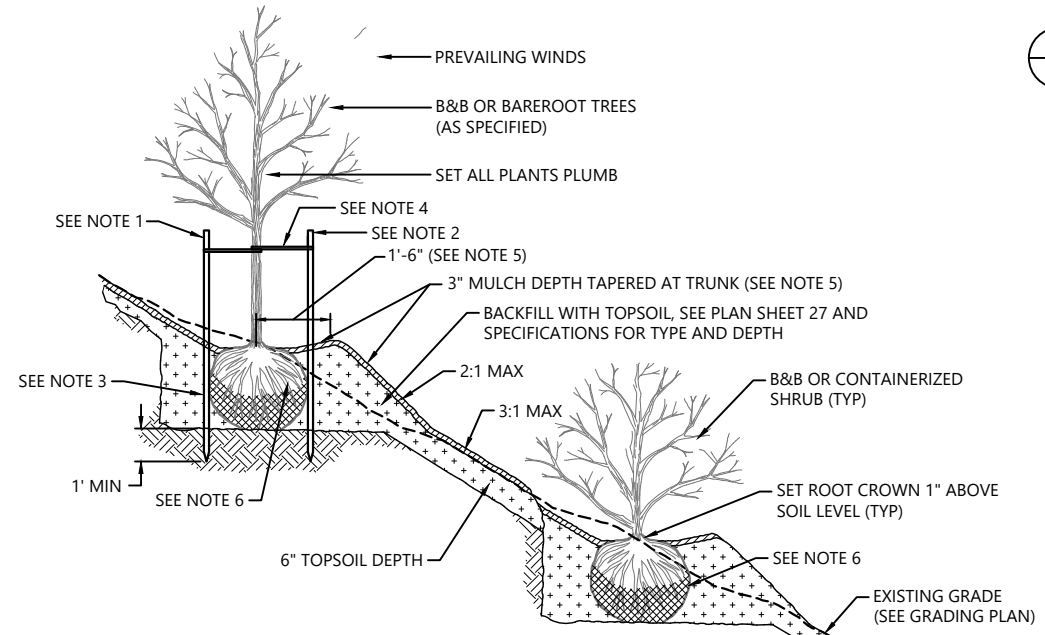
- NOTES:
1. SOAK POLES CONTINUOUSLY PRIOR TO PLANTING.
 2. THE POLE CUTTINGS SHALL EXTEND THROUGH THE VADOSE ZONE AND INTO THE PERMANENT WATER TABLE.
 3. AT LEAST 2/3 OF THE POLE SHOULD BE BELOW THE GROUND (AT LEAST 3 FEET).
 4. "MUDDYING": FILLING THE HOLE WITH WATER THEN SOIL TO MAKE A MUD SLURRY CAN REMOVE AIR POCKETS.
 5. USE STEEL BAR TO CREATE PILOT HOLES (FULL DEPTH) PRIOR TO INSTALLING POLES.



MADRONE PLANTING

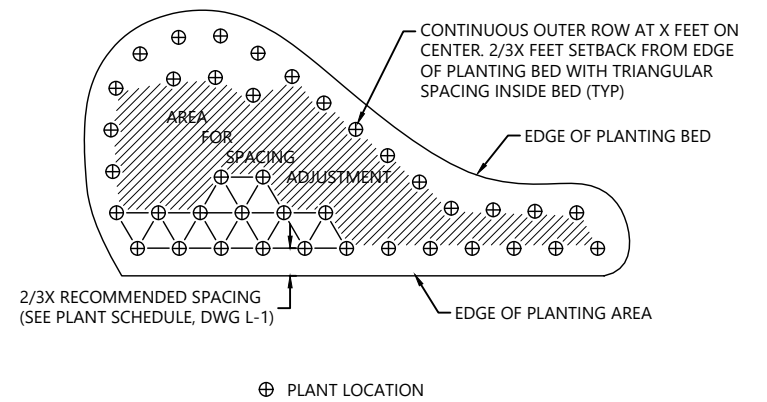


2 CONIFER TREE PLANTING AND STAKING DETAIL - SECTION
 SCALE: NOT TO SCALE



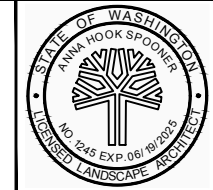
- NOTES:
1. STAKE TREES 2-INCH-DIAMETER LODGE POLE PINE OR DOUGLAS FIR STAKES.
 2. ONE STAKE PER TREE ON WINDWARD SIDE;
 3. SECOND STAKE ON LEEWARD SIDE.
 4. CHAINLOCK (OR EQUAL) TREE TIE. LOOP EACH TIE AROUND TREE LOOSELY TO PROVIDE 1-INCH SLACK FOR DIAMETER GROWTH.
 5. SHAPE SOIL TO PROVIDE 3-FOOT-DIAMETER OR ROOTBALL DIAMETER (WHICHEVER IS GREATER) WATERING RING.
 6. ROPES AT TOP OF ROOTBALL SHALL BE CUT. REMOVE TOP 2/3 OF BURLAP. NON-BIODEGRADABLE MATERIAL SHALL BE COMPLETELY REMOVED.

3 TREE AND SHRUB PLANTING ON SLOPE DETAIL - SECTION
 SCALE: NOT TO SCALE



4 SHRUB AND GROUNDCOVER PLANTING LAYOUT DETAIL - PLAN
 SCALE: NOT TO SCALE

100% DESIGN: NOT FOR CONSTRUCTION



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**NORTHPORT WATERFRONT
 SEDIMENT CLEANUP**

PLANTING DETAILS

L-2

SHEET # **29** OF **29**

PLAN INTENDED TO BE VIEWED IN COLOR. ADJACENT BLOCK IS "BLUE" INCH SCALE ACCORDINGLY

Appendix E
Construction Specifications

SECTION 01 10 00
SUMMARY

PART 1 – GENERAL

1.01 SUMMARY OF WORK

- A. The purpose of this project is to remediate sediment and soils at the Northport Waterfront Site (Site) contaminated, in part, by operations at the former Le Roi Smelter. Work at the Site includes implementation of temporary construction controls for safety and environmental protections; excavation, screening, stockpiling, transporting, and disposal of contaminated sediment and soils impacted by arsenic, lead, copper, and zinc above MTCA Method A and Method B Cleanup Levels (as applicable); importing and blending of reused aggregates for backfill; capping and grading areas where contaminated materials remain in place; resurfacing and safety improvements to the existing trail; creation of public access elements including ADA-accessible picnic area and seating area; native restoration planting and seeding (including maintenance period); and restoration of the properties to preconstruction conditions.
- B. Cleanup action will occur at five Management Areas (MAs) defined on the Construction Drawings (Appendix A01), including the Seasonal Beach MA, Jetty MA, Bay and Public Dock MA, Bayshore MA, and Hillside MA.
1. Seasonal Beach MA: A combination of removal and capping of contaminants will remove contaminated materials from areas with the greatest identified impacts from smelter waste and protect human and environmental health by capping remaining contaminated material.
 2. Jetty MA: The entire jetty will be capped to limit public exposure to contaminated material and ensure durability.
 3. Bay and Public Dock MA: The area around the dock will be excavated and capped, while the bay area will be capped to prevent exposure to contaminated sediments.
 4. Bayshore MA: The area will be mostly capped, with a small amount of excavation and replacement along the boat ramp to maintain level transition.
 5. Hillside MA: The area includes a combination of excavation and backfilling of contaminant hotspots and discouraging access to the hillside to minimize the potential for exposure.
- C. Work will be conducted during seasonal dry periods on a portion of the site inundated during other times of the year. The Contractor's work will need to be sequenced to account for low-water periods.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 10 00 – SUMMARY

- D. Access to the site requires crossing an active BNSF railroad, and work is adjacent to a public park owned by the Town of Northport. The Contractor shall coordinate access and accommodate access constraints presented by the presence of the railroad and public park.

1.02 BACKGROUND

- A. The former Le Roi Smelter operated from 1896 to 1921 and refined various ores. The smelter processed 500 tons of ore per day and directly discharged ‘slag’ the main byproduct to the Columbia River. Granulated slag in the form of sand-sized particles and slag aggregates were deposited along the Northport town waterfront. The waste slag contains metals including arsenic, lead, copper, and zinc that present potential risks to the human health and the environment.
- B. In addition to contaminants deposited from former smelter operations, contaminants have been deposited in the waterfront site from upstream sources.
- C. In 2004, the U.S. Environmental Protection Agency oversaw an emergency response action at the upland smelter area. Response actions included demolishing structures, excavating shallow contaminated soil, and consolidating and capping soil with a barrier layer and 1-foot gravel on site.

1.03 TIME FOR COMPLETION

- A. Contract Time and Substantial Completion: The project shall achieve Substantial Completion within 150 calendar days after the date of the Notice to Proceed. See Section 01 77 00 – **Closeout Procedures** for Substantial Completion requirements.
 - 1. Weekends and legal holidays work restrictions are accounted for and included in the contract time allowed for this project.
- B. Final Completion: The Contractor shall achieve Final Completion **60** calendar days from the date of Substantial Completion. See **Section 01 77 00 – Closeout Procedures** for Final Completion requirements.

1.04 LIQUIDATED DAMAGES AND ACTUAL DAMAGES

- A. If the Contractor fails to achieve Substantial Completion in the required contract time, the Contractor authorizes Ecology to deduct liquidated damages from project progress payments in the amount of \$500 per calendar day until Contractor achieves Substantial Completion.
- B. If the Contractor fails to achieve Final Completion within the time stipulated after Substantial Completion, the Contractor shall be subject to actual damages incurred by Ecology until Contractor achieves Final Completion.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 10 00 – SUMMARY

1.05 EXISTING CONDITIONS

- A. See Construction Drawings (**Appendix A01**) for approximate depiction of features, topography, and conditions.

1.06 PROPERTY ACCESS

- A. Ecology has acquired ownership, easement, and/or access agreements to the project site to facilitate the construction indicated on the Construction Drawings (A01). Access shall not occur through adjacent private properties except as approved by Ecology.
- B. It is the Contractor's responsibility to obtain at its expense, any additional area it requires and not previously identified by Ecology for use for the storage of materials, vehicles, temporary buildings, or similar requirements.
- C. Contractor shall make the final determination of access routes, subject to approval by Ecology. Contractor shall provide protective measures to protect all features, utilities and existing structures.
- D. All access and staging areas shall be protected from cross-contamination or contamination during material loading, or from other causes.

1.07 NOTIFICATION OF WORK AND WORK SCHEDULE

- A. Provide Ecology 7 calendar days advance notice before beginning excavation work.
- B. As described in Section 01 33 00 – Submittal Procedures, provide Ecology a property specific work schedule covering all work elements for each property, including boundary survey, preconstruction survey, site preparation, fencing installation, temporary erosion and sediment control (TESC) measure installation, excavation, Ecology testing period, post-excavation survey, backfill, installation of finishes, irrigation system testing, utility work and outages, final restoration, post-restoration survey, seeding/sodding, fencing removal, cleanup, and site maintenance. Provide the schedule as 1 page electronic pdf file with activities and dates clearly indicated in simple format. Include site address, and Ecology and Contractor project representatives contact name and contact information.
- C. Provide weekly schedule updates per Section 00 72 00 – General Conditions and Section 01 33 00 – Submittal Procedures.
- D. Surveying must be completed and documentation submitted prior to beginning excavation.

1.08 PROJECT WORK HOURS / NOISE

- A. General: The Contractor shall determine their work schedule for completing the work at the various properties under the following conditions:

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 10 00 – SUMMARY

1. Working Days, Hours and Noise:
 - a. Weekdays only (Monday through Friday). No work is permitted during weekends or legal holidays as defined by the State of Washington Department of Revenue except for response to emergencies, TESC and SWPPP requirements, or required maintenance activities including watering. Project work on weekends, if necessary, requires prior written approval from Ecology.
 - b. Equipment operation only between the hours of 7:00 am and 7:00 pm
- B. In-Water Work Periods Construction Timing
 1. Construction will occur “in the dry” when exposure of the main channel edge is at a minimum elevation of approximately 1,280 feet North American Vertical Datum of 1988.
 2. Construction activities shall occur using land-based equipment operating above the waterline.
 3. Construction Windows
 - a. Fall low water: Typically September through November
 - b. Spring low water: Typically March through May
 - c. Water levels vary daily and have been observed to change as much as 2 feet in a single day on site. Water levels are controlled by upstream flow volumes at the International Border and by the downstream water surface elevation at Grand Coulee Dam.

1.09 CULTURAL RESOURCES

- A. The following properties (listed by Site Code) will have a cultural resources observer (paid for by Ecology) present on site during excavation activities.
 1. 45ST568
 2. 45ST682
- B. Ecology may have a cultural resources observer on other sites to observe excavation work, excavated soils, and subgrades.
- C. The Contractor shall notify Ecology 3 working days in advance of conducting any excavation work or backfill work that covers subgrades, so that Ecology can arrange for the cultural resource’s observer.
- D. The Contractor shall stop excavating as directed by the cultural resources observer to allow the observer to observe and/or sample excavated soils or exposed subgrade.
- E. There always exists the potential for unanticipated discoveries during excavation work. Contractors, workers and Ecology must be aware of clues that signify a

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 10 00 – SUMMARY

potential discovery and what actions must be taken to protect discovery. The mandatory cultural resource training will be provided to all Contractor's personnel before excavation begins. Ecology will provide training. Assume 30 minutes of training for Contractor crew.

F. Unanticipated Discovery Procedures:

1. If artifacts or evidence of buried features, or potential human remains are discovered during construction, cease work and follow the provisions of the Inadvertent Discovery Plan (Appendix A02).

1.10 PROJECT DRAWINGS

- A. Construction Drawings – **See Appendix A01.**

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01 10 00

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 20 00 – PRICE AND PAYMENT PROCEDURES

SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES

PART 1 – GENERAL

1.01 RELATED SECTIONS

- A. The provisions and intent of the Contract, including the **Section 00 72 00 – General Conditions** and **Section 00 73 00 – Supplemental Conditions** apply to this work as if specified in this section. Work related to this section is described throughout these Specifications.
- B. Individual submittals are required in accordance with the pertinent sections of these Specifications.

1.02 PAYMENT PROCEDURES

- A. “Pencil Copies” of the monthly Application for Payment shall be presented to Ecology or Ecology’s Representative not more than three (3) days prior to the anticipated submittal of the “formal” Application for Payment. The Contractor shall hold a meeting with Ecology or Ecology’s Representative, required subcontractor representatives to discuss the quantities to be included in the Application for Payment for the respective month. Upon agreement of the quantities performed, the Contractor shall complete the Application for Payment for submittal.
- B. The Application for Payment shall clearly identify the work performed for the given time period based on a percentage of work completed for Lump Sum bid items and actual quantities installed for unit price items.
- C. Prior to submitting the Application for Payment to Ecology, the Contractor and Ecology or Ecology’s Representative shall review the work accomplished to agree upon percentage of Work completed using the project’s Schedule of Values.
- D. Following review, the Contractor shall prepare an original Application for Payment with complete supporting documentation attached and submit electronically (preferred method in support of Ecology’s “Green” contracting practices) to the attention of James Peterson, Ecology Contracts Officer. The pay estimate shall be emailed to:

Email: jimp416@ecy.wa.gov

- E. The Ecology Contracts Officer will review the amount invoiced to verify costs are in accordance with the Ecology Project Manager’s recommendations, authorized scope of work, proposed rates, and the terms and conditions of the Contract. Once verified, the Ecology Contracts Officer approves the Application for Payment and forwards to Ecology’s finance department for processing. Payments for approved Applications for Payment shall be made within thirty (30) days of receipt by the Ecology Contracts

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 20 00 – PRICE AND PAYMENT PROCEDURES

Officer, unless the Application for Payment has been returned to the Contractor for revision(s) and resubmittal. Applications for Payment requiring revision(s) will be returned to the Contractor per Article 6.04 Progress Payments of **Section 00 72 00 – General Conditions**.

1.03 PRICING PROCEDURES

- A. Pricing for the various Lump Sum or unit prices in the Bid Form, as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of work being described, as necessary to complete the various items of the work in accordance with the requirements of the Contract Documents.
- B. Pricing also includes all costs of compliance with the regulations of public agencies having jurisdiction, including safety and health requirements of the Division of Occupational Safety and Health (DOSH) of the Washington State Department of Labor and Industries and the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA).
- C. No separate payment will be made for any item that is not specifically set forth in the Bid Form, and all costs therefore shall be included in the prices named in the Bid Form for the various appurtenant items of work.
- D. All other work not specifically mentioned in the measurement and payment sections identified below shall be considered incidental to the work performed and merged into the various unit and Lump Sum prices bid. Payment for work under one item will not be paid for under any other item.
- E. Ecology reserves the right to make changes should unforeseen conditions necessitate such changes. Where work is on a unit price basis, the actual quantities occasioned by such changes will govern the compensation.

1.04 MEASUREMENT AND PAYMENT

- A. Measurement and payment shall be in accordance with the schedules below and shall be based upon Lump Sum/Known Quantity bid items as stipulated in the Bid Form. Payment shall be considered full compensation for furnishing all labor, materials and equipment to complete the Work specified, to include all direct, indirect and overhead costs, and profit.
- B. Trench Excavation Safety Provisions: If any of Lump Sum or Unit Price Bid Item contains any work which requires trenching exceeding a depth of four feet, all costs for trench safety shall be included in the appropriate Bid items for adequate trench safety systems as necessary, in compliance with Chapter 39.04 RCW, 49.17 RCW and WAC 296-155-650.
- C. In measuring all acceptably completed items of work, Ecology will:

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 20 00 – PRICE AND PAYMENT PROCEDURES

1. Use United States standard measure;
 2. Make all measurements as described in this section, unless individual specifications require otherwise;
 3. Follow methods generally recognized as conforming to good engineering practice;
 4. Conform to the usual practice of carrying measurements and computations to the proper significant figure or fraction of units for each item; and
 5. Measure horizontally or vertically (unless otherwise specified).
- D. The terms listed below shall be defined as follows in all measurements under this section:
1. “Acre”: area equal to 43,560 square feet.
 2. “Cubic Yard (CY)”: volume of material equal to 27 cubic feet.
 3. “Gallon”: measurement shall be in U.S. gallons, as measured by the licensed disposal facility at the time of disposal.
 4. “Hour”: hourly rate for equipment and personnel, including fees, taxes, and any other incidentals. Prevailing wage rates shall apply for the work in this Contract.
 5. “Linear Foot”: measured parallel to the structure’s base or foundation, unless the Drawings require otherwise.
 6. “Lump Sum” (when used as an item of payment): complete payment for the work described for that item in the Contract. Lump Sum payments also may be made based on percent of completion. Minor adjustments to the work shall be assumed to be incidental with regard to global Lump Sum work items such as health and safety, survey, mobilization, and other similar items.
 7. “Ton”: 2,000 pounds of weight.
- E. For each item listed below, Ecology will use the method of measurement described.
1. Standard Manufactured Items: measured by the manufacturer’s identification gage, unit weight, section dimension, etc. Ecology will accept manufacturing tolerances set by each industry unless cited specifications require more stringent tolerances.
- F. No measurement will be made for:
1. Work performed or materials placed outside the Limits of Work shown in the Drawings or set by Ecology;
 2. Materials wasted, used or disposed of in a manner contrary to the Contract;
 3. Rejected materials (including those rejected after placement if the rejection resulted in the Contractor’s failure to comply with the Contract);
 4. Hauling and disposing of rejected materials;

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 20 00 – PRICE AND PAYMENT PROCEDURES

5. Material remaining on hand after the work is completed; or
 6. Any other work or material contrary to any Contract provision.
- G. Lump Sum/Known Quantity, any alternate bid items, and any Unit Price Bid items are identified in **Section 00 41 43 – Summary of Pay Items and Quantities**.
- H. **Section 00 41 43 – Summary of Pay Items and Quantities** identifies basis of bid quantities provided by Ecology for specific items of work for use in the preparation of bids for this project. The basis of bid quantities is estimated quantities for the work described. After Contract award, as work progresses on the project, there may be underruns or overruns in the basis of bid quantities provided by Ecology which result in an adjustment (either an increase or decrease) to the Contract amount. This adjustment to the Contract amounts due to changes in the basis of bid quantities will be negotiated in accordance with **Section 00 72 00 – General Conditions, Part 7 – Changes**.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01 20 00

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 26 13 – REQUEST FOR INFORMATION (RFI)

SECTION 01 26 13
REQUEST FOR INFORMATION (RFI)

PART 1 – GENERAL

1.01 GENERAL

- A. Request for Information: A document submitted by the Contractor requesting clarification of a portion of the Contract Documents, hereinafter referred to as an RFI.
- B. Should the Contractor be unable to determine from the Contract Documents the exact material, process or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of Work is described differently at more than one place in the Contract Documents; the Contractor shall request Ecology make an interpretation of the requirements of the Contract Documents to resolve such matters. The Contractor shall comply with procedures specified in this Section to make Requests for Information.
- C. The Contractor shall prepare and maintain a log of RFIs. At any time requested by Ecology, the Contractor shall furnish copies of the log showing all outstanding RFIs.

1.02 SUBMITTALS

- A. RFIs shall be prepared and submitted in accordance with the following:
 - 1. RFIs shall be provided in writing to Ecology by the Contractor using the form found in Appendix D01.
 - 2. Each RFI shall be given a discrete, consecutive number.
 - 3. Each page of the RFI and each attachment to the RFI shall bear the Project name, date, RFI number, and a descriptive title.
 - 4. Each RFI should contain a clear and legible statement of the Work element where interpretation is requested, including specific reference(s) to the pertinent Sections and paragraphs of the Project Documents.
 - 5. The RFI statement shall clearly state the reasons why the RFI is being submitted by the Contractor.
 - 6. Contractor shall sign all RFIs attesting to good faith effort to determine from the Contract Documents the information requested for interpretation.
 - 7. Contractor shall be responsible for delays resulting from the necessity to resubmit an RFI due to insufficient or incorrect information presented in the RFI.
- B. Contractor shall carefully study the Contract Documents to ensure that information sufficient for interpretation of requirements of the Contract Documents is not included.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 26 13 – REQUEST FOR INFORMATION (RFI)

1. RFIs that request interpretation of requirements clearly indicated in the Contract Documents will be returned without interpretation.
 2. Frivolous RFIs shall be subject to reimbursement from Contractor to Ecology for costs incurred in review of the frivolous RFIs by Ecology, Ecology's Representative, or other consultants and design professionals engaged by Ecology.
- C. Subcontractor-Initiated and Supplier-Initiated RFIs: RFIs from Subcontractors and material suppliers shall be submitted through, be reviewed by, and be attached to an RFI prepared, signed, and submitted by the Contractor. RFIs submitted directly by Subcontractors or material suppliers will be returned unanswered to the Contractor.
1. Contractor shall review all Subcontractor- and supplier-initiated RFIs and take actions to resolve issues of coordination, sequencing, and layout of the Work.
 2. RFIs submitted to request clarification of issues related to means, methods, techniques, and sequences of construction or for establishing trade jurisdictions and scopes of Subcontracts will be returned without interpretation. Such issues are solely the Contractor's responsibility.
 3. Contractor shall be responsible for delays resulting from the necessity to resubmit an RFI due to insufficient or incorrect information presented in the RFI.
- D. In all cases in which RFIs are issued to request clarification of issues related to means, methods, techniques, and sequences of construction, the Contractor shall furnish all information required for Ecology or Ecology Representative to analyze and/or understand the circumstances causing the RFI and prepare a clarification or direction as to how the Contractor shall proceed.
1. If information included with this type of RFI by the Contractor is insufficient, the RFI will be returned unanswered.
- E. Ecology shall review RFIs and respond to the Contractor within 10 working days of receipt. RFIs received shall be considered received on the next regular working day for the purpose of establishing the start of the 10-day response period.
- F. RFIs shall not be used for the following purposes:
1. To request approval of submittals.
 2. To request approval of substitutions.
 3. To request changes that only involve change in Contract Time and/or Contract Sum.
 4. To request different methods of performing Work than those indicated in the Contract Documents.
- G. In the event the Contractor believes a response to an RFI by Ecology will result in additional cost or time, the Contractor shall not proceed with the Work indicated by the RFI until authorized to proceed by Ecology.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 26 13 – REQUEST FOR INFORMATION (RFI)

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01 26 13

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION

SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

PART 1 – GENERAL

1.01 PROJECT SUPERVISION

A. Contractor's Supervision

1. The Contractor shall provide the services of a full-time, experienced and qualified construction field superintendent who shall be assigned to the job during the course of the work. The person designated as construction field superintendent shall have direct charge of the work and shall be authorized to accept and execute all orders and directions issued by Ecology. The construction field superintendent shall be readily available during normal work hours for consultation with Ecology and be physically on the job Site during Site activities. The construction field superintendent shall not be removed or replaced during the entire course of the Contract work without the written approval of Ecology.
2. The Contractor shall manage the project. The Contractor shall inform the Ecology Project Manager (and Ecology or Ecology's Representative) with information throughout the work so that they can make informed and effective decisions.
3. Unprofessional behavior of any kind by Contractor and Subcontractor personnel is unacceptable and will not be tolerated on this project.
 - a. Ecology will direct the Contractor to immediately remove any Contractor or Subcontractor personnel from the project, for the duration of the project, that exhibit unprofessional behavior to Ecology staff, Ecology representatives, the property owner, or general public, and replace with competent personnel that are acceptable to Ecology.
 - b. Upon notification by Ecology, the Contractor's failure to immediately address and correct any displays of unprofessional behavior by its personnel or by Subcontractor personnel, or to remove personnel exhibiting such behavior when directed to do so by Ecology is grounds for termination of the Contract for cause.

B. Ecology Supervision

1. Ecology's Project Manager or Ecology's Representative (consultant) will represent Ecology on the site.

1.02 MEETINGS

The Contractor's project manager and/or project superintendent shall attend, at a minimum, the following meetings with Ecology or Ecology's Representative:

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION

A. PRECONSTRUCTION MEETING

1. Following the award, Ecology will notify the selected bidder of the time and date of a preconstruction meeting. The preconstruction meeting will be scheduled only after all the preconstruction submittals are received. The preconstruction meeting will be conducted at the Site and include a site visit.
 - a. The following are requested to attend the preconstruction meeting:
 - 1) Ecology:
 - a) Ecology Contracts Manager (as required)
 - b) Ecology Project Manager
 - c) Ecology's Representative (Consultants)
 - 2) Contractor's Representatives:
 - a) Superintendent
 - b) Contract Administrator (if required)
 - c) Major Subcontractors (as required)
 - d) Major Suppliers (as required)
 - b. The suggested agenda for the preconstruction meeting will include the following:
 - 1) Communications and routing
 - 2) Schedule of Values
 - 3) Execution of the Contract
 - 4) Discussion of the General Conditions
 - 5) Discussion of the Special Conditions
 - 6) Discussion of the Project Specific Requirements
 - 7) Discussion of the Technical Specifications
 - 8) Change Order Process
 - 9) Terms and Conditions of Payment
 - 10) Site visit
 - 11) Other issues, if any

B. WEEKLY PROGRESS/CONSTRUCTION MEETINGS

1. Ecology will schedule and administer weekly progress meetings throughout progress of the work.
2. Ecology will arrange meetings, prepare standard agenda with copies for participants, preside at meetings, record minutes and distributes copies of the minutes within 5 working days of the weekly progress meeting to the Contractor, meeting participants, and others affected by decisions made.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION

3. Attendance is required for the Contractor's job superintendent, major Subcontractors and suppliers, Ecology, and others as appropriate to the agenda topics for each meeting.
4. Standard Agenda
 - a. Near misses/incidents/safety discussion
 - b. Review minutes of previous meeting.
 - c. Review of project health and safety (issues, near misses, safety incidents)
 - d. Review of work progress and Contractor's daily reports specified in Section 01 45 00.
 - e. Field observations, problems, and decisions.
 - f. Identification of problems that impede planned progress.
 - g. Maintenance of Progress Schedule.
 - h. Corrective measures to regain projected schedules.
 - i. Planned progress during succeeding work period
 - j. Coordination of projected progress.
 - k. Maintenance of quality and work standards.
 - l. Effect of proposed changes on Progress Schedule and coordination.
 - m. Demonstration that the project record drawings are up-to-date.
 - n. Other business relating to the work.

C. SPECIAL MEETINGS

1. Contractor's project manager and/or project superintendent shall attend special meetings that may be held at Ecology's request when a problem or deficiency is present or likely to occur. The purpose of these meetings will be to define and discuss a problem or recurring work deficiency, review alternative solutions, and identify a plan to efficiently and effectively resolve the problem or deficiency.
2. Contractor's project manager and/or project superintendent shall attend other meetings at Ecology's request to coordinate Contractor's activities with related work being conducted by Ecology.
3. Contractor's project manager and/or project superintendent's attendance at off-site meetings with regulatory agencies or other parties shall be arranged as necessary. Contractor shall participate in off-site meetings at no additional cost to Ecology.

D. HEALTH AND SAFETY MEETINGS

1. Contractor shall conduct health and safety meetings for Contractor personnel as required by Contractor's health and safety plan, including but not limited to daily tailgate safety meetings. Ecology may attend Contractor's health and safety

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION

meetings, as needed, to be aware of work conditions or health and safety concerns that could affect the normal business activities of Ecology's or Ecology's Representative's employees or tenants, or the coordination or execution of work under other Contracts.

1.03 NOTIFICATION POINTS

- A. The Contractor shall notify Ecology at all milestone points prior to proceeding further, to allow inspection of the Contractor work progress. Ecology or Ecology's Representative may request additional Notification points based on review of the above information provided by the Contractor.

1.04 CONSTRUCTION SCHEDULE SUBMITTALS

- A. Project Progress Schedule: The Contractor shall submit a Preliminary Project Schedule before Ecology will schedule the preconstruction meeting. The schedule shall be a Critical Path Method (CPM) schedule developed in accordance with Section 00 72 00, 3.02 Construction Schedule. The schedule shall be used to evaluate progress of work based on the Schedule of Values. The schedule shall show the Contractor's planned order and interdependence of activities, and sequence of work. The schedule shall be updated monthly or as often as requested by Ecology.
- B. The Contractor shall update the Project Progress Schedule on a weekly basis, and bring the required number of copies to the Weekly Construction Meeting. At a minimum, schedule updates shall reflect the following information:
1. The actual duration and sequence of as-constructed Work activities, including changed Work.
 2. Approved time extensions.
 3. Unresolved requests for time extensions shall be reflected in the Schedule Update by assuming no time extension will be granted, and by showing the effects to follow-on activities necessary to physically complete the project within the currently Contract Time.
 4. Any construction delays or other conditions that affect the progress of the Work.
 5. Any modifications to the as-planned sequence or duration of remaining activities.
 6. Any modifications to the Critical Path.
 7. The physical completion of all remaining Work in the remaining Contract Time.
- C. Refer to **Section 00 72 00 – General Conditions** Part 3.02 – Construction Schedule for additional requirements. (Note: **Section 00 73 00 – Supplemental Conditions** may contain additional requirements).
- D. **Schedule of Values:** Provide a detailed cost break down of lump sum bid items to Ecology for approval. Furnish a fair evaluation of actual cost of each Work item listed. This will be used in processing Contractor's request for partial payment. Submittal of

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION

breakdown does not affect the Contract terms. The Schedule of Values shall at a minimum address, the cost of materials, labor, and equipment needed to complete each element of every work activity covered under the lump sum bid item. Costs for any permit shall be listed separately, in accordance with Section 00 72 00 – General Conditions, Part 5.02 Permits, Fees, and Notices.

1.05 CONSTRUCTION SCHEDULE REGARDING SUBMITTALS

- A. The Contractor is hereby notified that Ecology will not defer liquidated damages or waive specified requirements due to project delays resulting from Contractor actions or inaction (including Contractor insufficient planning) or other causes, including but not limited to:
 - 1. Contractor's late or inadequately packaged submittals, or submittals that require more than two Ecology reviews before approval by Ecology.

1.06 DIRECTION FROM ECOLOGY

- A. All direction regarding the project shall be obtained from Ecology.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01 31 00

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 33 00 – SUBMITTAL PROCEDURES

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. General: The types of submittals specified in this Section include Shop Drawings, product data, Samples and miscellaneous Work-related submittals. Specialized submittal requirements are specified in applicable sections for each unit of Work. Refer to other Division 01 sections and other Contract Documents for requirements of administrative submittals.
- B. Timing of Submittals: Submittals shall be submitted in accordance with the schedule in **Table 01 33 00-1: Partial List of Submittals Provided for the Contractor's Convenience**. The preconstruction conference will be scheduled only when all submittals required for submission by the preconstruction conference are received by Ecology. Contractor will not be authorized to mobilize to the site until all submittals required for submission by mobilization are received and approved by Ecology.

1.01 RELATED REQUIREMENTS

- A. The provisions and intent of the Contract, including the General and Supplemental Conditions apply to this Work as if specified in this section. Work related to this section is described throughout these Specifications.
- B. Individual submittals required in accordance with the pertinent sections of these Specifications. Other submittals may be required during the course of the Project and are considered part of the normal Work to be completed under the Contract.
- C. The list below may be incomplete, and it is the Contractor's responsibility to ensure that the Contractor has met all conditions of the contract requirements.

1.02 SUBMITTALS

A. PRECONSTRUCTION SUBMITTALS

- 1. The Contractor will provide a comprehensive Contractor's Quality Control Plan (CQCP) in writing before commencing the Work. The CQCP will include sketches as applicable. Ecology or Ecology's Representative may request additional information if deemed necessary based on review of the Contractor's proposed activities. The CQCP will be submitted to Ecology or Ecology's Representative within 14 days after Notice of Award and prior to commencement of Work. The CQCP will include detailed construction plans for each of the primary elements of the Work.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 33 00 – SUBMITTAL PROCEDURES

- a. Excavation and Material Placement Quality Control Plan: The Contractor shall submit, as part of the CQCP, a written plan addressing the proposed process of checking grade, excavation depths, and placed material grades and thicknesses.
- b. Material Screening Plan: The Contractor shall submit, as part of the CQCP, a written plan addressing the proposed process for material sorting operations.
- c. Cap Material Blending Plan: The Contractor shall submit, as part of the CQCP, a written plan describing proposed methods and quality control procedures to be used during blending of beneficially reused aggregates with imported cap material aggregates.
- d. Decontamination Plan: The Contractor shall submit, as part of the CQCP, a written decontamination plan for each property to Ecology for approval, addressing vehicle, boot, equipment, and personnel decontamination, and sediment and wash water disposal.
- e. Material Stockpile Management Plan: The Contractor shall submit, as part of the CQCP, a written plan for material stockpiling addressing stockpile size, location, best management practices, contaminated stockpile location on source property and duration, testing requirements for disposal and loadout for disposal, and cross-contamination protection for contaminated and clean materials.
- f. Access and Staging Plan: The Contractor shall submit, as part of the CQCP, a written plan describing access and staging, including material loading and unloading locations and procedures.
 - 1) Access and Staging Plan shall describe access locations and routes, avoiding utilities and tree critical root zones, utility protection, demolition and restoration, City street use and haul permits, signs, flagging, and related items, contaminated soil loading areas, and stockpile locations. Plan shall include a diagram showing traffic control and signage.
 - 2) The Access and Staging Plan shall comply with the access and staging areas and routes shown on the Drawings.
 - 3) The Access and Staging Plan shall meet the Temporary Erosion and Sediment Control requirements per **Section 01 57 13 – Temporary Erosion and Sediment Control**.
 - 4) Coordinate Access and Staging Plan with Site Security Plan, Material Stockpiling Plans, Schedule, and other submittals.
 - 5) Staging plan shall show areas and usage, and traffic routes.
 - 6) The Contractor shall close the area within the Work limits to use by the public for the duration of the Work. The plan shall discuss how the Contractor will restrict access to the Project site by the public through the

DIVISION 01 – GENERAL REQUIREMENTS
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Project life. The plan shall take into account required access by the Property Owner for maintenance, on-going access, or other Property Owner needs.

- 7) Identify locations of cultural and historic resources that will be protected within the footprint of the available Staging Area and methods by which such resources will be protected.
 - 8) The plan shall also discuss restoration of damaged property resulting from construction activities.
- g. Dust Control Plan: The Contractor shall submit, as part of the CQCP, a Dust Control Plan describing activities, sources to control, control methods and procedures, source of water and method for hauling and applying, monitoring, corrective measures if dust control actions are insufficient, monitoring, and documentation. The Dust Control Plan shall address the below items:
- 1) Dusts are likely to contain arsenic, copper, lead, and zinc due to the nature of the site contamination.
 - 2) Dust control measures shall be implemented prior to the start of all site Work including but not limited to establishing Work limits, demolition, and excavation activities. The Contractor shall not proceed with demolition and excavation until ground is sufficiently wet to prevent dust. Contractor shall demonstrate that the ground is sufficiently wet and receive Ecology's Representative's written approval prior to conducting full scale demolition and excavation activities.
 - 3) Implement dust monitoring and control measures continuously during construction. During remediation excavation, dusts could contain arsenic and lead, and dust control measures shall be diligently implemented to prevent dust generation and prevent any dust from escaping the limits of excavation. Dust generation during soil handling and truck loading shall be prevented. Potentially contaminated dust shall not be allowed to blow or disperse into areas not designated for remediation.
 - 4) Dust control is required on roads used by Contractor.
 - 5) Maintain excavations, stockpiles, roads, plant site, waste areas, borrow area and other Work areas within or without the Project boundaries free from dust which would cause a hazard or nuisance to others.
 - 6) Provide approved, temporary method of stabilization consisting of water sprinkling to control dust. Sprinkling must be repeated at intervals necessary to keep disturbed areas at least damp. Provide continuous sprinkling, if necessary, to control dust.
 - 7) Ambient Monitoring: The Contractor shall continuously visually observe for dust during all excavation, soil handling, hauling, and truck loading

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activities. Note: Ambient monitoring is different than the personnel exposure monitoring performed under the Health and Safety Plan.

- 8) Control: Dust control shall be provided at all times for soil excavation, handling and truck loading. The Contractor shall have appropriate dust control equipment and measures, including but not limited to sprayers or water trucks, available at all times. Provide water pumps and hoses to reach all areas of the Work. Provide sufficient volume of water spray to prevent dust generation. If equipment breaks down or is unavailable, cease Work until dust control can be provided. The Contractor is encouraged to obtain approval from water district owning hydrants to obtain water from water district fire hydrants to ensure a continuous and adequate water supply for dust generation.
 - 9) Stop Work: Ecology's Representative shall be the final judge of whether the Contractor is providing adequate dust control. If dust leaves the construction site or excavation area, the Contractor shall cease Work immediately, with no compensation to the Contractor for cost or delay. Work shall not be resumed until the Contractor provides additional oversight, labor, equipment and dust control measures such that the Work can be completed with adequate dust control. During windy conditions, the Contractor shall stop Work, if necessary, to control dust generation.
 - 10) The Contractor shall thoroughly clean all areas and surfaces contaminated by blown dust and fall-out, including sidewalks, siding, window ledges, decks/patios (and items therein), playground equipment and surfaces, buildings, and other items. Cleaning shall consist of vacuuming and brushing, followed by pressure washing.
- h. Light Control Plan: The Contractor shall submit, as part of the CQCP, a Light Control Plan for controlling light generated from construction equipment at the Work site for the duration of the Work.
- 1) At a minimum, the Light Control Plan shall include the following information:
 - a) Hours of Work operation, including daytime and nighttime hours.
 - b) Hours during which lights will be used to illuminate the Work, including seasonal changes.
 - c) Layout of existing and temporary lights to be used.
 - d) Preventive and mitigation measures to minimize light pollution at the Work Site.
 - e) Light monitoring approach on an as-needed basis if community nuisance feedback has been received.

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- f) Update and modify identified light control measures to address deficiencies; adjust for seasonal changes; and, as appropriate, when there are major changes in the Work.
 - g) The Light Control Plan shall meet applicable local light control codes and standards in the areas of Work.
 - h) Potential light control measures and BMPs may include the following:
 - i) Shielding.
 - j) Light shrouds or barriers to help direct light into the Work areas.
 - k) Glare control.
 - l) Specific lamp types.
 - m) Choosing downcast, rather than upcast, lights.
 - n) Reposition lighting equipment to avoid directing light outside the immediate Work area.
 - o) Subdividing light control into specific Work zones.
 - p) Resequence Work during the day (if feasible).
 - i. Spill Prevention and Response Plan: The Contractor shall submit, as part of the CQCP, a Spill Prevention and Response Plan for construction that includes the following:
 - 1) Narrative description of the proposed construction methods, materials, and equipment to be used for Work.
 - 2) Assessment and listing of hazardous materials and/or potential contaminants that could be released during execution of Work.
 - 3) Safety Data Sheets (SDSs) with cleanup instructions for potential contaminants.
 - 4) Spill response/cleanup materials and instructions for use.
 - 5) Procedures and precautions to prevent spills.
 - 6) Spill response training for on-site personnel, including the location of the containment and cleanup materials at site.
 - 7) Emergency notification in case of a spill or release. Ecology, property owner and Ecology's Representative must be included on list of notified
2. General requirements of the CQCP
- a. Quality control organization
 - b. A comprehensive summary of the inspection and testing requirements
 - c. A comprehensive list of inspection and test methods, schedules, and procedures

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- d. Documentation methods and procedures
 - e. Requirements for corrective action when quality control and/or acceptance criteria are not met
 - f. Procedures to be followed to comply with the Record Document requirements (**Section 00 72 00 Part 4.02 – Project Record** and **Section 01 77 00 – Closeout Procedures**)
 - g. Temporary Facilities
 - h. Any additional elements that the Contractor deems necessary to adequately control all construction processes required by this contract.
3. Project Schedule: The Contractor will submit a Preliminary Project Schedule no later than seven (7) days after the date the Notice to Proceed issued. The schedule will be a Critical Path Method (CPM) schedule developed by the Precedence Diagramming Method (PDM). The Project Schedule will display the following information, at a minimum:
- a. Construction Start Date
 - b. Critical Path
 - c. Identification and sequencing of contract Work by Work Area
 - d. Listing of Each Contract Bid Item
 - e. Activity Description
 - f. Activity Duration
 - g. Predecessor Activities
 - h. Successor Activities
 - i. Identification of necessary coordination dates with Ecology or Ecology's Representative to coordinate tenant interaction
 - j. Physical Completion Date
 - k. The Contractor will update the Project Schedule on a weekly basis and bring the required number of copies to the Weekly Construction Meeting. At a minimum, schedule updates will reflect the following information:
 - 1) The actual duration and sequence of as-constructed Work activities, including changed Work.
 - 2) Approved time extensions.
 - 3) Unresolved requests for time extensions will be reflected in the Schedule Update by assuming no time extension will be granted, and by showing the effects to follow-on activities necessary to physically complete the Project within the currently authorized time for completion.

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- 4) Any construction delays or other conditions that affect the progress of the Work.
 - 5) Any modifications to the as-planned sequence or duration of remaining activities.
 - 6) Any modifications to the Critical Path.
 - 7) The Physical Completion of all remaining Work in the remaining Contract Time.
- I. Refer to **Section 00 72 00 – General Conditions, Part 3.02 – Construction Schedule** for additional requirements.
4. Site-Specific Health and Safety Plan (HASP) (**Section 01 35 29.13 – Health, Safety, and Emergency Response Procedures for Contaminated Sites**). Assess the potential safety risks to on-site personnel and the environment and develop a HASP to safely execute the Work under this Contract. The Contractor is responsible for independently evaluating the physical and chemical hazards associated, or potentially associated with the Project site and the Work under this Contract and developing a plan that adequately addresses these hazards in compliance with applicable local, state, and federal regulations. The Contractor will submit the HASP to Ecology or Ecology’s Representative for review and general concurrence. A copy of the approved HASP will be maintained on site at all times.
 5. Spill Prevention, Control and Countermeasure Plan
 6. Green Cleanup Project Work Plan
 7. Site Security Plan
 8. Haul Route Plan
- B. Periodic Submittals
- The Contractor will provide the following submittals to Ecology or Ecology’s Representative at specified intervals for the following specific activities:
1. Contractor’s Daily Report
 2. Log of Disposal Site and Quantities
 3. Quantity Sheets (Load Receipts)
- C. Other Submittals
1. Quality Control Reports
 2. Cutting and Patching Proposal
 3. Submit manufacturer’s product data for all materials incorporated into the Work, and such submittals shall be reviewed by Ecology prior to bringing material on-site.

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4. Submit supplemental test data where specified herein.
- D. Closeout Procedures
1. National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit Notice of Termination Form
 2. Project Record
 3. Notice of Disputes or Claims with Subconsultants
 4. Minority and Women Owned Business Enterprises (MWBE) Utilization Summary
 5. Vehicle Log book(s)
- E. Submittal List: Table 01 33 00-1 provides a summary of submittals for the Contractor's convenience.
1. Table 01 33 00-1 is not intended to be comprehensive, and the failure to include any submittal otherwise called for in these Contract Documents shall not alleviate the Contractor's requirement to provide it.
 2. "Latest Acceptance Date" is the latest date for acceptance of the submittal by the Engineer considering the specified or logical inter-relationship of the Work elements. If submittals are not accepted by the "Latest Acceptance Date", a delay in the Project could result. The Contractor shall prepare and submit submittals as quickly as possible and shall plan for time for the Engineer's review and plan for the possibility that submittals might be rejected or only partially approved on first submittal, such that re-submittal and re-review is required.

1.03 RELATED SECTIONS

- A. Section 01 35 43.10 – Green Construction Practices
- B. Section 01 40 00 – Quality Requirements
- C. Section 01 60 00 – Product Requirements
- D. Section 01 77 00 – Closeout Procedures

1.04 REFERENCES

- A. Definitions: Work-related submittals of this Section are categorized for convenience as follows:
1. Shop Drawings: As defined at **Section 00 72 00 – General Conditions**, paragraph 4.03.
 2. Product Data: Standard printed information on materials, products and systems; not specifically prepared for this Project, other than the designation of selections from among available choices printed therein.

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3. Samples: Fabricated and un-fabricated physical examples of materials, products and units of Work; both as completed units and as smaller portions of units of Work; either for limited visual inspection or (where indicated) for more detailed testing and analysis.
4. Miscellaneous: Submittals related directly to the Work (non-administrative) include warranties, informational, maintenance agreements, workmanship bonds, Project photographs, survey data and reports, physical Work records, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, operating and maintenance materials, overrun stock, and similar information, devices and materials applicable to the Work and not processed as Shop Drawings, Product Data or Samples.

1.05 GENERAL SUBMITTAL REQUIREMENTS

- A. Coordination and Sequencing:
 1. Coordinate preparation and processing of submittals with performance of the Work so that the Work is not delayed by submittals and reviews. Coordinate and sequence different categories of submittals for same Work, and for interfacing units of Work, so that one will not be delayed for coordination with another.
 2. See **Section 01 31 00 – Project Management and Coordination** paragraph 1.05 regarding timeliness of submittals.
2. Preparation of Submittals: Provide permanent marking on, or with, each submittal to identify Project, date, Contractor, subcontractor, submittal name and similar information to distinguish it from other submittals.
3. Line out inapplicable items on submittals.

1.06 SPECIFIC SUBMITTAL REQUIREMENTS

- A. General:
 1. Except as otherwise indicated in individual Work Sections, comply with requirements specified herein for each indicated category of submittal.
 2. Provide and process intermediate submittals, where required between initial and final, similar to initial submittals.
 3. Include a transmittal with all submittals.
 4. Include an updated submittal register that identifies new submittals and Contractor's number. An example submittal schedule (or register) is provided in the appendices of this manual. Provide Ecology with the selected submittal schedule for review and approval prior to its use.
 5. Submittals received shall be considered received on the next working day for the purpose of establishing the start of the specified response period.

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6. Submit to the Ecology Project manager: 1 paper copy, and 2 electronic copies one delivered as a CD and another via email. The electronic files shall be in PDF format. Emailed files shall be less than 10 MB each.
- B. Product Data:
1. General:
 - a. Collect required data into one submittal for each unit of Work or system; and mark each copy to show which choices and options are applicable to Project. Include manufacturer's standard printed recommendations for application and use, compliance with standards, applications of labels and seals, notation of field measurements which have been checked, and modify details as required for application into the Work. Include color selection information where necessary.
 - b. Do not proceed with installation of materials, products or systems until final copy of applicable product data has been reviewed and accepted by Ecology and is in possession of Installer. Maintain one complete set of product data at the site for use by Ecology.
 2. Preparation and Processing: Do not submit product data, or allow use of products on the Project, until compliance with requirements of Contract Documents has been confirmed by Contractor. Submittal is for information and record, unless otherwise indicated. Initial submittal shall be a final submittal unless returned by Ecology, marked with an "Action" which indicates an observed noncompliance.
 3. Do not proceed with fabrication, delivery, or installation until submittal is fully reviewed and accepted. For mid-Project testing of soils and similar materials, submit test results sufficiently in advance (considering review time) of when acceptance is needed.
- C. Samples:
1. General: Provide Samples identical with final condition of proposed materials or products for the Work. Include "range" Samples (not less than three (3) units) where there are unavoidable variations between units of each set. Provide full set of optional Samples where Ecology's selection is required. Prepare Samples to match Ecology's sample where indicated. Include information with each sample to show generic description, source or product name and manufacturer, limitations, and compliance with standards. Samples are submitted for review and confirmation of color, pattern, texture and "kind" by Engineer. Engineer will not "test" Samples (except as otherwise indicated) for compliance with other requirements, which are, therefore, for exclusive responsibility of the Contractor.
 2. Processing: Submit two (2) sets of Samples for Ecology's review and "Action"; one (1) set will be returned. Large Samples, which may be incorporated into the Work, may be submitted singly.

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- 3. Reusable Samples: Returned Samples which are intended or permitted to be incorporated in the Work are so indicated in the individual Work sections, and must be in undamaged condition at time of use.
- D. Warranties and Guarantees: In addition to copies desired for Contractor’s use, furnish three (3) executed copies, except furnish additional copies where required for maintenance manuals.

1.07 ACTION ON SUBMITTALS

- 1. Ecology’s Action: Ecology will review each submittal, mark with “Action”, and where possible return within **ten (10) working days** of receipt. Submittals shall be considered received on the next regular working day for the purpose of establishing the start of the 10-day response period. Where submittal must be held for coordination, they will be returned to the Contractor within two (2) weeks of receipt for the Contractor to resubmit when it is appropriate.
 - 1. Final Unrestricted Release: Work may proceed, provided it complies with Contract Documents, when submittal is returned with marking: “Approved as Submitted”.
 - 2. Final-But-Restricted Release: Work may proceed, provided it complies with notations and corrections on submittal and with Contract Documents, when submittal is returned with the marking “Approved as Noted”.
 - 3. Returned and Rejected: Do not proceed with Work. Submittal item is not acceptable and may not be used on the Project when noted as “Not Approved”.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

Table 01 33 00-1: Partial List of Submittals Provided for the Contractor’s Convenience

Submittal	Due Date/Update Schedule	Spec. Section & Subpart
Required Prior to Start of Construction		
Project-Progress Schedule	14 calendar days after issuance of Notice to Proceed before Preconstruction Meeting; update monthly	00 72 00, 3.02; 01 31 00, 3.02.B
Permits	Prior to start of construction	00 72 00, 5.02;

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Submittal	Due Date/Update Schedule	Spec. Section & Subpart
HASP and Safety Plans with Site Specific COVID-19 Safety Plan	Before Pre-Construction Meeting. 7 calendar days prior to commencing any excavation Work	00 72 00, 5.07; 00 73 00, C., 00 73 19, 1.02.A; 01 35 29.13 3.02.A
Contractor's Quality Control Plan	Before Pre-Construction Meeting	01 33 00, 1.02A 01 45 00, 1.01.C 01 45 00, 1.05
Access and Staging Plan (as part of the CQCP)	Before Pre-Construction Meeting	31 00 00, 1.06.B
Site Security Plan	Before Pre-Construction Meeting	01 35 29.13, 1.03.A
Site-Specific HASP	Before Pre-Construction Meeting	01 35 29.13, 1.04
Dust Control Plan (as part of the CQCP)	Before Pre-Construction Meeting	01 50 00, 1.06.D
SPCC Plan	Before Pre-Construction Meeting	01 35 29.13, 1.04.3
Names of Persons Responsible for Safety	Before Pre-Construction Meeting	01 35 29.13, 1.04.1.11
Spill Prevention and Response Plan (as part of the CQCP)	Before Pre-Construction Meeting	01 50 00, 1.05.B
Green Cleanup Project Work Plan	Before Pre-Construction Meeting	01 35 43.10, 3.01
Material Stockpile Management Plan (as part of the CQCP)	Before Pre-Construction Meeting	02 61 00, 1.6.C
Required Before Use		
Product and Material Submittals, Test Data	Ecology approval required before delivery of material to site(s). Allow 10 working days for Ecology review	01 60 00, 1.03
Cutting and Patching Proposal	10 working days before cutting and patching Work begins	01 73 29, 1.02.A
Ongoing		

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Submittal	Due Date/Update Schedule	Spec. Section & Subpart
Updated Project – Progress Schedule	Weekly	00 72 00, 3.02; 01 31 00, 1.04
Safety Meeting Minutes	Daily	01 35 29.13, 1.04.5
Contractor’s Daily Reports	Daily	00 72 00, 8.03.B 01 45 00, 2.01
Quantity Sheets	Weekly	01 40 00, 1.02 01 40 00, 1.03
NPDES Construction Stormwater General Permit – Discharge Monitoring Reports	Monthly	01 57 13 1.01.C, 3.01
Application for Payment	Monthly	00 72 00, 6.03; 01 20 00
Personnel Monitoring Results	Final Completion	00 73 19, 1.02.C
Notice of Disputes or Claims with Subconsultants	Immediate Knowledge of Delay	00 72 00, 3.06
Permits, Licenses, certifications, inspection reports, etc.	Duration of Project	01 40 00, 1.04.1
License and Permit Applications and related documentation	Duration of Project	01 41 00
Variations for Discrepancies between Contract Documents and governing codes and regulations	Duration of Project	01 41 00
Before First Pay Submittal		
Statements of Intent to Pay Prevailing Wage	Prior to First Pay Request for general and before invoicing for any subcontractor Work for subs	00 72 00, 5.04
List of Subcontractors and Suppliers	Submit with Contract Package and update/revise if needed during the contract	00 72 00, 5.20
Schedule of Values	Within 14 calendar days of Notice to Proceed and Prior to First Pay Request	00 72 00, 6.02; 01 31 00, 1.04.D

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Submittal	Due Date/Update Schedule	Spec. Section & Subpart
Each Pay Submittal		
Statement That Prevailing Wages Were Paid	Certify with each pay request	00 72 00, 5.04.E
Apprenticeship Participation	Submit with each pay request if applicable to the Project	00 72 00, 10.12
Subcontractors and Supplier List	Submit with each pay request	00 72 00, 5.20
MWBE Subcontractors and Supplier List	Submit with each pay request	00 72 00, 10.11
As Needed (Initiated by the Contractor)		
Application for Payment	Monthly	00 72 00, 6.03; 01 20 00
Requests for Substitutions	15 days prior to submittal	01 60 00, 1.07.A
Change Order Proposal	As Needed	00 72 00
At Ecology Request		
Milestone Progress for Inspections	When Required	01 31 00, 1.03.A
Certified Copy of Payroll	Upon Request	00 72 00, 5.04.G
Change Order Request	As Needed	00 72 00
Closeout Procedures		
NPDES Construction Stormwater General Permit Notice of Termination Form	Prior to Final Completion	01 57 13, 1.01.C, 3.01
Project Record	Prior to Final Completion	00 72 00, 4.02
Notice of Disputes or Claims with Subconsultants	Prior to Final Acceptance	00 72 00, 6.09.B
MWBE Utilization Summary	Submit with final invoice	00 72 00, 10.11
Vehicle Log book(s)	Prior to Final Acceptance	31 00 00, 1.06.B and 3.05.B
Permit Completion Documentation	Prior to Final Acceptance	01 41 00, 3.01.D; 01 77 00, 1.06

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Submittal	Due Date/Update Schedule	Spec. Section & Subpart
Affidavit of Wages Paid	Required from general and subcontractors before Notice of Final Acceptance is issued.	00 72 00, 5.04.C

END OF SECTION 01 33 00

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SECTION 01 35 29.13 – HEALTH, SAFETY, AND EMERGENCY RESPONSE
PROCEDURES FOR CONTAMINATED SITES

SECTION 01 35 29.13
HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR
CONTAMINATED SITES

PART 1 – GENERAL

1.01 SUMMARY

- A. This section includes requirements for the Contractor's responsibility for general health and safety while working on the property; requirements for Hazardous Waste Operations and Emergency Response training; and requirements for site Health and Safety Plans (HASP). The work in this section also includes compliance with all laws, regulations, and ordinances with respect to safety, noise, dust, fire and police action, civil disobedience, security, or traffic.
- B. Site Specific Hazards: This site contains contaminated soil and sediment with metals, including arsenic, copper, lead, and zinc. The work will involve contact with these soils and sediments. The Contractor shall meet Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 HAZWOPER rules and Labor & Industries rules, including necessary worker training requirements.
- C. The project involves direct exposure to soils and sediment that could potentially cause a threat to human and ecological receptors. Direct contact as well as airborne ingestion are potential concerns during dredging, excavation, and movement of materials on the Site.
- D. Personnel engaged in hazardous materials work shall be trained and certified to conduct work with potential risk of exposure to hazardous substances. Work shall be conducted in accordance with Contractor's site-specific HASP prepared in accordance with **Section 00 73 19 – Health and Safety Requirements**.
 - 1. All construction activities with a potential risk of exposure to excavated material must be conducted by personnel who, at a minimum, have 40-hour HAZWOPER training, are current in annual refresher training, and are able to identify potential upgrades needed in the level of health and safety protection. Certificates of personnel training are to be submitted to Ecology prior to the pre-construction meeting and updated during the project as needed for personnel changes.
 - 2. The Contractor shall provide a person designated as the Site Safety and Health Officer, who is thoroughly trained in rescue procedures, HAZWOPER, and the use of all necessary safety equipment, including, if needed, air monitoring equipment and gas detectors. The person must be present at all times while work is being performed and conduct testing as necessary.

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- a. The Contractor's Site Safety and Health Officer or designee shall conduct inspections of the Site in accordance with the HASP to determine the HASP's effectiveness and shall immediately correct any deficiencies identified.
 - b. The Site Safety and Health Officer shall be empowered with the delegated authority to order any person or worker on the Site to follow the safety rules. Failure to observe these rules is sufficient cause for removal of the person or worker(s) from this project.
 - c. The Site Safety and Health Officer is responsible for determining the extent to which any safety equipment must be utilized, depending on conditions encountered at the site.
3. Site-specific safety and hazard awareness briefings shall be required for all workers and other people entering the site. Briefings will inform these individuals of the chemical hazards of the soil and define appropriate protections to minimize potential exposure. A written record of the date(s) and time(s) of such training and of the attendees is required.
- E. All required health, safety, and environmental monitoring for worker health and safety shall be the responsibility of the Contractor.
 - F. Transport of known or potentially contaminated materials shall be performed by properly licensed, insured, and registered waste haulers that are acceptable to Ecology and in accordance with applicable local, state, and federal regulations for transportation. Transport Contractor(s) shall submit documentation that demonstrates it is properly licensed and in compliance with applicable Washington State Department of Transportation regulations, as well as a copy of its contingency and spill control plans describing measures to be implemented in the event of spills or discharges during material handling and transporting. See **Section 02 61 00 – Removal and Disposal of Contaminated Soils** for specific requirements.
 - G. The project involves work that poses a potential threat to the physical safety of those performing the work. Water safety is a concern during all work (including debris removal, excavation, backfill, and material placement).
 - H. The Contractor shall monitor sediments, and waste materials for indications of potentially hazardous, dangerous, and/or contaminated materials based on the nature and extent of contaminants described in the scope of work. If such conditions are encountered, the Contractor shall stop all work in that area and notify Ecology or Ecology's Representative immediately.
 - I. In accordance with generally accepted construction practice, applicable law and the General Conditions, the Contractor shall be solely and exclusively responsible for:
 1. Construction means and methods.
 2. Safety of employees engaged in the work while on and off the site, and others who may visit the site or be affected by the work.

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3. Safety of the public with respect to the work areas, access and staging areas, and transportation corridors.
 4. Safety of the work itself including material and equipment to be incorporated therein.
 5. Projection of property at the site or adjacent thereto.
 6. Safety programs, equipment, and protective devices required to ensure the safety of persons and protection of property for whom/which the Contractor is responsible.
- J. The duties of Ecology in conducting review of the Contractor's performance are not intended to include review of the adequacy of the Contractor's work methods, equipment, bracing, scaffolding, or safety measures in, on, or near the construction site.
- K. The Contractor is hereby informed that work on this project could be hazardous. Contractor shall comply with applicable laws and regulations including state, federal OSHA, and other regulations referenced in these Contract Documents.
- L. At all times, maintain the job in a condition that is safe for Ecology to make site visits and to conduct construction reviews. If Ecology cannot allow personnel to visit the job because it is not safe, the Contractor is not providing required safe access to the Work as required.

1.02 RELATED SECTIONS

- A. Comply with the more stringent of any requirements contained herein or in the following Sections:
1. **Section 00 73 19 – Health and Safety Requirements**
 2. **Section 02 61 00 – Removal and Disposal of Contaminated Soils**

1.03 REFERENCES

- A. Order of precedence. Where a conflict arises between health and safety standards, the most stringent standard shall take precedence. Where a conflict arises between standards in this Specification and the Project Drawings, the most stringent standard shall take precedence.
- B. Codes and Standards (including but not limited to):
1. Washington Industrial Safety and Health Act (WISHA), chapter 49.17 RCW
 2. Safety and Health Core Rules, chapter 296-800 WAC
 3. Hazardous waste operations and emergency response, 29 CFR 1910.120, OSHA 29 U.S. Code Chapter 15.

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4. WAC 173-340-810 Work safety and health, Model Toxics Control Act – Cleanup chapter 173-340 WAC.
5. Dangerous Waste Regulations, chapter 173-303 WAC.

1.04 SUBMITTALS

- A. Site-specific HASP: The Contractor shall submit a Site-specific HASP.
 1. Prepare a Site-specific HASP in accordance with the requirements of this section and submit to Ecology before the pre-construction meeting. The plan shall meet the requirements stated herein and requirements listed in **Section 00 73 19 – Health and Safety Requirements** in a single plan. As a minimum, the Contractor’s site HASP shall set forth definite procedures for informing workers about health and safety, for instructing workers in safe practices, for assuring that workers are using appropriate safety equipment and safe work practices, and for reporting accidents. Include the following, as applicable:
 - a. Description of work to be performed and anticipated chemical and/or physical hazards associated with the work
 - b. A series of maps of the site illustrating the locations of anticipated hazards and areas of control for those hazards
 - c. Hazardous material inventory and safety data sheets (SDSs) for all chemicals that will be brought on site
 - d. Engineering controls/equipment to be used to protect against anticipated hazards
 - e. Personal protective equipment and clothing including head, foot gear, personal floatation devices, hand, skin, eye, ear, and respiratory protection
 2. The Contractor shall have available at the site, at all times, a person(s) holding a valid certificate of first aid training. A valid first aid certificate is one that is less than 3 years old. The Contractor’s crew leaders, supervisors, or persons in direct charge of crews (i.e., a group of two or more employees working at the site) shall possess a valid first aid certificate.
 3. The Contractor shall provide first aid supplies at the Site for its employees.
 4. Procedures that will be used for the following:
 - a. Lockout/tagout
 - b. Fall protection
 - c. Water rescue
 - d. Hazards

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- e. Suspect materials
 - f. Odorous conditions and toxic gases
 - g. Exposure monitoring to be used to evaluate actual hazards compared with anticipated conditions
 - h. Site housekeeping procedures and personal hygiene practices
 - i. Personnel and equipment decontamination plan
 - j. Administrative controls
5. An emergency plan including the following:
 - a. Locations of and route to nearest hospital
 - b. Locations of first aid kits, fire extinguishers, and portable eye washes
 - c. The name and qualifications of the person who will be responsible in the event of an emergency
 - d. Site personnel trained in first aid and/or CPR
 - e. A medical surveillance program for Site personnel before, during, and after completion of Site work
 6. The name and qualifications of the person preparing the HASP and person designated to implement and enforce the plan
 7. A signatory page for Site personnel and visitors to acknowledge receipt, understanding, and agreement to comply with the plan
 8. If health and safety issues arise frequently, the Contractor may be required to provide a full-time health and safety professional onsite, at the expense of the Contractor, to ensure compliance with all applicable health and safety rules and regulations.
- B. Site Security Plan: The Contractor shall submit a Site Security Plan that identifies methods to prevent access to all work areas by the general public. Site plan shall include access control fencing locations, access routes and staging areas, material loading and unloading areas, signage for traffic control, and other relevant features. Provide this plan for review and approval prior to the Pre-Construction Meeting.
- C. Spill Prevention, Control, and Countermeasure Plan. The Contractor shall submit a Spill Prevention, Control, and Countermeasure (SPCC) Plan prior to the start of any Work to Ecology for review and comment. This plan may be combined with the Spill Prevention and Response Plan (the combined plan shall address all items identified for each plan). The SPCC Plan shall address the following:
1. The Contractor shall be responsible for prevention, containment, and cleanup of spilled oil, fuel, and other petroleum products used in the Contractor's operations. All such prevention, containment, and cleanup costs shall be borne by the

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Contractor. The Contractor shall prepare a SPCC Plan prior to the start of construction activity.

2. All pollutants other than sediment that occur on site during construction shall be handled and disposed of in a manner that does not contaminate stormwater or surface water. Fueling of Contractor's equipment shall be performed away from storm drain outlets. Extreme care shall be taken to prevent fuel spills. A Contractor's representative shall be present at all times when equipment is being fueled. In the event of a spill the Fire Department or Coast Guard shall be called. Absorbent oil pads and drip pans shall be placed beneath the vehicle being fueled and under parked vehicles (overnight and otherwise).
3. The Contractor is advised that discharge of oil from equipment or facilities into state waters or onto adjacent land is not permitted under state water quality regulations.
4. The Contractor shall, at a minimum, take the following measures regarding oil spill prevention, containment, and cleanup.
5. Fuel hoses, lubrication equipment, hydraulically operated equipment, oil drums, and other equipment and facilities shall be inspected regularly for drips, leaks, or signs of damage, and shall be maintained and stored properly to prevent spills. Proper security shall be maintained to discourage vandalism.
6. All land-based oil and product storage tanks shall be diked, contained, and/or located so as to prevent spills from escaping into the water. Diking and containment area surfaces shall be lined with impervious material to prevent oil from seeping through the ground and dikes.
7. All visible floating oils shall be immediately contained with booms, dikes, or other appropriate means and removed from the water prior to discharge into state waters. All visible oils on land shall be immediately contained using dikes, straw bales, or other appropriate means and removed using sand, ground clay, sawdust, or other absorbent material, which shall be properly disposed of by the Contractor. Waste materials shall be temporarily stored in drums or other leak-proof containers after cleanup and during transport for disposal. Waste materials shall be disposed of off-site in accordance with applicable local, state, and federal regulations.
8. In the event of any oil or product discharges into public waters, or onto land with a potential for entry into public waters, the Contractor shall immediately notify the parties as indicated in Article 3.01 Spill Response.
9. The Contractor shall always maintain the following materials in quantities sufficient to address site needs (as a minimum):
 - a. Oil-absorbent booms
 - b. Oil-absorbent pads or bulk material

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- c. Oil-skimming system
 - d. Oil dry all, gloves, and plastic bags
 - e. 5-gallon buckets
 - f. Shovels
- D. Competent Person(s): The Contractor shall submit the name(s) of the designated competent person in charge of health and safety. Update Ecology immediately with new names if a change occurs.
- E. Safety meeting: Conduct daily tailgate safety meetings/job safety briefings and prepare minutes to be submitted to Ecology daily. The Contractor shall prepare its own form on which to document daily safety meetings. This form shall be completed each workday, filed as part of the project record, and be submitted as part of the progress payment request.

PART 2 – PRODUCTS

2.01 PRODUCTS SPECIFIED FOR HEALTH AND SAFETY

- A. Provide the equipment and supplies necessary to support the work as described in the site-specific HASP per **Section 00 73 19 – Health and Safety Requirements**. Equipment and supplies as needed may include but are not limited to:
- 1. Hazardous materials inventory and MSDSs/SDSs for the chemicals brought on site;
 - 2. Enclosure equipment (for dust control as needed);
 - 3. Fencing and barriers;
 - 2. Warning signs and labels;
 - 3. Fire extinguishers and equipment to support open flame or spark producing “hot” work;
 - 4. Equipment to support lockout/tagout procedures;
 - 5. Fall protection equipment;
 - 6. Personal protective equipment
 - a. The Site is designated for Level D personal protective equipment. All workers shall, as a minimum, wear the following personal protective equipment at all times while at the site:
 - 1) A hard hat (American National Standards Institute [ANSI] Z89.1) with reflective tape and six-point suspension
 - 2) Safety glasses (ANSI Z87.1) with permanently affixed side shields
 - 3) A retroreflective safety vest

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- 4) Steel-toed, at least ankle high lace-up, defined-heel safety boots (ANSI Z41.1, Class 75)
 - 5) Gloves, ear protection, and respiratory protection as appropriate for work duties
 - 6) All workers shall wear personal floatation devices when working over or near water. Water rescue equipment and devices are also required and shall be provided by the Contractor.
7. Area and personnel exposure monitoring equipment;
 8. Water rescue equipment;
 9. Decontamination equipment and supplies;
 10. First aid equipment;
 11. Release prevention equipment; and
 12. Field documentation logs/supplies.
 13. Temporary sanitation facilities.
- B. The Contractor's HASP shall be amended as needed to include special work practices warranted by site conditions actually encountered.
- C. The Contractor shall maintain a copy of the HASP and SPCC on each site at all times.

PART 3 – EXECUTION

3.01 SPILL RESPONSE

- A. Implement the spill response plan. Maintain copies of all SDS sheets at the site for chemicals on site including fuels, cleaners, fertilizers, and other chemical materials.
1. Comply with all applicable codes and ordinances for spill prevention and response.
 2. Provide appropriate spill response materials including, but not limited to the following: containers, adsorbents, shovels, and personal protective equipment. Spill response materials shall be available at all times when contaminated materials/wastes are being handled or transported. Spill response materials shall be compatible with the type of materials and contaminants being handled.
 3. Emergency Spill Response Notification: Notify Ecology of any spill of fuel or hazardous substance, regardless of quantity.
 4. Under state law, Ecology must be notified when any amount of regulated waste or hazardous material that poses an imminent threat to life, health, or the environment is released to the air, land, or water, or whenever oil is spilled on land or to waters of the state. The spiller is always responsible for reporting a

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spill. Failure to report a spill in a timely manner may result in enforcement actions. If you are not responsible for a spill, making the initial notification does not make you liable. However, please consult with Ecology's response team before attempting any type of response or cleanup. Also notify property owner and Engineer.

5. If oil or hazardous materials are spilled to state waters, the spiller must notify Ecology, state, and federal spill response agencies. The contact information for these entities are:
 - a. Ecology Representative
 - b. A/E (Ecology's Representative) – John Laplante, PE, Anchor QEA – 206-795-2676
 - c. State – Washington Emergency Management Division (EMD) – 1-800-258-5990 or 1-800-OILS-911
 - d. Federal – National Response Center (NRC) – 1-800-424-8802
 - e. The appropriate **Ecology Regional Office** for your county (**noted below**). An Ecology spill responder will normally call the reporting party back to gather more information. The agency will then determine its response action. Also notify the Ecology Project Manager and A/E assigned to the project.
 - 1) **Eastern Regional Office – 1-509-329-3400**

END OF SECTION 01 35 29.13

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SECTION 01 35 43.10
GREEN CONSTRUCTION PRACTICES

PART 1 – GENERAL

1.01 SUMMARY

- A. Cleaning up contaminated sites involves the use of energy, water, and other natural resources. Site cleanup activities can create an environmental footprint beyond the site itself. Because the environmental footprint of a remediation activity may exceed the site physical boundary, Green Remediation best management practices (BMPs) can be used to minimize the footprint and maximize environmental outcomes.
- B. Ecology desires to minimize its environmental impact in all phases of cleanup actions, including construction, and refers to this as Green Remediation. To meet this intent, to the extent practicable, the Contractor shall explore and implement green remediation strategies and applications in the performance of the requirements of this project to maximize use of sustainable construction practices, reduce energy and water usage, promote demolition and construction materials reuse and recycling and use of recycled content materials, and minimizing impacts from site cleanup activities through controls on construction activities to preserve and protect our land, air, and water resources.
- C. These guiding principles are the foundation for developing and implementing green construction practices:
 - 1. Minimize total energy use and increase the percentage of energy use from renewable resources.
 - 2. Minimize air pollution and greenhouse gas emissions.
 - 3. Reduce water use and negative impacts on water resources.
 - 4. Improve materials management and reduce, reuse and recycle material and waste.
 - 5. Protect ecosystems during site cleanup.
 - 6. Consider climate change.

1.02 RELATED SECTIONS

- A. Section 01 33 00 – Submittal Procedures
- B. Section 01 50 00 – Temporary Facilities and Controls
- C. Section 01 57 13 – Temporary Erosion and Sediment Control and Construction Stormwater Pollution Prevention
- D. Section 01 60 00 – Product Requirements

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- E. Section 01 74 19 – Construction Waste Management and Disposal
- F. Divisions 2 through 35: See Part 2 – Products for Material Requirements in each Section

1.03 REFERENCES

- A. ASTM E2893-16, Standard Guide for Greener Cleanups, ASTM International, West Conshohocken, PA, 2016, www.astm.org
- B. National Menu of Best Management Practices (BMPs) for Stormwater-Construction, National Pollutant Discharge Elimination System (NPDES), EPA, 2022, <https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater-construction>

1.04 SUBMITTALS

- A. Green Cleanup Project Work Plan: Prior to start of work, the Contractor shall submit a Green Cleanup Project Work Plan that shall identify and describe each green remediation practice it proposes to use and how it will be implemented, to include practices required by the contract documents and proposed by the Contractor. This plan will include, at a minimum, practices that do the following:
 - 1. Incorporate equipment emission reduction controls and describe procedures for equipment operations that identify measures to operate equipment to minimize emissions, including engine idling reduction procedures, use of biodiesel and/or ultra-low-sulfur fuels only, and use clean technology equipment designed to reduce exhaust emissions.
 - 2. Minimize transportation requirements on the project by use of the least-impacting transportation methods practical, combining trips, and use of backhaul.
 - 3. Maximize use of products containing recycled materials (i.e., compost materials, concrete, Backfill Material, and erosion control materials) that satisfy the specified performance requirements for project materials and procedures for material recycling, reuse, and waste minimization.
 - 4. Use material suppliers in proximity of the project work sites.
 - 5. Use, to the maximum extent possible, the Green and Sustainable Site Cleanup BMPs from **Table 01 35 32-1** and describe how they will be implemented.
 - 6. The Green Cleanup Project Work Plan shall include a format for reporting/documenting BMPs used on the project as part of Contractor’s weekly project progress updates that include the following measures:
 - a. Equipment inventory and emission reduction controls on each piece of equipment
 - b. Equipment use based on hour meters

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- c. Total quantity of fuel (in gallons) used each week and type of fuel used
- d. Disposal of construction wastes as identified in Part 3, paragraph 3.03. The Contractor shall include a section on materials reuse, recycling, waste stream reduction, and resource conservation measures employed as part of the weekly project progress reports. This section will document which measures are in place to keep uncontaminated wastes out of landfills or disposal facilities. These actions are intended to conserve energy or other natural resources, thereby reducing negative impacts of a cleanup action.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 PROTECTION OF LAND, AIR, AND WATER RESOURCES

- A. Contractor shall consider and incorporate both temporary and permanent site controls to minimize impacts from site clearing, excavation, backfill, and grading operations that should include:
 - 1. Minimizing noise created over ambient noise levels.
 - 2. Use of dust control measures.
 - 3. Retaining construction water runoff and developing a method for reuse of water on site or use of recycled water for equipment wash down and dust control.
 - 4. Disposal of construction debris at recycling centers.
 - 5. Following erosion and sediment control practices including silt curtains and other similar barriers to prevent silt laden runoff from stormwater or other sources from leaving the project site without treatment.
 - 6. Maintaining a responsive oil spills cleanup capability including materials on site.
 - 7. No burning of any kind on the project site.
 - 8. Use of native landscape materials, plastic sheeting, and recycled wood waste mulches to stabilize construction sites and minimize erosion.

3.02 EQUIPMENT EMISSIONS CONTROLS

- A. The Contractor shall include the following actions, as applicable, to reduce equipment exhaust emissions from the project site and which shall be included in its Green Cleanup Project Work Plan, to include:
 - 1. Alternative Fuel Use and Clean Technologies: The Contractor is encouraged to use clean technologies and/or fuels on all diesel equipment to the extent practicable and/or feasible. The preference is for clean diesel technologies, but alternative fuels, such biodiesel, ultra-low sulfur diesel fuel, or natural gas-powered vehicles are acceptable options. These alternative fuels will be used

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where they are available within a reasonable distance to the sites. For equipment retrofits, the Contractor will employ the Best Available Control Technology on non-road and on-road diesel powered equipment used at a site. Examples of clean diesel technologies include diesel particulate filters (DPFs), and diesel oxidation catalysis (DOCs). For alternative fuel usage, the Contractor shall use commercially available biodiesel blends, with the goal to use at least a B20 blend (i.e., 20% biodiesel and 80% petro diesel) or ultra-low sulfur diesel fuels, in the equipment engines that are used at the site.

2. No-Idle Practices: In addition to using alternative fuel, the Contractor shall use methods to control nuisance odors associated with diesel emissions from construction equipment including the following:
 - a. Turning off diesel combustion engines on construction equipment not in active use, and on trucks that are idling while waiting to load or unload material for 5 minutes or more; and
 - b. Locating diesel equipment away from the general public and sensitive receptors.
 - c. Idling of diesel powered vehicles and equipment must not be permitted during periods of non-active vehicle use. Diesel powered engines shall not be allowed to idle for more than 5 consecutive minutes in a 60-minute period when the equipment is: not in use, occupied by an operator, or otherwise in motion, except as follows:
 - 1) When equipment is forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control,
 - 2) When it is necessary to operate auxiliary systems installed on the equipment, only when such system operation is necessary to accomplish the intended use of the equipment,
 - 3) To bring the equipment to the manufacturers recommended operating temperature,
 - 4) When the ambient temperature is below forty (40) degrees F or above eighty (80) degrees F, or
 - 5) When equipment is being repaired.
3. Clean Air Technologies: In performance of all activities under this contract, the Contractor shall, where feasible, use cleaner engines, cleaner fuel and cleaner diesel control technology on diesel-powered equipment with engines greater than 50 horsepower whether the equipment is owned or rented. Cleaner engines include non-road engines meeting Tier 1 or cleaner standards and on-road engines meeting 2004 On highway Heavy Duty Engine Emission Standards or cleaner, whether the equipment is owned or rented. Cleaner fuels include biodiesel blends or ultra-low sulfur diesel. Cleaner diesel control technology

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includes EPA or California Air Resources Board (“CARB”) verified diesel particulate filters (“DPFs”) or diesel oxidation catalysts (“DOCs”).

4. Engine Maintenance: Contractors perform routine and scheduled engine inspections and conduct preventative maintenance, giving any problems identified immediate attention. Perform routine engine cleaning and use environmentally friendly lubricants (i.e., bio-based) where available and where specified as an approved lubricant by engine and equipment manufacturers.
5. Transportation Alternatives: The Contractor shall transport material to and from the site by truck, rail, barge, or other method or a combination of methods as site requirements may dictate, and when feasible, to an Ecology approved facility in accordance with local, state, and federal regulations.

3.03 CONSTRUCTION MATERIALS HANDLING AND DISPOSAL

- A. Disposal of Construction Demolition Debris and Unsuitable Materials: To the greatest extent possible, the Contractor shall minimize the amount of waste disposal in landfills by seeking opportunities to reduce, reuse or recycle demolition materials that are not contaminated by hazardous substances. The Contractor shall dispose of uncontaminated, recyclable, or salvable demolition materials by a combination of salvage, reuse, or recycling at a facility approved by the Department of Ecology. The Contractor shall submit receipts, scale tickets, and/or waybills to Ecology documenting disposal and/or recycling. Recyclable materials may include building materials such as lumber and other wood products, metal, concrete, rebar, pipe materials, and asphalt, but shall not include materials impacted by contaminated soils.

3.04 GREEN REMEDIATION AND SUSTAINABLE BEST MANAGEMENT PRACTICES

- A. Table 01 35 43-1 below identifies the BMPs that the Contractor shall incorporate, where practical, into the project requirements.

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Table 01 35 32-1: Green Remediation and Sustainable Best Management Practices

Action	Potentially Applicable to Site?	Potential Benefits			
		Air	Energy	Water	Land
Use alternate fuels such as biodiesel, ultra-low sulfur diesel, and E85.	YES	Reduces air emissions from on-site construction equipment and from trucking waste materials.	Reduces use of petroleum products in on-site construction equipment and in trucking waste materials.	This action is not applicable to the above category.	Less toxic to the environment should a leak occur.
Require vehicles and construction equipment to use idle reduction technologies	YES	Reduces direct and indirect greenhouse gas and other emissions, e.g., CO, CO ₂ , VOC _s , NO _x , SO _x .	Reduces fuel use in on-site construction equipment and vehicles.	This action is not applicable to the above category.	Reduces noise impacts.
Sequence work to minimize double-handling of materials.	YES	Reduces air emissions from on-site construction equipment. Reduces nuisance dust.	Reduces fuel use in on-site construction equipment.	Reduces water quality impacts from erosion	Restores land sooner.
Use on-site renewable energy to power elements of the remedy, e.g., wind and solar power for treatment system.	NO	This action is not applicable to the above category.	Reduces purchased energy.	This action is not applicable to the above category.	May be an asset to redevelopment if left on site after cleanup.
Purchase green energy to power elements of the remedy	YES	Reduces air impacts of cleanup.	This action is not applicable to the above category.	This action is not applicable to the above category.	This action is not applicable to the above category.
Use permeable surface soil barriers, e.g., vegetated topsoil or gravel	YES	This action is not applicable to the above category.	This action is not applicable to the above category.	Reduces stormwater runoff	Increases post cleanup marketability of developable sites.

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Action	Potentially Applicable to Site?	Potential Benefits			
		Air	Energy	Water	Land
Reclaim grey water for reuse.	NO	This action is not applicable to the above category.	This action is not applicable to the above category.	Reduces water use.	This action is not applicable to the above category.
Use engineered surface soil barriers, e.g., pavement, cover system.	YES	Reduces air emissions from on-site construction equipment and from trucking.	Reduces fuel use in on-site construction equipment and in trucking waste materials.	This action is not applicable to the above category.	Reduces waste material requiring off-site disposal.
Use in-situ remediation technologies (e.g. monitored natural attenuation; chemical oxidation).	NO	May reduce air emissions by reducing excavation and materials handling.	Reduces fuel use in on-site construction equipment and in trucking waste materials.	This action is not applicable to the above category.	Less intrusive, especially if structures present like roads, utilities and valuable buildings.
Use cleanup technologies that permanently destroy contaminants (incineration, treatment).	NO	This action is not applicable to the above category.	May be more energy intensive.	This action is not applicable to the above category.	Reduces future contaminant migration concerns; eliminates need for long term maintenance and monitoring.
Use sorted soils to backfill excavation.	YES	Reduces emissions from trucking in clean fill.	This action is not applicable to the above category.	This action is not applicable to the above category.	Reduces clean fill material requirements.
Retain existing structures on site.	YES	Reduces air emissions from demolition activities.	Reduces fuel used for demolition and in trucking wastes off site.	This action is not applicable to the above category.	Preserves structures for future redevelopment; provides link to the past.

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Action	Potentially Applicable to Site?	Potential Benefits			
		Air	Energy	Water	Land
Recycle waste materials generated during cleanup	YES	This action is not applicable to the above category.	This action is not applicable to the above category.	This action is not applicable to the above category.	Reduces material requiring off-site disposal
Collect rainwater for on-site use e.g., dust control.	YES	This action is not applicable to the above category.	This action is not applicable to the above category.	Reduces water use; stormwater impacts.	This action is not applicable to the above category.
Install temporary dewatering systems to lower groundwater.	NO	This action is not applicable to the above category.	This action is not applicable to the above category.	Reduces potential ground and surface water impacts.	Better control of limits of excavation.

END OF SECTION 01 35 43.10

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 41 00 – REGULATORY REQUIREMENTS

SECTION 01 41 00
REGULATORY REQUIREMENTS

PART 1 – GENERALS

1.01 PERMITS, CODES, AND REGULATIONS

- A. Ecology Obtained Permits. The following permits have been applied for (or are on file) and incorporated into the contract (**See Appendix B**):
1. NWP 38: Cleanup of Hazardous and Toxic Waste
 2. NHPA Section 106 Concurrence
 3. ESA Section 7 Concurrence
 4. Clean Water Act Section 401 WQC
- B. Exempt Permits: The following list identifies permits that Ecology is exempt from meeting procedural requirements (Reference: RCW 70.105D.090 Remedial Actions – Exemption from procedural requirements). The Contractor does NOT have to apply for these permits.
1. Ch. 70.94 RCW, Washington Clean Air Act;
 2. Ch. 70.95 RCW, Solid Waste Management, Reduction, and Recycling;
 3. Ch. 70.105 RCW, Hazardous Waste Management;
 4. Ch. 75.20 RCW, Construction Projects in State Waters;
 5. Ch. 90.48 RCW, Water Pollution Control; and
 6. Ch. 90.58 RCW, Shoreline Management Act of 1971
- C. Permits transferred to the Contractor: The following list of permits shall be transferred to the Contractor from Ecology upon issuing Notice to Proceed (NTP). The Contractor shall maintain and conform to the following listed permits and additional or other applicable permits, codes, and regulations as may govern work.
1. Not applicable
- D. Permits to be obtained by the Contractor: The Contractor shall apply and pay for, obtain, maintain, and conform to the following listed permits and additional or other applicable permits, codes, and regulations as may govern work. Obtain permits prior to the start of construction.
1. Not applicable
- E. Submit copies of any license or permit applications, or other regulatory documentation, to Ecology when submitted to local jurisdictions or authorities.

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SECTION 01 41 00 – REGULATORY REQUIREMENTS

- F. Obtain and pay fees for licenses, permits, inspections, discharges, and approvals required by laws, ordinances, and rules of appropriate governing or approving agencies necessary for proper completion of Work.
- G. Conform to the current applicable codes, regulations and standards, which is the minimum standard of quality for material and workmanship. Provide labor, materials, and equipment necessary for compliance with code requirements or interpretations, although not specifically detailed in the Drawings or specifications. Be familiar with applicable codes and standards prior to bidding.
- H. Process through Engineer, requests to extend, modify, revise, or renew any of the permits or approvals provided by Ecology (listed above). Furnish requests in writing and include a narrative description and adequate Drawings to clearly describe and depict proposed action. Do not contact regulatory agency with requests for permit extensions, modifications, revisions, or renewals without the prior written consent of Ecology.

1.02 VARIATIONS WITH CODES, REGULATIONS AND STANDARDS

- A. Nothing in the drawings and specifications permits Work not conforming to codes, permits or regulations. Promptly submit written notice to Engineer of observed variations or discrepancies between the Contract documents and governing codes and regulations.
- B. Appropriate modifications to the Contract documents will be made by Change Order to incorporate changes to Work resulting from code and/or regulatory requirements. Contractor assumes responsibility for Work contrary to such requirements if Work proceeds without notice.
- C. Contractor is not relieved from complying with requirements of Contractor documents which may exceed, but not conflict with, requirements of governing codes.

1.03 COORDINATION WITH REGULATORY AGENCIES

- A. For Contractor obtained permits and approvals, coordinate Work with appropriate governing or regulating authorities and agencies.
- B. Provide advance notification to proper officials of Project schedule and schedule revisions throughout Project duration, in order to allow proper scheduling of inspection visits at proper stages of Work completion.
- C. Regulation coordination is in addition to inspections conducted by Ecology. Notify Ecology of scheduled inspections involving outside regulating officials, to allow Ecology to be present for inspections.
- D. The Contractor shall be responsible for adhering and conforming to all applicable provisions, conditions, and requirement of the permits listed in the specifications. Any conflict between these contract specifications and issued permits will be brought to the attention of Ecology and the Engineer. Nothing whatsoever shall be deemed to

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authorize violation of these permits. Permits, approvals, certification, or orders for dredging and disposal work under this contract from the entities listed below will be issued prior to Notice of Award, and copies will be provided to the Contractor prior to Notice to Proceed:

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 PERMIT COMPLIANCE

- A. Comply with the terms and conditions of all permits.
- B. Notify Ecology within 24 hours regarding any non-compliance with permits.
- C. Close out all permits in accordance with permit terms and conditions before Final Completion.
- D. Submit documentation of permit completion including sign-off by permit issuers prior to Final Completion.

END OF SECTION 01 41 00

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SECTION 01 42 00 – REFERENCES

SECTION 01 42 00
REFERENCES

PART 1 – GENERAL

1.01 DEFINITIONS

- A. “General”: Basic Contract definitions are included in the General Conditions of the Contract.
- B. “Approved”: When used to convey Ecology or Engineer’s action on Contractor’s submittals, applications, and requests, “approved” is limited to Ecology or Engineer’s duties and responsibilities as stated in the Conditions of the Contract.
- C. “Directed”: A command or instruction by Ecology or Engineer. Other terms including “requested”, “authorized”, “selected”, “required”, and “permitted” have the same meaning as “directed”.
- D. “Indicated”: Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including “shown”, “noted”, “scheduled”, and “specified” have the same meaning as “indicated”.
- E. “Regulations”: Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. “Furnish”: Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. “Install”: Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. “Project” refers to the overall completion of all work to cleanup all properties included in the work.
- I. “Provide”: Furnish and install, complete and ready for intended use.
- J. “Properties”, “parcels”, or “sites” refer to, in aggregate, all of the locations where work is being completed. Property, parcel, or site refers to an individual location where work is being completed, and includes associated work areas such as rights-of-ways, alleys or streets or adjacent properties used for loading, access, and staging, or similar use.

1.02 GENERAL

- A. Applicable standards of the construction industry have the same force and effect (and are made a part of the Contract Documents by reference) as if directly copied or bound herein.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 42 00 – REFERENCES

1.03 PUBLICATION DATES

- A. When compliance with an industry standard is required, comply with the standard in effect on Bid Date.

1.04 ABBREVIATIONS AND NAMES

- A. The following acronyms or abbreviations, referenced in the Contract Documents, are defined to mean the associated name. Applicable standards include, but are not limited to the following:

1. ACI American Concrete Institute
2. ADA Americans with Disabilities Act
3. ANSI American National Standards Institute
4. APWA American Public Works Association
5. ASTM ASTM International
6. CESCL Certified Erosion and Sediment Control Lead
7. CFR Code of Federal Regulations
8. Ecology Washington State Department of Ecology
9. EPA U.S. Environmental Protection Agency
10. ESA Endangered Species Act
11. ESC Erosion and Sediment Control
12. HAZWOPER Hazardous Waste Operations and Emergency Response
13. L&I Washington State Department of Labor & Industries
14. MA Management Area
15. MTCA Model Toxics Control Act
16. NHPA National Historic Preservation Act
17. NWP Nationwide Permit
18. NPDES National Pollution Discharge Elimination System
19. NRC National Response Center
20. OSHA U.S. Occupational Safety & Health Administration
21. RCRA Resource Conservation and Recovery Act
22. RCW Revised Code of Washington
23. SDS Safety Data Sheet
24. SEPA State Environmental Policy Act

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 42 00 – REFERENCES

- 25. SWPPP Stormwater Pollution Prevention Plan
- 26. TESC Temporary Erosion and Sediment Control
- 27. WAC Washington Administrative Code
- 28. WDA Waste Disposal Authorization
- 29. WISHA Washington Industrial Safety and Health Act
- 30. WQC Water Quality Certification
- 31. WSDOT Washington State Department of Transportation

B. Typical abbreviations for units include, but are not limited to the following:

- 1. CFM or cfm cubic feet per minute
- 2. CY or cy cubic yard
- 3. FPM or fpm feet per minute
- 4. FT or ft foot or feet
- 5. Gal or gal gallons
- 6. IN or in inch or inches
- 7. LBF or lbf pounds force
- 8. LF or lf lineal foot
- 9. LS lump sum
- 10. NTU Nephelometric Turbidity Unit
- 11. PCF or pcf pounds per cubic foot
- 12. PPM or ppm parts per million (typically mg/kg for mass)
- 13. Pts or pts points
- 14. SF or sf square foot or feet
- 15. SY or sy square yards

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01 42 00

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 45 00 – QUALITY CONTROL

SECTION 01 45 00
QUALITY CONTROL

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. This section describes the Contractor’s general quality control requirements, duties, and responsibilities during execution of the Contract Work. Detailed quality control requirements are presented in individual specification sections.
- 1. The Contractor shall establish, provide, and maintain an effective Quality Control Program, as described in the Contractor’s Quality Control Plan (CQCP) which details the methods and procedures that will be taken to assure that all materials and completed construction conform to requirements of the Contract Documents and Manufacturer recommendations. Although the guidelines are established and certain minimum requirements are specified herein and elsewhere in the Contract Documents, the Contractor shall assume full responsibility for accomplishing the stated purpose.
- B. The Contractor shall be prepared to discuss and present, at the Preconstruction Meeting, its understanding of the quality control requirements. The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the (CQCP) has been reviewed and approved by Ecology or Ecology’s Representative.
- C. The Contractor’s CQCP shall comply with the protocols established by Ecology’s Construction Quality Assurance Plan (CQAP). Ecology will appoint a Construction Quality Assurance Officer who will be responsible for overseeing the implementation of the CQAP and will serve as Ecology’s designated representative during construction.

1.02 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with the requirements of the standard, except where more rigid requirements are specified by applicable codes.
- B. Conform to reference standard by date of issue current on date of contract documents, except where a specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 45 00 – QUALITY CONTROL

1.03 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce work of specified quality.
- B. Comply with manufacturer's instructions, including each step in the sequence.
- C. Should manufacturer's instructions conflict with contract Documents, request clarification from Ecology or Ecology's Representative before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce required and specified quality.

1.04 SUBMITTALS

- A. The Contractor shall provide the CQCP to Ecology or Ecology's Representative in accordance with **Section 01 33 00 – Submittal Procedures**.
- B. The Contractor shall provide the Contractor's Daily Report. Requirements include the following:
 - 1. Date the report is issued
 - 2. Project name and Ecology Contract number
 - 3. Work performed each day
 - 4. Name of workers and subcontractors performing work each day, including hours worked by each person
 - 5. Type of equipment and hours used each day
 - 6. Surveys completed
 - 7. Submittals made
 - 8. Weather conditions, summary of stormwater management, monitoring completed and results, best management practices modified, stormwater released, and contingencies implemented
 - 9. Identification of bid item quantities used each day or percent complete for lump sum items
- C. Identification of potential items that may result in schedule overruns or added costs

1.05 MATERIAL INSPECTION CONTROL

- A. For bulk items, furnish quantity sheets (load receipts) to account for each load delivered to the Site. Deliver quantity sheets to the Ecology's Representative on site

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 45 00 – QUALITY CONTROL

at time of delivery. In the event Ecology's Representative is not on the Site, deliver quantity sheets daily to a location designated by Ecology.

1.06 QUANTITY SHEETS/WEIGHT TICKETS

- A. Provide disposal weight tickets from the approved disposal site(s) for each load of excavated contaminated soil leaving the Site. Submit disposal weight tickets in batches on weekly. Provide cumulative disposal ticket summary printouts from the approved disposal site(s) when requested by Ecology.
- B. For bulk items, supply quantity sheets (load receipts) to account for each load delivered to the Site. Deliver quantity sheets to Ecology's Representative on site at delivery time. If Ecology's Representative is not on site, deliver quantity sheets daily to a place designated by Ecology.
- C. No payment shall be made for materials delivered for which quantity tickets or the disposal site load summary have not been turned into Ecology's Representative or delivered to the designated place at the end of the working day. Backdated tickets are not acceptable as a basis of payment, except at Ecology's discretion.
- D. If the bid item for material to be delivered to the Site is stated in tons, only weight slips from a certified scale are acceptable for payment purposes, unless approved in advance by Ecology.
- E. No payment for materials will be made until proper accounting has been made. Final quantity records are approved by Ecology, with payment at Ecology's discretion.

1.07 REPORTS AND DOCUMENTS

- A. Permits, Licenses, and Certificates: For Ecology's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.08 LISTED OR APPROVED SOURCES

- A. The listing of material and/or product sources or manufacturers in these Technical Specifications is not a guarantee that the material in all manner is acceptable or commercially available. The Contractor shall confirm requirements and availability at the time of bidding and supply. Products such as soils, compost, sod, and seed are inherently natural products with varying physical, chemical, and biological properties. Conformance to specifications shall be confirmed by the Contractor based on project-specific testing.

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SECTION 01 45 00 – QUALITY CONTROL

1.09 TESTING SERVICES

- A. Necessary materials testing shall be performed by an independent testing laboratory during the execution of the Work. Access to the area necessary to perform the testing and/or to secure the material for testing shall be provided by the Contractor.
- B. Testing does not relieve the Contractor from performing work to contract requirements.
- C. Retesting required because of non-performance to specified requirements shall be performed by the same independent firm. Payment for retesting will be charged to the Contractor by deducting testing charges from the Contract sum.
- D. Subsequent sampling and testing, required as the work progresses to assure continued control of materials and compliance with all requirements of contract Documents, shall be the responsibility of Ecology, except as required by other sections of these specifications.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 CONTRACTOR QUALITY CONTROL

- A. **Documentation:** The Contractor shall maintain current quality control records of all inspections and tests performed. These records shall include factual evidence that the required inspections or tests have been performed, including type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, proposed corrective action; and corrective actions taken.
- B. **Non-compliance:** Ecology or Ecology’s Representative may notify the Contractor of any non-compliance with project quality control requirements. The Contractor shall, after receipt of such notice, immediately take corrective action.
 - 1. In cases where quality control activities do not comply with either the CQCP or the contract provisions, or where the Contractor fails to properly operate and maintain an effective Quality Control Program, as determined by Ecology or Ecology’s Representative, Ecology or Ecology’s Representative may:
 - a. Direct the Contractor to replace ineffective or unqualified quality control personnel or subcontractors.
 - 2. Carry out the functions and operations of the CQCP. Costs incurred by Ecology to operate the Quality Control Program plan or to otherwise remedy the Contractor’s non-compliance with quality-related provisions of the Contract shall be deducted from the total amount due the Contractor.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 45 00 – QUALITY CONTROL

3. Order the Contractor to stop operations until appropriate corrective actions are taken.
4. Withhold payment for the items not corrected based on the costs for the items as listed in the Schedule of Values.
5. Any failure by Ecology to notify the Contractor of any non-compliance with any of the foregoing requirements shall not be deemed as a waiver of its enforcement rights hereunder and that the Contractor is still bound by the terms and conditions of said requirement.

3.02 CONTRACTOR'S DAILY REPORT

- A. Contractor shall provide Ecology with a written daily report at the end of each day's work. The Contractors Daily Report shall describe the work accomplished that day and address each item listed in Article 2.01 of this section. The Contractor's Daily Reports will be one of the agenda items discussed at the weekly project meeting described in **Section 01 31 00 – Project Management and Coordination**.

END OF SECTION 01 45 00

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 PROTECTION OF PROPERTY AND EXISTING FACILITIES

- A. Provide protections necessary to prevent damage to property and facilities. When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect or misconduct in execution of Work, or in consequence of non-execution of Contractor, restore, or have restored at Contractor's expense, such property to a condition similar and equal to that existing before such damage or injury was done, by repairing, rebuilding, or otherwise restoring same, or make good damage or injury in some other manner acceptable to Ecology.
- B. Rubber-tired or rubber-tracked equipment are permitted to operate on paved driveways, walkways and sidewalks with pavement protection measures in place and following proper equipment decontamination to minimize spread of contaminants off site (see **Section 02 61 00 – Removal and Disposal of Contaminated Soils, paragraph 3.3**). If equipment must operate on paved driveways and sidewalks, appropriate protection methods should be used to prevent damage to the structures.
- C. Remove and temporarily relocate the existing boat ramp during construction to allow for excavation and placement in the Public Dock Management Area (MA).
- D. Protect existing trees and other vegetation not designated for removal (to remain in place) against cutting, breaking or skinning of roots, skinning and bruising of bark, or smothering of trees by stockpiling materials within critical root radius. Provide necessary temporary guards to protect trees and vegetation to remain in place.
- E. Make every effort to minimize damage and cutting major tree roots during excavation operations. Provide protection for larger tree roots exposed or cut during excavation operations.
- F. Do not paint facilities to remain. Instruct Contractor staff, utility locate firms and surveyors that existing facilities to remain shall be protected and not defaced. Markings as needed shall be temporary and shall be removed at the completion of the project.
- G. Existing landscaping and vegetation to remain shall not be pruned or trimmed without approval from Ecology.
- H. No additional site work not indicated in the project manual shall be completed without approval from Ecology.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

- I. Protect cultural or historical resources, including cultural or historical resources that have been identified in the footprint of the Staging Area, in accordance with the provisions of the permits governing work within cultural/historic resource areas.

1.02 DAMAGE TO FACILITIES, ROADS, VEGETATION OR PROPERTY

- A. The Contractor shall complete photo-documentation of site conditions, including private and public property/rights-of-ways prior to the start of work by the Contractor.
- B. During the course of construction, the Contractor shall repair any damage to any part of the project property damaged by Contractor's actions, operations or neglect. Contractor shall make repairs to the original condition, as acceptable to the Ecology's Representative, at no cost to Ecology.
- C. Repair to "original condition" includes conforming to codes and regulatory requirements. Repairs shall conform to the most stringent of the following:
 1. Meet applicable codes, including obtaining appropriate permits and inspections.
 2. Meet relevant industry standards for the type of pipe, conduit, wire, etc., as published by a National Industry Association.
 3. Meet applicable and relevant ASTM standards.
 4. Replace the damaged item with an equivalent item. For pipe, conduit, wire, or similar item, replace the damaged item with the same size item of the same material of the same specification (e.g., schedule 40) based on inspection of the damaged item and concurrence of the Ecology's Representative. Replace a standard length of pipe or conduit or other item, and use joints or connectors specifically manufactured for the repair the type of item/material damaged. Provide waterproof jacketing or other seals, coatings, or other ancillary items. Repair tracer wires and or conductive warning tapes.
 5. Complete all testing typically implemented for installation of the damaged item (e.g., pressure testing of water lines) and comply with regulatory procedures (e.g., disinfection of water lines).
 6. Pipe wraps, clamps, and similar patches shall not be used.
- D. Repair, restore or replace any curbs, parking lot pavement, utilities, vegetation or property damaged by the Contractor to the original condition at the time construction began. Repair or replace trees and vegetation indicated to remain (or not indicated for removal) which has been damaged by construction operations, in a manner acceptable to the Ecology's Representative.
- E. All repairs made within rights-of-ways, including repair of sidewalks and curbs, shall meet Town of Northport, Stevens County, or Washington State Department of Transportation requirements as applicable.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

1.03 RELATED SECTIONS

- A. Section 01 35 43.10 – Green Construction Practices

1.04 ENVIRONMENTAL PROTECTIONS – GENERAL

- A. Scope: Provide labor, materials, equipment and perform Work required for protection of environment during and as a result of construction operations under contract.
- B. Applicable Regulations: Comply with applicable federal, state and local laws and regulations concerning environmental pollution control and abatement, and specific requirements elsewhere in this project manual to prevent and provide for control of environmental pollution. Comply with applicable federal and state laws for the protection of cultural and historic resources.
- C. Subcontractors: Contractor is responsible for compliance with provisions of this Section by subcontractors.

1.05 SUBMITTALS

- A. Submit an Access and Staging Plan as described in **Section 01 33 00 – Submittal Procedures**.
- B. Submit a Dust Control Plan as described in **Section 01 33 00 – Submittal Procedures**.
- C. Submit a Spill Prevention and Response Plan as described in **Section 01 33 00 – Submittal Procedures**.
- D. Submit a Light Control Plan as described in **Section 01 33 00 – Submittal Procedures**.

1.06 ENVIRONMENTAL PROTECTIONS

- A. Protection of Land Resources: Give special attention to the effect of Contractor's operations upon surroundings. Take special care to maintain natural surroundings undamaged and conduct Work in compliance with following requirements.
 - 1. When Work is completed, remove storage, and other Contractor buildings and facilities, and restore sites to a neat and presentable condition appropriate to surrounding landscape, unless otherwise specified. Remove debris resulting from Contractor's operation.
 - 2. Store petroleum products, industrial chemicals and similar toxic or volatile materials in durable containers located in areas where accidental spillage will not enter water. Store such materials in an area surrounded by containment dikes of sufficient capacity to contain an aggregate capacity of containers (110% secondary containment).

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

B. Protection and Restoration of Property:

1. Preserve public and private property, structures, monuments, power and telephone lines, other utilities, and prevent damage to the natural environment.
2. Provide steel plates, thick plastic ground protection mats, or ¾-inch thick plywood (OSB or wafer board not allowed) as necessary to cover facilities and pavements and lawn areas that must be crossed with tracked equipment. Secure plates or plywood sections together with lumber and fasteners as necessary to prevent turning or dislodging due to travel and/or turning of equipment. Replace plywood as it becomes waterlogged or loses rigidity and its protective properties degrades beyond its intended purpose.
3. When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect or misconduct in execution of Work, or in consequence of non-execution of Contractor, restore, or have restored at Contractor's expense, such property to a condition similar and equal to that existing before such damage or injury was done, by repairing, rebuilding, or otherwise restoring same, or make good damage or injury in some other manner acceptable to Ecology.

C. Protection of Water Resources:

1. Perform Work not to create conditions injurious to fish or to their habitat, or which would make water unsuitable for private, municipal, or industrial use.
2. Take special measures to prevent chemicals, fuels, oils, grease, bituminous materials, waste washings, herbicides, insecticides, lime, wet concrete, cement, silt or organic or other deleterious material from entering waterways.
3. Dispose of off site, in a lawful manner conforming to applicable local, state and federal laws wastes effluents, trash, garbage, oil, grease, chemicals, cement, bitumen, petroleum, and chemical products or wastes containing such products. Furnish Ecology with documentation showing compliance with this requirement.
4. Conform to applicable local, state and federal laws for disposal of effluents. Dispose of waters used to wash down equipment in manner to prevent their entry into a waterway, and comply with project specific requirements for water management. If waste material is dumped in unauthorized areas, remove material and restore area to condition of adjacent, undisturbed area. If necessary, excavate contaminated ground and dispose of as directed by Ecology and replace with suitable compacted fill material with surface restored to original condition.

D. Temporary Water Pollution/Erosion Controls:

1. Provide for prevention, control and abatement of soil erosion and water pollution within the limits of Project, to prevent and/or minimize damage to adjacent bodies of water and to the Work.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

2. Coordinate temporary soil erosion/water pollution control measures with permanent drainage and erosion control Work to ensure effective and continuous controls are maintained throughout Project life.

1.07 SPILL RESPONSE

- A. Implement the spill response plan. Maintain copies of all SDS at the site for chemicals on site including fuels, cleaners, fertilizers, and other chemical materials.
 1. Comply with all applicable codes and ordinances for spill prevention and response.
 2. Provide appropriate spill response materials including, but not limited to the following: containers, adsorbents, shovels, and personal protective equipment. Spill response materials shall be available at all times when contaminated materials/wastes are being handled or transported. Spill response materials shall be compatible with the type of materials and contaminants being handled.
- B. Emergency Spill Response Notification: Immediately notify Ecology of any spill of fuel or hazardous substance, regardless of quantity. All oil and hazardous materials spills cause environmental damage.
 1. Under state law, Ecology must be notified when any amount of regulated waste or hazardous material that poses an imminent threat to life, health, or the environment is released to the air, land, or water, or whenever oil is spilled on land or to waters of the state. The spiller is always responsible for reporting a spill. Failure to report a spill in a timely manner may result in enforcement actions. If you are not responsible for a spill, making the initial notification does not make you liable. However, please consult with Ecology's response team before attempting any type of response or cleanup. Notify property owner and Ecology's Representative.
 2. If oil or hazardous materials are spilled to state waters, the spiller must notify both federal and state spill response agencies. The federal and state response agencies are:
 - a. **Federal – National Response Center (NRC) – 1-800-424-8802.** The NRC is a part of the federally established National Response System and staffed 24 hours a day by the U.S. Coast Guard.
 - b. **State of Washington Emergency Management Division (EMD) – 1-800-258-5990 or 1-800-424-8802; AND**
 - c. The appropriate **Ecology Regional Office** for your county (**see numbers below**). An Ecology spill responder will normally call the reporting party back to gather more information. The agency will then determine its response action. Also notify Ecology, property owner, and Ecology's Representative.
 3. Ecology Regional Spill Reporting Numbers:

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SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

- a. **Eastern Regional Office – 1-509-329-3400**
(Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, and Whitman counties).

1.08 TEMPORARY ACCESS ROADS

- A. Prepare and maintain temporary access roads as required throughout construction.
- E. Maintain access road throughout construction, including regular application of water for dust control.
- F. Upon completion of the Work, remove fill and restore existing grades to original or postconstruction contours as applicable. Repair any damage to asphalt roads and parking lot areas.

1.09 TEMPORARY CONSTRUCTION ENTRANCE

- A. Quarry spalls or an approved equal shall be placed to the depth lines and locations indicated on the Contract Drawings in Appendix A01 for the Temporary Construction Entrance.
- G. Place in layers not more than 12 inches in loose depth and spread level prior to placement of successive lifts.

1.10 PROPERTY TRAFFIC/PEDESTRIAN CONTROLS

- A. Implement the Access and Staging plan. Comply with the plan. Revise the plan as required and submit promptly for Ecology's review and approval prior to implementing changes.
- H. Properly warn the public of construction equipment and activities, open trenches, and/or other unsafe conditions by providing all necessary warning equipment. Equipment includes warning signs, barricades, fencing, flashing lights and traffic control personnel (flaggers).
 - 1. Flaggers to have current Washington State Traffic Control (Flagging) Certification.
 - 2. Conduct operations with the least possible obstruction and inconvenience to the property owners and the public.
 - 3. Do not obstruct property owner access to their garages, homes or pets. Provide temporary access ways, gates, and plywood coverings as needed. On a reasonably frequent basis, escort property owners to access areas of their property that are outside the cleanup area but that are not accessible due to cleanup.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

1.11 PROTECTION OF WORK

- A. Protect Work, materials, and equipment against damage, weather conditions, or other hazards. Equipment, Work or materials found damaged or in other than new condition will be rejected by Ecology's Representative.

1.12 USE OF PROJECT SITE SPACE

- I. Comply with access agreement (general form) (see Appendix D02) and any special access requirements in the contract documents.
- J. Contractor vehicle and equipment parking only as designated by Ecology's Representative.
- K. Implement the Access and Staging plan. Comply with the plan. Revise the plan as required and submit promptly for Ecology's review and approval prior to implementing changes.

1.13 SANITARY FACILITIES

- A. Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of Authorities Having Jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

1.14 WATER

- A. Provide all water for all uses including but not limited to irrigation, dust control, drinking, decontamination, and other needs.
 - 1. Obtain approval from appropriate water district prior to using water from fire hydrants.
 - 2. Provide water from off-site potable sources as required. Non-potable water shall not be used.
 - 3. Provide backflow prevention as required.
- L. Provide all hoses and other equipment needed to convey water.
- M. The Contractor shall not obtain water from private residential property owners.

1.15 ELECTRICAL POWER

- A. Provide temporary power as required from temporary independent power drop coordinated with utility, or by using generators.
- B. Do not use private power outlets at Work sites.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

PART 2 – PRODUCTS

2.01 QUARRY SPALLS

- A. For Stabilized Construction Entrance: Quarry spalls shall meet the following requirements.

Sieve Size	Percent Passing (by Weight)
8-inch	100
3-inch	40 max.
3/4-inch	10 max.

PART 3 – EXECUTION

3.01 TEMPORARY DOCK REMOVAL AND REINSTALLATION

- A. The Contractor shall remove and relocate the existing public dock to a safe location to protect it from damage while construction in the Public Dock MA takes place.
- N. The Contractor shall reinstall the dock to its original condition following construction completion and acceptance by Ecology.

END OF SECTION 01 50 00

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 57 13 – TEMPORARY EROSION AND SEDIMENT CONTROL

SECTION 01 57 13
TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. The work includes the provision of temporary and permanent erosion and sediment control (TESC) measures to prevent the pollution of air, water, and land within the project limits and in areas outside the project limits where work is accomplished in conjunction with the project.
- B. General: The work involves excavation of contaminated soils and sediments containing arsenic, copper, lead, and zinc. The Contractor shall diligently implement TESC procedures at all times during completion of the work to prevent cross-contamination between clean and contaminated areas, contaminated sediment tracking, dispersal of contaminated dust, and runoff of contaminated stormwater from excavation and stockpile areas. The Contractor is cautioned that release of contamination to uncontaminated areas may cause Ecology and/or the Contractor to be liable for the spread of contamination, including associated future actions and costs for investigation and remediation of the released contamination.
- C. NPDES Construction Stormwater General Permit coverage forms, activities, monitoring, reporting, and Notice of Termination.
 - 1. Coordinate with Ecology Water Quality per requirements of NPDES Construction Stormwater General Permit. Copy Ecology (Ecology's Representative) on all correspondence and submittals.
 - 2. The project site is a contaminated site subject to project-specific requirements that are more stringent than are applicable for a typical clean development site. Contaminated site requirements as listed below apply at all times from project inception to the time when all of the following are complete: 1) all fill materials are placed to full depth including Cap Material, armor rock, backfill and topsoil, 2) all subgrades with Management Areas are fully covered; 3) all excavated contaminated material has been hauled off-site and site cleaning and equipment decontamination is complete. Thereafter, project will revert to standard NPDES Construction Stormwater General Permit requirements.

1.02 RELATED SECTIONS

- A. **Section 01 35 43.10 – Green Construction Practices**

1.03 REGULATORY REQUIREMENTS

- A. Stormwater Management Manual for Eastern Washington, Washington State Department of Ecology (August 2019)

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01 57 13 – TEMPORARY EROSION AND SEDIMENT CONTROL

- B. City of Northport Storm Water Management Program Plan (2017). [20487_2017-ms-4-stormwater-management-program-plan.pdf \(cityofnorthport.org\)](#)
- C. Stormwater Pollution Prevention Plan (SWPPP) provided in **Appendix C03**, which was approved by Ecology Water Quality Section as a condition of coverage under the NPDES Construction Stormwater General Permit for this site. Meet project specific requirements as listed herein and in SWPPP.

1.04 QUALIFICATIONS

- A. Certified Erosion Sediment and Control Lead (CESCL). The Contractor shall designate a TESC Supervisor to be responsible for inspecting the TESC measures and for ensuring that the Contractor's operations are preventing sediment runoff. The minimum qualifications for the TESC-Supervisor include a current certification as a CESCL by a course approved by Ecology. The Contractor shall provide Ecology with a method for contacting the TESC-Supervisor 24-hours per day, 7 days a week.

1.05 CONSTRUCTION SEQUENCE SCHEDULE

- A. The Contractor shall maintain, modify, and update by taking ownership of the provided SWPPP and Contractor-prepared TESC Plans. Updates to the plan shall include the Contractor's construction sequence schedule. The TESC Plans and SWPPP shall be maintained to be at least as stringent as a requirement set forth in the construction drawings and owner provided SWPPP.
- B. SWPPP is provided in **Appendix C03** for this project. The Contractor shall update the provided SWPPP as required by the permit coverage. An alternative SWPPP may not be used in lieu of the provided SWPPP.
 - 1. The Contractor shall submit to Ecology revisions to the SWPPP on a weekly basis.
- C. The work schedule shall coordinate the time of land disturbing activities with the provision of erosion control measures to reduce on site erosion and off site sedimentation. Installation of temporary erosion control features shall be coordinated with the construction of permanent erosion control features to assure effective and continuous control of erosion and pollution.
- D. TESC Plan: The Contractor shall prepare a TESC Plan, SWPPP short form, and other documents that meet the requirements and intent of the project SWPPP, and modify, adapt, and maintain these plans and documents as required based on site conditions. The project specific documents shall include a site specific TESC Plan that describes the proposed layout of temporary erosion and sediment controls and best management practices to be used. The plan shall include the manufacturer's catalog cut sheets or a sample of materials to be used. The plan should identify the types of work and Best Management Practices for each phase of the project.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 57 13 – TEMPORARY EROSION AND SEDIMENT CONTROL

- E. NPDES Construction Stormwater General Permit: The Contractor shall modify, adapt, and maintain the furnished site specific SWPPP that includes the following elements: identified all potential sources of stormwater pollution at the construction site; describes practices to reduce pollutants in stormwater discharges from the construction site; and identifies procedures the operator shall implement to comply with the terms of NPDES Construction Stormwater General Permit, including project specific requirements.
- F. Ecology will issue a Transfer of Coverage for this site to the Contractor prior to the start of the work. The SWPPP prepared in conjunction with the Notice of Intent is included in the **Appendix C03** of this Project Manual.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. General: Meet specifications for TESC materials as outlined in Ecology’s *Stormwater Management Manual for Eastern Washington* including but not limited to the following TESC measures:
 - 1. Stabilized Construction Entrance (or alternate entrance);
 - 2. Nets and blankets;
 - 3. Plastic Sheeting;
- B. 10 mil string reinforced multi-layer plastic sheeting for stockpile base liners.
- C. 10 mil plastic sheeting (truck loading liners and access way liners to accommodate equipment traffic).
- D. All other applications: 6 mil unreinforced plastic sheeting.
 - 1. Silt Fence;
 - 2. Vegetated Strip;
 - 3. Triangular Silt Dike;
 - 4. Storm Drain Inlet Protection;
 - 5. Sandbags and anchors;
 - 6. Other applicable erosion and sediment control materials determined by best management practices (BMPs) and dynamics of the site.

PART 3 – EXECUTION

3.01 NPDES CONSTRUCTION STORMWATER GENERAL PERMIT

- A. Transfer of Coverage: Prior to the start of the work, Ecology will prepare a Transfer of Coverage for permit transfer to the Contractor. The Contractor shall sign the Transfer of Coverage form and submit it to Ecology Water Quality (with copy to Ecology) within 7 days of receipt, and prior to mobilization to site.
- B. Permit Requirements: The Contractor shall meet all the permit requirements including providing a currently certified CESCL, completing site inspections and filling

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 57 13 – TEMPORARY EROSION AND SEDIMENT CONTROL

out Site Inspection Checklists, preparing and submitting monthly Discharge Monitoring Reports (DMRs) (using Ecology’s electronic reporting process), and updating Ecology provided SWPPP as necessary throughout the life of the site work requiring this permit coverage.

- C. Notification to Ecology for Inspection: The Contractor shall notify the Ecology Water Quality Program by phone and email a minimum of 72-hours prior to first excavation and after installing TESC measures. Provide schedule and continue to update schedule as it changes. This notification informs Ecology that TESC measures are installed correctly and that they can be inspected by Ecology’s Water Quality personnel.
- D. When site is stabilized, remove TESC measures and complete final restoration of impacts from removal of TESC measures. When site is stabilized, including achieving a “uniform stand of grass” in seeded areas, prepare Notice of Termination form and submit to Ecology Water Quality in accordance with NPDES Construction Stormwater General Permit procedures. Submit copy of form to Ecology (Ecology’s Representative).

3.02 PREPARATION

- A. TESC measures shall be installed as stringent as or more stringent than indicated in the Contractor’s TESC plan and SWPPP, and shall be substantially upgraded by the Contractor following any observed deficiencies. Downgrading installed TESC measures shall only occur with concurrence of Ecology.

3.03 INSTALLATION

- A. Install BMPs per Contractor prepared and Ecology approved TESC Plans and BMP specifications.

3.04 TESC IMPLEMENTATION AND MAINTENANCE

- A. Implement stormwater TESC measures and BMPs per the site SWPPP.
 - 1. Prior to start of construction at each property, implement TESC Plan,
 - 2. Maintain installed TESC measures in place throughout the duration of construction and site stabilization. For sod sites, TESC measures may be removed after all materials are incorporated into the work, and all sod is placed, provided the site is otherwise fully stabilized. For hydroseed sites, achieve “uniform stand of grass”, then remove TESC measures, provided the site is otherwise fully stabilized.
- B. Run-on/Run-off Control: The Contractor shall prevent stormwater from higher elevation areas from running into excavations. Provide and maintain water diversion structures. Prevent water from flowing into excavation areas. Collect, manage and divert clean stormwater to drainages outside excavation areas.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 57 13 – TEMPORARY EROSION AND SEDIMENT CONTROL

- C. Prevent stormwater contact with contaminated subgrade, stockpiles, and Access and Staging Areas.
 - 1. The Contractor shall cover excavated areas, stockpiles, and staging areas with plastic sheeting to prevent contact of stormwater with potentially contaminated soils. Sheeting shall be secured in place daily as the work progresses. Secure sheeting in place with sandbags and anchor trenches (filled with clean soil). Overlap sheeting from higher elevation areas over lower elevation areas.
 - 2. Sheeting shall be arranged such that runoff is contained within excavations.
 - 3. Store any water that does not meet requirements in portable tanks. Disposed of stored water off-site at a permitted facility.
 - 4. Discharged water shall meet project specific discharge limits.
- D. Turbidity Limits:
 - 1. 25 NTU during any time when contaminated soils or material (including subgrades, track out, stockpiles, and non-decontaminated equipment) are present at a property.
 - 2. After covering subgrades with clean Backfill Materials, cleaning all track out, removing all contaminated soil stockpiles, and contaminating equipment: per NPDES Construction Stormwater General Permit.
 - 3. Water that contacted potentially contaminated soils, such as due to incomplete, damaged, or misplaced sheeting, shall not be discharged without treatment to meet the project specific discharge limits.
- E. All water shall be managed on site to the maximum extent practicable.
- F. Store water that cannot be maintained on site in portable tanks.
- G. Inspection: TESC Supervisor shall inspect erosion and sediment control daily and immediately before, during and after each rain event.
- H. Logs: TESC Supervisor shall maintain a log of all inspections.
- I. Sediment Control: The Contractor shall implement the following measures to eliminate sediment from leaving the site.
 - 1. Haul trucks shall not drive on exposed contaminated soils, in remediation areas, in topsoiled areas, and within critical root zones of trees.
 - 2. No track out or dispersal of sediment to areas outside cleanup limits is allowed. Protect all access and staging areas, and loading areas, with plastic sheeting. Clean plastic sheeting after loading each truck. Replace plastic sheeting daily or more frequently if damaged; holes are not allowed. Roll up plastic sheeting when not in use. Minimize loading of contaminated soils when raining; alternatively, prevent runoff of water from plastic sheeting into rights of way or adjacent areas. Fully contain and manage water on plastic sheeting.

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01 57 13 – TEMPORARY EROSION AND SEDIMENT CONTROL

3. Complete the work so as to limit placement of plastic sheeting over existing lawn in access and staging and loading areas to 5 days maximum. Restore any areas and lawn damaged by plastic sheeting or other protective measures.
 4. Clean equipment that contacted soils prior to leaving site. Equipment that contacts contaminated soils shall be thoroughly cleaned and decontaminated, first by dry brushing and vacuuming, or, as a contingency, by pressure washing (if approved by Ecology). Contain and dispose of wash water off site or, if it can be accomplished, infiltrate wash water into excavation area soils. Do not discharge sediment or wash water to areas adjacent to the remediation areas, or to restored areas, or to storm drains.
 5. Sweep all sediment tracked or deposited on public roadways within 30-minutes of occurrence. Cleaning is not a substitute for prevention of trackout.
 6. Sweep using high efficiency vacuum sweeper. Visible dust from sweeper exhaust is not allowed. Washing down pavements and streets is prohibited unless all wash water is fully contained and treated to meet project specific discharge limit.
- J. Stockpiles: Stockpiles shall be underlain by an impervious surface, and covered, with plastic sheeting of a size substantially larger than the pile, secured as required prior to leaving job site on a daily basis. Secure covers against movement by wind.

3.05 STORMWATER STORAGE, TREATMENT, AND DISCHARGE

A. Storage:

1. Manage water on site to the maximum degree possible. Infiltrate stormwater into existing excavations. Do not infiltrate water into areas beyond excavation limits or into areas of clean backfill.
2. Runoff that cannot be managed within existing excavations due to volume, topography or other cause shall be contained and pumped to a storage tank. Dispose of stored water at an off-site permitted facility.

3.06 MONITORING

A. Turbidity:

1. NPDES Permit Sites: Conduct monitoring of runoff that leaves any excavation area as required by the NPDES Construction General Stormwater Permit. Report all test results as required by permit. Promptly provide copy of test results and reporting forms to Ecology.
2. For each property, from start of any soil disturbance to the time when the work is complete as defined in Paragraph 1.01C of this Section, monitor discharge for turbidity for each storm event, or twice daily, or per NPDES Construction Stormwater General Permit requirements, whichever is more stringent.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 57 13 – TEMPORARY EROSION AND SEDIMENT CONTROL

3.07 DISCHARGE LIMIT

- A. Turbidity:
1. From the start of any soil disturbance to the time when the work is complete as defined in Paragraph 1.01C of this Section, project specific discharge limits apply.
 2. Project specific discharge limit: No discharge in excess of 25 NTU is allowed.
 3. If **stormwater discharged from the site exceeds 25 NTUs**, the Contractor must file a discharge report with:
 - a. Washington Emergency Management Division (ERTS) at 1 (800) 258-5990, details for reporting are provided in **Appendix C03 – SWPPP**.

3.08 COORDINATING RESTORATION WORK WITH TESC BMPS

- A. Sod and hydroseed:
1. Identify BMPs not necessary to remain in place after installing sod or hydroseed and that will impact the installation of sod or hydroseed.
 2. Remove unnecessary BMPs (not construction fencing) prior to installing sod or hydroseed.

3.09 TERMINATION, RESTORATION AND CLEAN UP

- A. After all sites are fully stabilized, and prior to submitting Notice of Termination to Ecology Water Quality and before Final Completion, remove and dispose all temporary erosion and sediment control materials and fully restore and stabilize the site.
- B. Prepare Notice of Termination form and submit to Ecology Water Quality in accordance with NPDES Construction Stormwater General Permit procedures. Submit copy of form to Ecology project manager.

END OF SECTION 01 57 13

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 60 00 – PRODUCT REQUIREMENTS

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.01 ECOLOGY FURNISHED ITEMS

- A. Ecology furnishes no items.

1.02 RELATED SECTIONS

- A. **Section 01 35 43.10 – Green Construction Practices**

1.03 SUBMITTALS

- A. Submit manufacturer's product data for all materials incorporated into the work, and such submittals shall be reviewed by Ecology prior to bringing material on site.
- B. Submit supplemental test data where specified herein.

1.04 IMPLIED/INCIDENTAL MATERIALS

- A. Minor materials required for proper Project completion although not specifically mentioned or shown in Contract Document, are part of materials to be provided by Contractor as part of Contract and are considered incidental to the total cost of the Project. No additional compensation is due to the Contractor for providing such items.

1.05 QUALITY OF MATERIALS

- A. Materials are to be new, free from defects, and of quality specified in the Contract Documents.
- B. Select and provide materials to ensure satisfactory operation and rated life in prevailing environmental conditions wherever installed.
- C. Same make and quality throughout the entire job, for each type. Furnish materials of lasted standard design products of manufacturers regularly engaged in their production.

1.06 SPECIFIED MATERIAL

- A. Contract documents generally reference only one make and model for each item of material or equipment required. This is not intended to be restrictive, but indicates the standard of quality, design, and features required.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 60 00 – PRODUCT REQUIREMENTS

- B. Specified product is the basis of design regarding physical size, strength, and performance. Products named indicate minimum acceptable product and are “or equal” unless noted otherwise.

1.07 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitutions immediately on discovery of need for change but not later than 15 days prior to time required for preparation and review of related submittals.

1. Conditions: Ecology will consider Contractor’s requires for substitution when the following conditions are satisfied:

- a. Requested substitution is consistent with Contract Documents and will produce indicated results.
- b. Requested substitution provides sustainable design characteristics that specified product provided.
- c. Requested substitution will not adversely affect Contractor’s construction schedule.
- d. Requested substitution received necessary approvals of authorities having jurisdiction.
- e. Requested substitution is compatible with other portions of the Work.
- f. Requested substitution has been coordinated with other portions of the Work.
- g. Requested substitution provides specified warranty.
- h. If requested substitution involves more than one Contractor, requested substitution has been coordinated with other portions of Work, is uniform and consistent, is compatible with other products, and is acceptable to all Contractors involved.

- B. Substitutions for Convenience: Ecology will consider requests for substitution if received within 20 days after the Notice to Proceed.

1. Conditions: Ecology will consider Contractor’s request for substitution when the following conditions are satisfied:

- a. Requested substitution offers Ecology a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Ecology must assume. Ecology’s additional responsibilities may include compensation to Engineer for redesign and evaluation services, increased cost of other construction by Ecology, and similar considerations.
- b. Requested substitution does not require extensive revisions to the Contract Documents.
- c. Requested substitution is consistent with Contract Documents and will produce indicated results.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 60 00 – PRODUCT REQUIREMENTS

- d. Requested substitution provides sustainable design characteristics the specified product provided.
- e. Requested substitution will not adversely affect Contractor’s construction schedule.
- f. Requested substitution has received necessary approvals of authorities having jurisdiction.
- g. Requested substitution is compatible with other portions of the Work.
- h. Requested substitution has been coordinated with other portions of the Work.
- i. Requested substitution provides specified warranty.
- j. If requested substitution involves more than one Contractor, requested substitution has been coordinated with other portions of Work, is uniform and consistent, is compatible with other products, and is acceptable to all Contractors involved.

1.08 SUBSTITUTION OF MATERIALS (“OR EQUAL”)

- A. Proposed equipment to be considered “or equal” will necessitate written approval by Ecology prior to substitution.
 - 1. On requests for substitution of materials clearly defined and describe proposed substitute.
 - 2. Accompany requests by complete specifications, samples, records of performance, certified test reports, and such other information as Ecology may request to evaluate the substitute product.
 - 3. Contractor is responsible for a substitute item suiting the installation requirements and for additional costs incurred as a result of substitution.
- B. Final decisions regarding quality and suitability of proposed substitutions rest solely with Ecology and will be based on information submitted.

1.09 TECHNICAL DATA

- A. Technical data and information contained herein rely entirely on tests and ratings provided by manufacturers who are solely responsible for their accuracy. Use of this information in no way implies Ecology has tested or otherwise verified the results of published manufacturer’s literature.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Transport products by methods to avoid product damage. Only deliver products to the site that are undamaged and free from defects.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 60 00 – PRODUCT REQUIREMENTS

- B. Provide proper equipment and personnel to handle and transport materials/products to the Project sites safely and undamaged.
- C. Promptly inspect material to assure that products comply with Contract requirements, quantities are correct, and products are undamaged.
- D. Store and/or stockpile materials and products only in areas designated and approved by Ecology prior to delivery.
- E. Arrange storage to provide easy access for inspections. Original product labels, certifications, tags, and stamps are to be intact and readily visible for inspection purposes.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01 60 00

**SECTION 01 73 29
CUTTING AND PATCHING**

PART 1 – GENERAL

1.01 SUMMARY

- A. This section includes procedural requirements for cutting and patching.
- B. See Divisions 2 through 32 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.02 SUBMITTALS

- A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
 - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
 - 2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
 - 3. Products: List products to be used and firms or entities that will perform the Work.
 - 4. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
 - 5. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
 - 6. Owner's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory Work.

1.03 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 73 29 – CUTTING AND PATCHING

- C. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Owner's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner
 - 1. If possible, retain original Installer or fabricator to cut and patch exposed Work listed below. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm

1.04 WARRANTY

- A. Existing Warranties: Replace, patch, and repair material and surfaces cut or damaged by methods and with materials in such a manner as to maintain in effect any warranties required or existing.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 73 29 – CUTTING AND PATCHING

- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid interruption of services to occupied areas.

3.03 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete/Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Sections of Division 2 – Site Work, where required by cutting and patching operations.
 - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 6. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 73 29 – CUTTING AND PATCHING

2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

END OF SECTION 01 73 29

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 74 19 – CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 – GENERAL

1.01 MTCA REGULATED WASTE / DEBRIS DISPOSAL

- A. Refer to **Section 02 61 00 – Removal and Disposal of Contaminated Sediments.**

1.02 NON MTCA REGULATED DEBRIS DISPOSAL

- A. No disposal site has been provided by Ecology for any debris or waste generated by or resulting from the specified Work.
- B. All waste and debris removed from the Work Site and not specified for reuse becomes the responsibility of the Contractor and disposed of off the project property in areas authorized by the applicable local, county, and/or state agencies and in accordance with current rules and regulations governing the disposal of solid waste. All disposal fees and sundry charges are paid by the Contractor and are incidental to the Contract. Excavated soil shall not be disposed of under this provision.
- C. The Contractor shall salvage, reuse, recycle, compost, mulch, or use for energy recovery as many construction materials as is feasible and cost-effective. The Contractor shall coordinate all salvaging and recycling operations.
- D. Items to be recycled on this project may include, but are not limited to, the following:
1. Concrete
 2. Asphalt
 3. Metals (ferrous and nonferrous)
 4. Wood
- E. Unless specified elsewhere in this Contract, salvaged and recycled material shall be managed in accordance with local, state, and federal regulations.
- F. Burning shall not be permitted on this project.

1.03 RELATED SECTIONS

- A. **Section 01 35 43.10 – Green Construction Practices**

1.04 PROGRESS CLEANING

- A. Remove rubbish and debris from the project property daily unless otherwise directed so as not to allow accumulation. Store materials that cannot be removed daily only in areas specified by Ecology.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 74 19 – CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

- B. Maintain Work Site in a neat and orderly condition at all times.
- C. All cleanup operations are incidental to the Contract and no extra compensation will be made.

1.05 FINAL CLEAN UP

- A. Clean up the entire construction Site and all grounds occupied by the Contractor in connection with the Work upon completion of the Work and prior to final inspection.
- B. Fine grade, rake clean and smooth all Work Sites and disturbed areas. Remove from the Project Site all rubbish, surplus and discarded materials, falsework, temporary structures, temporary staking/survey controls, equipment and debris.
- C. Leave all areas of the Site clean and ready for intended use prior to completion of work at the Site.
- D. Inspect all materials and surfaces for damage, scratches, marring, untreated ends of saw cuts, and repair to original or intended conditions.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01 74 19

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 77 00 – CLOSEOUT PROCEDURES

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 – GENERAL

1.01 SUMMARY

- A. This section describes the requirements for closeout of the Project, including cleanup, inspections, and provision of records to Ecology required to achieve Final Completion and Acceptance.

1.02 FINAL CLEANUP

- A. Execute final Project cleanup prior to final inspection. Final Project cleanup includes removal of all materials, equipment, waste, excess imported materials, temporary fencing, and staging area elements.

1.03 RELATED SECTIONS

- A. **Section 01 74 19 – Construction Waste Management and Disposal**

1.04 OPERATING AND MAINTENANCE (O&M) INSTRUCTION MANUAL (NOT USED)

1.05 PROJECT RECORD

- A. Before Final Completion, furnish Project Record Drawings, Specifications, disposal tickets and manifest, BMP Inspection Reports, and reports on emergency response actions/spill incidents (if applicable) to Ecology, in accordance with **Section 00 72 00 – General Conditions**, Part 4.02 Project Record.
- B. Payment held to 95%: Payment will be held to no more than 95 percent of the contract amount until Record Drawings/Project documentation are received by Ecology. Invoice for 100% of the contract amount may be submitted after receipt and approval of Record Drawings and documentation by Ecology.

1.06 CERTIFICATE AND PERMITS

- A. Submit signed original certificates of compliance and final approval from Authorities Having Jurisdiction.

1.07 OUTSTANDING DOCUMENTS

- A. Expedite and submit outstanding administrative documents including outstanding documents including but not limited Change Orders.

DIVISION 01 – GENERAL REQUIREMENTS
SECTION 01 77 00 – CLOSEOUT PROCEDURES

1.08 SUBSTANTIAL COMPLETION

- A. Reference Section 00 72 00 – General Conditions, Sub-Part 6.07 Substantial Completion.
- B. To achieve Substantial Completion, Contractor to meet the requirements as defined in the Project manual.
- C. Notification requirement: Notify Ecology in writing a minimum of seven (7) days in advance of the scheduled date of Substantial Completion to schedule an inspection to determine if Substantial Completion has been achieved.
- D. Ecology will conduct a “pre-final” inspection and formulate a final punchlist of Work items to be completed prior to the Final Completion inspection. Ecology will establish the date of Substantial Completion based on pre-final inspection findings. Following this inspection, Ecology will either issue a Notice of Substantial Completion or advise the Contractor of deficient items which must be corrected prior to issuance of Notice of Substantial Completion. Ecology will identify the items that the Contractor must complete to achieve Substantial Completion and those items that can be completed after Substantial Completion (but before Final Completion).

1.09 INSPECTION AND FINAL COMPLETION AND ACCEPTANCE

- A. Reference Section 00 72 00 – General Conditions, Sub-Part 6.09 Final Completion, Acceptance, and Payment.
- B. Notify Ecology in writing when Work, including punchlist items, have been completed.
- C. Ecology will schedule and conduct a final inspection to verify that outstanding Work items are complete.
- D. Ecology will establish the date of Final Completion based on the results of final inspection. Complete/correct any items identified as outstanding during final inspection prior to Final Completion of Project.
- E. Final Acceptance shall be issued when the invoice for 100% of the contract amount is approved by Ecology and all Affidavits of Wages paid are on file with Labor and Industries for the General Contractor and all subcontractors utilized on this Project, in accordance with the General Conditions.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01 77 00

SECTION 02 21 00
SURVEYING

PART 1 – GENERAL

1.01 SUMMARY

- A. This section describes survey work required to locate the extents of management areas, control grades, develop As-Built Surveys, and otherwise perform the Work.

1.02 RELATED SECTIONS

- A. Section 01 33 00 – Submittal Procedures
- B. Section 01 77 00 – Closeout Procedures
- C. Section 31 00 00 – Earthwork

1.03 SUBMITTALS

- A. Submit the Pre-Construction Survey for Washington State Department of Ecology (Ecology) review and approval 14 days prior to commencing Work.
- B. Submit Progress Surveys to Ecology with the Contractor Daily Activity Reports.
- C. Submit As-Built Surveys as described in this section.

1.04 CONTRACTOR'S SURVEY WORK

- A. The Contractor must provide all survey work required to locate the extents of excavation; control grades; conduct Pre-Construction Surveys, Progress Surveys, and As-Built Surveys; and otherwise perform the Work.
- B. It is the Contractor's responsibility to perform all Work. Other sections may also be related to the proper performance of this Work.

1.05 QUALIFICATION

- A. Survey work performed by the Contractor shall be under the direct supervision of a State of Washington Registered Professional Land Surveyor

1.06 PROJECT DATUM

- A. All topographic surveys must be prepared using the Project datum listed in these Technical Specifications and as shown on the Drawings.

DIVISION 02 – EXISTING CONDITIONS
SECTION 02 21 00 – SURVEYING

1. Horizontal datum: Washington State Plane North Zone, North American Datum of 1983, U.S. survey feet
2. Vertical datum: North American Vertical Datum of 1988

1.07 EXISTING CONDITIONS

- A. Existing contours shown on the Drawings may not reflect contours at the time of construction.
- B. Contractor must verify all grades, lines, levels, and dimensions shown on the Drawings and report any errors or inconsistencies to Ecology before commencing Work. Failure to do so will make the Contractor responsible for any resulting changes that may be required.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL

- A. The Contractor must conduct daily Progress Survey checks during the performance of the Work and must make a final survey check after completion of each stage of Work. Surveys must be made available to Ecology in a timely manner so any discrepancies can be resolved in the field. All quantities must be approved/verified by Ecology before payment.
- B. Survey Monuments and Benchmarks
 1. The basemap was prepared using a topographic survey prepared by RFK Land Surveying dated May 2, 2018. This topographic survey identifies reference benchmarks and local survey control used at that time. This topographic survey is available as a reference document.
 2. There are no maintained survey monuments or benchmarks located in the Work area. The Contractor must establish survey controls necessary to survey and control the Work.
- C. Surveying and layout
 1. Work from lines and levels established by the survey control provided in the Drawings.
 2. Establish secondary benchmarks and control points to set lines and levels through the Work Area.

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3. Locate and flag/stake the property line corners that are within 500 feet of the Project area.
 4. Locate and flag/stake the clearing and disturbance limits prior to commencing Work.
 - a) Flagging must consist of continuous orange safety fencing.
 - b) Keep the fencing in place and fully functional until directed to remove it by the Company.
 5. Locate and flag/stake utilities within and adjacent to the Limits of Work.
 6. Locate and lay out Project elements, including but not limited to grading stakes, grading, excavation, fill placement, cut slopes, and invert elevations.
 7. Provide and maintain temporary means of checking and rechecking layout to confirm correct and accurate removal and placement of materials.
 8. The Contractor must exercise care in the preservation of stakes and must reset them at their own expense if they are damaged, lost, displaced, or removed.
 9. If the Contractor demobilizes from the Site during high water and remobilizes for a second period of work, survey benchmarks must be checked and, if necessary, re-established after remobilization.
- D. Surveyor Log:
1. Maintain a surveyor log of control data and survey work on the Site.
 2. Provide access to the surveyor log when required by Ecology.

3.02 QUALITY CONTROL

- A. Pre-Construction, Post- Excavation, and As-Built Surveys must be performed by a licensed Professional Land Surveyor registered in Washington.
- B. Progress Surveys may be performed by a licensed Professional Land Surveyor or by an experienced member of the Contractor's team. The Contractor is solely responsible for the accuracy of Progress Survey work. If As-Built Surveys indicate a discrepancy in the Progress Surveys, the Contractor must reconcile discrepancies including performing corrective Work, if needed, to address any inaccuracies. Contractor corrective Work due to Progress Survey inaccuracy will be at the Contractor's sole expense.

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- C. Corrections of Work due to survey errors and omissions are the responsibility of the Contractor.
- D. Survey Accuracy
 - 1. Measurements performed in accordance with requirements of this Section are to be accurate within 0.01 foot in both vertical and horizontal planes.

3.03 PRE-CONSTRUCTION SURVEY

- A. The Contractor must conduct a Pre-Construction Survey to fully identify the original ground surface elevations and planimetric features throughout the Project areas where Work will be conducted.
 - 1. Pre-Construction Surveys must be performed by a licensed Professional Land Surveyor registered in Washington.
 - 2. The Contractor's survey must show 1-foot contour intervals at a minimum.
 - 3. The Pre-Construction Survey must cover all areas of Work as shown on the Drawings and extend at least 50 feet past the extents of land-disturbing activity boundaries. For the land-disturbing activities adjacent to the river, the Pre-Construction Survey must cover planned excavation limits as shown on the plans or as directed by Ecology.
 - 4. The Contractor must provide a Digital Terrain Model (DTM), land XML Model, or equal of the Contractor's survey to Ecology upon completion of the survey.
 - 5. Survey must be provided in Autodesk Civil3D 2022.dwg file format.
 - 6. The Contractor must also provide a printout in PDF format of all surveys that includes contour lines and labels, Site features, a scale bar, a north arrow, extents of management areas, and a legend.
 - 7. The Contractor must not begin Work prior to Ecology and Contractor mutual acceptance of the Pre-Construction Survey.

3.04 PROGRESS SURVEYS

- A. The Contractor must perform Progress Surveys to document progress of construction activities completed as part of the Contract.

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SECTION 02 21 00 – SURVEYING

- B. Progress Surveys will be used to determine progress payment quantities for pay items listed on the Bid Form, as measured by survey. Progress payments will be subject to final reconciliation of quantities based on the As-Built Survey.

3.05 AS-BUILT SURVEYS

- A. Upon physical completion of the Work, and in support of the Contractor's Request for Substantial Completion, the Contractor must submit an As-Built Survey for each component of Work (e.g., upon completion of Excavation, completion of Backfill and Cap Material placement). As-Built Surveys must show dimensions, locations, angles, and elevations of the Work and provide a summary of volumes of materials excavated or backfilled/capped.
- B. The As-Built Survey must include all aspects of the Work including, but not limited to, the following:
 - 1. All changes in grades
 - 2. Final post-excavation, post-backfill, and post-cap elevations
- C. Surveys must be submitted in electronic Autodesk Civil3D 2022.dwg file format, including a DTM, land XML surface, or equal. The Contractor must also provide a printout in PDF format of all surveys that includes contour lines and labels, Site features, a scale bar, a north arrow, the extents of the management area, and a legend.
- D. Ecology will check the Contractor's As-Built Survey and report any discrepancies to the Contractor for resolution as part of the Substantial Completion Punch List.
- E. Prior to issuance of the Certification of Substantial Completion, discrepancies must be corrected and resurveyed, and the As-Built Survey must be updated and resubmitted.

END OF SECTION 02 21 00

SECTION 02 61 00

REMOVAL AND DISPOSAL OF CONTAMINATED SOILS

PART 1 – GENERAL

1.1 DESCRIPTION

A. This section specifies soil disposal requirements for the project, including handling and loading of soil, transportation, off-site disposal, and related activities required to accomplish the work under this Contract. Work covered under this section includes, but is not limited to, the following elements:

1. Handling and loading of contaminated soil to trucks for transportation to the disposal facility(ies).
2. Transporting contaminated soil to the disposal facility(ies).

1.2 CHARACTER OF MATERIALS

A. Material from the Site includes potentially impacted soil and sediment. Materials consist of sand, silt, gravel, cobbles, boulders, smelter slag (granular and clinker slag).

B. Site materials may contain metals contamination. Maximum detected contaminant concentrations from the Remedial Investigation (GeoEngineers 2019) are in the following table.

Contaminant	Concentration (mg/kg)
Arsenic	67
Copper	4,057
Lead	60,200
Zinc	58,700

C. Concentrations listed are not to be considered for disposal purposes. Ecology’s Representative will sample and test stockpiles of excavated material that will be created by the Contractor. The results of this testing will be provided to the Contractor to inform the disposal process and for the Contractor’s use in its coordination with the disposal facility(ies).

1.3 REFERENCES

A. GeoEngineers, 2019. *Draft Final Remedial Investigation – Northport Waterfront*. Northport, Washington. Prepared for the Washington State Department of Ecology. October 2, 2019.

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- B. All references to Washington State Department of Transportation (WSDOT) shall refer to WSDOT Standard Specifications for Road, Bridge, and Municipal Construction (current version)
- C. 29 Code of Federal Regulations (CFR) 1910 Occupational Safety and Health Regulations
- D. Washington Administrative Code (WAC) 296-155 Safety Standards for Construction Work, including Part N, Excavations, Trenches, and Shoring
- E. 29 CFR 1926 Safety and Health Regulations for Construction
- F. Revised Code of Washington (RCW) Chapter 49.17 Washington Industrial Safety and Health Act (WISHA)
- G. RCW Chapter 39.04.180 Public Works/Trench Excavations – Safety Systems Required

1.4 QUALIFICATIONS

- A. Personnel engaged in hazardous materials work shall be Occupational Safety and Health Administration (OSHA) HAZWOPER and WISHA trained and certified. Conduct earthwork associated with known or potentially contaminated materials in accordance with the Contractor's Site-specific health and safety plan prepared in accordance with Section 01 33 00 – Submittal Procedures.
- B. Transportation of known or potentially contaminated materials shall be performed by properly licensed, insured, and registered waste haulers acceptable to the Washington State Department of Ecology (Ecology) and in accordance with applicable local, state, and federal regulations for transportation. The transportation contractor(s) shall submit documentation that demonstrates it is properly licensed and in compliance with applicable WSDOT regulations, as well as a copy of its contingency and spill control plans describing measures to be implemented in the event of spills or discharges during material handling and transporting.

1.5 CONTRACTOR RESPONSIBILITY

- A. Furnish all labor, equipment, supplies, and materials necessary to perform the handling, transportation, and disposal activities associated with the work under this Contract.

1.6 SUBMITTALS

- A. Prepare and submit for Ecology's approval a Disposal Plan as a component of the Contractor's Quality Control Plan described in Section 01 33 00 – Submittal

DIVISION 02 – EXISTING CONDITIONS

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Procedures that includes details of the Contractor's methods and equipment to accomplish the work under this section.

- B. Prepare and submit a list of proposed subcontractors to Ecology.
- C. Material Stockpile Management Plan: The Contractor shall submit a written plan for material stockpiling addressing stockpile size, location, best management practices for environmental protection, contaminated stockpile location and duration, and cross-contamination protection for contaminated and clean materials.
- D. Submit a list of a proposed facility(ies) that can receive contaminated soils, as well as facility(ies) that can receive wastes coded by Ecology as WT02.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 GENERAL

- A. Conduct all required activities associated with handling, transportation, and disposal of soil required to meet the Site cleanup goals in accordance with the requirements of the Contract Documents and as otherwise directed by Ecology to complete the Work under this Contract. Coordinate the Work with Ecology to limit adverse effects of the work on the activities of the Ecology, BNSF Railway, the City of Northport, other adjacent public and privately owned areas, and the public.
- B. All excavated soil not sorted and retained for beneficial reuse shall be loaded and transported directly to the off-site disposal facility.
 - 1. The Contractor shall use the Stevens County Landfill for the disposal of contaminated soils that comply with the facility's permits based on waste characterization testing. The Contractor shall coordinate arrangements for hauling such materials to the disposal facility and comply with all transportation and disposal requirements set forth in state and federal regulations.
 - 2. For material that does not comply with the Stevens County Landfill permit requirements, the Contractor shall use an alternate approved disposal facility.
 - 3. The Contractor shall coordinate submitting any required documentation or stockpile sample test results to the proposed disposal facilities for waste disposal approval.

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SECTION 02 61 00 – REMOVAL AND DISPOSAL OF CONTAMINATED SOILS

3.2 SITE CLEANUP AND MANAGEMENT OF DEBRIS AND WASTE MATERIALS

- A. The Contractor shall be responsible for preventing the uncontrolled off-site movement of all waste materials, spills, etc. resulting from the work under this Contract and shall be responsible for any consequences of any such uncontrolled off-site movement of material.
- B. The Contractor shall clean up soil tracked from the Site onto public roadways daily or more frequently, as directed by Ecology.
- C. Periodically clean up wastes, debris and leftover materials resulting from the earthwork activities. Clear the work areas of all debris and waste materials that may have accumulated during execution of the work and dispose of such materials in accordance with all applicable regulations.

3.3 DECONTAMINATION OF ALL EQUIPMENT

- A. All equipment mobilized to the Site by the Contractor shall be cleaned before being brought to the Site.
- B. Due to the Work being an environmental cleanup including removal of contaminated materials, the Contractor shall decontaminate all equipment thoroughly by dry brushing and vacuuming at the end of the Project. Pressure wash only as contingency if approved by Ecology.
- C. Provide a means to clean truck wheels, such as dry brushing and vacuuming, or, as a contingency, washing. Clean pavements daily to remove any accumulated sediment or track out. Cleaning track out is not a substitute for proper wheel cleaning. Manage wash water appropriately.

END OF SECTION 02 61 00

SECTION 03 10 00
CONCRETE FORMING AND ACCESSORIES

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. The Work includes furnishing all necessary material, labor, and equipment for providing the structural support and physical barriers or forms which control the shape and location of the concrete. Also included in this section are the requirements for the removal of the forms and their supports. This section is applicable to all concrete work unless covered specifically in another section. For paving and miscellaneous sitework concrete, see Section 03 30 00 – Cast-in-Place Concrete.

1.02 RELATED SECTIONS

- A. Section 03 20 00 – Concrete Reinforcing
- B. Section 03 30 00 – Cast-in-Place Concrete

1.03 REFERENCES

- A. American Concrete Institute (ACI) 301-05 Specifications for Structural Concrete
- B. ACI 318-08 Building Code Requirements for Structural Concrete and Commentary
- C. ACI 347-04 Guide to Formwork for Concrete
- D. Precast/Prestressed Concrete Institute *Manual for Quality Control for Plants and Production of Structural Precast Concrete Products*, 4th Edition (MNL-116)
- E. Washington State Department of Transportation/American Public Works Association *Standard Specifications for Road, Bridge, and Municipal Construction* (latest edition) and amendments

1.04 QUALITY ASSURANCE

- A. Design all forms, falsework, accessories, and shoring to meet the requirements of the concrete type, sequence of placing, schedule, and other conditions of the project. Forms, falsework, accessories, and shoring designs, including drawings and calculations, shall be stamped by a Professional Engineer registered in Washington.
- B. All forms, falsework, accessories, and shoring shall be inspected by the Owner's Representative before placing concrete. Workers performing concrete

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formwork shall have at least 5 years of experience with the types of construction involved and the techniques necessary for completion of the Work.

1.05 SUBMITTALS

- A. Submit form, falsework, and shoring drawings and calculations for review prior to executing the Work. Drawings shall show details of member sizes, connections, product data, and other related elements, including proposed construction joints. The calculations shall clearly state the material weights, lateral pressures, rates of pour, and working loads for form ties, friction collars, wedges, she-bolts, and accessories used in the design.
- B. Form and falsework drawings shall indicate the construction sequence, methods for release, and sequence of removal.
- C. Do not construct forms or falsework until the Owner has reviewed the drawings and calculations. Review by the Owner does not relieve the Contractor of the responsibility for sufficiency of the forms or falsework.
- D. In the event patented systems are used for forms or falsework, submit complete drawings, details, and calculations for review.

PART 2 – PRODUCTS

2.01 FORMWORK – GENERAL

- A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.
- B. The design of formwork shall be the responsibility of the Contractor.
 - 1. Design and construct to provide resultant concrete that conforms to design with respect to shape, lines, and dimensions.
- C. Comply with Washington and local codes with respect to design, fabrication, erection, and removal of formwork.
- D. Comply with relevant portions of ACI 347, ACI 301, and ACI 318.

2.02 FORM MATERIALS

- A. Form materials: At the discretion of the Contractor.
 - 1. Forms shall be of steel, fiberglass, plywood, or dense particleboard and carefully matched for uniform thickness for the entire deck.
 - 2. Form material shall be capable of providing specified concrete finish quality.

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2.03 FORMWORK ACCESSORIES

- A. Form release agent: Colorless mineral oil that will not stain concrete or impair application and performance of anti-graffiti coating
- B. Form ties: Removable or snap-off metal ties, fixed or adjustable length, free of tie devices leaving holes no larger than 1 inch in diameter in concrete surface. The portion that remains embedded in the concrete shall have a minimum cover of 2 inches after patching.

PART 3 – EXECUTION

3.01 GENERAL

- A. Set forms and falsework to allow for structural camber, plus an allowance for shrinkage and settlement. The finished concrete shall conform to the lines and grades indicated on the Drawings. Forms shall be constructed as to be rigid, unyielding, true to line, level, and sufficiently tight to prevent escape of mortar.
- B. Openings, embedded objects, and reinforcement shall be placed at the locations shown on the Drawings. They shall be formed and fastened securely in position to maintain minimum cover for all reinforcement and to leave smooth surfaces, true openings, accurate geometry, etc. after the forms are removed.
- C. Clean forms of all material, debris, or other objects and substances deleterious to the concrete, concrete surface, or element prior to casting.

3.02 ERECTION

- A. Verify lines and levels before proceeding with formwork and ensure dimensions agree with the Drawings.
- B. Coordinate this section with other sections of work that require attachment of components to formwork.
- C. Construct falsework in accordance with applicable codes and regulations.
- D. Construct forms to produce finished concrete conforming to shape, dimensions, locations, and levels indicated within tolerances required by ACI 347.
- E. Obtain approval before framing openings in structural members not indicated on the Drawings.
- F. Align form joints and make watertight. Keep form joints to a minimum.
- G. Use 3/4-inch chamfer strips on external corners of slabs, beams, joints, and columns, except where indicated otherwise on the Drawings.

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- H. Form chases, slots, openings, drips, recesses, expansion, and control joints as indicated.
- I. Line forms for all exposed surfaces. Do not stagger joints of form lining material. Align joints to obtain uniform pattern.
- J. Clean formwork in accordance with ACI 347 before placing concrete.
- K. Reuse of formwork and falsework is subject to requirements of ACI 347.
- L. Formwork and falsework shall be designed and fabricated in accordance with state regulations.

3.03 FORM INSTALLATION

- A. Prior to final setting or placing of reinforcing steel, forms for exposed concrete shall be treated with a release agent, bond breaker, or parting compound. Apply the compound at a rate recommended by the manufacturer to provide a smooth surface free of dusting action caused by the chemical reaction of the compound.
- B. Immediately remove any release agent or bond breaker that comes in contact with reinforcement or embedded objects.
- C. Forms may be set with a slight bevel or draft for easy removal, where approved by the Owner. Use 1/2-inch chamfer strips on all exposed inside and outside corners, including all vertical faces.
- D. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings affected by the agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.
- E. All forms shall be mortar tight. Standing water in the forms shall not be permitted. Forms shall be cleaned before assembly and prior to placing concrete.

3.04 INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Provide formed openings where required for items to be embedded in or passing through concrete work. Locate openings and embeds as indicated on the Drawings.
- B. Locate and set in place items that will be cast directly into concrete as indicated on the Drawings.

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- C. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.
- D. Install accessories in accordance with manufacturer's instructions so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- E. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
- F. Close temporary openings with tight-fitting panels, flush with inside face of forms and neatly fitted so joints will not be apparent in exposed concrete surfaces.

3.05 FIELD QUALITY CONTROL

- A. An independent testing agency shall perform field quality control tests as specified on the Drawings.
- B. Inspect erected formwork, shoring, and bracing to ensure work is in accordance with formwork design and to verify that supports, fastenings, wedges, ties, and items are secure.
- C. Do not reuse wood formwork for concrete surfaces to be exposed to view. Do not patch formwork.

3.06 FORM REMOVAL

- A. Forms shall remain in place for the minimum length of time shown below, provided the ambient temperature is 40°F or higher.

	Ordinary Concrete (Type I-II or II)	High-Early-Strength Concrete (Type III)
Footings or wall faces	3 days	24 hours

- B. When lower temperatures prevail, forms shall remain in place longer, at the Owner's discretion. All periods where the ambient temperature is below 40°F shall be disregarded in determining the length of time forms are to remain in place. The Contractor may submit a cold-weather concreting plan in accordance with Section 03 30 00 – Cast-in-Place Concrete for prior approval. Development and incorporation of an approved cold-weather concreting plan shall be at the Contractor's expense.
- C. In lieu of the above methods for determining the minimum time forms shall remain in place, forms may be removed when concrete cylinder tests, according

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to ACI 318, indicate a compressive strength greater than or equal to 80% of the specified 28-day strength has been reached. Additional concrete cylinder testing for the purpose of establishing the 80% threshold level shall be at the Contractor's expense.

- D. The removal of forms as stipulated herein shall in no case relieve the Contractor of responsibility for the performance, acceptability, or finish of the Work. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- E. All form and falsework removal shall be accomplished in a manner that prevents damage to the concrete, concrete finishes, and adjacent work elements.

END OF SECTION 03 10 00

SECTION 03 20 00
CONCRETE REINFORCING

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. This section details the supply and installation of reinforcement for all cast-in-place concrete elements in the Work

1.02 RELATED SECTIONS

- A. Section 03 10 00 – Concrete Forming and Accessories
- B. Section 03 30 00 – Cast-in-Place Concrete

1.03 REFERENCES

- A. American Concrete Institute (ACI) 315 Details and Detailing of Concrete Reinforcement
- B. ASTM International (ASTM) A82 Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
- C. ASTM A615 Deformed and Plain Billet Steel Bars for Concrete Reinforcement
- D. ASTM A706 Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement

1.04 SUBMITTALS

- A. Submit the following in accordance with Section 01 33 00 – Submittal Procedures:
 - 1. Submit shop drawings, including placement of reinforcement.
 - 2. Shop drawings shall consist of bar bending details, bar schedules, and placement drawings. Bar schedules shall detail each type of bar and provide a total weight.
 - 3. Indicate on shop drawings, bar bending details, lists, quantities of reinforcement, sizes, spacings, locations of reinforcement and splices, and mechanical splices if approved by the Owner's Representative, with identifying code marks to permit correct placement without reference to structural drawings. Prepare reinforcement drawings in accordance with ACI 315.

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4. Detail lap lengths and bar development lengths as shown on the Drawings.

PART 2 – PRODUCTS

2.01 REINFORCEMENT

- A. Reinforcing steel: ASTM A615/A615M Grade 60
- B. Weldable reinforcing steel: ASTM A706/A706M, Grade 60
- C. Reinforcement accessories
 1. Tie wire: Annealed, minimum 16 gage
 2. Chairs, bolsters, bar supports, and spacers: Sized and shaped for adequate support of reinforcement during concrete placement
 3. Wire for reinforcement shall comply with the requirements of ASTM A82 Specifications for Steel Wire, Plain, for Concrete Reinforcement.

2.02 FABRICATION

- A. Fabricate reinforcing steel in accordance with ACI 315.
- B. Reinforcement splices shall be located as detailed on the reviewed placing drawings. Obtain the Owner's Representative's approval for locations of reinforcement splices other than those shown on reviewed placing drawings.
- C. Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.03 SOURCE QUALITY CONTROL

- A. All steel incorporated in the Work shall be identified by heat number.
- B. Upon request, provide the Owner's Representative with a certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, prior to fabrication.
- C. Upon request, inform the Owner's Representative of the proposed source of material to be supplied.

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PART 3 – EXECUTION

3.01 FIELD BENDING

- A. Do not field bend or field weld reinforcement, except where indicated or authorized by the Owner's Representative. When field bending is authorized, bend without heat, applying slow and steady pressure.
- B. Replace bars that develop cracks or splits or exhibit excessive surface contamination.

3.02 HANDLING AND STORAGE

- A. Reinforcing steel shall be handled and always stored so that damage, surface contamination, and loss of identification tags are avoided.

3.03 PLACING REINFORCEMENT

- A. Place reinforcing steel as indicated on reviewed shop drawings and in accordance with ACI 315
- B. Place, support, and secure reinforcement against displacement. Do not deviate from required position.
- C. Do not displace or damage vapor barrier.
- D. Prior to placing concrete, obtain the Owner's Representative's approval of reinforcing steel and placement.
- E. Ensure cover to reinforcement is maintained during concrete pour.
- F. Deviation from placement, such as for construction access, is to be noted and submitted to the Owner's Representative for review not less than 14 days prior to construction.

3.04 FIELD TOUCHUP AND REMEDIATION

- A. Where reinforcing bars project temporarily from concrete structures already cast, protect the exposed bar portions from corrosion until subsequent concrete is placed. Prior to placing concrete, clean off loose rust and mill scale or coating that may reduce concrete bond.

3.05 FIELD QUALITY CONTROL

- A. An independent testing agency shall inspect installed reinforcement for conformance to Contract Documents before concrete placement.

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SECTION 03 20 00 – CONCRETE REINFORCING

END OF SECTION 03 20 00

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. This section consists of furnishing all labor, materials, tools, equipment, and incidentals, and doing all the work involved in constructing cast-in-place concrete, including forming, placing, curing, stripping, and finishing as indicated in the Drawings and as specified and as directed by the Owner.
- B. This section covers the supply and installation of cast-in-place concrete for miscellaneous Site concrete not specified elsewhere.
- C. The section covers concrete paving for pedestrian surfaces, including pathways and concrete pads for Site furnishings, and the extent and location of the concrete paving as indicated on the Drawings.

1.02 RELATED SECTIONS

- A. Section 03 20 00 – Concrete Reinforcing
- B. Section 12 93 00 – Site Furnishings
- C. Section 31 00 00 – Earthwork

1.03 REFERENCES

- A. General
 - 1. The Contractor shall comply with provisions of all local, state, and federal codes, specifications, standards, and recommended practices.
 - 2. The publications listed in this article form a part of this section to the extent referenced.
 - 3. Where a date is given for reference standards, the edition of that date shall be used. Where no date is given for reference standards, the latest edition available on the date of the Notice Inviting Bids shall be used.
- B. American Concrete Institute (ACI)
 - 1. ACI 211.1 Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete

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2. ACI 301 Specifications for Structural Concrete for Buildings
 3. ACI 302.1R Guide for Concrete Floor Slab Construction
 4. ACI 304 Guide for Measuring, Mixing, Transporting, and Placing Concrete
 5. ACI 305R Hot Weather Concreting
 6. ACI 306R Cold Weather Concreting
 7. ACI 308 Guide to Curing Concrete
 8. ACI 315 Details and Detailing of Concrete Reinforcement
 9. ACI 318 Building Code Requirements for Structural Concrete
 10. ACI 347.3R Guide to Formed Concrete Surfaces
- C. ASTM International (ASTM)
1. ASTM C31 Standard Practice for Making and Curing Concrete Test Specimens in the Field
 2. ASTM C33 Standard Specification for Concrete Aggregates
 3. ASTM C39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
 4. ASTM C94 Standard Specification for Ready-Mixed Concrete
 5. ASTM C143 Standard Test Method for Slump of Hydraulic-Cement Concrete
 6. ASTM C150 Standard Specification for Portland Cement
 7. ASTM C171 Sheet Materials for Curing Concrete
 8. ASTM C172 Standard Specification for Sampling Freshly Mixed Concrete
 9. ASTM C173 Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
 10. ASTM C260 Standard Specification for Air-Entraining Admixtures for Concrete

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11. ASTM C289 Standard Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method)
 12. ASTM C309 Liquid Membrane-Forming Compounds for Curing Concrete
 13. ASTM C494 Standard Specification for Chemical Admixtures for Concrete
 14. ASTM C618 Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
 15. ASTM C1017 Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
- D. Washington State Department of Transportation (WSDOT)
1. WSDOT M41-10 Standard Specifications for Road, Bridge, and Municipal Construction, current edition and amendments

1.04 QUALITY ASSURANCE

- A. Manufacturer qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment. Ready-mixed concrete plants shall be approved and certified by the National Ready Mixed Concrete Association or qualified by WSDOT.
- B. Installer qualifications: A firm with a minimum of 5 years' experience with concrete placing and finishing
- C. BACI publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301 Specification for Structural Concrete, Sections 1 through 5
 2. ACI 117 Specifications for Tolerances for Concrete Construction and Materials
- D. Special inspection: Notify the Owner at least 48 hours before inspection. Inspection will be required immediately prior to any intended pours or placement of concrete.
- E. Concrete work: Concrete work, where indicated, shall be exposed, as finished. Special care must be taken to provide specified, finished surfaces without gravel pockets and other defacements.

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1.05 SUBMITTALS

- A. The Contractor shall submit all submittals for the Owner's review and acceptance in accordance with the requirements of Section 01 33 00 – Submittal Procedures.
- B. Submit the following:
 - 1. Source of concrete
 - 2. Source of cementitious material(s)
 - 3. Source of aggregate(s), including a test report dated within the past 1 year demonstrating aggregates meet the ACI code requirements
 - 4. The Owner, at its discretion, may require samples of the proposed aggregate(s) to be supplied by the Contractor, at the Contractor's cost, for independent testing purposes.
 - 5. Proposed admixtures and method of application
 - 6. Mix design for each type of concrete, indicating material content of each component per cubic foot. Mix design acceptance shall be per ACI 318.
 - 7. Proposed quality control plan, including proposed methods for early identification of trends in concrete properties and for taking corrective actions.
 - 8. Certification that proposed concrete materials and mix design conform to ACI and the requirements of this section
 - 9. Certification that the proposed concrete production plant, including delivery equipment, conforms to ACI code and the requirements of this section
 - 10. Details of proposed patching, repair, and finishing procedures
 - 11. Product data for concrete placement equipment, including but not limited to tremie pump
- C. Product certifications in accordance with Section 01 33 00 – Submittal Procedures

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PART 2 – PRODUCTS

2.01 GENERAL

- A. Concrete materials shall conform to all requirements of ACI 301, ASTM C94, and this section. If there is a conflict between the reference standards and this section, the requirements of this section shall govern.

2.02 MATERIALS

- A. Cementitious materials
1. Cement: All Portland cement shall be Type II and low alkali, conforming to ASTM C150. All cement shall be the product of the same manufacturer.
 2. Pozzolans: Fly ash shall conform to ASTM C618, Class F and shall not exceed 15% by weight of total cementitious material.
 3. For concrete with a 28-day compressive strength of 4,500 pounds per square inch (psi), the minimum weight of cementitious materials per cubic yard of concrete shall be 660 pounds.
 4. For concrete with a 28-day compressive strength of 5,000 psi, the minimum weight of cementitious materials per cubic yard of concrete shall be 750 pounds.
- B. Aggregates: Conform to the requirements of ASTM C33. The maximum size of coarse aggregates shall be not greater than 1 inch and shall conform to the requirements of ACI 318 Section 25.2.1 for congested areas, unless noted otherwise in the Drawings.
1. Fine aggregates:
 - a) Fine aggregates shall be free of materials with deleterious reactivity to alkali in cement.
 - b) Fine aggregates shall consist of sand or other inert material or combination thereof having hard, strong, durable particles free from an adherent coating.
 - c) Fine aggregates shall be washed thoroughly to remove clay, loam, alkali, organic matter, or other deleterious matter.
 - d) Fine aggregates shall meet the particle gradation requirements for Class 1 fine aggregates expressed as percentages by weight in the following table:

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Sieve Size	Class 1 Percent Passing	
	Min.	Max.
3/8"	99	100
No. 4	95	100
No. 8	68	86
No. 16	47	65
No. 30	27	42
No. 50	9	20
No. 100	0	7
No. 200	0	2.5

Individual tests variations under the minimum or over the maximum will be permitted as follows, provided the average of three consecutive tests is within the Specification limits:

Sieve Size	Permissible percent of Variation in Individual Tests
No. 30 and coarser	2
No. 50 and finer	0.5

2. Coarse aggregates

- a) Coarse aggregates shall consist of gravel or other inert material or combination thereof having hard, strong, and durable pieces free from adherent coatings.
- b) Coarse aggregates shall be washed to thoroughly remove clay, silt, bark, sticks, alkali, organic matter, or other deleterious material.
- c) Coarse aggregates shall meet the particle gradation requirements for AASHTO Grading No. 57 as follows:

Passing Sieve Size	AASHTO Grading No. 57	
	Minimum	Maximum
1-1/2 inch	99	100
1 inch	95	100
1/2 inch	25	60
No. 4	0	10
No. 8	0	5

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C. Admixtures

1. Calcium chloride or admixtures containing added chlorides shall not be used.
2. Water-reducing admixtures shall conform to the requirement of ASTM C494, Type A or Type D.
3. High-range water-reducing admixtures shall conform to the requirements of ASTM C494, Type F or Type G.
4. Non-chloride accelerators shall conform to the requirements of ASTM C494, Type C or Type E.
5. Air entraining admixtures shall conform to ASTM C260 and shall be compatible with the water-reducing admixture employed. Air content for air-entrained concrete shall not exceed 3% in accordance with ASTM C173.
6. Water-reducing admixtures shall comply with ASTM C1017.
7. Anti-washout admixtures shall be in accordance with ASTM C494, Type S, or U.S. Army Corps of Engineers Concepts and Requirements Division (CRD) C661-06.
8. Passive-action corrosion-inhibiting admixtures shall be in accordance with ASTM C494, Type C, Type E, or Type S.

D. Concrete shall have a minimum compressive strength at 28 days as follows:

1. Footings and other thickened edge: 5,000 psi
2. Concrete paving for pathways and Site furnishing pads: 4,000 psi, air entrained

E. Water

1. Water shall be clean and not detrimental to concrete.
2. Water-cement ratio shall be as follows:
 - a) For concrete with a 28-day compressive strength of 4,000 psi, the water-cement ratio shall not exceed 0.45.
 - b) For concrete with a 28-day compressive strength of 4,500 psi, the water-cement ratio shall not exceed 0.45.

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- c) For concrete with a 28-day compressive strength of 5,000 psi, the water-cement ratio shall not exceed 0.40.

2.03 BONDING AGENTS AND ADHESIVES

- A. Bonding agents as required
- B. Primers and sealers: As recommended by the adhesive and bonding agent manufacturers

2.04 CONSTRUCTION/EXPANSION JOINTS IN CONCRETE PAVING

- A. Joint filler: Preformed, non-extruding asphalt-impregnated resilient material; ASTM D1752, Type I, 3/8-inch wide by depth required to bring top surface within 1/2 inch of slab surface
- B. Joint sealer: Self-leveling polyurethane; ASTM C920, Type M, Grade SL, Class 25, color: gray
- C. Construction/expansion joint cap: Removable high-impact extruded polystyrene; place on joint filler during concrete placement. Joint cap by Burke Company or equal.

2.05 MIXING CONCRETE

- A. Ready-mixed concrete: Measure, batch, mix, and deliver concrete according to ASTM C94 and ASTM C1116, and furnish batch ticket information.
 - 1. When air temperature is between 85 °F and 90°F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90°F, reduce mixing and delivery time to 60 minutes.

2.06 CURING MATERIALS

- A. Clear, waterborne, membrane-forming curing and sealing compound: ASTM C1315, Type 1, Class A, non-yellowing, volatile organic compound compliant, semigloss sheen
 - 1. Provide as method of curing and sealing for exposed-to-view interior concrete floors.
 - 2. Sheen: Medium (semigloss)
 - 3. Acceptable products:
 - a) The Euclid Chemical Company: Super Diamond Clear VOX

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- b) L&M Construction Chemicals, Inc.: Lumiseal WB Plus
 - c) Meadows, W.R., Inc.: Vocomp-30
 - d) Tamms Industries, Inc.: LusterSeal WB 300
 - e) US Mix Products Company: US Spec Radiance UV-25
 - f) Vexcon Chemicals, Inc.: Vexcon Starseal 1315 Beading Flat
4. Curing compounds for colored concrete: Curing compound shall comply with ASTM C309 and be approved by color additive manufacturer for use with colored concrete. Provide color cure and seal products to match colored concrete.

2.07 CONCRETE REINFORCEMENT AND DOWELS

- A. Concrete reinforcement and dowels used for concrete paving and miscellaneous Site concrete shall meet the requirements of Section 03 20 00 – Concrete Reinforcing.

PART 3 – EXECUTION

3.01 GENERAL

- A. All concrete work shall be in accordance with ACI codes.
- B. No work shall commence until review in writing is given by the Owner for concrete materials and mix design.
- C. Upon written review by the Owner of a concrete mix design, including ingredients and sources of materials, changes or modifications in any manner shall not be permitted without prior approval of the Owner.

3.02 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.03 PREPARATION

- A. Reinforcement: per Section 03 20 00 – Concrete Reinforcing
- B. Verify forms are clean and free of rust before applying release agent.
- C. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

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- D. In locations where new concrete is doweled to existing work, install dowels as indicated in the Drawings.
- E. For exterior slabs on grade, maintain moisture content of subgrades within 3% of optimum moisture to attain required compaction density.

3.04 CONSTRUCTION JOINTS

- A. Construction joints shall be provided only at locations approved by the Owner, and the overall number of joints shall be minimized.
- B. The hardened surface of construction joints shall be roughened by mechanical means to full amplitude of 0.2 inch to expose clean and sound aggregate prior to casting the subsequent part of the structure. Roughen concrete surface by suitable methods authorized by the Owner. The next layer of concrete shall be of the quality specified but shall be proportioned with an excess of mortar and be well-vibrated to achieve maximum bond, all as required by ACI.
- C. Reinforcing steel shall be continuous through control joints unless noted otherwise.
- D. Prepare previously placed concrete by cleaning with steel brush and conditioning surface to saturated-surface dry prior to placement of adjoining concrete.
- E. For concrete paving at pathways and pads, provide crack-control joints every 5 feet on center and construction/isolation joints every 15 feet on center.

3.05 CONCRETE SUPPLY

- A. The elapsed time from batching of concrete (measured from the time the cement is added to the aggregate) to commencement of discharge at the Site shall not exceed 90 minutes. Retarder use requires prior approval of the Owner.
- B. Stationary and truck mixers with blades worn more than 10% from original blade design profile will not be allowed. Accumulations of hardened mortar or concrete shall be completely removed, or use of the equipment shall not be allowed.
- C. All mixers and agitating equipment used in production of concrete will be subject to testing for batch uniformity of the concrete by the Owner.

3.06 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.

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- C. Prior to placing concrete, obtain the Owner’s approval of the proposed method for protection of concrete during placing and curing.
- D. Concrete shall not be deposited by freefall into the forms when the drop exceeds 5 feet. A drop pipe, tremie pipe, or other approved method shall be employed in such circumstances.
- E. Pumping of concrete
 - 1. Pumping of concrete is permitted, subject to the Owner’s approval of equipment and mix design. If pump placement is used, the mix designs may be modified, subject to the Owner’s approval, to provide the desired properties at the point of discharge.
 - 2. Placing equipment shall be operated only by experienced operators.
 - 3. During pumping, the Contractor shall have a standby placing system, acceptable to the Owner, on site to ensure that, in the event of breakdown of the primary placing equipment, the concrete placement can continue without cold joints.
 - 4. The minimum diameter of the hose or conduit shall be 4 inches unless otherwise approved by the Owner. Pumping equipment, hoses, and conduits not functioning properly shall be replaced.
 - 5. If, in the Owner’s opinion, the equipment and pumped concrete are not satisfactory, the Contractor shall discontinue the pumping operation and shall place concrete using other methods approved by the Owner.
- F. All concrete shall be consolidated by internal vibration using an adequate number of immersion vibrators with the correct frequency. One spare vibrator for each two operating ones shall be on hand during all concrete placement operations.
- G. Ensure reinforcement, embedded parts, and inserts are not disturbed during concrete placement for all concrete work.
- H. Repair underslab vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas a minimum 6 inches and seal watertight.
- I. Separate slabs on grade from vertical surfaces with joint filler. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface.
- J. Place concrete continuously between predetermined expansion, control, and construction joints. Do not interrupt successive placement; do not permit cold joints to occur.

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- K. Saw cut joints within 24 hours after placing. Use 3/16-inch-thick blade, and cut into 1/4 depth of slab thickness.
- L. Screed floors level, maintaining surface flatness of a maximum 1/4 inch in 10 feet or as indicated in the Drawings.
- M. Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature, and test samples taken.

3.07 CURING OF CONCRETE

- A. Comply with requirements of ACI 308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Formed surfaces: Maintain concrete with minimal moisture loss at relatively constant temperature for the period necessary for hydration of cement and hardening of concrete.
 - 1. Normal concrete: Not less than 7 days
 - 2. High-early-strength concrete: Not less than 4 days
- C. Surfaces not in contact with forms
 - 1. Start initial curing as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than 3 days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
 - 2. Begin final curing after initial curing but before surface is dry.
 - a) Moisture-retaining cover: ASTM C171. Seal in place with waterproof tape or adhesive.
 - b) Curing compound: ASTM C309. Apply in two coats at right angles using application rate recommended by manufacturer.

3.08 COLD AND HOT WEATHER PROTECTION

- A. All concrete work in cold or hot weather shall be executed strictly in accordance with ACI 305R or ACI 306R recommendations, as applicable.

3.09 TOLERANCES

- A. The dimensional tolerances for concrete work shall be as given in ACI code, unless noted otherwise.

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3.10 FINISHING

- A. Repair surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed form finish: Provide smooth-form finish per ACI 301. Rub down or chip off fins or other raised areas 1/8 inch or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
 - 1. Provide smooth finish meeting classification CSC4 or CSC3 per ACI 347.3R.
- D. Exterior concrete paving for pathways and pads: Finish with broom finish perpendicular to the path of travel. The surface shall be rodded across the screeds and smoothed with a “bull float” light steel trowel and broom finished. The general surface shall have no irregularities greater than 3/16 inch in depth or variations in grade of more than 3/8 inch in 10 feet. The broom stria shall be approximately 1/8 inch depth. The slab shall be edged or patterned with a 2-inch-wide edging tool having a 3/4-inch corner radius.

3.11 REPAIRS AND SURFACE PATCHING

- A. Immediately after removal of formwork, concrete surfaces shall be inspected for defects. Repairable defects shall be repaired as soon as practicable with patching mortar as described herein. If proper and effective repair of a defect is not feasible, or the repair work carried out is not successful, the elements affected shall be identified to the Owner and shall be removed and replaced at the Contractor’s cost.
- B. Immediately after removal of formwork, all bolts, ties, nails, or other metal not required for further construction purposes, shall be removed or cut back to a depth of at least 2 inches from the surface of the concrete. The cutout areas and cavities shall be repaired as soon as practicable with patching mortar as described herein.
- C. Surface irregularities, such as bulges, fins, lips, or plugs shall be removed by chipping or grinding and, if necessary, shall be repaired as soon as practicable with patching mortar as described herein. Grinding, when used, shall not proceed until the concrete has sufficiently hardened to prevent dislodgement of coarse aggregate particles.
- D. Materials used to repair or patch surface defects shall be made of similar constituents and of approximately the same proportions as used for the concrete being patched, except adjustments to the aggregate size and sand

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content may be made if required to provide similar finish to adjacent surfaces as determined by trial repair or patch. The quantity of mixing water shall be no more than necessary to facilitate handling and placing.

- E. Proprietary bagged patching materials may be used, subject to approval by the Owner.
- F. The patching mortar shall color match the color of the surrounding concrete.
- G. The patching mortar shall be mixed in advance and allowed to stand with frequent manipulation with a trowel, without addition of water, until it has reached the stiffest consistency that will permit placing.
- H. Bonding grout shall be prepared using a mix of one part cement to one part fine sand passing a No. 30 mesh sieve, mixed to the consistency of thick cream and then well-brushed into the surfaces to be repaired or patched.
- I. A preapproved latex-type bonding agent may be added to the repair or patching material. Quantity and use of admixture shall be accordance with the manufacturer's specifications.

3.12 PROTECTION

- A. Take every precaution to prevent damage, abrasions, and staining of surfaces and edges of concrete during the work. Provide plywood or insulation protection and polyethylene wrappings or other means as required to concrete elements that may be damaged by subsequent construction activities. Remove and dispose of protective coverings at physical completion of construction.
- B. Barricades shall be erected to prevent traffic on newly finished surfaces.

3.13 FIELD QUALITY CONTROL

- A. An independent testing agency shall perform field quality control tests.
- B. Provide free access to concrete operations at the Site and cooperate with appointed firm.
- C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
- D. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
- E. Compressive strength tests: ASTM C39: For each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed.

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- F. Take one additional test cylinder, cured on site under the same conditions as the concrete it represents, during cold-weather concreting.
- G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143.
- H. At the Owner's discretion, the Owner's testing agency will do the following:
 - 1. Advise the Owner and Contractor on the suitability of aggregates, cementitious materials, admixtures, and mix design for the various types of concrete.
 - 2. Perform sampling and testing at point of concrete deposit as required by the Owner.
 - 3. Provide overall review of the Contractor's quality control plan and perform checks during the progress of the work.
- I. Inspection or testing by the Owner and/or their testing agency will not augment or replace Contractor Quality Control or relieve the Contractor of its contractual responsibility for quality work.

3.14 DEFECTIVE CONCRETE

- A. Test results: The testing agency shall report test results in writing to the Owner and Contractor within 24 hours of the test.
- B. Defective concrete is defined as concrete not conforming to required lines, details, dimensions, tolerances, or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Owner. The cost of additional testing shall be borne by the Contractor when defective concrete is identified.
- D. Do not patch, fill, touch up, repair, or replace exposed concrete, except upon express direction of the Owner for each individual area.

END OF SECTION 03 30 00

DIVISION 04 – MASONRY
SECTION 04 40 00 – STONE ASSEMBLIES

SECTION 04 40 00
STONE ASSEMBLIES

PART 1 – GENERAL

1.01 SUMMARY

- A. Scope of work: Work includes furnishing and installing rock walls.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 06 10 00 – Rough Carpentry
B. Section 31 00 00 – Earthwork

1.03 TOLERANCES

- A. The finished surface elevations and gap sizes shall not deviate from the lines and grades shown on the Drawings by more than the tolerances listed in the following table. Tolerances are measured perpendicular to the indicated neatlines. Extreme limits of the tolerances given shall not be continuous in any direction for more than five times the nominal stone dimension for rock, backfill, and depth of foundation.

NEATLINE TOLERANCES

Material	Above Neatline feet (inches)	Below Neatline feet (inches)
Foundation/bedding layer	0.10 (1.2)	0.10 (1.2)
Rock walls	0.3 (4)	0.3 (4)
All other materials	0.10 (1.2)	0.10 (1.2)

JOINT WIDTH TOLERANCES

Material	Minimum inches	Maximum inches
Mortar joints	3/8	1 ^a
Dry-set joints	1	3 ^a

Note:

- a. Chink gaps greater than maximum to create joints with required tolerances.

- B. The intention is that the work shall be built generally to the required elevations, slope, and grade, and the outer surfaces shall be even and present a neat

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appearance. Placed material not meeting these limits shall be removed or reworked as directed by the Owner's Representative.

PART 2 – PRODUCTS

2.01 ROCK FOR ROCK WALLS

- A. Imported granite stone and rock
 - 1. The Contractor shall provide weathered granite stone or approved equal. Contractor provided granite stone shall consist of the sizes required for constructing the various items shown on the Drawings. Granite stone shall be free from segregation, seams, cracks, and other defects tending to destroy its resistance to weather. Imported granite stone shall conform to the requirements for quality described in Washington State Department of Transportation/American Public Works Association *Standard Specifications for Road, Bridge, and Municipal Construction* (current edition) and amendments Section 9-13.7(1) – Rock for Rock Walls of the Standard Specifications.

2.02 FOUNDATION/BEDDING LAYER FOR ROCK WALLS AND STEPS

- A. The foundation/bedding layer for rock walls and steps shall meet the requirements of Standard Specifications Section 9-03.9(3) – Crushed Surfacing Base Course.
- B. Refer to Section 31 05 19 – Geotextiles for Earthwork.

2.03 GRAVEL BACKFILL FOR DRAINS

- A. Refer to Section 31 00 00 – Earthwork.
- B. Refer to Section 31 05 19 – Geotextiles for Earthwork.

PART 3 – EXECUTION

3.01 BASE PREPARATION

- A. Areas on which rock walls are to be placed shall be graded and/or dressed to conform to cross sections and details shown on the Drawings within an allowable tolerance as stated in Article 1.04 of this section. The prepared base shall be approved by the Owner's Representative. Where such areas are below the allowable minus tolerance limit, they shall be brought to grade by fill with earth similar to the adjacent material and compacted to a density equal to the adjacent in-place material. Immediately prior to placing the foundation/base

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layer, the prepared base will be inspected by the Owner's Representative, and no material shall be placed thereon until that area has been approved.

3.02 INSTALLATION OF DRAINAGE GEOTEXTILE

1. Refer to Section 31 05 19 – Geotextiles for Earthwork. The section is for granite rock walls.
2. The drainage geotextile shall be placed in direct and continuous contact with the soils, without wrinkles or folds, on a smooth, graded surface approved by the Owner's Representative. The drainage geotextile shall be placed in such a manner that placement of the overlying materials will not excessively stretch nor tear the drainage geotextile. Anchoring of the terminal ends of the drainage geotextile shall be accomplished as shown on the Drawings.
3. The drainage geotextile shall be placed with the roll direction oriented directly up-slope. Overlapped seams of roll ends shall be a minimum of 2 feet.
4. Care shall be taken during installation to avoid damage occurring to the drainage geotextile as a result of the installation process. Should the drainage geotextile be damaged during installation, a geotextile patch shall be placed over the damaged area extending 2 feet beyond the perimeter of the damage.
5. The armor system placement shall begin at the toe and proceed up the slope. Placement shall take place to avoid stretching and subsequent tearing of the drainage geotextile.
6. Slope protection and spalls smaller than 100 pounds shall not be dropped from a height exceeding 1 meter (3.28 feet) or a demonstration provided showing the placement procedures will not damage the drainage geotextile.
7. In underwater applications, the drainage geotextile and overlying spalls shall be placed the same day.
8. Following placement of spalls, grading of the slope shall not be permitted if the grading results in movement of the spalls directly above the drainage geotextile.
9. Field monitoring shall be performed to verify the spalls do not damage the drainage geotextile.

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10. Any drainage geotextile damaged during backfill placement shall be replaced as directed by the Owner's Representative at the Contractor's expense.
11. The Contractor shall comply with the manufacturer's handling requirements for the drainage geotextile.

3.03 SUBDRAIN INSTALLATION AND GRAVEL BACKFILL

- A. Refer to Section 31 00 00 – Earthwork for gravel backfill.

3.04 PLACEMENT OF FOUNDATION/BASE LAYER AND DRAINAGE BACKFILL FOR ROCK WALLS

- A. General

1. Material shall be spread uniformly on the geotextile to the slope lines and grades as indicated in the Contract Documents and in such a manner as to avoid damage to the prepared base. Placing of materials by methods that tend to segregate the particle sizes within the bedding layer or cause mixing of the separate layers will not be permitted. Placement shall not damage the geotextile.

- B. Foundation/base layer

1. Placement shall begin at the bottom of the area to be covered in one lift. The foundation/base layer shall be compacted to 95% dry density prior to placement of any subsequent layers of rock material and approved by the Owner's Representative. Any damage to the surface of the prepared base during placing of the material shall be repaired before proceeding with the Work.

- C. Drainage backfill for rock walls

1. Placement shall begin after installation of the base/foundation layer and the drainage geotextile has been installed and approved. Subsequent loads of material shall be placed against previously placed rock wall material in such a manner as to ensure a relatively homogenous mass. Compaction of drainage backfill for rock wall material will not be required, but the material surface shall be finished to present an adequately even surface, free from mounds or windrows.

3.05 PLACEMENT OF ROCK WALLS

- A. Placement of rock

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1. The Owner's Representative shall be present during rock and stone installation. Stone shall be of a shape as to form a stable protection structure and base for the required section and/or detail. Adjacent stone shall be selected with reasonable care as to size and shape and placed in contact with adjacent rock.
- B. Rock and stone sizes shall be as specified in the Drawings using the largest rock at the bottom and progressively smaller rocks toward the top. The rocks shall be placed so there are no continuous joint planes in either the vertical or lateral direction. Each rock shall have at least three contact surfaces and shall be set stable, with no rocking.
- C. Rock and stone shall be placed in a manner that will produce a well-graded mass of rock with the minimum practicable percentage of voids and shall be constructed, within the specified tolerances, to the lines and grades shown on the Drawings or staked in the field. The average tolerance of the entire job shall have no more than 50% of the tolerances specified above. Rock and stone shall be placed individually to ensure contact between stones. Place to full course thickness of one rock depth in one operation and in such a manner as to avoid displacing the Backfill Material. Placement shall begin at the bottom of the area to be covered and continue up-slope. Subsequent loads of material shall be placed against previously placed material in such a manner as to ensure a relatively homogenous mass. The finished wall shall be free from objectionable pockets of small stones and clusters of larger stones. Rock and stone shall be placed individually.
- D. The following practices will not be permitted: placing rock by dumping it into chutes, placing rock by dumping, or running equipment directly over completed rock and stone.
- E. Rearranging of individual stones shall be required to the extent necessary to obtain a keyed-in, well-graded distribution of stone sizes, as specified above.

END OF SECTION 04 40 00

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES
SECTION 06 10 00 – ROUGH CARPENTRY

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 – GENERAL

1.01 SUMMARY

A. This section includes the following:

1. Trail steps

1.02 DEFINITIONS

- A. Exposed framing: Framing not concealed by other construction
- B. Dimension lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension
- C. Lumber grading agencies, and the abbreviations used to reference them, include the following:
1. Northeastern Lumber Manufacturers' Association
 2. National Lumber Grades Authority
 3. West Coast Lumber Inspection Bureau
 4. Western Wood Products Association (WWPA)

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 03 20 00 – Concrete Reinforcing
- B. Section 04 40 00 – Stone Assemblies
- C. Section 31 00 00 – Earthwork

1.04 REFERENCE STANDARDS

- A. American Society of Mechanical Engineers (ASME)
1. ASME B 18.2.1 Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series)
 2. ASME B18.2.1-2012 and B 18.6.1 Wood Screws (Inch Series)

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- B. ASTM International (ASTM)
 - 1. ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - 2. ASTM A307 Standard Specification for Carbon Steel Bolts and Studs, and Threaded Rod 60,000 psi Tensile Strength
 - 3. ASTM A563 Standard Specification for Carbon and Alloy Steel Nuts
 - 4. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 5. ASTM A666 Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar
 - 6. ASTM D3498 Standard Specification for Adhesives for Field-Gluing Plywood to Lumber Framing for Floor Systems
 - 7. ASTM F1667 Standard Specification for Driven Fasteners: Nails, Spikes, and Staples
- C. American Wood-Preservers' Association (AWPA)
 - 1. AWPA M4
 - 2. AWPA U1 Use Category System: User Specification for Treated Wood
- D. National Institute of Standards and Technology (U.S. Department of Commerce)
 - 1. PS 1 Structural Plywood
- E. WWPA
 - 1. WWPA G-5 Western Lumber Grading Rules

1.05 ACTION SUBMITTALS

- A. Product data: For each type of process and factory-fabricated product, indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from the chemical treatment manufacturer and certification by the treating plant that treated the materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

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2. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. Fastener patterns: Full-size templates for fasteners in exposed framing

1.06 INFORMATIONAL SUBMITTALS

A. Material certificates: For dimension lumber specified to comply with minimum allowable unit stresses, indicate species and grade selected for each use and design values approved by the American Lumber Standard Committee (ALSC) Board of Review.

B. Evaluation reports: For the following, from The International Code Council (ICC) Evaluation Service:

1. Wood-preservative-treated wood

1.07 QUALITY ASSURANCE

A. Testing agency qualifications: For the testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested

1.08 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting that is securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 – PRODUCTS

2.01 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with the grade stamp of the grading agency.

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2. For exposed lumber indicated to receive a stained or natural finish, omit the grade stamp and provide certificates of grade compliance issued by the grading agency.
3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
4. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum moisture content of lumber: 15%, unless otherwise indicated

2.02 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative treatment by pressure process: AWWA U1; Use Category UC2

1. Preservative chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium; do not use inorganic boron (SBX) for sill plates.
2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

B. Kiln dry lumber after treatment to a maximum moisture content of 19%. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

1. For exposed lumber indicated to receive a stained or natural finish, omit the marking, and provide certificates of treatment compliance issued by the inspection agency.

D. Application: Treat items indicated on the Drawings and the following:

1. Trail steps

2.03 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Provide fasteners with hot-dip zinc coating complying with ASTM A153.

B. Nails, brads, and staples: ASTM F1667

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- C. Power-driven fasteners: NES NER-272
- D. Wood screws: ASME B18.6.1
- E. Lag bolts: ASME B18.2.1
- F. Bolts: Steel bolts complying with ASTM A307, Grade A ASTM A563 hex nuts

PART 3 – EXECUTION

3.01 INSTALLATION, GENERAL

- A. Set rough carpentry to the required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction, and scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Sort and select lumber so natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces too small to use with the minimum number of joints or optimum joint arrangement.
- C. Comply with AWWA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
- D. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code
 - 3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
- E. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members, where the opposite side will be exposed to view or receive finish materials. Make tight connections between members.

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Install fasteners without splitting wood. Drive nails snug, but do not countersink nail heads unless otherwise indicated.

- F. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced and with adjacent rows staggered.
 - 1. Comply with indicated fastener patterns where applicable. Before fastening, mark fastener locations, using a template made of sheet metal, plastic, or cardboard.
 - 2. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

3.02 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply U.S. Environmental Protection Agency (EPA)-registered borate treatment. Apply borate solution by spraying to comply with the EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes sufficiently wet that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with the EPA-registered label.

END OF SECTION 06 10 00

SECTION 12 93 00
SITE FURNISHINGS

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. Provide all labor, materials, and equipment necessary to supply and install the following:
 - 1. Benches
 - 2. Picnic tables
 - 3. Removable bollard
 - 4. Pavilion

1.02 QUALITY ASSURANCE

- A. Manufacturer's Instructions: Adhere to manufacturer's instructions for product handling, assembly and installation, and maintenance.
- B. Manufacturer's original factory finish must be intact for the installation to be considered satisfactory. On-site touchup will not be accepted. Inspect benches upon delivery to ensure lumber is not split or rough, powder coating is not scraped and does not have areas missing coating, and legs and back supports are square. Reject damaged or inferior benches.

1.03 RELATED SECTIONS

- A. Related sections include the following:
 - 1. Section 03 30 00 – Cast-in-Place Concrete

1.04 SUBMITTALS

- A. For each product specified, submit the following for approval prior to delivery:
 - 1. Manufacturer's product data
 - 2. Manufacturer's installation instructions
 - 3. Color samples for each product
 - 4. Manufacturer's warranty

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- B. For Pavilion, submit design in the form of shop drawings for review and approval 60 days after acceptance of Contract. Shop drawings shall be drafted to scale and submitted in PDF file format.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Ensure all specified Site furnishings are delivered to the Site undamaged and are protected while under project construction prior to final acceptance.

PART 2 – PRODUCTS

2.01 BENCHES

- A. Benches shall have the following specifications:
 - 1. DuMor, Model 79-60, or approved equal
 - 2. A length of 6 feet with S-1 embedment and Douglas fir lumber
 - 3. Powder coated in color Heritage Brown or selected by Owner during construction
 - 4. Embedment of a minimum depth of 30 inches and per manufacturer's specifications

2.02 PICNIC TABLES

- A. Americans with Disabilities Act (ADA)-compliant tables shall have the following specifications:
 - 1. DuMor, Model 75-68-1, ADA accessible, with S-1 embedment and Douglas fir lumber or approved equal
 - 2. Powder coated in color Heritage Brown or selected by Owner during construction
 - 3. Embedment per manufacturer's specifications

2.03 BOLLARDS

- A. Bollards shall have the following specifications:
 - 1. Removable/Lockable Ironsmith Atlantian Removable Pipe Bollards in Model 9029-6R3, 6- × 6-inch schedule 40 pipe with cast aluminum cap for removable installation, aluminum, and gray, with 9000 R-6 receiver or approved equal

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2. Bollards embedded per manufacturer specifications

2.04 PAVILION

- A. The pavilion shall have the following specifications:
 1. Sentinel Mountain Series Shelter, Model 98-102-3T, site-specific Wind Load and Snow Load as determined by vendor, 1,500-pound-per-square-foot soil bearing, 2,500-pound-per-square-inch concrete bearing, 8- × 8-inch steel posts, and Hi-Rib steel roof or approved equal
 2. Embedment per manufacturer's specifications

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify installation conditions as satisfactory to receive the Work of this section. Do not install until unsatisfactory conditions are corrected. Beginning Work constitutes acceptance of conditions as satisfactory.

3.02 EMBEDMENT INSTALLATIONS

- A. Site furnishings shall be embedment installation on concrete paving as shown on the Drawings.
- B. Use only manufacturer-approved anchoring devices.
- C. Mark bench locations on concrete as shown on the Drawings and obtain Owner's approval of location prior to embedment installation. Open space around benches and picnic table shall comply with the ADA.

3.03 INSTALLATION OF MANUFACTURED ITEMS

- A. Install all equipment in accordance with Specifications, Contract Documents, and manufacturer's directions. Where these may be in conflict, the more stringent requirements govern.
- B. See Section 03 30 00 – Cast-in-Place Concrete, for footings.

3.04 CLEANUP

- A. Remove all metal, wood, and concrete debris, protective wrappings and coverings, and shipping materials from the Site. Remove all residues, and repair all stains, scuffs, abrasions, and marks from the finished product prior to requesting inspection. Fully restore all areas of the Site that were impacted by the installation activities.

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END OF SECTION 12 93 00

SECTION 31 00 00
EARTHWORK

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. The Work described in this section includes excavation, material screening, material stockpiling, stockpile management, backfill, capping, material handling/transportation, and other work incidental to the earthwork shown on the Drawings or required to accomplish the Work covered by the Contract.

1.02 REFERENCES

The following is a list of standards that may be referenced in this section:

- A. American Association of State Highway and Transportation Officials (AASHTO) T85 Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone
- B. ASTM International (ASTM) D6913 Standard Test Method for Particle-Size Analysis of Soils Using Sieve Analysis
- C. AASHTO T96 Los Angeles Wear, 500
- D. Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge and Municipal Construction (current edition)
- E. Washington Area Code (WAC) 296-155 Washington Safety Standards for Construction Work
- F. WAC 296-155 Part N: Excavation, Trenching, and Shoring

1.03 DEFINITIONS

- A. Armor Rock: Aggregate material to be used for placement in the Jetty Management Area (MA) and as a detail to protect the US25 bridge footings
- B. Backfill Material: Aggregate material to be used for subgrade placement below the cap in the Seasonal Beach and Hillside MAs
- C. Cap Material A: Aggregate material to be used for placement in the Bay, Public Dock, and Bayshore MAs, and as an overlay on the top surface of the Jetty MA
- D. Cap Material B: Aggregate material to be used for placement in the Seasonal Beach MA

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- E. On-Site Screened Cap Material: Aggregate material sorted from Site excavated material and blended with Cap Aggregate B1 prior to placement
- F. Required Excavation Thickness: The material removal minimum thickness the Contractor must remove to meet the goals of the cleanup as shown on the Drawings
- G. Required Placement Thickness: The material placement minimum depth/thickness the Contractor must place to meet the goals of the cleanup as shown on the Drawings

1.04 QUALITY ASSURANCE

- A. The Contractor is responsible for verifying the quality of the Work.
- B. The Washington State Department of Ecology (Ecology) may require that an independent testing laboratory test imported materials at any time. If the material is found to be noncompliant with the Contract, the Contractor shall bear the cost of testing and removal of all noncompliant materials from the Site and replacement of the materials with those meeting the requirements of the Contract.
- C. Transportation of excavated materials for off-site disposal shall comply with approved haul routes and disposal site as identified in the Drawings and these Technical Specifications. All transportation activities shall be documented in vehicle logbooks.
- D. It is the responsibility of the Contractor to verify the accuracy of all survey information provided by Ecology prior to commencing excavation or filling operations. Commencement of these operations constitutes acceptance of the survey information as appropriate to meet the intent of the Contract.

1.05 SUBMITTALS

- A. Imported materials characterization, testing and reporting
 - 1. The Contractor shall ensure and provide documentation that imported materials are natural, are free of contaminants (including debris or recycled materials), and meet the Specifications (including chemical criteria in Table 31 00 00-1). Ecology maintains the right to reject any materials that have been determined to be substandard for any reason. In the event of rejections, it shall be the responsibility of the Contractor to remove all stockpiles of rejected material from the Site at no cost to Ecology.
 - 2. The Contractor shall submit a particle gradation analysis per ASTM D6913 for each product specified in this section to check compliance with these

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Technical Specifications. Products specified in this section shall be approved by Ecology prior to being imported to the Site.

- B. Waste disposal records
- C. The Contractor shall submit all weight tickets, manifests, and waste disposal records from the disposal facilities receiving excavated materials.

PART 2 – PRODUCTS

2.01 BACKFILL MATERIAL

- A. Backfill Material shall consist of well-graded natural or crushed material within the size range provided below. The materials shall be uniform in quality and substantially free from wood, roots, bark, debris, recycled concrete, and other deleterious material.

Sieve Size	Percent Passing
2-1/2 inches	99–100
2 inches	65–100
1 inch	50–85
No. 4	15 maximum

- B. The Contractor may propose an alternate material substantively similar to the gradation above for review and approval by Ecology.

2.02 TOPSOIL MATERIAL

- A. Refer to Section 32 91 13 – Soil Preparation and Finish Grading.

2.03 ON-SITE SCREENED CAP MATERIAL

- A. On-Site Screened Cap Material shall consist of approved material excavated from the Seasonal Beach MA and screened for beneficial reuse by the Contractor during Site excavation activities. On-Site Screened Cap Material may be used for blending with Cap Aggregate B1 in any application for which Cap Material B has been specified.
- B. On-Site Screened Cap Material shall meet the following criteria for reuse:
 - 1. The material shall be free from debris or other deleterious materials.
 - 2. The material shall contain no organic matter or soft, friable particles in quantities considered objectionable by Ecology.
 - 3. On-Site Screened Cap Material shall include Seasonal Beach MA excavated materials 6 inches and larger.

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- C. On-Site Screened Cap Material shall be produced by the Contractor by screening and retaining all excavated materials that do not pass through a 6-inch square mesh.

2.04 CAP MATERIAL

- A. Cap Materials shall include Cap Material A and Cap Material B, to be placed in specific locations shown on the Drawings.
- B. Cap Material A
1. Cap Material A shall meet the following requirements for grading when placed in hauling vehicles for delivery to the project or during manufacture and placement into temporary stockpiles. Alternate gradations may be used if proposed by the Contractor and accepted by Ecology. The alternate gradation shall have nominal aggregate size of no less than 1-1/2 inches and no greater than 3 inches.

Sieve Size	Percent Passing
2-1/2 inches	99–100
2 inches	65–95
1 inch	50–85
No. 4	26–44
No. 40	16 maximum
No. 200	5.0–9.0

Notes:

1. All percentages are by weight.
 2. The portion of sediment retained on No. 4 sieve shall not contain more than 0.2% wood waste.
- C. Cap Material B
1. Cap Material B shall be well-graded, clean, naturally occurring, water-rounded material.
 - (a) Cap Material B shall be created using a mixture of components of Cap Aggregate B1, as described in this section, and On-Site Screened Material at a ratio of 60% Cap Aggregate B1 and 40% On-Site Screened Material.
 - (b) Depending on available quantity of On-Site Screened Cap Material, the Contractor may be required to substitute Cap Aggregate B2 for On-Site Screened Material in the blending process. The Contractor shall select a mixing operation that will result in a well-graded distribution of cobble sizes.
 2. Cap Aggregate B1 shall be graded as follows:

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Approximate Size¹ (inches)	Percent Passing
6	99–100
5	70–90
2	30–60
3/4	10 maximum

Note:

1. Approximate size can be determined by taking the average dimension of the three axes of the rock—length, width, and thickness—by use of the following calculation:

$$\frac{\text{Length} + \text{Width} + \text{Thickness}}{3} = \text{Approximate Size}$$

3. The grading of Cap Material B shall be visually observed by Ecology’s Representative before it is loaded for placement.
- D. Cap Aggregate B2
1. The Contractor shall identify a source and provide a price for purchase and delivery of Cap Aggregate B2.
 2. Cap Aggregate B2 shall be natural rounded stone free from organics or anthropogenic or deleterious materials and shall be graded as follows:

Approximate Size (inch)	Percent Passing
18	100
16	80–95
12	50–80
8	15–50
4	15 maximum

2.05 ARMOR ROCK

- A. Armor rock shall consist of broken stone or broken concrete rubble and shall be free of rock fines, soil, or other extraneous material. Concrete rubble shall not be contaminated by foreign materials such as fibers, wood, steel, asphalt, sealant, soil, plastic, and other contaminants or deleterious material. Concrete rubble that is imported to the Site will require testing and certification for toxicity characteristics.
- B. The Contractor shall provide armor rock from approved off-site sources.
- C. Armor rock shall be hard, dense, and durable.
 1. Minimum specific gravity per AASHTO T85: 2.55.

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2. Degradation Factor per WSDOT Test Method T 113: 15 minimum
3. Los Angeles abrasion per 500 revolutions: AASHTO T96: 50%.

D. The size of armor rock shall be as follows:

Proportion	Size Range
20%–90%	300 pounds to 1 ton (2 cubic feet to 1/2 cubic yard)
15%–80%	50 pounds to 1 ton (1/3 cubic foot to 1/2 cubic yard)
10%–20%	3 inches

2.06 ANALYTICAL TESTING OF IMPORTED MATERIALS

- A. Imported materials, except Cap Material B2 and Armor Rock, shall be tested to ensure they conform with the chemical screening criteria presented in Table 31 00 00-1.

Table 31 00 00-1: Imported Material Chemical Screening Values

Analyte	Value^a
Conventional Pollutants	
Ammonia	230
Total sulfides	39
Metals	
mg/kg dw	
Arsenic	14
Cadmium	2.1
Chromium	72
Copper	400
Lead	360
Mercury	0.66
Nickel	26
Selenium	11
Silver	0.57
Zinc	3200
Organometallics	
µg/kg dw	
Monobutyltin	540
Dibutyltin	910
Tributyltin	47
Tetrabutyltin	97
Organic and Chlorinated Organic Chemicals	
µg/kg dw	
4-methylphenol	260
Benzoic acid	2,900
Pentachlorophenol	1,200
Phenol	120

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Analyte	Value^a
Dibenzofuran	200
Phthalates	µg/kg dw
Bis(2-ethylhexyl)phthalate	500
Di-n-butyl phthalate	380
Di-n-octyl phthalate	39
Pesticides and PCBs	µg/kg dw
Beta-hexachlorocyclohexane	7.2
Carbazole	900
Dieldrin	4.9
Endrin ketone	8.5
Total Aroclors	110
Total o,p' and p,p' DDDs	310
Total o,p' and p,p' DDEs	21
Total o,p' and p,p' DDTs	100
Polycyclic Aromatic Hydrocarbons	µg/kg dw
Total polycyclic aromatic hydrocarbons	17,000
Bulk Petroleum Hydrocarbons	mg/kg dw
TPH-diesel	340
TPH-residual	3,600

Notes:

a. All screening values are dry weight normalized.

µg/kg: microgram per kilogram

DDD: dichlorodiphenyldichloroethane

DDE: dichlorodiphenyldichloroethylene

DDT: dichlorodiphenyltrichloroethane

dw: dry weight

mg/kg: milligram per kilogram

PCB: polychlorinated biphenyl

TPH: total petroleum hydrocarbon

PART 3 – EXECUTION

3.01 SITE PREPARATION

- A. Refer to Section 31 10 00 – Site Clearing
- B. Implement environmental protection measures, Site access and traffic control, utility protection and replacement (if necessary), air emissions control, dust control, drainage and erosion control, spill prevention and pollution control, and all other controls needed to protect environmental quality during the work.

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3.02 EXCAVATION

- A. The Contractor shall conduct all required excavation activities in accordance with the requirements of the Drawings and as otherwise directed by Ecology to complete the work under this Contract. Excavation requirements of MAs are as follows.
1. The Seasonal Beach MA shall be excavated a minimum of 2 feet in areas shown on the Drawings. Additional excavation as needed to smooth transitions between excavation and placement areas with placement-only areas.
 2. Limited excavation shall be conducted on the Jetty MA if needed to maintain a smooth finished grade between the Jetty MA and Seasonal Beach MA.
 3. The Public Dock MA shall be excavated a minimum of 2 feet under and immediately adjacent to the dock to allow for placement of the 2-foot cap without change to the existing bathymetry.
 4. Hillside MA
 1. Hillside Excavation Area 1 and Hillside Excavation Area 2, identified in the Drawings, shall be excavated to depths of 4 and 3 feet, respectively.
 2. The Hillside Trail area will be excavated, if needed, to achieve a running slope between 5% and 8% and a maximum 2% cross slope.
 3. Limited excavation shall be conducted under the direction of the Ecology's Representative. Areas of visible slag in the Hillside MA (focusing generally on the southwestern portion of the MA), the slag, and up to 2 feet of contaminated soil will be removed, assuming the areas are easily accessible and that excavation does not disturb mature vegetation.
- B. Required excavation depth shall be achieved over at least 95% of the surface area of the required excavation footprint, as determined by evaluation of Contractor's post-excavation survey(s).
- C. No larger than a 30- by 30-foot area may be less than the required excavation depth.
- D. Excavate to the elevations and grades shown on the Drawings. No payment will be made for removal of material greater than 0.5 foot below the required excavation depth.
- E. Contractor operations will require work in a potentially hazardous environment. Ensure adequate protection for all personnel, and comply with all health and safety requirements of the Contractor's Site-specific Health and Safety Plan.

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- F. The Contractor shall coordinate with Ecology on extents of required excavation, depending on water level encountered during excavation activities. Ecology's Representative may direct modifications to the soil excavation limits for the purposes of achieving Site cleanup objectives and for environmental protection needs. All excavation shall be performed above the waterline, with the exception of excavation at the Bay and Public Dock MA.
 - 1. The Contractor shall coordinate excavation during shallow-water conditions at the Bay and Public Dock MA.
 - 2. The Contractor shall select, provide, deploy, and maintain Best Management Practices (BMPs) such as portable dams (e.g., Aquadam) or supersacks filled with sand to create a temporary cofferdam during excavation in the Bay and Public Dock MA. The Contractor shall have available supplemental BMPs, such as a silt curtain. Ecology may direct the Contractor to deploy such supplemental BMPs as an additional protective measure for any excavation that occurs below the water surface. The Contractor shall list the type and quantity of supplemental BMPs that will be maintained on site as part of the Contractor's work plan.
- G. Ecology reserves the right, during progress of Work, to vary slopes, grades, and dimensions of excavations from those specified in the Drawings. The Contractor shall immediately notify Ecology if such modifications are cause for any requested change in compensation by the Contractor.
- H. The Contractor shall assist Ecology's Representative in confirmatory sample collection, as needed. The Contractor will maintain excavated areas before backfilling while confirmatory testing is conducted.
- I. An archeological monitor provided by Ecology will observe soil excavation activities for the purposes of cultural artifact discovery consistent with a monitoring plan to be developed by a qualified archeologist and approved by Ecology. The Contractor shall assist the archeological monitor in the cultural artifact monitoring activities by providing access for observation activities. The Contractor shall strictly adhere to Ecology's procedures and instructions if cultural artifacts are encountered during excavation activities.
- J. Take precautions to preserve material below and beyond established lines of excavation in the soundest possible condition.
 - 1. Damage to Work due to the Contractor's operations shall be repaired by, and at the expense of, the Contractor.

3.03 MANAGEMENT OF EXPOSED SURFACES

- A. The Contractor shall be aware of the potential for erosion and contamination from newly exposed surfaces. The Contractor shall control the potential for erosion of materials and loss of soils from freshly exposed surfaces by rolling or grading the

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surfaces to a flat and smooth condition. If this procedure is judged to be insufficient for protection against erosion in the opinion of Ecology, then the Contractor shall institute additional procedures.

3.04 EXCAVATION SUPPORT AND PROTECTION

- A. Construct the excavation to the lines shown on the Drawings. Sides of excavations are to be cut or shored to maintain stable side slopes. Maintain sides of excavations in a clean and safe condition until completion of backfilling.
- B. The use of stable open cut angles and/or shoring and bracing are required at excavations deeper than 4 feet below adjacent existing grade. The Contractor shall be responsible for planning, designing, installing, maintaining, and removing support and protection for excavations and trenches in accordance with WAC Chapter 296-155, Part N, and applicable requirements of the Occupational Safety and Health Administration (OSHA) and Washington Industrial Safety and Health Act.
- C. Excavation support systems shall be designed and installed to protect surrounding property and structures. Excavation support systems shall also be designed so installation and removal of the support systems do not disturb soil adjacent to or below the required excavation or trench section.
- D. Address vibration and settlement effects on the surrounding structures, utilities, and property.
- E. The Contractor shall visit the Site prior to submittal of its bid to ascertain the excavation depths, soil parameters, and loading requirements the Contractor will use when assessing the need for and design of shoring, if needed.
- F. Unless otherwise indicated, remove all sheeting, shoring, and bracing after placement of backfill.

3.05 EXCAVATED MATERIALS SCREENING

- A. The Contractor shall screen excavated materials from the Seasonal Beach MA and retain aggregate 6 inches in diameter or larger for placement consistent with Article 2.03.
- B. The Contractor shall provide screening means and methods to Ecology and Ecology's Representative for review and approval as part of the Construction Quality Control Plan.
- C. Cap Materials shall be handled in a manner that limits segregation or sorting of the graded Cap Material. If excessive sorting such that the Cap Material would not be properly graded after placement is observed by Ecology's Representative, the Contractor will be required to remix the Cap Material to achieve a more well-graded consistency.

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- D. Any anthropogenic materials, including slag or other debris, retained on the 6-inch square mesh during screening shall be removed for disposal by methods selected by the Contractor
- E. At a minimum, the proposed screening plan shall discuss the following:
 - 1. Equipment (e.g., triple deck screen) to be used for screening
 - 2. Stockpile management
 - 3. Screening procedures
 - 4. Procedures for removal and disposal of any anthropogenic material (e.g., clinker slag) retained during the screening process

3.06 STOCKPILING

- A. The Contractor shall propose the staging and stockpile design consistent with the requirements of this section and the Drawings for review and approval by Ecology's Representative. The following categories of stockpiles may be required for execution of the work:
 - 1. Excavated materials stored prior to screening
 - 2. Excavated materials stockpiled after screening and unsuitable for on-site reuse during waste characterization
 - 3. On-Site Screened Cap Materials after screening and prior to blending
 - 4. Blended cap materials prior to cap placement
 - 5. Imported materials (separated by material type)
- B. All stockpiles of material for waste characterization shall be clearly delineated or staked with identifying signage.
- C. The Contractor shall be responsible for constructing, maintaining, and restoring the staging area.
 - 1. The Contractor shall use protective measures, such as quarry spalls, as needed to protect the surface of the staging area.
- D. Stockpiles shall not be placed within 5 horizontal feet of the upper edge of any excavation. Stockpiles and stockpile areas shall be maintained in good condition and constructed of materials compatible with the material being stored.
- E. The Contractor shall employ BMPs as necessary to prevent loss of stockpiled materials by such events as erosion, spillage, or wind. The Contractor shall also prevent loss of material during transfer of materials to and from the stockpile areas.

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- F. Place, grade, and shape all stockpiles for proper drainage. Protect from wind and moisture, which may require use of plastic sheeting and securing of sheeting with sandbags or other approved material.
- G. The Contractor shall comply with the following criteria for stockpiling of excavated materials:
 - 1. Stockpiles of all unscreened excavated material and off-site disposal stockpiles shall be placed on an impervious geosynthetic material.
 - 2. The Contractor shall segregate stockpiles of excavated material for off-site disposal into no more than 1,500-cubic-yard stockpiles and provide clear signage with identification information. Ecology's Representative will conduct sampling of temporary stockpiles to characterize the excavated material prior to disposal. The Contractor shall sequence its work to accommodate Ecology's Representative's sampling and analysis to avoid any delays in the work schedule.
 - 3. Upon approval of Ecology's Representative, the Contractor may consolidate, within another location of the temporary stockpiling area, stockpiles that have the same final waste characterization based on sampling results.
- H. The Contractor shall remove water within the stockpile area by pumping to a containment vessel. The Contractor shall be responsible for properly disposing of water collected within the stockpile areas.

3.07 TRANSPORTATION OF EXCAVATED MATERIALS

- A. The Contractor shall transport excavated materials for off-site disposal at the approved, suitably permitted disposal facility(ies) based on excavated material characterization information provided by Ecology's Representative.
- B. Prior to departure from the Site, each vehicle operator shall note the time and date on the vehicle log book. Each stop with a loaded vehicle, other than for traffic controls, shall be entered into the log book indicating the circumstances requiring the stop. The time the vehicle enters the disposal site property shall also be noted in the log book.
- C. At the off-site disposal facility, the vehicle operator shall conform to the agreed-upon operational procedure established by the off-site disposal facility operator and Contractor. The procedure shall include, but not be limited to, traffic control, turnouts, turnarounds, queue time, truck washing facilities, gate security, etc.
- D. Construction site loading: The material shall be loaded into the hauling vehicles under the direction of the Contractor. Prior to dispatching, the Contractor shall ensure the proper entries have been entered into the vehicle log book.
- E. Transportation of waste materials: After being dispatched, the hauling vehicle shall proceed to the disposal facility via the approved haul route. All stops

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en route, other than traffic controls, shall be entered into the log book, indicating location, and odometer reading. Each loaded vehicle shall cross a certified scale and obtain weight tickets in triplicate that have been machine numbered, noting time and date. One copy of the ticket will be given to the disposal site representative at the Site, one copy will be given Ecology's Representative upon return to the construction site, and one copy shall be retained by the Contractor. The weight tickets will be used to establish quantities for payment and care shall be exercised to avoid loss or obliteration of the tickets.

- F. Disposal site unloading: Upon arriving at the disposal site, the vehicle operator shall enter the date, time, and odometer reading into the vehicle log book. Once on the disposal site, the operator shall conform to the agreed-upon operational procedure for unloading the material. After unloading, the vehicle shall be washed, swept, or otherwise cleaned to the satisfaction of the Contractor and all regulatory agencies having jurisdiction.
- G. Return to construction site: On the return trip to the construction site, the operator shall again cross a certified scale and obtain weight tickets in triplicate for the empty vehicle, indicating time and date. Empty weight tickets shall be delivered in the same manner as loaded weight tickets. Operators shall obtain an empty weight ticket for every load, except that no more than two empty weight tickets will be required for any 1 day that particular hauling unit is in service. Vehicle log book entries shall be summarized in the Contractor's Daily Report.
- H. Certified scales: The certified scales utilized for the weighing of materials hauled to the disposal site shall be located within 10 haul route miles of the disposal-site gate. The scales shall be currently certified by the Washington State Department of Agriculture Weights and Measures Program and operated by a "Certified Weightmaster" or equivalent for disposal in Oregon.
- I. Documentation: Documentation of haul activity shall include, but not be limited to, the following:
 - 1. Documentation as to the quantity, date, and number of hauling vehicles
 - 2. Weight tickets in triplicate from a certified scale
 - 3. Copies of test reports
 - 4. Copies of permits
 - 5. Copies of correspondence from regulatory agencies
 - 6. Haul activity reporting in the Contractor's Daily Reports
 - 7. Vehicle log book(s)

3.08 DISPOSAL OF EXCAVATED MATERIALS

- A. Refer to Section 02 61 00 – Removal and Disposal of Contaminated Soils.

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3.09 MATERIAL PLACEMENT

- A. The Contractor shall furnish and place materials within the MAs of the Site as shown on the Drawings.
 - 1. Backfill Material shall be placed to fill depressions in the subgrade in the Seasonal Beach MA. Backfill Material shall also be used in Hillside MA excavation areas.
 - 2. The Contractor shall conduct a progress survey after filling the subgrade to ensure the design cap thickness of 2 feet is achieved.
 - 3. Cap Placement
 - 1. Cap Material A shall be placed to a minimum thickness of 2 feet at the Bay and Public Dock MA and Bayshore MA.
 - 2. Cap Material B shall be placed to a minimum thickness of 2 feet at the Seasonal Beach MA.
 - 3. Armor rock shall be placed on the Jetty MA to achieve a minimum thickness of 2 feet on top of the existing grade. Armor rock will terminate in a “self-launching toe” geometry that will protect the armor rock from being undermined by river current-induced shear stresses, as depicted on the Drawings.
- B. Cap Material placement shall be sequenced closely following excavation work and prior to inundation of the Work area by rising river water.
- C. Required Placement Thickness shall be achieved over at least 95% of the cap footprint.
- D. No larger than a 30- by 30-foot area shall be less than the Required Placement Thickness.
- E. Placement is not allowed in the brick feature area adjacent to the Bayshore MA shown on the Drawings.
- F. Placement shall occur to the elevations and grades shown on the Drawings. No payment will be made for Cap Material placement greater than 0.5 foot above the Required Placement Thickness.
- G. Placement of materials on slopes shall be conducted from the toe of the slope upward. The first layer of the material shall be placed with care to minimize disturbance of the underlying on-site material and mixing of on-site materials with the placement layer.
- H. Placement of rock shall be done with a limited drop height to minimize potential for displacement of the underlying on-site material. Rock shall not be dropped from a height of more than 1 foot and shall not be allowed to roll down the slope.

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- I. Ecology's Representative will direct the extent of material placement activities for the purposes of achieving Site cleanup objectives. All material placement shall be performed above the waterline, with the exception of material placement at the Bay and Public Dock MA.
- J. The Contractor may be required to remove any placement material deposited outside the areas indicated on the Drawings, at the Contractor's own expense, unless such placement is otherwise approved by Ecology.

END OF SECTION 31 00 00

SECTION 31 05 19
GEOSYNTHETICS FOR EARTHWORK

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. This section describes the requirements for the physical characteristics and installation of the following geosynthetic materials as part of the Work:
 - 1. Geotextile. A geotextile marker fabric must be used to demarcate import material and on-site reuse material stockpiles from the existing soil at the staging area.
 - 2. Impervious geosynthetic. An impervious geosynthetic must be used to prevent contact between the excavated stockpile material and the existing ground surface.

1.02 RELATED SECTIONS

- A. Section 01 50 00 – Temporary Facilities and Controls
- B. Section 01 57 13 – Temporary Erosion and Sediment Control

1.03 REFERENCES

- A. ASTM International (ASTM) standards
 - 1. ASTM D4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity
 - 2. ASTM D4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
 - 3. ASTM D4751 Standard Test Methods for Determining Apparent Opening Size of a Geotextile
 - 4. ASTM D4873 Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples
 - 5. ASTM D5261 Standard Test Method for Measuring Mass per Unit Area of Geotextiles

1.04 DELIVERY, STORAGE, AND HANDLING

- A. General: Deliver, store, and handle geosynthetic materials in accordance with ASTM 4873 Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples.
- B. Ship geosynthetic materials in a closed trailer.

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- C. Protect geosynthetic materials from ultraviolet light exposure, precipitation, inundation, mud, dirt, dust, puncture, cutting, and other damaging or deleterious conditions.
- D. Immediately restore damaged protective covering.

1.05 SUBMITTALS

- A. Submit material certification/data sheets for geotextile marker fabric.
- B. Submit material certification/data sheets for impervious geosynthetic materials.

1.06 QUALITY CONTROL

- A. The Contractor must reject rolls for which Quality Control requirements are not met.
- B. The Contractor must certify the quality of the rolls of geotextile.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Geotextile
 - 1. Product is nonwoven or woven continuous-filament polypropylene or polyester fabric.
 - 2. Product is resistant to soil chemicals.
- B. Impervious Geosynthetic
 - 1. Product shall provide in an impermeable barrier between the existing subgrade and stockpiled material, including any seam or overlap locations.
 - 2. Product shall be sufficiently robust so as not to be damaged during stockpile placement.
 - 3. The proposed impervious geosynthetic material and installation methods shall be approved by Ecology's Representative.

2.02 LABELING

- A. The Contractor must mark or tag geosynthetic material rolls with the following information:
 - 1. Manufacturer's name
 - 2. Product identification
 - 3. Lot number
 - 4. Roll number

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5. Roll dimensions

PART 3 – EXECUTION

3.01 INSTALLATION

- A. The surface underlying the geosynthetic materials must be smooth and free of rocks, sticks, or protrusions that could damage the geotextile.
- B. Geosynthetic rolls that are damaged or contain imperfections will be repaired or replaced as directed. The geosynthetic materials must be laid smooth and flat and free of tensile stress, folds, and wrinkles.
- C. Impervious Geosynthetic: The Contractor shall use an installation method that does the following:
 1. Results in an impermeable barrier between the existing subgrade and stockpiled material
 2. Prevents leakage from seams or penetrations of any water that contacts the stockpiles

- 1.

3.02 SEAMS/SECURING

- A. Overlap seams: Continuously overlap panels a minimum of 12 inches at all longitudinal and transverse joints.
- B. The Contractor will determine whether welding is required for impervious geosynthetic and shall weld seams, if appropriate, in accordance with the geosynthetic material manufacturer's recommendations.

3.03 PROTECTION

- A. When placing excavated materials over geosynthetic materials, the Contractor must ensure the following:
 1. No damage to geosynthetic materials occurs.
 2. No slippage of geosynthetic materials on underlying layers occurs.
 3. No excessive tensile stress in the geosynthetic materials occurs.
 4. The overlying material is free of any debris that could damage or otherwise reduce the effectiveness of the geosynthetic materials.

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3.04 REPAIRS

- A. The Contractor must repair holes or tears in geosynthetic materials with a patch from the same geosynthetic material, seamed in place with a minimum seam overlap of 12 inches in all directions, or welding if determined necessary by the Contractor.
- B. The Contractor must remove any soil or other material that may have penetrated the torn geosynthetic materials.

END OF SECTION 31 05 19

**SECTION 31 10 00
SITE CLEARING**

PART 1 – GENERAL

1.01 SUMMARY

- A. This section specifies Site clearing and grubbing.

1.02 SUBMITTALS

- A. Procedures: Section 01 33 00 – Submittal Procedures.
- B. Log of disposal site and quantities

1.03 JOB CONDITIONS

- A. Existing conditions: Determine the actual condition of the Site as it affects the work. Before work, notify the Washington State Department of Ecology's (Ecology's) Representative if any conditions appear different than the Contract represents.
 - 1. By submitting a bid, the Contractor represents it has visited the Site to become familiar with the quantity and character of all materials to be cleared and agrees the premises were made available prior to the deadline for submission of bids for whatever inspection and tests the Contractor deemed appropriate.
 - 2. The Site may have underground and other utilities. It is the Contractor's responsibility to adequately locate and verify all existing utilities prior to initiating work related to this section to avoid damage to utilities.
- B. Protection
 - 1. Do not damage structures, landscaping, or vegetation outside of the specific excavation and backfill areas shown on the drawings.
 - 2. Provide, erect, and maintain barricades, coverings, and other types of protection measures necessary to prevent damage to existing trees, structures, utilities, landscaping, and other features to remain in place on or adjacent to the Site.
 - 3. Remove salvaged items in a manner that protects adjacent property, structures, vegetation, and utilities.
 - 4. Maintain benchmarks, monuments, and other reference points. Re-establish if disturbed or destroyed at no cost to Ecology.
- C. Repair or replace property damaged by Contractor's activities.

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SECTION 31 10 00 – SITE CLEARING**

PART 2 – PRODUCTS [NOT USED]

PART 3 – EXECUTION

3.01 PERFORMANCE

A. Clearing and grubbing

1. Notify Ecology's Representative prior to commencement of clearing and grubbing activities.
2. Coordinate clearing and grubbing operations with erosion control and tree protection requirements.
3. Unless otherwise indicated on the Drawings, do not remove trees or significant vegetation without authorization from Ecology.
4. Unless otherwise indicated, remove obstructions such as brush, trees, logs, stumps, roots, heavy sod, vegetation, rock, stones larger than 6 inches in any dimension, broken or old concrete and pavement, debris, and structures where the completion of the Work requires their removal.
5. Grubbing shall consist of complete removal of roots, stumps, trash, and other debris from all graded areas so the Site is free of roots and debris.
6. Provide for legal off-site disposal of materials generated during clearing and grubbing. Submit information on the disposal site and quantities to Ecology's Representative.

B. Utility lines

1. Protect existing utility lines from damage.
2. Immediately notify Ecology's Representative of any damage to, or an encounter with, an unknown existing utility line.
3. The Contractor is responsible for the repairs of damage to existing utility lines identified by or made known to the Contractor prior to the start of clearing and grubbing operations.

C. Utility interference: Where existing utilities interfere with the work, notify Ecology's Representative and coordinate necessary relocation with the utility owner.

D. Protection: Provide protection devices, including barricades, fencing, warning signs, lights, and other items necessary to ensure the security of, and safety within, the Site during this phase of the work. Notify Ecology's Representative when Site clearing is complete.

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SECTION 31 10 00 – SITE CLEARING**

END OF SECTION 31 10 00

SECTION 32 11 23
AGGREGATE BASE COURSES AND SURFACING

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. The work described in this section includes, but is not limited to, placement and compaction of aggregate materials as the base course for asphalt pavements, miscellaneous concrete, and pathway surfacing.

1.02 RELATED SECTIONS

- A. Section 31 00 00 – Earthwork
- B. Section 32 12 16 – Asphalt Paving
- C. Section 03 30 00 – Cast-in-Place Concrete

1.03 REFERENCES

- A. Washington State Department of Transportation/American Public Works Association *Standard Specifications for Road, Bridge, and Municipal Construction* (current edition) and amendments
- B. ASTM D422 Standard Test Method for Particle-Size Analysis of Soils
- C. ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 pounds per square foot)
- D. ASTM D2922 Standard Test Methods for Density of Soil and Soil Aggregate in Place by Nuclear Methods

1.04 QUALITY ASSURANCE

- A. The Contractor is responsible for verifying the quality of the Work and shall perform compaction and density tests on request of the Owner to check compliance with these Technical Specifications. A copy of the test reports shall be furnished to the Owner.
- B. The Owner's Testing Agency may perform compaction and density tests to verify compliance with these Specifications.
- C. The Owner may require that an independent testing laboratory test imported materials at any time. If the material is found to be noncompliant with the Contract, the Contractor shall bear the cost of testing and removal of all

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noncompliant materials from the Site and replacement of the materials with those meeting the requirements of the Contract. If the materials tested are found to be compliant with the requirements of the Contract, the Owner will reimburse the Contractor for costs incurred by testing, plus markups as allowed for elsewhere in the Contract.

1.05 SUBMITTALS

- A. The Contractor shall submit the following for the approval by the Owner, in accordance with Section 01 33 00 – Submittal Procedures, and as further specified in this section:
 - 1. Imported base and surfacing materials: The Contractor shall submit a particle gradation analysis in graph and table forms based on the sieve sizes in these Technical Specifications for each product specified in this section. Products specified in this section shall be approved by the Owner prior to being imported to the Site.

PART 2 – PRODUCTS

2.01 AGGREGATE

- A. One of the following materials shall be used for aggregate base courses, as indicated on the Drawings:
 - 1. Crushed surfacing top course consistent with the Standard Specifications Section 9-03.9(3).
 - 2. Crushed surfacing base course consistent with the Standard Specifications Section 9-03.9(3).

2.02 CRUSHED SURFACING TOP COURSE, STABILIZED 1/4-INCH MINUS CRUSHED ROCK (#4 TO DUST CRUSHED GRAVEL)

- A. 1/4-inch minus crushed rock (#4 to dust) shall consist of crushed ledge rock or talus bearing no naturally occurring or worn surfaces. Graduation of the top course shall be as follows:

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Sieve Size	Percent Passing
3/8-inch square sieve	100
No. 4 sieve	95–100
No. 8 sieve	75–80
No. 16 sieve	55–65
No. 30 sieve	40–50
No. 50 sieve	25–35
No. 100 sieve	20–25
No. 200 sieve	5–15

- B. The stabilizer binder shall be PX-300, a nontoxic, organic binder that is a colorless and odorless blend of aqueous polymer emulsions that bind the 1/4-inch minus crushed rock together to produce a firm, stable surface.
1. Stabilizer binder as provided by G.M. Boston Company, as supplied by PolyFirm Stabilizers, LLC, 1819 23rd Avenue, Suite E422, Seattle, Washington 98122; phone: (206) 650-0832, ; e-mail: alexander.r.smith@gmail.com; fax: (206) 219-4149; website: www.polyfirm.com or approved equal.

PART 3 – EXECUTION

3.01 PLACEMENT OF BASE AGGREGATES FOR PAVEMENT

- A. Provide a minimum compacted lift of specified aggregate true to the elevations shown on the Drawings. Provide base aggregates as required to match adjacent existing pavements or landscapes. Extend base aggregates a minimum of 4 inches beyond the horizontal layout lines of pavement or more if indicated on the Drawings.
- B. Pavement bases shall be graded such that upon approval of compaction, the surface of the base is at the correct elevation to receive pavement to design finished grade.

3.02 PLACEMENT OF CRUSHED SURFACING TOP COURSE FOR CRUSHED ROCK PATHS

- A. Place crushed surfacing aggregate to thicknesses and elevations shown on the Drawings.

3.03 COMPACTION

- A. The Contractor shall compact the base course and top course by means of an appropriately sized static, vibratory, or impact-type compactor suited to the soil and physical restrictions of the area to be compacted. Although the Contractor is responsible for the selection of the method of compaction, selection of an

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inappropriate method shall not relieve the Contractor of the responsibility to achieve the specified result. Jetting, sluicing, or water settling will not be permitted.

- B. Compaction testing performed by Ecology’s Representative shall not relieve the Contractor of the obligation to place and compact materials as required in accordance with these Specifications.
- C. Control soil compaction during construction so as to provide minimum percentage of density specified for area classification. Do not allow equipment traffic to overly compact areas beyond specified percentages. Correct over-compaction as directed by the Owner, including ripping, regrading, and re-compaction or over-excavation and in-kind replacement per plan.
- D. Do not place the base course on surfaces that are frozen, overly wet, or graded inconsistently.
- E. Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages for maximum dry density for soils determined in accordance with ASTM 1557 (Modified Proctor).
 - 1. Subgrades
 - a) Subgrade soils in paving areas: 90%
 - b) Import aggregate base in paving areas: 95%
- F. Moisture Control
 - 1. Where subgrade or lift of soil material must be moisture conditioned before compaction, uniformly apply water or a layer of soil material to the surface of the subgrade to prevent free water appearing on the surface during or subsequent to compaction operations.
 - 2. Before compaction, moisten or aerate each layer as necessary to provide optimum content. Compact each layer to the required percentages of maximum dry density or relative dry density for each area classification.
 - 3. Do not perform compaction operations on excessively wetted soils.

END OF SECTION 32 11 23

**SECTION 32 12 16
ASPHALT PAVING**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. This Work shall consist of providing, placing, and compacting one or more layers of plant-mixed hot mix asphalt (HMA) on a prepared foundation or base to the lines, grades, and thicknesses where existing paving has been removed or damaged during construction.

1.02 RELATED SECTIONS

- A. Section 31 00 00 – Earthwork
- B. Section 32 11 23 – Aggregate Base Courses and Surfacing
- C. Section 32 13 13 – Concrete Paving and Site Miscellaneous Concrete

1.03 REFERENCE STANDARDS

- A. Washington State Department of Transportation (WSDOT)/American Public Works Association (APWA) *Standard Specifications for Road, Bridge, and Municipal Construction* (current edition) and amendments
- B. ASTM C131 Test Method for Resistance to Degradation of Small Size Course Aggregate
- C. ASTM D422 Standard Test Method for Particle-Size Analysis of Soils
- D. WSDOT Test Method of test for Determination of Method 705 Degradation Value
- E. WSDOT Test – Maximum Specific Gravity of Bituminous Paving Mixtures Method 113

1.04 QUALITY ASSURANCE

- A. The Contractor must be experienced in work of the highest professional quality and have facilities and personnel adequate for the Work specified. The Contractor must be acquainted with all work related to Site improvements and other work.
- B. Unless otherwise referenced or modified herein, quality control and quality standards for this section shall be as specified in the Standard Specifications.

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- C. Testing shall comply with Standard Specifications Sections 9-03.8(2) and 9-03.20. Aggregates for the HMA Class specified shall meet the requirements for pavements having less than 3 million equivalent single-axle loads in accordance with Standard Specifications Section 9-03.8(2). Tests must be performed by a certified testing agency or licensed laboratory. Two copies of the results of each test shall be submitted to the Owner for approval prior to continuation of the Work to be tested, unless otherwise directed.
- D. Other tests as may be referenced elsewhere in this section

1.05 SUBMITTALS

- A. The Contractor shall submit the following for approval by the Owner, in accordance with Section 01 33 00 – Submittal Procedures, and as further specified in this section:
 - 1. HMA: Mix design and batch plant information
 - 2. Aggregate for asphalt: Sieve analysis test results

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Materials for HMA paving shall meet the requirements of Standard Specifications Sections 5-04.2, 9-02, and 9-03.
- B. Paving asphalt shall be AR-4000W.
- C. Wearing course: Finish course HMA surfacing shall be Class 1/2-inch PG 64-22 unless noted otherwise on the Drawings.
- D. Where noted on the Drawings, the levelling or base course HMA surfacing shall be Class 1 PG 64-22.

2.02 SOURCE QUALITY CONTROL AND TESTS

- A. Provide mix design for HMA. Mix design shall be submitted, reviewed, and approved based on the commercial evaluation procedures as described in WSDOT Standard Specifications Section 5-04.3(7)A3.
- B. On-site sampling and testing will be conducted in accordance with the nonstatistical method.

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PART 3 – EXECUTION

3.01 NEW ASPHALT PAVING (INCLUDING PATCHING)

- A. In areas where existing paving has been removed during the demolition phase of work, new asphalt concrete paving shall be placed over compacted base aggregate meeting the requirements of Section 32 11 23 – Aggregate Base Courses and Surfacing.
- B. Minimum asphalt thickness shall be as shown on the Drawings.
 - 1. New asphalt patching shall meet the grade of adjacent existing asphalt concrete paving (to remain). Edges of new and existing pavement shall be flush without ridges or gaps.

3.02 EXISTING ASPHALT REPAIR

- A. All pavement cuts will be made uniformly by wheel or saw cutting. If edge of trench line degrades, ravels, or is nonuniform, additional saw cutting will be required prior to final patch or paving.
- B. Apply a tack coat to the existing pavement and edge of cut. Tack coat will be applied as specified in Standard Specifications Section 5-04.3(5)A, except that longitudinal joints between successive layers of asphalt concrete will be displaced laterally a minimum of 12 inches unless otherwise approved by the Public Works Director. Fine and coarse aggregate will be in accordance with Standard Specifications Section 9-03.8. Asphalt concrete thicker than 3 inches will be placed in equal lifts not to exceed 3 inches each.
- C. Surface smoothness will be pursuant to Standard Specifications Section 5-04.3(13). The paving will be corrected by removal and repaving of the trench only.
- D. Asphalt concrete pavement for wearing course will not be placed on any traveled way between October 1 and April 1 without written approval from the Owner.
- E. Asphalt for prime coat will not be applied when the ground temperature is lower than 50°F without written permission of the Owner.
- F. Asphalt concrete will not be placed on any wet surface, when the average surface temperatures are less than those specified in the following table, or when weather conditions otherwise prevent the proper handling or finishing of the bituminous mixtures.

Compacted Thickness	Wearing Course	Other Courses
Less than 0.10	55°F	45°F

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0.10 to 0.20	45°F	35°F
More than 0.20	35°F	35°F

- G. All joints on trenching or overlays will be sealed using crack sealant as specified in Standard Specifications Section 5-04.3(5)C.
- H. The final patch will be completed as soon as possible and within 3 days after first opening the trench. This time frame may be adjusted if delays are due to inclement paving weather or other adverse conditions that may exist. However, delaying of final patch or overlay work is allowable only subject to the Owner's approval. The Owner may deem it necessary to complete the Work within the three-day time frame and not allow any time extension. If this occurs, the Contractor will perform the necessary work as directed by the Owner.

3.03 TACK COAT

- A. The allowable temperature range for tack coat material is 290°F to 325°F.
- B. Where the new asphalt concrete abuts a curb or gutter, cold pavement joint, trimmed meet line, or any metal surface, a thin tack coat of asphalt shall be applied on the vertical face of the abutting surface by hand painting prior to paving. The application on the contact surfaces shall be thin and uniform to avoid an accumulation of excess asphalt in puddles. The Contractor shall not apply the tack coat on vertical contact surfaces above the finished height of the asphalt concrete being placed.

3.04 ASPHALT

- A. Placement: A course of asphalt concrete shall be installed to the lines and grades as indicated on the Drawings. The hot plant mix shall have an installation temperature of 275°F to 300°F.
- B. Compaction: Compaction of the asphalt concrete pavement shall conform to the requirements of Standard Specifications Section 5-04.3(10)A. Density of the pavement in place shall be a minimum of 91% or the reference maximum density as determined by WSDOT Test Method 705. The reference maximum density shall be determined as the moving average of the most recent five determinations for the lot of asphalt concrete being placed.
- C. Curing and cleaning: New asphalt pavement must be completely cured (minimum of 7 days of warm, dry weather and longer if cold or damp) prior to application of any materials. Pavement needs to be clean and free of all foreign matter. A high-pressure washer, air broom, or hand sweeper shall be used; removal of grease and oil requires the use of a strong detergent. After using detergents, the surface must be thoroughly flushed with water.

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3.05 PLANING EXISTING ASPHALT PAVING

- A. Planing of existing asphalt paving shall be performed in accordance with Standard Specifications Section 5-04.3(14).
- B. Planings and other debris resulting from the planing operation shall be removed and disposed of by the Contractor or stockpiled with rotomilled asphalt to be processed and reused as aggregate base or on-site embankment fill per Section 31 00 00 – Earthwork.

3.06 PREPARING EXISTING SURFACES FOR HMA OVERLAY

- A. Existing asphalt surfaces to be overlaid shall be prepared in accordance with Standard Specifications Section 5-04.3(5)A. Before placing asphalt as an overlay, the surface shall be cleaned by sweeping to remove dust and foreign matter.
- B. A tack coat shall be applied to all planed asphalt paving surfaces on which an overlay course of HMA is to be placed or abutted, in accordance with Standard Specifications Section 5-04.3(5)A.

END OF SECTION 32 12 16

DIVISION 32 – EXTERIOR IMPROVEMENTS
SECTION 32 31 29 – WOOD FENCES

SECTION 32 31 29
WOOD FENCES

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. This work consists of installing a split-rail fence and concrete footings, as indicated on the Drawings.

1.02 RELATED SECTIONS

- A. The following sections contain requirements that relate to this section:
1. Section 03 30 00 – Cast-in-Place Concrete
 2. Section 32 93 10 – Tree and Shrub Protection

PART 2 – PRODUCTS

2.01 SPLIT-RAIL FENCE POSTS AND RAILS

- A. The split-rail fence shall have two-hole posts with 10-foot-long rails.
- B. Fence posts and rails shall consist of Western red cedar, grade No. 2, of good quality and approved by the Owner before use.
- C. Rails shall be split, not sawn.
- D. Peeler cores shall not be used for posts or rails.
- E. Wood shall not require preservative treatment.
- F. Posts should be square in cross section, have a minimum girth of 6 inches, and post tops shall be tapered.
- G. Standard-weight rails with a minimum diameter of 4 inches shall be used.
- H. Rails shall be tapered at the tips to fit into post slots as shown on the Drawings.

2.02 CONCRETE FOR POST FOOTING

- A. All concrete for split-rail fence footing shall be as specified in Section 03 30 00 – Cast-in-Place Concrete.

**DIVISION 32 – EXTERIOR IMPROVEMENTS
SECTION 32 31 29 – WOOD FENCES**

PART 3 – EXECUTION

3.01 PROTECTION WITHIN THE DRIPLINE

- A. Where existing trees are within the area of work, or where existing trees outside the area of work have driplines extending into the area of work, the Contractor shall employ all methods to minimize adverse impacts to these existing trees, including limbs and roots.

3.02 FENCE CONSTRUCTION

- A. Auger holes for post footings shall be advanced in firm, undisturbed, or compacted soil. Holes for new post footings shall be sized as shown on the Drawings.
- B. The Contractor shall over-excavate hole depths to 6 inches deeper than post bottoms. Over-excavated holes shall be filled with gravel in the bottom of the hole to provide a base to set posts on.
- C. The Contractor shall place concrete around posts in a continuous placement and tamp for consolidation, checking each post for vertical and top alignment. Posts shall be supported plumb until concrete has cured.
- D. Tops of post footings shall be flush with finished grade, troweled, and sloped outward to drain. Top of footing shall appear true and circular in shape with post at center of circle.
- E. Posts shall be 8 feet on center, maximum.
- F. Slots shall be cut out of posts and rails, with tapered tips meeting and rails installed in slots as shown on the Drawings.

END OF SECTION 32 31 29

**SECTION 32 84 00
IRRIGATION**

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. Description of Work: The Contractor shall install a temporary irrigation system to deliver water to Site planting areas. Work in this section must conform to the Owner's irrigation standards (listed in Part 2). The Work shall consist of preparation of an acceptable bidder-designed system. The Contractor shall provide and install all material necessary for a complete system, including pipe, valves, fittings, heads, connected to an existing water connection, and piping and all appurtenances related thereto. Included shall be all labor for trenching, plumbing, backfill, electrical adjustments, mechanical connections, and other labor necessary for installation of a satisfactorily operating system. Whether mentioned or not, the intent is that the Contractor furnish a complete and operable system covering the planting areas as indicated on the Drawings.

1.02 RELATED SECTIONS

- A. The following sections contain requirements that relate to this section:
1. Section 31 10 00 – Site Clearing
 2. Section 32 91 13 – Soil Preparation and Finish Grading
 3. Section 32 93 00 – Planting
 4. Section 32 93 10 – Tree and Shrub Protection

1.03 QUALITY ASSURANCE

- A. Materials: Whenever any material is specified by name/number, such specifications are for the purpose of facilitating a description of materials and establishing quality and shall be deemed and construed to be followed by the words "or approved equal." No substitutions that have not been submitted for prior approval to the Owner will be permitted. All materials shall be new, without flaws or defects, and shall be the best of their class and kind. Furnish sufficient descriptive literature and/or samples for any material submitted as "equal" substitutes. All materials shall be guaranteed for a period of 1 year against material defects and workmanship.
- B. Qualifications: The bidder-designed irrigation sprinkler system improvements must be designed by a person with at least 3 years' experience in commercial

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SECTION 32 84 00 – IRRIGATION

landscape irrigation design. In addition, the designer shall either be a Washington State registered landscape architect or a designer certified by either the American Society of Irrigation Consultants or the Irrigation Association. Irrigation sprinkler system installation shall be under the direction of a journeyman lawn sprinkler mechanic or experienced journeyman plumber. All electrical work must be done by a licensed electrical Contractor.

- C. Quality of Work: All materials and equipment shall be installed in a neat and professional manner. The Owner reserves the right to direct removal and replacement of any items that, in its opinion, do not present an orderly and neat or professional appearance. Such removal and replacement shall be done, when directed in writing, at the Contractor's expense without additional cost to the Owner.
- D. Codes and regulations: All local, municipal, and state laws, rules, and regulations governing or relating to any of this Work are hereby incorporated into and made part of these Technical Specifications, and their provisions shall be carried out by the Contractor. Anything contained in these Technical Specifications shall not be construed to conflict with above-mentioned rules, regulations, or requirements. Where conflict may occur, rules, regulations, or requirements of the governing code shall be adhered to. However, when these Technical Specifications and/or Drawings call for or describe materials, quality, or construction of a better quality, higher standard, or larger size, these Technical Specifications and/or Drawings shall take precedence over the requirements of said rules, regulations, and codes.
- E. Permits and inspections: Any permits for installation or construction of Work included under this Contract that are required by any legally constituted authorities having jurisdiction will be obtained and paid for by the Owner unless otherwise directed in this section. The Owner shall also arrange for and pay all costs in connection with any inspections and examinations required by these authorities. In all cases, where inspection of the irrigation system is required and/or where portions of the Work are specified to be performed under direction and/or inspection of the Owner, the Contractor shall notify the Owner 48 hours prior to the time when such inspection and/or direction is required. Re-excavation or alteration to the system due to the Contractor's failure to have the required inspection shall be performed at the Contractor's expense.
- F. System coverage: The system is to provide full coverage for all areas shown on the plans. It is anticipated that the Contractor will exercise professional judgment in location and placement of all irrigation components. Should the Contractor elect to make changes to the approved design without prior written approval of the Owner, the responsibility for full coverage in the area to be affected rests solely with the Contractor.

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- G. Condition at Site: Before proceeding with any work, the Contractor shall inspect the Site, check all grades, and verify all dimensions and conditions affecting the Work to ensure the work may proceed safely. If the Contractor should find existing field conditions at variance with the Documents and Specifications, the Contractor shall notify the Owner in writing prior to installation of the irrigation system. Extra work arising from failure to do so shall be at the Contractor's expense.

1.04 SUBSTITUTIONS

- A. Substitute equipment will be considered only when the performance by gallonage, pressure, flow rate, etc. is equal to the product originally specified.

1.05 DAMAGE TO PROPERTY

- A. Exact location of all existing utilities and structures, whether or not indicated on the Drawings, shall be determined by the Contractor. Any of the Owner's property, including existing buildings, equipment, piping, pipe covering, sewers, sidewalks, landscaping, etc., damaged by the Contractor during the Work shall be replaced or repaired by the Contractor in a manner satisfactory to the Owner at the Contractor's expense before final payment is made.

1.06 SUBMITTALS

- A. Submit complete materials list 30 days prior to performing work. Submit manufacturer catalog data and full descriptive literature (catalog cut sheets).
- B. Equipment or materials installed or furnished without prior approval of the Owner will be rejected, and such materials will be required to be removed and replaced with approved materials at the complete expense of the Contractor.
- C. Qualifications of the bidder-designed irrigation sprinkler system designer: The Contractor shall submit the resume of the irrigation designer 30 days after acceptance of the Contract. Only a designer that meets the minimum qualifications provided in Paragraph 1.03.B above shall be approved.
- D. Submit design in the form of shop drawings for review and approval 60 days after acceptance of Contract. Shop drawings shall be drafted to scale at 1 inch = 20 feet and submitted in PDF file format showing the following:
 - 1. Valve location, type, flow, and size
 - 2. Sprinkler head layout and type
 - 3. Pipe location and size (clearly indicate lateral versus mainline piping)
 - 4. Wire locations

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- 5. Sleeving plan showing size, location, and quantity
- E. The design shall be prepared by a qualified irrigation sprinkler system designer that has been preapproved.

PART 2 – PRODUCTS

2.01 GENERAL

- A. All materials and equipment shall be new and the best grade of its kind. All items of equipment or material shall be as indicated or specified by patent or proprietary name and/or names of manufacturer or accepted equals. Substitution will be allowed as specified in Section 01 45 00 – Quality Control.
- B. All materials and equipment shall be installed per manufacturers' specifications. Each type of material or model of equipment shall be of one manufacturer throughout.

2.02 IRRIGATION HEADS

- A. Rotors
 - 1. Hunter: All institutional, I-10, I-25, I-20, 1-inch inlet
- B. Spray heads and pop ups:
 - 1. Hunter Pro-spray: PRS40 with appropriate MP rotator nozzles
 - 2. Rainbird Pop-ups: Standard spray head nozzles, 1800 series
- C. Quick coupler:
 - 1. Rainbird 44LRC

2.03 SWING JOINTS

- A. Triple-swing joint construction only

2.04 AUTOMATIC CONTROL VALVES

- A. Rainbird plastic valve, including PEB OR PESB; choose the best valve that best matches existing automatic control valve system and controller.
- B. Valves shall be installed using unions with a manual isolation valve upstream.
- C. Wire splices
 - 1. 3 M DBY or DBR per application

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- D. Wire size
 - 1. 14-gauge heavy insulated wire to support commercial and public systems
 - 2. Route all valve wiring through conduit; allow for 40% extra space for future usage.
- E. Wire valves
 - 1. The common wire will be white; zones will be red and, at minimum, one extra wire.

2.05 OTHER ITEMS

- A. Valve boxes
 - 1. CARSON, 8- by 8-inch metal plate on lid, 2 to 4 inches below grade
- B. Manual drains
 - 1. CHAMPION #200 Drain Valve or BUCKNER 80-M

2.06 PIPING

- A. Mainline
 - 1. Schedule 40 pipe for PVC lines size 4 inches and smaller, install with letters facing up.
 - 2. When cutting tap into mainline, the Contractor is to flush each direction to ensure it is debris free.
- B. Laterals
 - 1. Class 200 pipe for PVC lines larger than 4 inches, install with letters facing up.
- C. Sleeving
 - 1. Schedule 40, twice the diameter of the insert
- D. Pipe beveling
 - 1. Bevel pipe ends on pipe 2 inches and larger

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- E. Glue
 - 1. For welded pipe mainlines and laterals 3 inches or less, 705 Weldon CLEAR or GRAY (no BLUE). Use proper glue according to manufacturer's instructions and use P-70 primer.
 - 2. For mainline larger than 3 inches, use gasket (O-ring) joining systems with joint restraints and appropriate thrust blocking.

PART 3 – EXECUTION

3.01 DESIGN

- A. General: The Contractor is responsible for designing the irrigation system in accordance with these Technical Specifications and highest standards of durability, distribution uniformity, efficiency of design, and ease of maintenance. Irrigate all areas indicated on the Drawings.
- B. Design parameters: The following shall be incorporated into the design:
 - 1. Irrigation sprinkler heads shall be spaced to provide full coverage in all irrigated areas.
 - 2. Minimum allowable PVC lateral line pipe size is 3/4 inch in diameter.
 - 3. Irrigation mainline minimum allowable schedule 40 PVC pipe size is 2 inches in diameter.
 - 4. Irrigation valve zones and head types shall be laid out according to similar types of planting requirements and overall exposure.
 - 5. Provide quick-coupler valves every 100 feet along mainline.
- C. Install all materials and equipment in strict accordance with manufacturer's written instructions and recommendations, local and state codes, laws, ordinances, and regulations.
- D. Turn-off and turn-on: The following requirements are applicable to seasons during the construction Contract time frame until substantial completion. The Contractor shall turn off and winterize the entire system to prevent freezing damage at the end of the watering season during the first year. The system will be turned on by the Contractor in the spring, and the Contractor will check the system to ensure proper operation for the coming season in the first year.

3.02 EXCAVATION AND BACKFILLING

- A. General: Excavate straight and true, with bottom uniformly sloped to low points.

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- B. Trench depth: Excavate straight trenches to a depth of 3 inches below invert of pipe, unless otherwise indicated. Unless otherwise specified, trenches shall be deep enough to allow 12 inches of cover over lateral lines and 18 inches of cover over supply mainlines. Maximum cover depth: 24 inches. All trenches must be straight and not have abrupt changes in grade. Trench bottoms with uniform slope, free of rocks or sharp edged objects.
- C. Route irrigation lines around roots of existing trees. Care shall be exercised by the Contractor when excavating trenches near existing trees. Trenches having exposed tree roots shall be backfilled within 24 hours unless adequately protected by moist burlap or canvas directed by the Owner. Pipe shall lay side by side in trench. No stacking of pipe is permitted.
- D. Backfill: Backfilling shall be done when the pipe is not in an expanded condition due to heat or pressure. Cooling of the pipe can be accomplished by operating the system for a short time before backfilling or by backfilling in the early part of the morning before the heat of the day. Backfill shall contain no lumps or rocks larger than 1 inch.
- E. Compaction: Use hand-operated plate-type vibratory or other suitable hand tampers in areas not suitable for larger rollers or compactors. Compact initial backfill material surrounding pipes and conduit to 90% maximum density. For pipes, conduits, and sleeves under roads and slabs, compact backfill as specified herein for other utilities under roads and slabs.

3.03 INSTALLATION

- A. General: The Contractor shall exercise care in handling, loading and unloading, and storing of irrigation equipment and materials to avoid damage. The pipe and fittings shall be stored under cover and shall be transported in a vehicle with a bed long enough to allow the length of pipe to lay flat.
- B. Pipe: Install in a manner so as to provide for expansion and contraction as recommended by the manufacturer. Cut plastic pipe to ensure a square cut. Remove burrs at cut ends prior to installation. Solvent-weld or slip seal all plastic joints. Only approved solvent shall be used. Install all plastic pipe and fittings as shown and instructed by the pipe manufacturer. The Contractor shall assume full responsibility for correct installation. All mainline pipe is to be Schedule 40 PVC; all lateral piping is to be class 200 PVC. No PVC pipe shall be threaded.
- C. Joints: All plastic-to-metal joints shall be made with plastic Schedule 80 male adapters. The male adapter shall be hand tightened, plus one turn with a strap wrench. Care should be taken at solvent joints not to use an excess amount of solvent. Allow PVC joints to set at least 24 hours before pressure is applied to system. Use primer at joints.

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- D. Backfilling shall be done when the pipe is not in an expanded condition due to heat or pressure. Cooling of the pipe can be accomplished by operating the system for a short time before backfilling or by backfilling in the early part of the morning before the heat of the day.
- E. Great care must be taken to ensure the inside of the pipe is absolutely clean. Any pipe ends not being worked must be protected and not left open.

3.04 CONTROL WIRE

- A. Control wires are to be taped to the bottom of the supply line at 10-foot intervals with at least three wraps of electrical tape. Place in pipe sleeves or conduit under all paving.
- B. Splices will be permitted only at the valves and never between valves or the valve controller. There must be a separate lead or “hot” wire to each automatic valve. One common wire will be acceptable. All splices shall be contained in valve boxes, with one unconnected spare control wire to run to the remote valves of the system for future repairs.
- C. Three unconnected spare control wires are to be run from the controller through each intermediate control valve box in both directions.

3.05 AUTOMATIC CONTROL VALVES

- A. Submit shop drawings for approval. The control valve assembly shall include gate valve, control valve, disc filter, and pressure regulator. Provide 6-inch drain rock in each vault. Stake all proposed control valve locations for approval.

3.06 OTHER IRRIGATION EQUIPMENT

- A. General: Install all irrigation equipment materials per manufacturer’s recommendations and Owner-approved irrigation design shop drawings.

3.07 TESTING

- A. Flushing: After all new irrigation piping and risers are in place and connected, all necessary division work has been completed, and prior to installation of irrigation heads, all control valves shall be opened sequentially and a full head of water used to flush out the system completely.
- B. Pretest prior to request for system testing. Request no tests until confident work will pass. Notify Owner 48 hours prior to test.
- C. Pressure test: After flushing is complete, pressure test mainline with all control valve assemblies installed (control valve isolation valve open, flow control in

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operating position), to 100 pounds per square inch. The system will pass test when it maintains less than a 2% drop in a 15-minute time period.

3.08 FINAL INSPECTION

- A. Coverage: Before the sprinkler system will be accepted, the Contractor, in the presence of the Owner, shall perform a water coverage test to determine if the water coverage and operation of the system is adequate for planting. If the system is determined inadequate due to the Contractor's poor design, work quality, or materials, it shall be repaired or replaced at the Contractor's expense and the test repeated until accepted. Dry spots or areas without sufficient overlap will not be acceptable.

3.09 CLEANUP

- A. Keep premises reasonably free from accumulation of debris. On completion of each division of work, remove all debris, equipment, and surplus materials, and leave the Site in a neat and orderly fashion.

3.10 RECORD DRAWINGS

- A. The Contractor shall record all changes that may be made during installation of the system. Immediately upon installation of any piping, valves, wiring, sprinkler heads, etc., in locations other than shown on the shop drawings or of sizes other than indicated, the Contractor shall clearly indicate such changes on a clean set of Drawings. Mainlines and remote control electric valves must be positively located by dimension from fixed reference points. Note mainline sizes clearly and accurately for maintenance reference. Submit three prints and one reproducible (Mylar) of Record Drawings.
- B. After final acceptance of the completed installation, the Contractor shall be responsible for having complete Drawings prepared showing all such changes, and these shall be submitted to the Owner for recording purposes per Section 01 70 00 – Execution and Closeout Requirements.

3.11 SYSTEM FAMILIARIZATION

- A. Upon acceptance of the system by the Owner, the Contractor shall provide the necessary keys and/or other tools necessary to operate/drain/activate the system and shall spend sufficient time with the Owner to ensure the system operation/maintenance/winterizing can continue after the departure of the Contractor.

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SECTION 32 84 00 – IRRIGATION

3.12 GUARANTEE

- A. The system shall be guaranteed for all labor and materials for a period of 1 year from the date of written acceptance of the system. During the guarantee period, the Contractor shall check, clean, and adjust the sprinkler heads and otherwise ensure adequate operation of the system as directed by the Owner and, in any event, on no less than two separate occasions a minimum of 4 months apart during the 1-year period.

3.13 SYSTEM PROTECTION

- A. In the event the system is completed in a season when the system will not be in use, the Contractor will winterize the system upon completion of testing (and approval of the Owner) and reactivate the system in the spring. The Contractor shall, upon completion of the winterizing phase, submit a letter to the Owner certifying that the system was winterized and drained and indicating the date such action was accomplished. The Contractor will be liable for any damages resulting from failure to comply.

END OF SECTION 32 84 00

DIVISION 32 – EXTERIOR IMPROVEMENTS
SECTION 32 91 13 – SOIL PREPARATION AND FINISH GRADING

SECTION 32 91 13
SOIL PREPARATION AND FINISH GRADING

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. The work includes furnishing and installing jute fabric, straw wattle, Sonotubes, and planting topsoil for planted areas.

1.02 QUALITY ASSURANCE

- A. All products supplied shall comply with applicable state and local codes.

1.03 RELATED SECTIONS

- A. Section 01 57 13 – Temporary Erosion and Sediment Control
- B. Section 31 00 00 – Earthwork
- C. Section 31 10 00 – Site Clearing
- D. Section 32 84 00 – Irrigation
- E. Section 32 93 00 – Planting

1.04 SUBMITTALS

- A. Submit the following samples to the Owner for approval:
 - 1. Topsoil (5-pound bag) with manufacturer's data sheet and soil analysis test
- B. Submit the following material certification/data sheets:
 - 1. Straw wattle
 - 2. Jute fabric
 - 3. Sonotubes

1.05 PROJECT CONDITIONS

- A. Keep streets, sidewalks, and the Site clean and free from debris and affected drains open and freely flowing at all times. Protect drains with filter fabric covers

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SECTION 32 91 13 – SOIL PREPARATION AND FINISH GRADING

during construction. Appropriate erosion control measures shall be employed in accordance with Section 01 57 13 – Temporary Erosion and Sediment Control.

PART 2 – PRODUCTS

2.01 TOPSOIL

- A. Topsoil mix shall consist of 60% sand and 40% composted organic soil amendment by volume.
- B. Sand
 - 1. The sand component shall meet the following specifications within reasonable variations and shall be free of phytotoxic materials and viable seeds, rhizomes, or roots of state-listed noxious weeds:

Screen Size	Percent Passing
1/4 to 3/8 inch	100%
#46	99%
#10	65%
#20 to #18	35%
#40 #20 + #35	<30%
#40 + #60	<15%
#100	2%–10%
#200	1%–5%

- 2. Compost shall meet the specifications within Article 2.01 and the Standard Specifications.
- C. Topsoil shall also have the following characteristics:
 - 1. Mix shall contain 10% to 20% organic matter by weight (loss on ignition).
 - 2. The pH range shall be from 6.0 to 7.5.
 - 3. Soluble salt contents shall be less than 3.0 mmhos/cm.
- D. Topsoil shall contain sufficient quantities of available nitrogen, phosphorus, potassium, calcium, magnesium, sulfate, copper, zinc, manganese, iron, and boron to support normal plant growth. In the event of nutrient inadequacies, provisions shall be made to add required materials prior to planting.
- E. Acceptable sources follow:
 - 1. Dirt Works, Kettle Falls, Washington
 - 2. Access Development and Excavating, Colville, Washington

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3. Broadway Landscape Supply, Spokane Valley, Washington
4. Circle M Landscape, Spokane, Washington
5. Other approved equal: For other available sources, refer to the current edition of the *Directory of Recycled Content Building and Construction Products*, published by the Clean Washington Center, Department of Trade and Economic Development, 2001 Sixth Avenue, Suite 2700, Seattle, Washington 98121; phone: (206) 464-7040.

2.02 STRAW WATTLE

- A. Straw wattle shall be manufactured from 100% new, undyed, weed-free straw fibers. Straw wattle shall be a minimum of 9 inches in diameter (+/-1 inch), 25 feet long (+/-0.5 foot), and weigh approximately 2.2 pounds per foot (+/-10%).

2.03 JUTE FABRIC

- A. Jute matting shall be of a uniform, open, plain weave of unbleached, single just yarn. The yarn shall be of a loosely twisted construction and shall not vary in thickness by more than half of its normal diameter. Jute matting shall be furnished in rolled strips approximately 50 yards in length. Matting width shall be 48 inches, with an average weight of 0.92 pounds per square yard. A tolerance of +/-1 inch in width and 5% in weight will be allowed.

2.04 WOODEN STAKES FOR STRAW WATTLE AND JUTE FABRIC

- A. Stakes shall be 2- x 2-inch Douglas fir with one tapered end, 2 feet in length. No split or badly splintered stakes will be accepted.

2.05 SONOTUBES

- A. Sonotubes shall be Sonotube concrete forms with Rainguard or approved equal. One acceptable source would be Sonoco at phone: (843) 383-7272.

2.06 LANDSCAPING FENCE POSTS

- A. Landscaping fence posts shall be 6 feet in length, with a “studded T” cross section and have riveted stabilization plates. Fence posts shall conform to ASTM International 702 and be painted with green enamel paint, except at the top, where a light color paint will be substituted.

DIVISION 32 – EXTERIOR IMPROVEMENTS
SECTION 32 91 13 – SOIL PREPARATION AND FINISH GRADING

PART 3 – EXECUTION

3.01 PREPARATION OF SUBGRADE

- A. Obtain Owner approval of subgrade prior to work in this section. Rip, disc, or scarify subgrade soils to a minimum depth of 12 inches, except within driplines of existing trees to remain. Subgrade elevations shall be set to accommodate the depth of the soil amendment or topsoil as specified on the Drawings. A tolerance of 0.10 foot is allowed.

3.02 PLACING TOPSOIL

- A. Topsoil at planting areas
 - 1. Scarification: Scarify or till subgrade to a minimum depth of 12 inches. The entire surface should be disturbed by scarification. Do not scarify within dripline of existing trees to be retained.
 - 2. Planting areas to receive topsoil
 - a) Place 12 inches of imported topsoil over scarified subgrade as shown on the Drawings and perform fine grading. Rake beds to smooth and remove surface rocks larger than 2 inches in diameter.
 - b) Refer to Section 32 93 00 – Planting for installing mulch at planting beds.

3.03 FINE GRADING

- A. Perform fine grading to attain finish grades as shown on the Drawings.
- B. Rake out all rocks, roots, sticks, and other debris larger than 1 inch in diameter or sticks longer than 3 inches. Leave surface even and readily able to accommodate planting installation. For compaction, refer to Section 31 00 00 – Earthwork.

3.04 STRAW WATTLE INSTALLATION

- A. Install straw wattle and secure with rebar stakes as shown on the Drawings after installation of jute fabric.

3.05 JUTE FABRIC INSTALLATION

- A. Immediately following the establishment of the finished grade, jute fabric shall be unrolled parallel to the flow of water. Where more than one strip of jute fabric is required to cover the given area, it shall overlap the adjacent mat by a minimum of 4 inches. The upslope end of each strip of jute fabric shall be

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SECTION 32 91 13 – SOIL PREPARATION AND FINISH GRADING

staked and buried in a 6-inch-deep trench, with the soil firmly tamped against the mat. Three stakes per width of fabric (one stake at each overlap) shall be driven below the finish groundline prior to backfilling of the trench. The Owner may require that any other edge exposed to more than normal flow of water or strong prevailing winds be staked and buried in a similar manner.

- B. The edges of jute fabric shall be buried around the edges of catch basins and other structures. Jute fabric must be spread evenly and smoothly and be in contact with the soil at all points.
- C. Jute fabric shall be held in place by approved wooden stakes driven vertically into the soil. The fabric shall be fastened at intervals not more than 3 feet apart in three rows for each strip of the matting and blanket, with one row along each edge and one row alternately spaced in the middle. All ends of the fabric and check slots shall be fastened at 24-inch intervals across their width. The length of fastening devices shall be sufficient to securely anchor the fabric against the soil, and the fastening devices shall be driven flush with the finished grade.

3.06 SONOTUBE INSTALLATION

- A. The Contractor shall use extreme caution in placing cap material around the landscaping Sonotubes such that the tubes are not damaged or displaced during that work. In the event the tubes are damaged due to the Contractor's activities, they shall be replaced at the Contractor's expense.
- B. Install Sonotubes plumb at least 6-inches below the surface and directly over imported topsoil prior to the placement of cap material. Support Sonotubes with landscaping fence posts as needed to prevent movement during placement of cap material.

3.07 INSPECTION

- A. The Contractor shall notify the Owner least 48 hours in advance of the time of inspection required for completion of soil preparation before the planting of trees, shrubs, and groundcover can occur.

END OF SECTION 32 91 13

SECTION 32 93 00
PLANTING

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. Provide and plant trees, shrubs, and ground covers as shown and specified. The work includes the following:
 - 1. Plants and planting
 - 2. Mulch and fertilizer
 - 3. Maintenance until acceptance

1.02 QUALITY ASSURANCE

- A. Comply with sizing and grading standards of the latest edition of the *American Standard for Nursery Stock*.
- B. Nomenclature shall conform to *Hortus Third: A Concise Dictionary of Plants Cultivated in the United States and Canada* compiled by the L.H. Bailey Arboretum, Cornell University, 1976.
- C. All plants shall be nursery grown or collected materials that have been held in a nursery for at least 1 year. Nursery climatic conditions must be similar to those in the locality of the project. All plants shall be weed free at the time of planting.
- D. Stock furnished shall be at least the minimum size indicated. Larger stock is acceptable at no additional cost, and providing that the larger plants will not be cut back to size indicated. Provide plants indicated by two measurements so that only a maximum of 25% are of the minimum size indicated, and 75% are of the maximum size indicated.

1.03 RELATED SECTIONS

- A. Related sections include the following:
 - 1. Section 31 10 00 – Site Clearing
 - 2. Section 32 91 13 – Soil Preparation and Finish Grading

1.04 SUBMITTALS

- A. Plant nursery sources and photographs

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1. The Contractor shall submit a list of nurseries supplying all plant species shown on the Drawings. Submit representative color and dated photographs of each plant species.
- B. Submit the following material samples
 1. Mulch submittal: The Contractor shall notify the Owner of the source of supply and provide a 1 gallon sample for approval before installation.
- C. Submit the following material certification/data sheets
 1. Planting fertilizer
 2. Plant material sources, including names and photographs of representative plant species

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver fertilizer materials in original, unopened, and undamaged containers showing weight, analysis, and name of manufacturer. Store in such a manner as to prevent wetting and deterioration of the fertilizer.
- B. Dig, pack, transport, and handle plants with care to ensure protection against injury. Inspection certificates required by law shall accompany each shipment invoice or order to stock. On arrival, the certificate shall be filed with the Owner. Protect all plants from desiccation. Wilt-Pruf or another antidessicant shall be applied only with approval of the Owner. If plants cannot be planted immediately upon delivery, properly protect them with soil, wet peat moss, or in a manner acceptable to the Owner. Water heeled-in plantings daily. No plant shall be bound with rope or wire in a manner that could damage or break the branches.
- C. Cover plants transported on open vehicles with a protective covering to prevent windburn.
- D. Provide dry, loose soils for planting. Frozen or muddy soil is not acceptable.
- E. Stock shall be handled by root balls only, not by the trunks, stems, or tops.

1.06 PROJECT CONDITIONS

- A. Work notification: Notify the Owner at least 5 working days prior to the installation of plant material.
- B. Protect existing utilities, paving, and other facilities from damage caused by planting operations.

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- C. Do not install plant material when ambient temperatures may be below 35°F or above 80°F.
- D. Do not install plants when wind velocity exceeds 30 miles per hour (mph).
- E. Confine work to designated areas. Do not disturb existing vegetation outside project limits, and protect all trees, shrubs, and ground covers within project limits not designated to be removed. Do not permit vehicular traffic or materials storage under or around new or existing trees.

1.07 SEQUENCING AND SCHEDULING

- A. Planting vegetation shall be performed between October 1 and April 30. Planting at other times shall only be done by written permission by the Owner and only if an irrigation system is available at the Site at the time of planting.

1.08 WARRANTY

- A. Warrant plant material to remain alive and be in healthy, vigorous condition for a period of 1 year after the date of Physical Completion. Inspection of plants will be made by the Owner at the completion of planting.
- B. Replace, in accordance with the Drawings and Technical Specifications, all plants that are dead or, as determined by the Owner, in an unhealthy or unsightly condition and have lost their natural shape due to dead branches or other causes due to the Contractor's negligence. The cost of such replacement(s) is at the Contractor's expense. Warrant all replacement plants for 1 year after Physical Completion or installation, whichever is longer..
- C. Warranty shall not include damage or loss of trees, plants, or ground covers caused by fires, floods, freezing rains, lightning storms, or winds over 75 mph, winter kill caused by extreme cold and severe winter conditions not typical of the planting area, acts of vandalism, or negligence on the part of the Owner.
- D. Remove and immediately replace all plants, as determined by the Owner, to be unsatisfactory during the initial planting installation.
- E. This warranty also applies to existing trees, shrubs, and ground covers to be removed and heeled-in for later replanting on site.

PART 2 – PRODUCTS

2.01 PLANT MATERIALS

- A. Plants: Provide plants typical of their species or variety, with normal, densely developed branches and vigorous, fibrous root systems. Provide only sound,

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healthy, vigorous plants free from weeds, defects, disfiguring knots, sunscald injuries, and abrasions of the bark, plant diseases, insect eggs, borers, and all forms of infestation. All plants shall have a fully developed form without voids, open spaces, broken branches, flush cuts, or stubs.

1. Dig balled and burlapped plants with firm, natural balls of earth of sufficient diameter and depth to encompass the fibrous and absorbing root system necessary for full recovery of the plant. Provide ball sizes complying with the latest edition of the *American Standard for Nursery Stock*. Cracked or mushroomed balls are not acceptable.
2. Bare-root plants: Dug with adequate fibrous roots, covered with a uniformly thick coating of mud by being puddled immediately after they are dug, or packed in moist straw, sawdust or peat moss.
3. Container-grown stock (including plugs): Grown in a container for a sufficient time for the root system to have developed to hold its soil together, firm and whole.
 - a) No plants shall be loose in the container.
 - b) Container stock shall not be pot bound.
 - c) No pruning wounds shall be present with a diameter of more than 1/2 inch, and such wounds must show vigorous callousing on all edges. Trees shall not be pruned within 6 months prior to delivery.
 - d) Deciduous trees that have solitary leaders shall have only the lateral branches thinned by pruning. All conifer trees shall have only one leader (growing apex) and one terminal bud and shall not be sheared or shaped. Trees having a damaged or missing leader, multiple leaders, or Y-crotches will be rejected.

B. Cuttings

1. Cuttings are live plant material without a previously developed root system. Source plants for cuttings shall be dormant when cuttings are taken, and all cuts shall be made with a sharp instrument.
2. Cuttings may be collected. If cuttings are collected, the requirement to be nursery grown or held in nursery conditions does not apply. Written permission shall be obtained from property owners and provided to the Owner before cuttings are collected. The Contractor shall collect cuttings in accordance with applicable sensitive area ordinances. Cuttings shall meet the following requirements:

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- a) Source plants for cuttings shall be dormant when cuttings are taken, and all cuts shall be made with a sharp instrument.
- b) Live branch cuttings shall have flexible top growth with terminal buds and may have side branches. The rooting end shall be cut at an approximate 45° angle.
- c) Live stake cuttings shall have a straight top cut immediately above a bud. The lower, rooting end shall be cut at an approximate 45-degree angle. Live stakes are cut from 1- to 2-year-old wood. Live stake cuttings shall be cut and installed with the bark intact, with no branches or stems attached, and be 1/2 to 1-1/2-inches in diameter.
- d) Live pole cuttings shall have a minimum 2-inch diameter and no more than three branches, which shall be pruned back to the first bud from the main stem.

2.02 FERTILIZERS

- A. Fertilizer shall conform to reference FS O-F-24D, Commercial Fertilizers and Washington State Department of Agriculture laws. Fertilizer for all tree plantings shall be “BioPaks-16-6-8 plus minors and biostimulants” available from Reforestation Technologies International at phone: (800) 784-4769, or approved equivalent.
- B. BioPak, or approved equivalent, shall consist of a 10-gram biodegradable planting packet containing a blend of 16.00% total nitrogen (N), 6.00% available phosphoric acid (P₂O₅), and 8.00% soluble potash (K₂O). It shall also contain 6.92% combined sulfur (S), 0.52% zinc (Zn), 0.54% iron (Fe), 0.54% magnesium (Mg), 0.23% copper (Cu), 0.05% Boron (B), and 0.56% manganese (Mn). The N, phosphorous, and potassium sources shall be coated with a polyurethane coating to provide 15.69% coated slow-release nitrogen, 5.09% coated slow-release available phosphate, and 6.80% available soluble potash. It shall also contain 5.0% humic acid derived from rutile sands, 0.25% kelp extract, and 0.9% naphthalene acetic acid.
- C. The soil conditioner shall consist of Mycor Tree Saver mycorrhizal fungal transplant inoculant for trees and shrubs or an approved equal consisting of the following:
 - 1. Ectomycorrhizal fungi: 95 million spores per pound
 - 2. Vesicular arbuscular mycorrhizal fungi: 5,300 spores per pound
 - 3. Rhizosphere bacillus: 324 million colony-forming units per pound

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4. Potassium polyacrylamide: 33%
5. Formononetin: 0.007%
6. Microbial Nutrients: 39.4%
7. Inert Ingredients: 27.3%

2.03 MULCH

- A. Mulch shall consist of composted organic soil amendment and conform to Section 32 91 13 – Soil Preparation and Finish Grading, Article 2.01.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Finish grading shall be inspected and approved by the Owner prior to planting.
- B. Plant material shall be inspected and approved by the Consultant and Owner at the nursery or Site prior to installation. Remove unsatisfactory material from the Site immediately.

3.02 PREPARATION AND SEQUENCING

- A. The Contractor shall locate plants by staking with stakes and flags as indicated on the Drawings or as approved in the field. If obstructions not shown on the Drawings are encountered, do not proceed until the Owner has selected alternate plant locations.
- B. Plant materials shall be installed after topsoil and irrigation have been installed and approved by the Owner.

3.03 PLANT INSTALLATION

- A. Plants brought to the planting site shall be bare root, balled, and burlapped or in containers, depending on how specified in the planting schedule in the Contract for the particular type of planting material. Plants shall not be planted during freezing weather or when the ground is frozen. Plants shall not be planted during excessively wet conditions. Plants shall not be placed on any day in which temperatures are forecast to exceed 80°F, unless the Owner approves otherwise. Plants shall not be placed in areas below finished grade.
- B. Plants shall be removed from containers in a manner that prevents damage to the root system. Containers may require vertical cuts down the full depth of the container to accommodate removal. All circling roots shall be loosened to ensure natural directional growth after planting.

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- C. Excavate circular plant pits with scarified vertical sides, except for plants specifically indicated to be planted in beds. Provide planting pits at least twice the diameter of the root system or container. Pit depth shall accommodate the entire root system. Scarify the bottom and sides of the pit to a depth of 4 inches. If groundwater is encountered upon excavation of planting holes, the Contractor shall promptly notify the Owner.
- D. Place specified planting soil for use around the balls and roots of the plants.
- E. Install fertilizer packets around plant root balls based on plant size and manufacturer recommendations.
- F. Set plant material in the planting pit to proper grade and alignment. Set plants upright, plumb, and faced to give the best appearance or relationship to each other or adjacent structure. Set crown of plant material at the finish grade. No filling will be permitted around trunks or stems or above grafts on grafted trees. Backfill the planting pit with specified soil or amendment. Do not use frozen or muddy mixtures for backfilling. Form a ring of soil around the edge of each planting pit to retain water.
- G. After balled and burlapped plants are set, water in soil mixture around bases of balls and fill all voids.
 - 1. Remove all burlap or plastic wrapping materials, twine, wires, and wire baskets from root balls.
 - 2. If burlap has been chemically treated (green color), remove from the planting pit.
- H. Stake trees as indicated on the Drawings.
- I. Space ground cover plants using triangular spacing in accordance with indicated dimensions. Adjust spacing as necessary to evenly fill planting bed with indicated quantity of plants. Plant to within 18 inches of the trunks of trees and shrubs within planting bed and to within 12 inches of bed edge.
- J. Spread and arrange roots of bare-rooted plants in their natural position. Work in specified planting soil. Do not mat roots together. Cut all broken and frayed roots before backfilling with remaining specified planting soil.
- K. Mulching
 - 1. Mulch tree and shrub planting pits and shrub beds with required mulching material immediately after planting. Thoroughly water mulched areas. After watering, rake mulch to provide a uniform finished surface.
 - 2. Mulch ground cover beds immediately after planting.

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- L. Pruning: Prune all trees only to remove broken or damaged branches or for aesthetic purposes as directed by the Owner. Branches will be pruned at the branch collar. Neither stubs nor flush cuts will be acceptable.

3.04 MAINTENANCE

- A. Maintain planting until acceptance by the Owner.
- B. Maintenance shall include cultivating, weeding, watering, pruning (only as directed), and application of appropriate insecticides and fungicides necessary to maintain plants free of insects and disease.
 - 1. Reset settled plants to proper grade and position. Restore planting saucer and adjacent material and remove dead material.
 - 2. Straighten, repair, and adjust guywires and stakes as required.
 - 3. Correct defective work as soon as possible after deficiencies become apparent and weather and season permit.
 - 4. Water trees, shrub, perennial and ground cover beds within the first 24 hours of initial planting and not less than twice per week (including rain) until Physical Completion.

3.05 PHYSICAL COMPLETION

- A. Inspection to determine Physical Completion of planted areas will be made by the Owner, upon Contractor's request. Provide notification at least 10 working days before the requested inspection date.
 - 1. Planted areas will be accepted, provided all requirements, including the maintenance period, have been complied with and plant materials are alive and in a healthy, vigorous condition.
- B. Upon Physical Completion, the Owner will assume plant maintenance.

3.06 CLEANING

- A. Perform cleaning during installation and upon completion of the work. Remove from the Site all excess materials, soil, debris, and equipment. Repair damage resulting from planting operations.

END OF SECTION 32 93 00

**DIVISION 32 – EXTERIOR IMPROVEMENTS
SECTION 32 93 10 – TREE AND SHRUB PROTECTION**

**SECTION 32 93 10
TREE AND SHRUB PROTECTION**

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. This section includes administrative and procedural requirements for the protection of trees, shrubs, and plant material not designated for removal. Such trees, shrubs, and plant materials shall be left in place and protected from damage or injury by the Contractor during construction using full and adequate methods of protection.

1.02 RELATED SECTIONS

- A. The following sections contain requirements that relate to this section:
1. Section 31 10 00 – Site Clearing
 2. Other Division 32 specification sections that apply to the protection of trees, shrubs, and plant materials

PART 2 – PRODUCTS

2.01 TEMPORARY TREE PROTECTION FENCING

- A. Temporary tree protection fencing shall be high-visibility construction fencing as indicated on the Drawings and shall include the following:
1. High visibility plastic fence in high visibility orange composed of a high-density polyethylene material, posts, ties, wire or rope, at least 4 feet in height.
 2. Posts shall be steel or wood placed every 6 feet on center (maximum) or as needed to ensure rigidity.
 3. Fence tensile strength shall be 360 lbs./ft. using the ASTM D4595 testing method and fastened to the post every 6 inches with a polyethylene tie.
 4. Long continuous lengths of fencing shall use a tension wire or rope as a top stringer to prevent sagging between posts.

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SECTION 32 93 10 – TREE AND SHRUB PROTECTION

PART 3 – EXECUTION

3.01 PROTECTION WITHIN THE DRIPLINE

- A. Where existing trees are within the area of work or where existing trees outside the area of work have driplines extending into the area of work, the Contractor shall employ all methods to minimize adverse impact to these existing trees, including their limbs and roots. The Contractor shall notify the Owner of any construction work within the dripline of trees at least 1 working day before the scheduled activity. These methods may include but not be limited to the following:
1. Temporary high-visibility construction fencing
 2. Temporary tie-up of low limbs
 3. Application of a 4- to 6-inch-thick layer of mulch (or woodchips salvaged from clearing and grubbing operations) within the dripline of trees
 4. Timber or steel planking for protection of surface roots from equipment
 5. Tree root pruning or other tree root treatment as directed by the Owner and/or Urban Forester
- B. No storage of equipment or materials shall be allowed within the dripline of trees not designated for removal. Steel planking or timber planking made of 4-inch-thick material, with each plank covering a minimum of 8 square feet, shall be used to support backhoe and other equipment stabilizers when set within the dripline of a tree or sodded planting strip.
- C. Where sidewalk, curb, and pavement removal and placement operations that impact tree roots 2 inches or greater in diameter occur, the Owner will determine how these tree roots are to be handled.

3.02 ABOVE-GRADE WORK

- A. Tree removal or tree trimming within 10 feet of any overhead utility line requires the Contractor to notify the Owner.
- B. When the Contractor anticipates construction operations that will unavoidably affect tree limbs, the Contractor shall notify the Owner at least 5 working days in advance of commencing such operations.
1. Before trimming any trees, the Contractor shall notify the Owner of the proposed method and amount of trimming required.

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SECTION 32 93 10 – TREE AND SHRUB PROTECTION

2. Trimming shall be done by a professional tree service company, the past and current performance of which is in accordance with National Arborist Association tree-pruning standards.

END OF SECTION 32 93 10

Appendix F

Cost Estimate Details

This appendix is provided separately.

Appendix G

Construction Quality Assurance Plan



August 2023
Northport Waterfront Sediment Cleanup



100% Construction Quality Assurance Plan

Prepared for Toxics Cleanup Program, Washington State Department of Ecology

August 2023
Northport Waterfront Sediment Cleanup

Construction Quality Assurance Plan Outline

Prepared for
Toxics Cleanup Program
Washington State Department of Ecology
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Spokane, Washington 99205

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ABBREVIATIONS

CAP	Cleanup Action Plan
CQA	construction quality assurance
CQAO	Construction Quality Assurance Officer
CQAP	Construction Quality Assurance Plan
CQC	Contractor Quality Control
CWP	construction work plan
Ecology	Washington State Department of Ecology
EDR	<i>Engineering Design Report</i>
EPP	Environmental Protection Plan
HASP	Health and Safety Plan
MA	management area
QA	quality assurance
QC	quality control
RFI	request for information
Site	Northport Waterfront
TBD	to be determined

1 Introduction

1.1 Purpose

This Construction Quality Assurance Plan (CQAP) describes quality assurance (QA) protocols and methods that will be used to ensure remedial actions at the Northport Waterfront (Site) are implemented in accordance with the cleanup design and associated permitting requirements. This CQAP builds on the accompanying *Engineering Design Report* (EDR), which describes the approach and criteria for the engineering design of cleanup actions at the Site as set forth in the Cleanup Action Plan (CAP; Ecology 2022). The cleanup design is being led by the Washington State Department of Ecology (Ecology) under contract No. C2100057. The cleanup site ID is 14874.

1.2 Site Location and Background

The Site is located along the south bank of the Upper Columbia River in Northport, Washington. The Site is part of a larger Model Toxics Control Act cleanup that includes the former Le Roi Smelter, a rail corridor, and a current on-site smelter waste and yard soils repository. The Site consists of riverbank and nearshore sediment and upland soil along the Columbia River and borders, in part, the Northport town park used for fishing, camping, boating, and passive recreation activities.

1.3 Construction Activities Addressed by the CQAP

The key construction activities to be addressed by the CQAP follow:

- Excavation and stockpile management
- Waste characterization, off-site transport, and disposal
- Import of aggregates for caps, backfill, and armor rock
- Sorting and blending excavated material for beneficial reuse
- Cap material, backfill material, and armor rock placement
- Public access amenities construction

1.4 Organization

The remainder of this document is organized into the following sections:

- Section 2: Project Organization and Responsibilities
- Section 3: Construction Management Activities
- Section 4: Quality Assurance Program
- Section 5: Documentation
- Section 6: References

2 Project Organization and Responsibilities

The roles and responsibilities of the parties involved in the cleanup action activities are described in this section.

2.1 Roles and Responsibilities

2.1.1 *Owner*

Although Ecology does not own the property, for purposes of the CQAP, Ecology is identified as the Owner responsible for implementing the cleanup action in accordance with the CAP. The Owner, or its designated representative, will implement the CQAP and review Contractor work products. Monitoring activities will also be the responsibility of the Owner. Certain aspects of monitoring may be performed by the Contractor but overseen by the Owner to observe that the Contractor's construction and monitoring work is completed as stipulated by project permits, approvals, and contract documents.

Ecology is also the regulatory authority responsible for authorizing the cleanup action activities described in the EDR. Ecology will work cooperatively with other government agencies as necessary.

2.1.2 *Engineer of Record*

The Engineer of Record is responsible for the following two main tasks:

1. Preparing the design of the remedial action such that successful implementation of the design will result in achieving the construction activity specific objectives and requirements.
2. Providing consultation and observations during construction to assist with implementation of the remedial action in conformance with the approved design documents.

During implementation of the remedial action, noncompliant construction activities will be referred to the Engineer of Record. The Engineer of Record is responsible for determining whether the noncompliant construction is unacceptable or acceptable with a design modification. The Owner will have final authority to approve design modifications proposed by the Engineer of Record.

2.1.3 *Construction Quality Assurance Officer*

The Construction Quality Assurance Officer (CQAO; referred to as "Ecology's Representative" in the Specifications) will be responsible for overseeing the implementation of the CQAP and will serve as Ecology's designated representative during construction.

In overseeing implementation of the CQAP, the CQAO is responsible for monitoring construction performance for compliance with construction performance standards and design requirements during implementation of the cleanup action and is responsible for overseeing the required

inspection and verification activities. The CQAO will review documentation submitted by and work completed by the Contractor for adherence to performance standards and design requirements. The CQAO will be sufficiently familiar with the Ecology-approved design documents and the construction operations to recognize deviations from those documents. The CQAO will also have the ability to manage and maintain the integrity of the data generated during implementation of the remedial action.

The CQAO will be responsible for identifying field conditions that may warrant deviation from the Ecology-approved design documents. In such circumstances, the CQAO will coordinate with the Engineer of Record and Owner to identify and agree upon any necessary changes to meet the overall objectives of the design. Any agreed-upon changes will be documented in weekly progress reports to the Owner.

The CQAO may directly perform inspection or use inspectors with the requisite expertise and experience to help perform the duties described above.

2.1.4 Contractor

The Contractor will provide the labor, materials, and equipment required to construct the project in accordance with the contract documents. The selected Contractor will have demonstrable experience with excavation, capping, material rehandling, and material disposal. The Contractor is responsible for its own means and methods in the execution of the work and is responsible for ensuring the work complies with the requirements of the contract.

As part of the remedial action, the Contractor will be responsible for developing and implementing the Contractor Quality Control (CQC) Plan, including the required monitoring, sampling, testing, and reporting needed to implement the project in accordance with the contract documents. Independent of the Contractor's quality control (QC) program, the Owner will implement this CQAP to verify the remedial action is implemented in accordance with the design.

2.2 Project Communication

This section describes both internal communication between the Owner, project engineer, and Contractor during construction and external communication between the Owner and the public.

2.2.1 Internal Communication

The Engineer of Record is under direct contract to complete the design and provide construction quality assurance (CQA) for the Owner. The CQAO will be directly employed or subcontracted through the Engineer of Record. As such, communications will generally occur directly between the Engineer of Record and Owner during construction. As appropriate, the CQAO may also communicate directly with the Owner, although, in such cases, the Engineer of Record will be copied

on these communications. The Owner will have the ability to contact both the Engineer of Record and CQAO at any time.

2.2.2 External Communication

The external stakeholders include the tribes and the community. On- and off-site communications with the stakeholders will occur through Ecology. Ecology may elect to host outreach events or develop public communication tools (such as a project website) to provide information to external stakeholders.

Table 2-1 presents the list of individuals and their contact information for the roles described above.

**Table 2-1
Communication Points of Contact**

Role	Organization	Contact Name	Email and Mobile Phone
Owner	Ecology	TBD	TBD
Engineer of Record	Anchor QEA	John Laplante, PE	jlaplante@anchoragea.com 206-795-2676
CQAO	Akana	TBD	TBD
Contractor	TBD	TBD	TBD

3 Construction Management Activities

The Owner, through the CQAO and Engineer of Record, will perform the following construction management activities.

3.1 Review of Submittals

A submittal is anything specified in the contract documents or project permits that requires review by the Owner or Engineer of Record. Submittals are required from the Contractor to supplement the Technical Specifications and Drawings by showing the detail necessary to construct, verify, and confirm items to be incorporated into the work. Submittals and the review of submittals will be tracked by the CQAO with the submittal tracking table. The table will be used to track the progress of each submittal from initial receipt to final acceptance.

3.2 Construction Meetings

3.2.1 *Daily Tailgate Meetings*

The Contractor will hold daily tailgate meetings in accordance with Technical Specifications Section 01 31 00 (Project Management and Coordination). Besides the Contractor, additional attendees may include the inspectors, field staff, and other interested parties. The purpose of this meeting is to have a field review of staff safety and potential safety concerns, as well as planned daily work activities and related environmental concerns.

3.2.2 *Weekly Construction Progress Meetings*

Construction progress meetings will be held at least once per week in accordance with Technical Specifications Section 01 31 00 (Project Management and Coordination). The purpose of the meetings is to review progress of the previous week and the anticipated work/look ahead per the agenda defined in the Technical Specifications. The attendees will include the Contractor, Owner, Engineer of Record (as appropriate), CQAO, inspectors, safety representatives from the Contractor, and other parties, as needed. Minutes for the weekly progress meetings will be produced and distributed by Ecology or its representative in accordance with the Technical Specifications.

The procedures for the progress meetings are outlined in Technical Specifications Section 01 31 00 (Project Management and Coordination).

3.3 Inspection and Monitoring Reporting

Field-based inspection and monitoring will be conducted by the CQAO and include the following:

- Monitor compliance with contract requirements, confirming that each item of work complies with the Technical Specifications and Drawings.

- Identify activities that do not comply with the contract requirements and reason(s) why the work was not completed in accordance with the requirements of the contract.
- Coordinate with the Owner and Contractor to decide the appropriate course of action to verify completed work meets the intent of the contract and remediation objectives.
- Regularly document construction progress.

The CQAO will be knowledgeable of the requirements of each work element and will thoroughly prepare in advance of each work operation through detailed study and understanding of the Technical Specifications and Drawings.

A daily field activity report, recording all items of importance regarding work performed, including the following, will be prepared by the CQAO:

- Details of daily activities, including observations, measurements, inspections completed, data received, QC measures by the Contractor, and QA measures by the CQAO
- Communications with other members of the project team, Contractor, or Owner
- Environmental quality issues (e.g., air, noise, water), additional environmental controls that were implemented, problems encountered, and resolutions
- Site conditions (e.g., weather, water levels)
 - Note if and how any adverse condition may have affected the Contractor’s operations.
- Progress information
 - Report any delays, actions taken, and actions contemplated through coordination with the Contractor.
- Construction downtime
 - Report the daily and cumulative amount of time tracked as Contractor’s downtime.
- Equipment
 - Report arrival at and shipment from the Site of each major item of equipment by manufacturer and model number.
 - Report equipment in use and comment on reasons for idle equipment.
- Tests
 - Record tests and results thereof.
- Photograph log
 - Include key photographs to illustrate the work conducted.

3.4 Review and Acceptance of Work

Review and acceptance of work will be coordinated by the CQAO. The Contractor will provide all records required for review and acceptance of work to the CQAO. If records are incomplete, the CQAO will request additional information from the Contractor as necessary for review of the work.

The CQAO will coordinate with the Engineer of Record to review the Contractor's records and to make a recommendation of acceptance upon confirmation that the Contractor's records provide clear indication that the work has been completed in accordance with the contract documents. The Owner will make the final determination that the work is accepted as complete based on the review and recommendations of the CQAO and Engineer of Record.

4 Quality Assurance Program

The CQA program is described in this section for each major construction activity. For each activity, the following is provided:

- Description of construction activities to be implemented
- Specific performance objectives and criteria for the activity
- Inspection and verification activities
- QA measures
- Contingency actions

Remedial action construction elements subject to the CQA Program include the following:

- Soil excavation, temporary stockpiling, sorting and blending for beneficial reuse, waste characterization, transport, and disposal of excavated materials in an approved upland disposal facility
- Capping using a protective layer of clean sand, gravel, cobble, and/or armor materials
- Construction of public access amenities

For each of these construction elements, inspection and verification activities will be implemented to confirm performance objectives have been met.

During the remedial action, the CQA program will progress as follows:

- The Contractor will submit a CQC Plan as detailed in Section 5. The CQC Plan will be subject to Owner approval before cleanup action field work begins.
- The Contractor will conduct inspection and verification activities (i.e., sampling, testing, and monitoring) to ensure compliance with the approved design documents and to ensure performance objectives have been met.
- The Owner, in consultation with the Engineer of Record, will have final approval authority for all such inspections and for verifying that corrective actions, if any are warranted, are implemented.
- Any changes to Owner-approved design requirements or protocols will require Owner review and approval.
- The Contractor will provide documentation to the CQAO to demonstrate that specific components of the design documents have been properly implemented. The CQAO, in consultation with the Engineer of Record, will evaluate whether the components of the cleanup action are acceptable and complete and make recommendation to the Owner accordingly.

The remainder of this section details each construction element and associated performance objectives and criteria, along with QA measures and specific inspection and verification activities that

will be performed to confirm performance objectives have been met. The Site has been divided into five management areas (MAs) as shown in Figure 1-2 of the EDR. This section addresses the following main construction elements that will occur within each MA:

- Seasonal Beach MA activities include excavation and capping.
- Jetty MA activities include capping.
- Bay and Public Dock MA activities include excavation and capping.
- Bayshore MA activities include capping.
- Hillside MA activities include excavation, backfilling, and construction of public amenities.

4.1 Excavation and Stockpile Management

This section describes the construction oversight activities, including CQC and CQA tasks, that will occur to verify that excavation (and related stockpile management activities) within the Seasonal Beach MA, Bay and Public Dock MA, and Hillside MA have been completed in accordance with the design documents.

4.1.1 Description of Construction Activities

Excavation will be performed at the Seasonal Beach MA, the Bay and Public Dock MA, and the Hillside MA using land-based equipment. Excavated material from the Seasonal Beach MA will be screened for oversized material for on-site reuse. The material that is not retained for on-site reuse and excavated materials from the Public Dock MA and Hillside MA will be placed into stockpiles of approximately 1,500 cubic yards (cy) with visual delineation and clear signage of stockpile identification numbering. Sampling of the stockpile for waste characterization will be conducted by the CQAO. Based on characterization information, the Contractor will transport excavated material to a permitted landfill.

4.1.2 Performance Objectives

The following performance objective applies to excavation:

- Achieve the required excavation thickness.

4.1.3 Inspection and Verification

Verification of the completion of excavation will be performed for each MA. Post-removal topographic surveying will be performed to verify the limits and extents of removal depicted in the construction drawings within a MA have been achieved.

Daily and weekly reports will be prepared to track cumulative excavation volume progress, as well as production and coverage. The weekly report will contain actual excavated volumes for that week and the cumulative totals since the start of excavation. Should the actual cumulative totals fall behind the expected amounts, the CQAO requests direct notification and prompt implementation of a schedule

recovery plan, rather than waiting until generation of the weekly report. In addition, weekly (during active construction) or monthly (during no active construction) progress reports will be prepared and submitted to the CQAO.

4.1.4 Quality Assurance Measures

The CQA program will include the following QA measures for excavation, conducted by the CQAO:

- Review Contractor-provided progress surveys to evaluate whether the following required excavation performance metrics are being achieved.
 - Required depth of excavation achieved over at least 95% of the surface area of the required excavation footprint
 - No larger than a 30- by 30-foot area less than the required excavation depth
 - No payment for removal of material greater than 0.5 foot below the required excavation depth

4.1.5 Sampling Objectives and Requirements

There are no post-excavation sampling requirements.

4.1.6 Contingency Actions

In locations where required excavation performance metrics have not been achieved, the Contractor will be required to remove additional material. Where over-excavation has occurred, the Contractor will be required to backfill over-excavated areas.

4.2 Waste Characterization, Off-Site Transport and Disposal

This section describes the construction oversight activities, including CQC and CQA tasks, that will occur to characterize stockpiles and verify off-site transport and disposal has been completed in accordance with the design documents.

4.2.1 Description of Construction Activities

Stockpiles of material that will not be beneficially reused as cap aggregate will be temporarily stored in discrete stockpiles of approximately 1,500 cy. The CQAO will oversee collection of a five-point composite sample from each stockpile. Composite samples will be submitted for laboratory chemical characterization for conventional parameters and analyzed for Resource Conservation and Recovery Act 8 metals. Toxicity characteristic leaching procedure testing will also be conducted on the composite samples. The laboratory results will be reviewed by the CQAO and provided to the Contractor. The Contractor will submit the results to its approved disposal facilities for confirmation that the material meets facility-specific requirements.

Trucks will be loaded with excavated material. The excavated material will be transported to and disposed of at the Stevens County landfill based on the waste characterization results and the facility's permits. For material that does not comply with the Stevens County Landfill permit requirements, the Contractor will use an alternate approved disposal facility.

4.2.2 Performance Objectives

The following performance objectives apply to off-site transport and disposal:

- Confirm proper disposal in accordance with disposal facility approvals and permits.
- Prevent spillage and tracking of material off site.
- Confirm proper disposal at permitted facility through weight tickets.

4.2.3 Inspection and Verification

Stockpile inspection will occur to confirm stockpiles are appropriately protected, uniquely and clearly identified with signage, not larger than approximately 1,500 cy each, and not commingled until waste characterization has been completed and the disposal facility confirmed.

Shipping inspection will occur to confirm trucks are ready for off-site transport (e.g., clean, not overloaded) and all excavated materials designated for off-site disposal are transported to the landfill. After being approved for transport by the CQAO, trucks will proceed to the disposal site via the approved haul route.

4.2.4 Quality Assurance Measures

The CQA program will include the following QA measures for off-site transport and disposal, conducted by the CQAO:

- Confirm no mud or dirt is tracked off site during hauling activities.
- Review Contractor-provided weight tickets from the disposal facility and compare against surveyed excavation volumes.

4.2.5 Contingency Actions

If material is being tracked off site during construction, the Contractor must modify or enhance the measures for cleaning until material is not being tracked off site.

No contingency actions are anticipated for off-site disposal of material.

4.3 Import of Aggregates for Caps, Backfill, and Armor Rock

This section describes the construction oversight activities, including CQC and CQA tasks, that will occur to verify the procurement and import of aggregates has been completed in accordance with the design documents.

4.3.1 Description of Construction Activities

The Contractor will procure and import aggregates for use as cap materials, backfill, and armor rock. Materials will be obtained from a commercial source permitted for the supply of aggregates.

4.3.2 Performance Objectives

The following performance objectives apply to the import of aggregates for caps, backfill, and armor rock:

- Import material meets gradation requirements prescribed in the contract documents.
- Import material meets shape requirements prescribed in the contract documents.
- Import material meets chemistry criteria requirements prescribed in the contract documents.

4.3.3 Inspection and Verification

The Contractor must demonstrate the proposed material meets chemical quality and gradation requirements presented in the Technical Specifications. Import of aggregates inspection will consist of review of Contractor submittals by the CQAO and visual inspection of imported materials by the CQAO upon delivery.

4.3.4 Quality Assurance Measures

The CQA program will include the following measures for cap and armor material placement, conducted by Ecology or its representative:

- Review Contractor-submitted results for:
 - Aggregate source location(s)
 - Grain size distribution testing
 - Chemical analysis testing
- Compare the chemical concentrations from laboratory testing to the required chemistry levels specified in the contract documents.
- Visually observe imported materials to confirm they meet the shape criteria specified in the contract documents.
- Visually observe imported materials to confirm the general gradation remains consistent during import and that notable changes in the visual character of imported aggregates is not occurring.
- Visually observe imported materials for signs of deleterious or anthropogenic materials.

4.3.5 Contingency Actions

Materials that do not meet gradation requirements will be subject to further review by the Engineer of Record. The Engineer of Record may recommend to the Owner that minor deviations to gradation requirements are acceptable, provided that performance objectives of cap, backfill, or armor rock

would still be met. The Owner will make the final decision regarding acceptance of deviations from specified grain size distributions.

Materials that do not meet chemistry criteria will be rejected outright. If, in the opinion of material suppliers, certain chemistry limits are not achievable in natural source materials, the Contractor will be required to submit a request for information (RFI) justifying a request for deviation. The RFI will be reviewed by the Engineer of Record and Owner. The Owner will make the final decision regarding acceptance of deviations for chemistry criteria.

Materials that contain deleterious or anthropogenic materials will be rejected by the CQAO. The Contractor will be required to remove deleterious or anthropogenic materials or remove the rejected aggregates from the Site.

4.4 Sorting and Blending Excavated Material for Beneficial Reuse

This section describes the construction oversight activities, including CQC and CQA tasks, that will occur to verify material sorting and blending for beneficial reuse has been completed in accordance with the design documents.

4.4.1 Description of Construction Activities

The Contractor will sort excavated material to separate material for beneficial reuse on site from material that will be sent to the landfill for disposal. The sorted material will be blended with imported cap materials to achieve a uniformly blended mix.

4.4.2 Performance Objectives

The following performance objectives apply to the sorting of excavated material for beneficial reuse:

- Retain large natural materials for blending with imported cap materials.
- Achieve uniform blending with imported cap material.
- Confirm no slag or other deleterious material is incorporated into the blended cap material.

4.4.3 Inspection and Verification

Inspection will be conducted visually to observe sorting activities and confirm slag materials are being removed from sorted cap materials. Additionally, visual observations of blending activities will occur to confirm materials are being appropriately combined to achieve a uniform blend. The Contractor must provide estimated quantities that have been retained for reuse on its daily report.

4.4.4 Quality Assurance Measures

The CQA program will include the following measures for material sorting and blending conducted by Ecology or its representative:

- Visually observe material sorting to confirm the screen is operating properly.
- Visually observe that material passing the screen is handled/separated as excavated materials that will be sent off site for disposal.
- Visually observed blending activities to confirm reused material is uniformly blended into imported cap materials in a manner that achieves a visually uniform blend.
- Confirm and agree with quantity estimates of material retained for reuse provided by the Contractor.
- Review cumulative quantities of material retained for reuse to determine if quantity adjustments need to be made to bid items.

4.4.5 Contingency Actions

If material sorting equipment appears to be operating improperly (e.g., retaining finer material than specified), the equipment should be adjusted until it is operating properly. For blended materials not uniformly blended, the Contractor must complete more blending or change its methods.

4.5 Cap Material and Armor Rock Placement

This section describes the construction oversight activities, including CQC and CQA tasks, that will occur to verify cap construction and armor rock material placement have been completed in accordance with the design documents.

4.5.1 Description of Construction Activities

Cap material will be placed in all five MAs, and armor rock will be placed in the Jetty MA. Material will be delivered to the Site from an approved source, and placement will occur through mechanical methods from land-based equipment.

4.5.2 Performance Objectives

The following performance objectives apply to cap construction and armor rock placement:

- For caps and armor, the minimum design thickness must be met for $\geq 95\%$ of the cap surface area.
- The as-constructed cap should have uniform gradation consistent with the requirements of the contract documents.
- Grade Seasonal Beach MA to drain to avoid low spots that could create ponding when the river level drops.

- Fill the low point along the top of the jetty near the shoreline to prevent the outer portion of the jetty from becoming an island as water levels rise.

4.5.3 Inspection and Verification

Inspection will be conducted visually and by reviewing Contractor progress and as-built surveys as they compare to the preconstruction and post-excavation surveys. Visual observations will observe whether cap materials have sorted during placement, which would result in a non-uniform gradation of the cap surface. Where electronic tracking methods are used (e.g., bucket maps), the Contractor will be required to make this information available to the CQAO. The Contractor will be required to track the volume and/or weight of cap and armor rock material placed daily and to make this information available to the CQAO as part of its daily reports.

4.5.4 Quality Assurance Measures

The CQA program will include the following measures for cap and armor material placement, conducted by the CQAO:

- Conduct on-site visual observations of materials periodically to evaluate whether a notable change has occurred in the type of material being used for capping and armor rock placement.
- Visually observe that the cap gradation is generally uniform after placement and that unacceptable sorting has not occurred.
- Visually observe that appropriate materials have been placed in the appropriate location (e.g., armor rock versus cap material).
- Review Contractor-provided progress surveys to evaluate whether required cap thickness and coverage are being achieved, as follows:
 - Required cap thickness is achieved over $\geq 95\%$ of the capping footprint.
 - No larger than a 30- by 30-foot area is less than the required cap material thickness.
 - No payment will be made for cap material placement > 0.5 foot above the required cap material thickness.
 - The cap surface is generally graded toward positive drainage back to the river.
- Review Contractor-provided measurements of cap material placed (on a per-ton or per-cy basis) to compare as-placed quantities to theoretical quantities.

4.5.5 Contingency Actions

If the chemistry of the proposed material does not meet the requirements of the contract, the CQAO will reject these materials, and the Contractor must seek an alternate source for cap material.

If, based on visual observations, the cap or armor material appears to have changed compared to the material for which particle size and chemistry results have been submitted, the CQAO will require the Contractor to run additional tests to confirm the material continues to meet requirements.

If, based on visual observations, the cap material has become unacceptably sorted resulting in zones of finer cap gradations, the Contractor will be directed to rework and re-blend the cap material to a more uniform gradation.

Comparisons of pre- and post-placement topographic surveys could potentially underestimate the placed thickness of cap and/or armor layers, either due to subgrade settlement under the weight of the new material and/or due to the accuracy of the survey methods themselves. If the required cap or armor thickness cannot be confirmed using the survey information, the CQAO will take the following actions:

1. Review the Contractor's reported quantity of material and area over which it was placed (using bucket maps) to ensure the appropriate amount of material was installed to achieve the required thickness.
2. Review the topographic survey results for any indication of mounding, high spots, or other anomalies that would indicate placement was uneven.

If the required cap or armor thickness has not been achieved, or if slopes do not generally grade toward positive drainage in the river, the Contractor will be directed to place more cap material in areas noted as deficient.

4.6 Public Access Amenities

Public access amenities include work to enhance trails, installation of railings, benches, a picnic table and a shelter, pavement and pavement patching, and revegetation. CQC and CQA measures related to public access amenities are provided in the contract specifications and are not further described in this CQAP because these amenities are not required for achieving the cleanup objectives.

5 Documentation

Documentation and reporting for CQA activities will include preconstruction and construction documentation as detailed in this section. The Contractor and CQAO will work closely on a daily basis during the cleanup action to complete the project as specified in the design documents and to collect the documentation required. The following sections describe documentation that will be required throughout the cleanup action.

5.1 Preconstruction Documentation

The Contractor will be required to submit a construction work plan (CWP) for approval by the Owner and Engineer of Record. The CWP will contain the following elements:

- Project work plans
- CQC Plan
- Health and Safety Plan (HASP)
- Environmental Protection Plan (EPP)
- Survey Control Plan
- Construction Schedule

A brief description of the contents of each plan is provided in Sections 5.1.1 through 5.1.7.

5.1.1 Contractor Work Plans

The project work plans will describe, in narrative form, the methods to be employed in the cleanup action, including equipment types, modes of operation, schedules, sequence of activities, and other aspects necessary to describe how and when the specified work will be performed. The project work plans will have specific sections detailing how the following elements will be completed:

- Excavation
- Off-site transport and disposal
- Material screening and blending for beneficial reuse
- Stockpile management
- Import of aggregates
- Capping and armor material placement
- Public access amenities
- Spill prevention, control, and countermeasures
- Construction stormwater pollution prevention measures
- Temporary facilities and controls
- Air pollution and odor control
- Water quality protection

The project work plans will describe how each QC measure and verification activity identified in Section 4 will be addressed in the field.

5.1.2 Contractor Quality Control Plan

The CQC Plan will present the system through which the Contractor ensures construction activities are being implemented in compliance with the requirements of the contract and specifically how each of the QC measures and verification activities identified in Section 4 will be addressed in the field. The CQC Plan will identify personnel, procedures, methods, instructions, inspections, records, and forms to be used in the CQC system. Specifically, the CQC Plan will include a description of procedures for maintaining and updating daily activity logs, procedures for reporting out-of-specification conditions, recordkeeping procedures for personnel, equipment maintenance and calibration, and daily and weekly reporting requirements.

5.1.3 Contractor Health and Safety Plan

The Contractor will submit its HASP presenting the necessary health and safety requirements for jobsite activities and the measures and procedures to be employed for protection of on-site personnel. The plan will cover the controls, work practices, personal protective equipment, and other health and safety requirements that will be implemented by the Contractor in connection with the cleanup action construction activities. The Contractor shall use personnel trained to maintain the necessary health and safety protocols for this type of cleanup work.

5.1.4 Contractor Environmental Protection Plan

The Contractor will be required to submit an EPP describing the environmental protection measures and monitoring activities that will accompany all construction activities. The EPP will cover potential environmental releases as a result of the Contractor operations, as well as monitoring and corrective actions necessary to control such releases. The EPP will contain separate sections addressing contamination prevention, containment and cleanup, erosion and turbidity control, sound level control, air pollution and dust control, and water quality protection as they pertain to the pertinent construction activities described in Section 4.

5.1.5 Survey Control Plan

The Contractor will submit a Survey Control Plan prior to construction. The plan will detail the specific procedures, equipment, and personnel to be used for all landside and in-water (if necessary) surveying work. The plan will also discuss the QA and QC measures to confirm surveying results.

5.1.6 Construction Schedule

A detailed Construction Schedule will be submitted by the Contractor for each construction element prior to construction. Periodic schedule updates will be submitted by the Contractor following progress meetings.

5.2 Construction Documentation

During construction activities, the Contractor will be required to provide a variety of documentation to the CQAO, including testing results of materials received, weight tickets for shipments of materials removed or imported, survey results, and documentation of pay items completed. The Contractor will also maintain a daily log of activities as detailed in Section 5.2.1. Weekly progress reports will be prepared by the CQAO for submittal to the Owner and Engineer of Record as described in Section 5.2.2. Additional documentation is described in Sections 5.2.3 through 5.2.8. The records described in this section will be maintained in the project files. Monitoring data will be provided electronically to the Owner in the Construction Completion Report.

5.2.1 Contractor's Daily Reports

During construction activities, the Contractor will prepare a Daily Quality Control Report and submit it to the CQAO. The Contractor's daily report will record the following information, at a minimum:

- Date
- Weather conditions
- Identification of personnel on site and appropriate professional certifications
- Description of activities completed as identified by stationing and offset
- Any changes to best management practices or environmental controls
- Materials delivered or used
- Equipment used
- Period covered by the report and hours worked
- Area and quantity of materials excavated and disposed of on or off site
- Quantity of materials managed during sorting
- Area and quantity of materials placed on site
- Surveys completed and progress survey data
- Weight tickets from the disposal facility
- Results of any QC inspections, tests, or other monitoring activities
- On-/off-site loading facility activities
- Problems encountered and resolution of problems
- Downtime and delays to the operation
- Health and safety status

The Daily Quality Control Reports will be sent to the Owner on a weekly basis as part of the Weekly Summary Reports as discussed in Section 5.2.2.

5.2.2 Weekly Progress Reports

The CQAO will prepare a weekly summary report identifying progress organized by activity as follows:

- Excavation
 - Area(s) worked
 - Volume of material removed
 - Surveys completed
 - Schedule confirmation (i.e., confirm production is compliant with the schedule activity)
 - Problems encountered
 - Corrective actions
- Off-site transport and disposal
 - Quantities shipped off site for disposal
 - Disposal facility weight tickets
 - Problems encountered
 - Corrective actions
- Imported materials
 - Quantities imported, broken down by material type
 - Imported material testing results
 - Problems encountered
 - Corrective actions
- Sorting of excavated material
 - Quantities sorted, broken down by materials retained for reuse and materials designated for disposal
 - Problems encountered
 - Corrective actions
- Capping and armor placement
 - Area(s) worked
 - Weight/volume of material placed
 - Schedule confirmation
 - Problems encountered
 - Corrective actions
- Environmental controls
 - Samples collected
 - Summary of visual results
 - Summary of water quality protection measures

- Problems encountered
- Corrective actions

Additionally, the Contractor's daily reports will be attached to the CQAO's weekly report.

5.2.3 Import Material Characterization Reports

Prior to any on-site placement of import materials, the Contractor shall submit a Borrow Site Characterization Report to the project engineer. The characterization report will include identification of the source (including a map documenting the origin of the material), site inspection, and material sample and characterization (physical and chemical testing, as specified) to ensure the import material will meet the chemical and physical specifications of its intended use.

5.2.4 Requests for Information

RFIs will be prepared by the Contractor if formal clarification of contract requirements is needed. RFIs will be prepared in the form and submitted per the timing described in the contract documents. The Contractor will submit RFIs directly to the CQAO, The CQAO will forward RFIs to the Engineer of Record and Owner for processing, as appropriate.

5.2.5 Change Orders

If the Contractor identifies work that is out of scope, or the Owner determines additional work is required beyond that included in the construction contract, such changes will be addressed through a Change Order in accordance with the procedures and timing prescribed in the contract documents. The Owner will coordinate with the Engineer of Record and, as appropriate, the CQAO to review Change Order requests. The Owner will have the sole authority to approve Change Orders.

5.2.6 Progress Payments

The Contractor will prepare draft progress payment requests, including supporting documentation as required in the contract documents, to the CQAO for review. The CQAO will review the draft progress payment requests for accuracy relative to the work completed will request clarification or modifications to the Contractor if needed. Once the CQAO concurs the progress payment request accurately reflects the work completed, the progress payment request will be submitted to the Owner for processing in accordance with the timing and submittal requirements in the contract documents.

5.2.7 Postconstruction Documentation

Postconstruction documentation includes any reports to close out project work that were not previously submitted with the Contractor's daily report, such as final disposal weight tickets, as-built surveys, or similar documentation. Postconstruction documentation will be submitted by the

Contractor to the CQAO. The CQAO will forward postconstruction documentation to the Engineer of Record for inclusion in the Construction Completion Report.

5.2.8 Construction Completion Report and Record Drawings

Following completion of construction season, the Engineer of Record will prepare a Draft Construction Completion Report. The Draft Construction Completion Report will contain the following information:

- Introduction
 - Site location
 - Environmental setting
 - Relevant operational history
 - Summary of previous investigations and actions
- Cleanup action background
 - Basis for the cleanup action (i.e., the CAP)
 - Cleanup standards
 - Summary of design basis
 - Summary of deviations from the design, if any
- Construction activities
 - Description of excavation activities
 - Description of cap placement
 - Description of armor material placement
 - Description of sorting and stockpiling
 - Description of waste characterization
 - Description of transport and off-site disposal
 - Description of material reuse
 - Description of construction monitoring activities
 - Description of completion and demobilization
- Chronology of events
 - Description of the timing of construction activities, identifying milestones with reference to a tabular summary of a more detailed construction timeline
- Performance standards and CQC
 - Description of performance objectives and verification activities performed to confirm the cleanup action was implemented in accordance with the Technical Specifications and Drawings
 - Description of actual construction performance relative to performance objectives, including a summary of the results of CQA measurements and analyses
 - Description of contingency actions implemented, if any were necessary
 - Description of Ecology's oversight activities

- Final inspection and certifications
 - Description of final inspections, including the scope of inspections and noting any deficiencies identified and corrective actions implemented
 - Summary of health and safety monitoring during the implementation of the cleanup action with notation of deviations or incidents, if applicable
 - Identification of any institutional or engineering controls implemented to maintain the integrity of the cleanup action, including identification of parties responsible for maintaining and enforcing controls
- Operation and maintenance activities
 - Description of postconstruction monitoring and maintenance requirements
 - Description of contingency measures that would be implemented if postconstruction monitoring indicates such measures are warranted
- Observations and lessons learned
- Identification of problems encountered, if any, in implementing the cleanup action and corrective actions
 - Identification of successes in implementing the cleanup action
 - Analysis of lessons learned that may be applied to future activities
- Cleanup action contact information
 - Identification of individuals (contact names, addresses, and phone numbers) for design and remediation Contractors, Ecology oversight Contractors, and key personnel at Ecology and other agencies

The Construction Completion Report will also include copies of as-built drawings, summaries of waste disposal and analytical results, and other relevant supporting construction records.

6 References

Anchor QEA, LLC, 2023. *Draft Northport Waterfront Site 90% Engineering Design Report*. Prepared for the Washington State Department of Ecology. February 2023.

Ecology (Washington State Department of Ecology), 2022. *Final Cleanup Action Plan*.