

workers and businesses and the region. Bulkhead failure would also adversely affect the Port of Ilwaco Marina operations, likely fully blocking at least one slip from use and potentially causing damage to adjacent float structures and tenant vessels. Until this Project is completed, the facility is capacity-limited and at risk. The main access driveway to Safe Coast Seafoods has been blocked based on recommended load limitations in an effort to minimize vibration and load resulting from vehicles and machinery using the driveway located adjacent to the failing bulkhead. Without the Project, the eventual closure of the wharf will have cascading negative transportation and economic impacts for the region.

The proposed project includes the following elements as summarized in the project JARPA and JARPA figures (Sheet 1 through 9):

- Replacement of the existing bulkhead by removing limited portions of the existing creosote-treated timber bulkhead to accommodate placement of a new steel sheetpile bulkhead with steel cable tiebacks. The new bulkhead must be placed waterward of the existing bulkhead due to the instability of the existing structure and the risk of failure of the wharf and potential damage to the adjacent seafood facility structures during construction if the bulkhead was removed.
The bulkhead sheetpiles will be driven using a vibratory hammer. Impact hammer proofing may also be required to drive the sheetpiles to the final design elevation. Additional construction details are summarized in the attached project Joint Aquatic Resources Permit Application (JARPA) and affiliated drawings. A portion of the concrete rubble slope protection on the south end of the bulkhead will be moved and replaced with riprap to accommodate installation of the new bulkhead and maintain slope protection/stability.
- The access drive located behind and to the west of the bulkhead will be regraded and repaved as part of the bulkhead replacement.

Mitigation Sequence Analysis

The following mitigation sequence analysis is provided pursuant to City of Ilwaco SMP 6.3(2) and (3) and as requested by the City in a letter dated 2 May 2023. The project will implement Best Management Practices (BMPS)/avoidance and minimization measures (AMMs) during demolition and construction as described in Section 8.a. of the project JARPA (attached). The BMPs will avoid and minimize impacts to the environment to the extent practicable and include general construction and demolition BMPs; in-, over-, and near-water specific BMPs; creosote and pile removal BMPs; pile installation BMPs; and BMPs associated with overwater concrete placement.

The following mitigation sequence will be completed for the project and is presented as described in the Ilwaco SMP.

A. Avoidance

The proposed project only consists of maintenance and replacement/repairs to existing structures. The site use and purpose will not change. No "overall" expansion of the footprint is proposed, only that necessary to replace the bulkhead.

Several alternatives were considered prior to identifying the preferred alternative. The following is a summary of the alternatives considered and how they were evaluated as the Project was developed.

- *No Action*
 - The existing creosote treated timber bulkhead is actively failing with observed movement of up to 0.3 inch since monitoring began in November 2022.
 - Left as-is, the bulkhead will eventually fail, which will result in:
 - Permanent access removal by permanently blocking the access driveway adjacent to the bulkhead,
 - Potential damage to buildings/building foundations,
 - Life/safety issue for Safe Coast Seafood workers and marina tenants,
 - Inability for Safe Coast Seafood to maintain operations resulting in loss of income and revenue for this small community.
 - Obstructing a portion of marina (adjacent slip) and making it unusable.
- *Removal of bulkhead prior to construction of new bulkhead wall*
 - No bulkhead as-builts are available to identify how the existing bulkhead was constructed. Associated unknowns increase the risk of removing the structure prior to replacement. Removing the existing structure prior to replacement poses a high risk of slope failure and damage to:
 - the access drive,
 - Safe Coast building foundations, and
 - adjacent marina slip (including obstructing access to parts of the marina and potential damage to float structures).
 - Bulkhead failure would pose unacceptable risks to life/safety for Safe Coast Seafood workers and marina tenants.
- *Sheetpile bulkhead placement behind existing bulkhead*
 - No as-builts: The bulkhead appears to be supported by cable tie backs, possibly anchored to deadman piles behind/shoreward of the bulkhead. There is a potential for:
 - Increased risk of failure if sheet piles were driven behind the existing wall, severing the support provided by the cable tiebacks.
 - Unknown obstructions that could damage or impede sheetpile installation, increasing cost, delays and potential risk of existing slope failure.
 - The Project area is restricted by the continued business need for the adjacent access drive and the close proximity of the facility buildings and infrastructure. Space limitations also pose constructability challenges relative to pile and cap placement for a new bulkhead.
- *Cantilever bulkhead waterward of the existing bulkhead*
 - The cantilever option placed waterward of the existing bulkhead would have essentially the same impacts to marine habitat as the Preferred Alternative and would also require placement of filter rock backfill in the space between the new and the existing bulkhead.
 - The placement of the cantilever and Preferred Alternative is dictated by the

profile of the existing bulkhead which is leaning waterward by as much as 10 degrees in places and the need for a usable temporary berth area to replace the berth area rendered unusable by the deteriorated and unstable nature of the existing bulkhead.

- The cantilever option would require more steel as the bulkhead sheetpiles would be both longer and thicker to provide the necessary slope support at the site. The requirement for more steel will result in a higher cost to the Port.
- *Preferred Alternative – Anchored Sheetpile Bulkhead*
 - The Preferred Alternative will result in commensurate environmental impacts (approximately the same footprint, backfill volume, etc.) as the cantilever bulkhead alternative and, similarly, be the least environmentally impactful and will be a more economical solution for the Port.
 - The proposed placement of the bulkhead is controlled by the waterward lean of the existing bulkhead face and Safe Coast's need to replace the existing unusable temporary berth area with a usable temporary berth to support the facility's operations.
 - The size of the space/void between existing and replacement bulkheads results from the way the bulkhead leans waterward and the need for a usable berth area to replace existing one for Safe Coast Seafood operations.

Avoidance and minimization measures (AMMs) and BMPs will be implemented during construction to avoid and/or minimize impacts to wildlife. See the attached JARPA and Biological Evaluation for a full list of measures to preserve or enhance wildlife. Key AMMs/BMPs include:

- In-water construction activities will comply with the in-water construction window (anticipated to be November 1 through February 28)
- During any in-water and embankment work, containment booms will be used to surround the work areas or separate embankment work from surface water.
- Steel piling will be installed with a vibratory hammer when possible. Impact hammering will start with light tapping, then increase to full force gradually.
- A bubble curtain and one or more other noise attenuation methods will be used during impact installation or proofing of all steel piling.
- Where possible pre-cast concrete features will be used in lieu of cast -in-place concrete features.
- Uncured concrete will not be allowed to come into contact with the surface water for cast-in-place features.

The creosote treated timber revetment on the north end of the adjacent slip will be replaced with riprap shore protection rather than replacing in kind with a concrete revetment in the same location.

Additionally, the temporary berth for vessels along the bulkhead will be rehabilitated by adding anchor features (e.g. steel cleats) along the top of the new bulkhead wall versus incorporating fender piles and fender features that were eliminated as the design progressed. The final design eliminated the piles and features associated with the fenders thus avoiding the associated additional overwater and benthic impacts associated with such features.

B. Minimization

All federal, state, and local project permit requirements will be adhered to avoid and minimize impacts to protected species and habitat. Minimization measures associated with the proposed project BMPs include the use of steel sheetpiles (vs. treated timber or concrete piles) which minimizes the footprint of the structure to the extent practicable, placing sheetpiles using a vibratory hammer will limit or eliminate the need for impact pile driving except in those instances where the piles need to be driven to their final design elevation with impact proofing due to harder driving conditions at depth. Additional pile installation BMPs and monitoring (marine mammal monitoring) will be implemented to minimize pile driving noise impacts (e.g. bubble curtains, soft starts, etc.) and containment booms will be used during demolition and construction to prevent debris and sheen that may be associated with the creosote pile and feature removal. See the attached JARPA for additional impact minimization BMPs proposed for the project.

The proposed bulkhead has been sited as close to the existing bulkhead as possible based on the condition and lean of the existing, failing bulkhead while maintaining the purpose and utility of the structure as a temporary berth for vessels on- and off-loading at the Safe Coast Seafood facility. The proposed location for the new bulkhead construction minimizes the new overwater coverage, benthic habitat impacts, and fill placement (drainage rock placement in the space between existing and new structures) required to construct the new bulkhead to the extent practicable while maintaining the facility's purpose and utility.

C. Rectify the impact by repairing, rehabilitating, or restoring the affected environment.

Approximately 350 sf of concrete rubble will be removed to accommodate construction of the new bulkhead. The concrete will be removed from the marine environment and replaced with 350 sf of rip-rap shore protection. This will remove approximately 14 cy of concrete from the marine environment (below HTL). An additional 50 sf (2 cy) of concrete rubble slope protection will be removed from above HTL in the same area, removing more concrete from the shore environment. The removal of concrete improves the marine and shore environment improves site habitat conditions by eliminating concrete and its potential impacts on pH and marina chemistry from the site at these locations.

D. Reduce or eliminate the impact over time by preservation and maintenance operations.

The project includes removal of creosote from the environment by removing limited portions of the existing bulkhead. The amount of the existing bulkhead removal is limited by the condition and instability of the existing structure and additional removal of the bulkhead structure risks catastrophic failure of the wharf which has the potential to endanger Safe Coast Seafood building foundations and infrastructure. Bulkhead failure could adversely impact continued operations of the facility and risk the safety of the workers at that facility and the customers using the marina. Such a failure would likely have adverse effects on the marine environment due to the potential for increased turbidity caused by slope failure and the potential for building

materials and other materials used at the Safe Coast Seafood facility entering the marine waters immediately after a catastrophic bulkhead failure.

The placement of the new bulkhead and associated drainage gravel backfill waterward of the remaining portion of the creosote treated timber bulkhead will provide a measure of protection from wave action and vessel wakes, slowing the deterioration of the old bulkhead structure and likely slowing the release of creosote from the timbers staying place. This decrease in creosote releases from the remaining bulkhead will likely improve habitat conditions over the long term by diminishing the episodic concentration of creosote leaching into the marine waters.

E. Compensatory Mitigation for the impact by replacing, enhancing, or providing substitute resources or environments.

The Port of Ilwaco proposes the following compensatory mitigation to offset the reduction in habitat function to the marine environment due to increase in overwater shading and loss of benthic habitat from the new bulkhead construction. The proposed compensatory mitigation consists of pile removal, removal of creosote from the marine environment, beach nourishment, removal of floating timber debris/overwater coverage from the marine environment. The proposed compensatory mitigation was identified during extensive consultation with federal and state agencies including additional coordination with WDFW to identify sufficient mitigation to address project impacts.

Approximately twenty-eight (28) creosote-treated timber piles (12-inch diameter) and three (3) steel piles (12-inch diameter) will be removed adjacent to the existing bulkhead and as part of the north shoreline rehabilitation. In addition, the Port proposes to remove approximately thirty-six (36) 12-inch diameter derelict creosote-treated timber piles and 3 creosote-treated timber pile caps as mitigation for the fill and benthic habitat impacts created by the placement of the new bulkhead wall in front of the existing structure. This will result in approximately 64 total creosote-treated timber piles and 3 steel piles being removed along with approximately 70 lf of creosote treated timber retaining wall, and 40 lf of creosote treated timber pile caps.

Approximately 1,200 sf of fill below the HTL will result from the placement of the new bulkhead and drainage rock backfill (Table 1). Of the overall footprint, 1,200 sf will come into contact with the bottom substrate and result in benthic habitat impacts.

North shoreline riprap placement will occur in a 2,200-sf area, 1,850 sf of which occurs below the HTL and would result in benthic habitat impacts (Table 1). Approximately 750 sf of this will occur waterward of the existing retaining wall. A 6-inch layer (approximately 34 cy) of fish mix gravel will be placed over the north shoreline riprap below HTL to provide beach nourishment and improved habitat for fish passing through the marina.

South shoreline riprap placement will not result in any additional benthic habitat impacts (Table 1) but will result in the removal of approximately 350 sf (14 cy) of concrete from the

environment to be replaced with riprap shore protection. The removal of approximately sixty-four (64) 12-inch creosote-treated timber piles, three (3) 12-inch steel piles, 70 lf of creosote-treated timber retaining wall, and 40 lf of derelict creosote-treated timber pile caps, will restore approximately 165 sf of benthic habitat (Table 1) and remove approximately 34 tons of creosote from the marine environment.

Additionally, floating timber debris will be removed from the south portion of the marina as part of the project mitigation. This will remove approximately 2,510 sf of overwater coverage currently present in that portion of the marina (JARPA figure set, Sheet 9).

Table 1. Approximate Fill Impacts

Activity	Fill below HTL (sf)	Fill below HTL (cy)	Fill above HTL (sf)	Fill above HTL (cy)
<i>Bulkhead wall and shoreline protection installation</i>				
Sheetpile installation	400 sf	80 cy	0 sf	0 cy
Bulkhead drainage rock placement	1,000 sf	450 cy	0 sf	0 cy
Rip-rap shore protection and Fish Mix placement (north shoreline)	1,850 sf	172 cy	350 sf	26 cy
Concrete rubble removal (south shoreline)	-350 sf	-14 cy	-50 sf	-2 cy
Rip-rap replacement (south shoreline)	350 sf	30 cy	50 sf	5 cy
<i>Subtotal</i>	<i>3,250 sf</i>	<i>718 cy</i>	<i>350 sf</i>	<i>29 cy</i>
<i>Structure removal</i>				
Pile removal adjacent to existing bulkhead	-12 sf	-6 cy	0 sf	0 cy
North shoreline- retaining wall removal	-85 sf	-12 cy	0 sf	0 cy
Derelict pile/timber removal	-68 sf	-12 cy	0 sf	0 cy
Derelict Timber Structure Removal -South Marina	-2,510 sf	-350 cy	0 sf	0 cy
<i>Subtotal</i>	<i>-2,675 sf</i>	<i>-380 cy</i>	<i>0 sf</i>	<i>0 cy</i>
<i>Creosote removal from the Environment</i>	<i>34 tons</i>			

No Net Loss

The project will result in no net loss to habitat functions based on the baseline habitat conditions¹ that should be considered as “disturbed” at the project site and the avoidance, minimization, and mitigation measures that are included as part of the project and described in this memorandum. The project and associated mitigation will result in “equal or greater habitat functions....compared to existing conditions”^{2,3} at the project site as water quality and benthic habitat will be improved through removal of creosote and concrete from the environment. The shoreline habitat will be improved from existing

¹ WAC 220-660-080 (4)(f) “For calculating compensatory mitigation requirements under this chapter, the environmental baseline is habitat conditions at the time the HPA application is submitted.”

² WAC 220-660-080 (5)(d)

³ Ilwaco SMP, 4.1.2 (1) “The existing ecological functions and ecosystem-wide processes of critical areas should be protected.”

condition through placement of fish mix material over the project rip rap shoreline protection for beach nourishment and improved habitat for fish passing through the marina. The project will also provide protection to the timber bulkhead remaining in place, likely slowing deterioration from weathering, vessel wake, and wave action and decreasing the speed and concentration of the remaining creosote leaching into the marine waters. Additionally, the project mitigation will remove existing overwater coverage from the marina resulting in improved habitat for fish passing through the marina.

The proponent has avoided and minimized impacts to the marine environment to the greatest extent practicable through redesign, BMP implementation, and mitigation for permanent critical area impacts. Based on these measures, the project will not result in a net loss in critical area functions and values.

Attachments

- City of Ilwaco [SMP6.3(3)] pre-application meeting comment letter dated 2 May 2023
- WDFW Mitigation Consultation – Emails dated 14 June 2023
- Project JARPA & Permit Drawings
- Project Biological Evaluation (submitted to NOAA/NMFS 28 November 2022)

BIOLOGICAL EVALUATION

Produced for Port of Ilwaco

December 2022



moffatt & nichol

PORT OF ILWACO

Port of Ilwaco East Bulkhead Resilience Project

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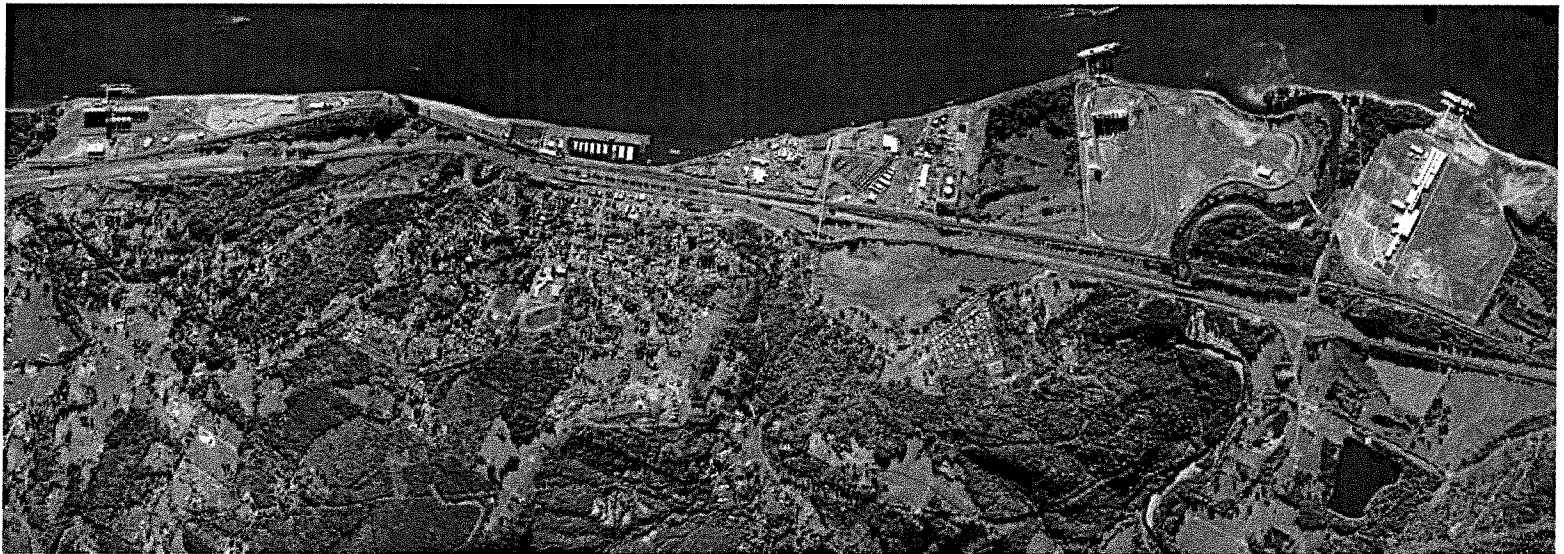


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Appendices

Appendix A: Design Drawings

Appendix B: Essential Fish Habitat Assessment



Glossary

AMMs	Avoidance and Minimization Measures
BE	Biological Evaluation
BMP	Best Management Practice
BO	Biological Opinion
cy	Cubic yard
dB	Decibel
dBA	A-Weighted Decibels
dBrms	Decibel Root Mean Square
DNR	Washington Department of Natural Resources
DPS	Distinct Population Segment
Ecology	Washington State Department of Ecology
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
ft	feet
hr	hour
HTL	High Tide Line
IPaC	Information For Planning and Consultation
l	liter
LCR	Lower Columbia River
LCFRB	Lower Columbia Fish Recovery Board
lf	Linear feet
MCR	Middle Columbia River
mg	milligram
MHHW	Mean Higher High Water
MLLW	Mean Lower Low Water
mph	Miles per hour
MSA	Magnuson Stevens Fishery Conservation and Management Act
NLAA	Not Likely to Adversely Affect
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
PCE	primary constituent element
Project	Port of Ilwaco East Bulkhead Resilience Project
RM	River Mile
sf	Square feet
SEL	Sound exposure level
SR F	Snake River fall-run
SRKW	Southern Resident Killer Whale
SR-SS	Snake River spring/summer-run
UCR	Upper Columbia River
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
UWR	Upper Willamette River
WDFW	Washington Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation



1. Purpose of the Biological Evaluation

The purpose of this Biological Evaluation (BE) is to address potential effects of the Port of Ilwaco East Bulkhead Resilience Project (herein referred to as 'Project') and address the proposed action in compliance with Section 7 of the Endangered Species Act (ESA). Section 7 requires consultation with the Services (U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA) Fisheries or National Marine Fisheries Service (NMFS) to evaluate whether proposed Project activities could potentially jeopardize the continued existence of any threatened, endangered, or proposed species, or result in the destruction or adverse modification of critical habitat.

The Project would consist of three primary elements;

1. Replacement of the failing bulkhead
2. Replacement of slope protection to the north and south of the bulkhead
3. Paving and grading the upland wharf area behind the bulkhead to mitigate the effects of sea level rise.

Creosote-treated structures would be removed as part of the proposed Project elements. The Port is also proposing to remove adjacent derelict creosote-treated piles as additional mitigation.

The Project has the potential to impact the following ESA-listed species and/or their critical habitat: Chinook salmon (*Oncorhynchus tshawytscha*), chum salmon (*Oncorhynchus keta*), Coho salmon (*Oncorhynchus kisutch*), sockeye salmon (*Oncorhynchus nerka*), steelhead (*Oncorhynchus mykiss*), bull trout (*Salvelinus confluentus*), green sturgeon (*Acipenser medirostris*), eulachon (*Thaleichthys pacificus*), leatherback sea turtle (*Dermochelys coriacea*), southern resident killer whales (*Orcinus orca*), humpback whale (*Megaptera novaeangliae*), western snowy plover (*Charadrius nivosus nivosus*), marbled murrelet (*Brachyramphus marmoratus*), and streaked horned lark (*Eremophila alpestris strigata*).

Appendix B of this BE also includes an assessment of essential fish habitat (EFH) protected under the Magnuson–Stevens Fishery Conservation and Management Act (MSA).

1.1. Project Location

The Project is located at the Port of Ilwaco on the southwest coast of Washington State near the mouth of the Columbia River (Figure 1). The Port area generally consists of a marina used for year-round moorage of recreational and commercial fishing vessels, upland commercial buildings, and a boatyard



(Figure 2). The Project site at the Port of Ilwaco is the bulkhead along the east side of the commercial fishing wharf (herein referred to as 'wharf'). The approximate coordinates of the Project site are latitude 46.30498 and longitude -124.0408. The wharf is an earth filled structure on the east side and pile supported on the west side. The wharf is protected by a failing creosote-treated timber bulkhead along the eastern limits of the wharf (Figure 2). The shoreline to the north of the bulkhead is protected by a low creosote-treated timber retaining wall and large log (Figure 2). The shoreline protection on the south side of the bulkhead consists of riprap and concrete rubble (Figure 2). The Safe Coast Seafoods buildings are located on the wharf (Figure 2). The Port and marina area is protected by a rubble breakwater (Figure 2).

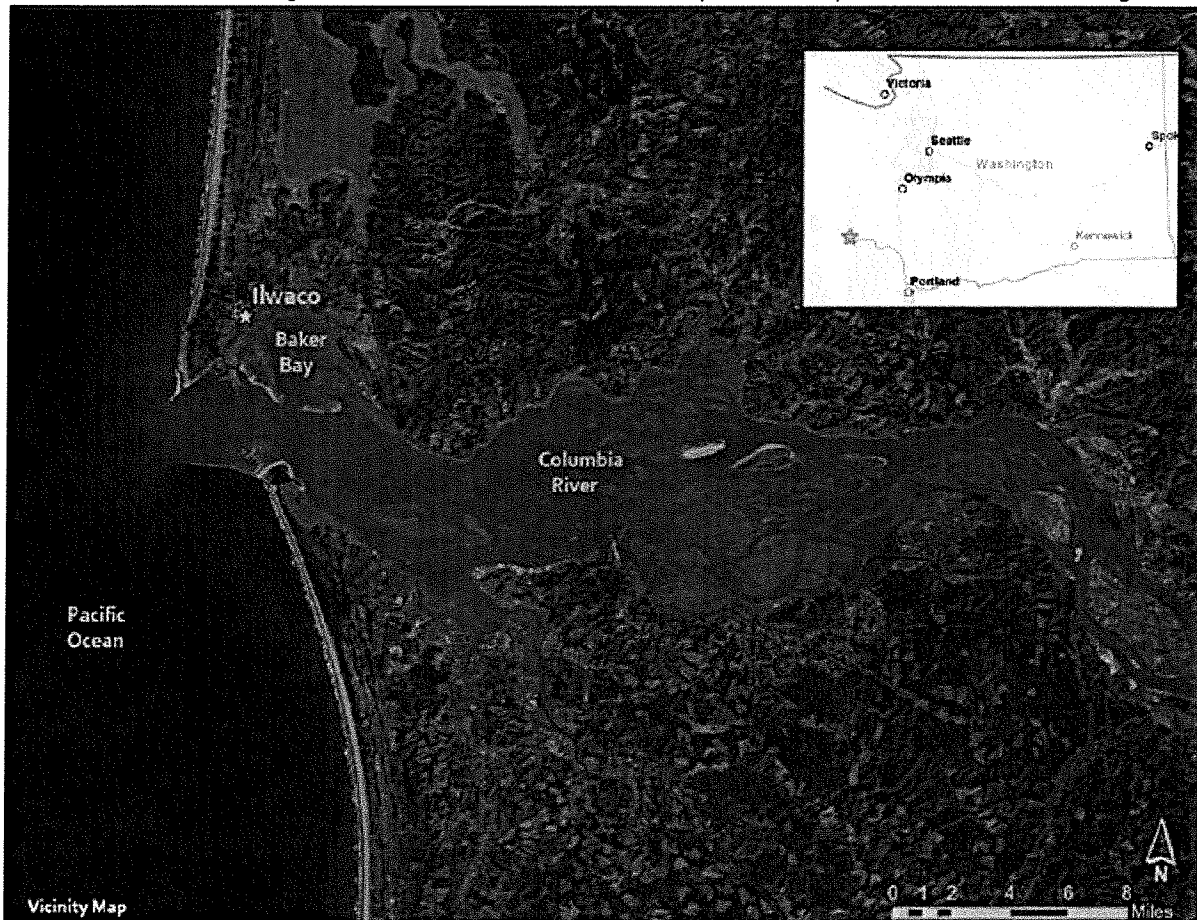


Figure 1. Vicinity Map



Figure 2. Project Location Aerial

1.2. Purpose and Need

The proposed Project is required for improved the safety, efficiency, and reliable use of the wharf. The Port is a key hub for commercial fishing, seafood and aquaculture processing, and recreation activities that greatly benefit the regional economy. The commercial fishing wharf, operated by Safe Coast Seafoods, is one of the most active in the state, landing roughly \$14 million in commercial seafood each year. Repair of the bulkhead wall is critical to ongoing operations at Safe Coast Seafoods. In its current condition, the bulkhead is in serious structural condition and at risk of failing. Frequent flooding due to high water levels from “king tides” and severe winter storm surges further threaten the structural capacity of the bulkhead. Pavement settlement has been observed on the adjacent landward driveway and access is now restricted based on those conditions and the condition of the deteriorating bulkhead. The 2022 geotechnical investigations (GeoEngineers, 2022) indicated that the project site is underlain by liquefiable soil.

Bulkhead failure would shut down cargo operations at the Port and negatively impact a wide variety of businesses in maritime and non-maritime sectors including Safe Coast Seafoods. The shutdown of the Safe Coast site due to failure of the bulkhead would lead to a series of economic impacts for many more workers and businesses and the region. The facility is capacity-limited and at risk until the bulkhead is replaced and the Project is completed. Without the Project, the eventual closure of the Wharf would result in cascading negative transportation and economic impacts for the region.

The Project would serve the following purposes and provide the following benefits:

- The replacement bulkhead will serve as the initial phase to increase the facility's climate change/sea level rise resiliency and will help protect Wharf facilities from flooding. The bulkhead will be designed to accommodate the planned increase to Safe Coast Seafoods facility ground floor elevations in the future.
- The top of the embankment elevation to the north of the bulkhead will be raised to approximately +14 feet (ft) mean lower low water (MLLW) and the existing creosote-treated timber retaining wall will be replaced with riprap to improve shoreline protection. The increase to top of bank elevation will mitigate sea level rise impacts between the bulkhead and the marina access pier to the east.
- Re-grading and re-paving of the upland area behind the bulkhead wall will facilitate positive drainage away from the Safe Coast Seafoods buildings and help protect the facilities during flood events.
- The bulkhead replacement would prevent the shoreline from failing into a portion of the active Port of Ilwaco Marina, which would impact operations in the marina.
- The new bulkhead will be designed to accommodate the temporary mooring of fishing vessels which will allow vessels to unload/load equipment and product and improve efficiencies at the Safe Coast Seafoods facility. The timber bulkhead is used for temporary mooring under existing conditions, but cannot be used for loading/unloading of vessels due to its poor, unstable condition.
- The Project will allow trucks to drive safely on the bulkhead again, which will improve the efficiency of cargo transfer operations and improve the port's competitiveness. The adjacent roadway has been closed to vehicle access due to the poor condition of the existing bulkhead.
- The removal of creosote-treated wood from the marine environment will provide water quality benefits.



1.3. Project Description

The proposed East Bulkhead Resilience Project at the Port would consist of three primary elements:

- Replacing the failing east bulkhead (Figure 3, shown in red) and the installation of fiberglass fender piles external to the bulkhead to support temporary berthing (Figure 3, shown in blue);
- Repairing/replacing slope protection north and south of the bulkhead (Figure 3, shown in green); and,
- Paving and re-grading the upland wharf area directly landward of the bulkhead to mitigate the effects of sea level rise. (Figure 3, shown in yellow).



Figure 3. Location of Proposed Project Activities

As part of the above elements, creosote-treated timber that configures the external wall of the existing bulkhead and retaining wall will be removed along with select derelict creosote-treated piles next to the bulkhead.

Project details are described below.

1.3.1. Bulkhead Wall

Bulkhead replacement will include installing a new 225 linear feet (lf) steel sheet pile wall waterward of the existing creosote-treated timber wall. Select creosote-treated timber piles that configure the exterior portion of the existing wall will be removed to accommodate installation of the new bulkhead. Drainage rock will be placed between the existing and new bulkhead walls and a fender system will be installed on the outer face of the new sheet pile wall.

Removal of the entire existing east bulkhead wall is not feasible without undermining the stability of the soil behind the bulkhead and the adjacent building foundations. The majority of the existing timber bulkhead will be abandoned in place behind the replacement bulkhead in order to protect the existing buildings at the Safe Coast Seafoods facility. Localized bulkhead demolition will likely consist of removal of the rotted top several feet of the existing creosote-treated timber piles above the timber wale location. This targeted demolition will take place above mean higher high water (MHHW). In addition, there may be localized notching of the bulkhead wall to accommodate the installation of the new tie-back ground anchors. Approximately twelve (12) 12-inch diameter existing creosote-treated timber piles and three (3) 12-inch diameter steel pipe piles that are located directly waterward of the existing timber bulkhead will be removed. These piles will be removed by either pulling them out directly using a chain or with a vibratory hammer depending on the eventual contractors preferred means and methods. The piles will be cut at the mudline if complete removal is not possible or the piles break. Upland demolition will consist of removal of the existing pavement and surface features.

The replacement bulkhead will be positioned to the waterside of the existing east bulkhead and will consist of a 225 lf steel sheet pile bulkhead wall with grouted ground anchors extending from a cast-in-place concrete pile cap down to a bedrock layer. The bulkhead wall will not increase in length. The top elevation of the new bulkhead wall will be approximately three (ft) higher than the existing bulkhead to accommodate for high tides and sea level rise. It is anticipated that the steel sheet piles will be driven using a vibratory hammer. The option for impact proofing will also be included in the event difficult driving conditions are encountered. The ground anchors will consist of high strength steel strands or steel bars and will be installed using either land-based equipment or from a barge depending on the contractors preferred means and methods. The anchor holes will be drilled with a full-length casing. All drill spoils will be contained and prevented from entering marine waters. The anchor holes will be filled with grout using a tremie tube and then then pressure grouted after the anchor tendons are installed. The anchors will be tensioned after all anchors have been installed and have reached the required grout



and concrete strengths. The cast-in-place concrete pile cap will then be constructed. The pile cap will be cast-in place in the dry and uncured concrete will not be allowed to come in contact with waters of Baker Bay (Figure 1).

The sheet pile placement in front of the existing bulkhead will result in an approximately 2- to 5-foot space between the existing bulkhead and the new bulkhead sheet piles. The area between the existing structure and the new bulkhead will be backfilled with drainage rock to allow for water to flow in and out of the soil supporting the Safe Coast Seafood facility. Approximately 400 cubic yards (cy) of free draining drainage rock backfill will be placed between the existing timber bulkhead and the replacement bulkhead (Table 1). The drainage rock will likely be placed using a clamshell operating from a barge. The clean drainage rock will be obtained from a commercial supplier. This placement will minimize the risk of slope failure that removing the existing structure would exacerbate. The drainage rock placement in the space between the existing and replacement bulkhead structures will minimize additional pressure from trapped groundwater behind the new bulkhead.

The southern portion of the replaced east bulkhead wall will be designed to accommodate the temporary mooring of fishing vessels by incorporating fiberglass fender piles for temporary berthing (Figure 3, shown in blue). This will allow vessels to unload/load equipment and product to the Safe Coast Seafoods facility. Vessels have temporarily moored adjacent to the existing bulkhead but, as its condition deteriorated and has become unstable, it can no longer be used for loading/unloading of vessels. It is anticipated that the fiberglass fender piles will be driven using vibratory hammers and proofed with an impact hammer as necessary.

The new bulkhead, pile cap, and fender system will have a footprint of approximately 1,500 square feet (sf) in marine waters (measured waterward of the high tide line [HTL]). Of the overall footprint in marine waters, approximately 1,150 sf of the replacement structure will result in benthic habitat impacts. The completed project will result in an increase of overwater coverage of 200 sf.

1.3.2. Slope Protection

Proposed slope protection repairs/replacement include:

- Removing and replacing armoring along the southern shoreline to accommodate bulkhead wall replacement
- Removing the creosote-treated timber retaining wall along the northern shoreline and replacing it with riprap.

Approximately 400 sf (16 cy) of riprap and concrete debris from the shoreline to the south of the bulkhead wall will be removed to accommodate replacement bulkhead installation (Table 1). Approximately sixteen (16) 12-inch diameter creosote-treated timber piles associated with the existing timber retaining wall will be removed from the shoreline along the north end of the bulkhead wall. The existing creosote-treated timber retaining wall to the north of the bulkhead will be completely removed. The associated piles will be removed by either pulling them out using a chain or with a vibratory hammer depending on the contractor's preferred means and methods. The piles will be cut at the mudline if complete removal is not possible or the piles break during removal.

The 400 sf (16 cy) of riprap removed from the south portion of the project to accommodate installation of the new bulkhead will be replaced with approximately 35 cy of riprap in the same 400 sf area to maintain slope stability (Table 1). Approximately 30 cy of replacement riprap (total 35 cy) will be placed waterward of the HTL (Table 1).

Approximately 165 cy (2,200 sf) of riprap, 140 cy (1,850 sf) of which occurs below the HTL, will be placed on the embankment to the north of the new bulkhead to replace the existing creosote treated timber retaining wall and provide shore protection (Table 1). The riprap slope protection will serve as grade transition from the vertical bulkhead structure to the adjacent sloped shorelines to the north and south. The top of the embankment will be raised to approximately +14 ft MLLW between the bulkhead and the marina access pier to the east to mitigate the effects of sea level rise.

1.3.3. Upland Paving and Grading

Upland paving and grading will be completed landward of the bulkhead wall along the wharf to mitigate sea level rise following construction of the new bulkhead. Approximately 8,000 sf of driveway along the wharf will be regraded and repaved with structural fill base course and asphalt pavement. The upland area will be re-graded and re-paved to maintain positive drainage away from the Safe Coast Seafoods buildings. The bulkhead will be outfitted with scuppers to allow rainwater to flow into the marina rather than pooling along the driveway or draining toward the Safe Coast facilities.

1.3.4. Benthic Habitat Impacts and Creosote Removal

Approximately twenty-eight (28) creosote-treated timber piles (12-inch diameter) and three (3) steel piles (12-inch diameter) will be removed from adjacent to the existing bulkhead and as part of the north shoreline rehabilitation. The Port also proposes to remove approximately thirty-six (36) 12-inch diameter derelict creosote-treated timber piles and 3 creosote-treated timber pile caps as mitigation for the fill

and benthic habitat impacts created by the placement of the new bulkhead wall in front of the existing structure. This will result in approximately 64 total creosote-treated timber piles and 3 steel piles being removed along with approximately 70 lf of creosote-treated timber retaining wall, and 40 lf of creosote-treated timber pile caps.

Approximately 1,500 sf of drainage rock backfill (Table 1) will be placed below the HTL to encourage groundwater drainage between the existing bulkhead and the new bulkhead. The construction of the bulkhead will result in approximately 1,150 sf of benthic habitat impacts. The new fender system will result in approximately 200 sf of new overwater coverage.

The riprap to be placed on the north shoreline to replace the existing shoreline protection (creosote-treated timber retaining wall) will be placed over a 2,200 sf area, 1,850 sf of which occurs below the HTL and would result in benthic habitat impacts (Table 1). Approximately 750 sf of the riprap shore protection will be placed waterward of the existing retaining wall. The riprap to be replaced on the shoreline to the south of the bulkhead will not result in any additional benthic habitat impacts (Table 1).

The removal of approximately sixty-four (64) 12-inch creosote-treated timber piles, three (3) 12-inch steel piles, 70 lf of creosote-treated timber retaining wall, and 40 lf of derelict creosote-treated timber pile caps will restore approximately 165 sf of benthic habitat (Table 1) and remove approximately 20 tons of creosote from the marine environment.

Table 1. Approximate Fill Impacts

Activity	Fill below HTL (sf)	Fill below HTL (cy)	Fill above HTL (sf)	Fill above HTL (cy)
<i>Bulkhead wall and shoreline protection installation</i>				
Sheetpile and fender pile installation	500 sf	40 cy	0 sf	0 cy
Bulkhead drainage rock placement	1,000 sf	400 cy	0 sf	0 cy
Rip-rap placement (north shoreline)	1,850 sf	140 cy	350 sf	25 cy
Rubble/ rip-rap removal (south shoreline)	-350 sf	-14 cy	-50 sf	-2 cy
Rip-rap replacement (south shoreline)	350 sf	30 cy	50 sf	5 cy
<i>Structure removal</i>				
Pile removal adjacent to existing bulkhead	-12 sf	-6 cy	0 sf	0 cy
North shoreline- creosote-treated timber retaining wall removal	-85 sf	-12 cy	0 sf	0 cy
Derelict pile/timber removal	-68 sf	-12 cy	0 sf	0 cy

1.3.5. Construction Sequencing

Construction sequencing for the bulkhead replacement will likely be as follows:

- Localized demolition of the existing east bulkhead wall



- Installation of the new steel sheet pile wall
- Placement of drainage rock between the existing east bulkhead wall and new bulkhead wall
- Installation of new fender system along bulkhead

1.4. Avoidance and Minimization Measures (AMMs)

The Project will take place in the water and along the shoreline in the west portion of the Port of Ilwaco Marina which is located along the northeast shore of Baker Bay in Ilwaco, Washington. The paving and regrading portions of the Project will all occur at the top of the shoreline in the dry. The bulkhead sheetpile wall cap will be cast in place and uncured concrete will not be allowed to come into contact with surface waters. The shoreline riprap replacement will be placed in the dry to the extent practicable. The bulkhead demolition, placement of the new bulkhead, fenders and appurtenances will be accomplished using equipment operated from a barge(s).

The following AMMs will be used for this Project:

1.4.1. General AMMs

- Containment booms will be used to surround in-water work areas or separate embankment work from surface water. The booms will serve to contain and collect any oily material and/or floating debris potentially released during construction. Oil-absorbent materials will be employed immediately if visible sheen is observed. Accumulated debris will be collected daily and disposed of at a permitted upland site approved by the owner.
- Hydraulic water jets will not be used to install piles.
- Water quality standards and procedures that limit the impact of pollutants will be observed.
- Land-based staging areas for activities, such as storage of machinery, equipment, materials, and stockpiled soils will be established landward of the top of bank. A silt fence will be installed around the perimeter of the upland work areas and locations where machinery, materials, and stockpiled soils are situated. Any temporary stockpiles will be covered and bermed when not in use.
- All federal, state, and/or local construction permit requirements will be followed during demolition and construction activities.



1.4.2. In, Over, and Near Water AMMs

- In-water construction activities will comply with the in-water construction window (anticipated to be November 1 through February 28 within state and federal permits).
- Typical construction best management practices (BMPs) for working in, over, and near water will be applied, including activities such as the following:
 - Checking equipment for leaks and other problems that could result in the discharge of petroleum-based products or other material into waters of Baker Bay.
 - Corrective actions will be taken in the event of any discharge of oil, fuel, or chemicals into the water, including:
 - Containment and cleanup efforts will begin immediately upon discovery of a spill and will be completed in an expeditious manner in accordance with all local, state, and federal regulations. Cleanup will include proper disposal of any spilled material and used cleanup material.
 - The cause of any spill will be ascertained, and appropriate actions taken to prevent further incidents or environmental damage.
 - Spills will be reported to the Washington State Department of Ecology (Ecology) Southwest Regional Spill Response Office pursuant to WAC 173-303-145 and WAC 173-182-260.
 - Work barges will not be allowed to ground out.
 - Excess or waste materials will not be disposed of or abandoned waterward of ordinary high water or allowed to enter waters of the state. Waste materials will be disposed of in an appropriate manner consistent with applicable local, state, and federal regulations.
 - Demolition and construction materials will not be stored where wave action or upland runoff can cause materials to enter surface waters.
 - Oil-absorbent materials will be present on site for use in the event of a spill or if any oil product is observed in the water.

1.4.3. Pile Removal and Installation AMMs

Pile removal BMPs will be applied, including activities such as the following:



- Removal of creosote-treated piles will be conducted consistent with the BMPs established in U.S. Environmental Protection Agency (EPA) Region 10, Best Management Practices for Piling Removal and Placement in Washington State, dated February 18, 2016 (EPA 2016).
- While creosote-treated piles are being removed, a containment boom will surround the work area to contain and collect any floating debris and sheen. Debris will be retrieved and disposed of properly.
- The piles will be dislodged with a vibratory hammer when possible and will not be intentionally broken by twisting or bending.
- The piles will be removed in a single, slow, and continuous motion in order to minimize sediment disturbance and turbidity in the water column.
- If a pile breaks above or below the mudline, it will be cut or pushed in the sediment consistent with agency-approved BMPs (U.S. Army Corps of Engineers [USACE], Department of Natural Resources [DNR], Ecology, and EPA).
- Removed piles, stubs, and associated sediments (if any) will be contained on a barge. If piles are placed directly on the barge and not in a container, the storage area will consist of a row of hay or straw bales, filter fabric, or similar material placed around the perimeter of the barge.
- All creosote-treated material, pile stubs, and associated sediments (if any) will be disposed of by the contractor in a landfill approved to accept those types of materials.
- Steel piling will be installed with a vibratory hammer when possible. Impact hammering will start with light tapping, then increase to full force gradually.
- A bubble curtain and one or more other noise attenuation methods such as a wood cushion block will be used during impact installation or proofing of all steel piling.
- Pile-driving will commence with a soft start procedure (ramping up) in order to alert nearby wildlife, allowing them to move out of the area prior to construction activities. For impact pile driving, contractors will be required to provide an initial set of strikes from the hammer at reduced percent energy, each strike followed by no less than a 30-second waiting period. This procedure will be conducted a total of two times before impact pile driving begins.
- To avoid impacts to marine mammals, an exclusion zone will be monitored during and immediately before pile driving activities. The exclusion zone will include the entire marina area shoreward of the breakwaters. Although ESA-listed species, including Southern Resident killer whales and humpback whales are not anticipated to occur within the marina where noise

impacts could occur, this avoidance measure would provide further protections against potential noise impacts to these species.

- During pile driving activities a qualified observer will monitor the exclusion zone, if any marine mammals are observed within the exclusion zone, all in-water Project activities shall cease. Project activities shall not commence or continue until the marine mammal has either been observed having left the exclusion zone, or at least 15 minutes have passed since the last sighting whereby it is assumed the marine mammal has voluntarily left the exclusion zone.

1.4.4. Overwater Concrete Placement Minimization and Concrete Placement AMMs

The Project has been designed to minimize the placement of concrete over water. Where possible, pre-cast concrete elements will be used. On-site (wet) concrete placement, where needed, will follow appropriate AMMs, including:

- Wet concrete will not contact surface waters.
- Forms for any concrete structure will be constructed to prevent leaching of wet concrete.
- Concrete process water will not be allowed to enter surface waters. Any process water/contact water will be routed to a contained area for treatment and will be disposed of at an upland location.

2. Action Area

This section describes the defined geographic area that could be affected by the direct and indirect effects of the proposed action (the "Action Area"). The Action Area includes all areas that may be directly or indirectly affected by the proposed activities and expands beyond the immediate location of these activities. The Action Area includes the footprint, extent of potential water quality impacts, and all areas in which related noise will exceed background noise levels. The calculated Action Area was defined by the activity with the greatest potential for adverse impact. For the proposed Project, the greatest potential extent of an adverse impact is Project related noise. Therefore, noise was used to define the total extent of the Action Area (see Section 2.3 and Figure 4)

2.1. Proposed Project Footprint

The Project footprint consists of the physical location of the proposed work. This includes the installation of the bulkhead and fender piles, installation of riprap on the northern shoreline, replacement of armoring on the southern shorelines, removal of the creosote-treated retaining wall, and removal of the derelict creosote-treated piles. The Project footprint is depicted above in Section 1, Figure 3.

2.2. Water Quality

In-water construction activities have the potential to elevate turbidity levels due to sediment resuspension. The proposed activities including structure removal, pile installation, drainage rock placement, and riprap placement could result in small scale turbidity plumes however these would be anticipated to be minor, temporary, and localized to the immediate vicinity of the Project activities.

2.3. Underwater and Terrestrial Noise

The proposed repairs have the potential to result in temporary elevated underwater and terrestrial noise levels, with the most substantial construction activity-related noise being the installation of the sheet pile wall and fender piles. The total extent of Project related noise is defined as the distance in which Project related noise will attenuate to background noise levels. Background in-water and in-air noise levels are discussed in Section 2.3.1. Noise levels associated with the proposed pile installation activities are described in Section 2.3.2.



2.3.1. Background Noise Levels

2.3.1.1. In-water

Site specific underwater noise levels are not available but are anticipated to be elevated due to anthropogenic activities associated with the commercial fishing operations and the use of the marina. Underwater noise levels in deep slow-moving rivers are typically about 120 decibel (dB) root mean square (rms) (Washington Department of Transportation [WSDOT] 2020). Given the occurrence of the Project in the Columbia River, a deep slow-moving river, 120 dBrms has been used to represent the anticipated in-water background noise level for the Project area. However, it should be noted that background noise may be higher than 120 dBrms depending on the levels of activity occurring at the wharf and marina.

2.3.1.2. In-air

Site specific in-air noise levels are not available but are anticipated to be elevated due to anthropogenic activities including port and marina traffic within the area. Waterfront Way is a one-lane street immediately adjacent to the Project site and would be anticipated to contribute background traffic noise. In addition, Howerton Avenue, a two-lane road, is approximately 150 ft from the Project site. The speed limit for Howerton Avenue is 25 miles per hour (mph). The WSDOT Biological Assessment Manual (2020) reports typical traffic noise levels for various speed limits (ranging from 35 mph to 75 mph) and traffic counts, ranging from 125 per hour (hr) to 6,000/hr). Traffic noise levels for traffic counts of approximately 125 vehicles per hour traveling at speeds of 35 miles per hour (mph), is 57 A-weighted decibels (dBA) at 50 ft from the source (WSDOT 2020). The Project is located within an area zoned as light industrial and adjacent to areas zoned as low density commercial (City of Ilwaco 2022). Commercial and industrial activities within the vicinity would be anticipated to contribute to background noise levels. Measured in-air background noise levels at the Port of Bellingham, a larger Port facility, ranged from 69 dBA to 73 dBA during peak traffic hours (Landau 2007). In the absence of site specific in-air noise data, 60 dBA is assumed to be representative of the in-air background noise level given the commercial and industrial activities in the area and proximity to roads.

2.3.2. Project-related Noise Levels

2.3.2.1. In-water Noise Levels

The Project proposes to install a 225 lf steel sheet pile wall and approximately ten (10) 12-inch diameter fiberglass piles. The fiberglass piles consist of concrete piles with fiberglass casings and anticipated in-water noise levels are based on documented noise levels for concrete pile installation. Noise levels for



the installation of 12-inch diameter concrete piles are not available and therefore noise levels for the installation of 14-inch diameter concrete piles were used to conservatively approximate potential noise levels. It is anticipated that the steel sheet pile wall and fiberglass fender piles will be driven using a vibratory hammer. The option for impact proofing has been included in the event that difficult driving conditions are encountered. A bubble curtain would be used during the impact pile driving of steel sheet piles and a 5dB noise reduction has been assumed. Anticipated noise levels for the proposed pile installation activities are shown in Table 2.

Vibratory pile driving noise levels for the installation of fiberglass piles are not available. Therefore, vibratory noise levels are based on the impact installation of fiberglass piles. Vibratory pile driving generally results in noise levels that are 10 to 20 dB lower than impact pile driving (WSDOT 2020). The noise levels from vibratory installation have been conservatively assumed to be 10 dB lower than the noise levels emitted during impact installation (Table 2).

Table 2. Anticipated In-water Pile Driving Noise Levels

Pile Type	Installation Method	Anticipated Noise Level		
		dB peak	SEL	dBrms
Sheet Pile* ¹	Impact (attenuated)	204	161	170
Sheet Pile ¹	Vibratory	177	163	163
Concrete (14-inch diameter) ¹	Impact	183	146	157
Concrete (12-inch diameter) ^{1,2}	Vibratory	173	136	147

* Assumes 5dB reduction for use of bubble curtain

¹ California Department of Transportation (Caltrans) 2020

² WSDOT 2020

³ Sound exposure level (SEL)

The impact installation of steel sheet pile walls has the greatest potential to result in noise impacts and was therefore used to determine the total extent of in-water noise. In-water noise would dissipate to the 120 dBrms background noise levels within 13.5 miles of the proposed pile driving activities if not confined by adjacent land masses (Figure 4). The rubble breakwaters around the marina would be anticipated to limit the extent of in-water noise to the marina/port area (Figure 4). Noise calculations were completed in accordance with the WSDOT 2020 Biological Assessment Manual, using the practical spreading loss model and assuming a 4.5 dBA attenuation rate for each doubling distance.

2.3.2.2. In-air Noise Levels.

Airborne noise levels for the installation of steel sheet piles and/or fiberglass piles is not available. In general, vibratory pile drivers can result in airborne noise levels of up to 105 dBA at 50 ft from the source (WSDOT 2020). Similarly, impact pile drivers can result in noise levels of up to 105 dBA at 50 ft from the



source (WSDOT 2020). The piles proposed for installation are small in size and would likely result in noise levels of less than 105 dBA. However, for the purpose of this noise analysis, 105 dBA was used as a conservative estimate to assess potential airborne noise impacts. In-air pile driving noise would dissipate to 60 dBA background noise levels within 1.7 miles of the proposed pile driving activities (Figure 4). Noise calculations were completed in accordance with the WSDOT 2020 Biological Assessment manual, using the spherical spreading loss model and assuming a 6 BA attenuation rate for each doubling distance.



Figure 4. Action Area as Defined by In-water and In-air Noise

3. Status of Species and Critical Habitat

This Section discusses the ESA-listed species and critical habitat known to occur, or with the potential to occur, within the Action Area. Chinook salmon (*Oncorhynchus tshawytscha*) chum salmon (*Oncorhynchus keta*), Coho salmon (*Oncorhynchus kisutch*), sockeye salmon (*Oncorhynchus nerka*), steelhead (*Oncorhynchus mykiss*), bull trout (*Salvelinus confluentus*), green sturgeon (*Acipenser medirostris*), eulachon (*Thaleichthys pacificus*), leatherback sea turtle (*Dermochelys coriacea*), southern resident killer whales (*Orcinus orca*), humpback whale (*Megaptera novaeangliae*), western snowy plover (*Charadrius nivosus nivosus*), marbled murrelet (*Brachyramphus marmoratus*), and streaked horned lark (*Eremophila alpestris strigata*) could occur in the Project Area (Table 3). It was determined that the Project may affect, but is not likely to adversely affect (NLAA) the ESA-listed species listed in Table 3. Yellow billed cuckoo (*Coccyzus americanus*) and monarch butterfly (*Danaus plexippus*) were evaluated for their potential to occur in the Project Area. However, it was determined that these species will either not occur in the Project Area based on the location of the Project and available habitat or would not be impacted by the Project given the nature of the proposed activities (Table 4). The Project would have no effect on the species listed in Table 4.

Information for this BE regarding listed species was obtained from the USFWS Information for Planning and Consultation (IPaC) website (USFWS 2022a) and the NMFS West Coast Region protected species website and Protected Resources App database (NMFS 2022a and NMFS 2022b) on 20 June 2022. Additional information came from the Washington Department of Fish and Wildlife's (WDFW's) database, SalmonScape (WDFW 2022a).

Table 3. ESA-Listed Species with Potential to Occur Within the Project Action Area

Species	ESU/DPS	Scientific Name	Agency	Federal Status	Critical Habitat
Chinook Salmon	Lower Columbia River evolutionarily significant unit (ESU)	<i>Oncorhynchus tshawytscha</i>	NMFS	Threatened	Occurs in Action Area
	SNAKE RIVER fall-run ESU			Threatened	
	SNAKE RIVER spring/summer-run ESU			Threatened	
	Upper Columbia River spring-run ESU			Endangered	
	Upper Willamette River ESU			Threatened	
Chum Salmon	Columbia River ESU	<i>O. keta</i>	NMFS	Threatened	Occurs in Action Area
Coho Salmon	Lower Columbia River ESU	<i>O. kisutch</i>	NMFS	Threatened	Occurs in Action Area

Species	ESU/DPS	Scientific Name	Agency	Federal Status	Critical Habitat
Sockeye Salmon	Snake River ESU	<i>O. nerka</i>	NMFS	Endangered	Occurs in Action Area
Steelhead	Lower Columbia River Distinct Population Segment (DPS)	<i>Onorhynchus mykiss</i>	NMFS	Threatened	Occurs in Action Area
	Middle Columbia River DPS			Threatened	
	Snake River Basin DPS			Threatened	
	Upper Columbia River DPS			Threatened	
	Upper Willamette River DPS			Threatened	
Green sturgeon	Southern DPS	<i>Acipenser medirostris</i>	NMFS	Threatened	Occurs in Action Area
Eulachon	Southern DPS	<i>Thaleichthys pacificus</i>	NMFS	Threatened	Occurs in Action Area
Sea turtles	Leatherback	<i>Dermochelys coriacea</i>	NMFS	Endangered	None in Action Area
Killer Whale	Southern Resident	<i>Orcinus orca</i>	NMFS	Endangered	None in Action Area
Humpback Whale	Central America DPS	<i>Megaptera novaeangliae</i>	NMFS	Endangered	None in Action Area
	Mexico DPS			Threatened	None in Action Area
Bull Trout	N/A	<i>Salvelinus confluentus</i>	USFWS	Threatened	None in Action Area
Western Snowy Plover	N/A	<i>Charadrius nivosus</i>	USFWS	Threatened	None in Action Area
Marbled Murrelet	N/A	<i>Brachyramphus marmoratus</i>	USFWS	Threatened	None in Action Area
Streaked Horned Lark	N/A	<i>Eremophila alpestris strigata</i>	USFWS	Threatened	None in Action Area

Source: USFWS Information for Planning and Consultation (IPaC) database (USFWS 2022) and the NOAA Fisheries Protected Resources App (NOAA 2022).

Table 4. ESA-Listed Species Determined to not Occur in Project Area or be Impacted by Project

Species	Scientific Name	Agency	Status	Additional Information
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	USFWS	Threatened	Yellow-billed cuckoo believed to be extirpated from all its historical range in Washington (85 Federal Register [FR] 11465). Associated with cottonwood and willow riparian habitat, a habitat that does not occur in the Action Area.
Monarch Butterfly	<i>Danaus plexippus</i>	USFWS	Candidate	Proposed activities would not destroy vegetation that could provide habitat. Impacts would not occur.

Source: USFWS (IPaC) database (USFWS 2022)



4. Listed Species and Critical Habitat

4.1. Chinook Salmon (*Oncorhynchus tshawytscha*)

The Action Area is potential habitat for five ESU of Chinook salmon (*Oncorhynchus tshawytscha*): the Lower Columbia River (LCR), Upper Willamette River (UWR), Upper Columbia River (UCR), Snake River spring/summer-run (SR-SS), and Snake River fall-run (SR-F).

The LCR ESU of Chinook salmon includes all natural spawning populations in river reaches accessible to Chinook salmon in Columbia River tributaries between the Grays and White Salmon Rivers in Washington and the Willamette and Hood Rivers in Oregon (70 FR 37160). The other ESUs with the potential to occur within the Action Area use the Columbia River as a migratory corridor to spawning and rearing habitats higher in the watershed.

The most recent 5-year status reviews for these ESUs indicate that there has been some modest increase in abundance for some ESU populations, but most are not currently meeting recovery goals (NMFS 2016a). Native stocks are scarce or nonexistent (Myers et al. 1998; Lower Columbia Fish Recovery Board [LCFRB] 2010a). Habitat degradation due to stream blockages, forest practices, urbanization, and agriculture are listed as primary causes of decline.

4.1.1. Distribution and Habitat Requirements

Chinook salmon have the most complex life history with a large variety of patterns compared to other Pacific salmon. The length of freshwater and saltwater residency varies greatly (Myers et al. 2006). Channel size and morphology, substrate size and quality, water quality, and cover type and abundance may influence distribution and abundance of Chinook salmon (Lower Columbia Fish Recovery Board [LCFRB] 2010a). Columbia River stocks return to spawn in the fall and spring after three to five years in the ocean. Spawning occurs in the mainstems of larger tributaries in coarse gravel and cobble (Myers et al. 1998).

4.1.2. Presence in Action Area

Habitat use within the Action Area is variable, depending on the stock. Adult fish migrate through the Action Area almost year-round. Depending on the ESU, adults enter the LCR between February and November and spawn in tributaries from August through September (Myers et al. 2006, LCFRB 2010b). The portion of the LCR that is within the Action Area does not provide any suitable spawning or rearing habitat for Chinook salmon, as suitable spawning substrate is virtually non-existent. If they are present, migrating adults are expected to be moving quickly through the Action Area.



Juvenile movement through the Action Area is also variable depending on the stock. Juveniles often move into the LCR and estuary to over-winter (LCFRB 2010c). Spring Chinook tend to rear in tributary streams for a year, and yearlings out-migrate rapidly during the spring freshet (LCFRB 2010b). Fall Chinook tend to out-migrate as sub-yearlings in the late summer and fall of their first year (LCFRB 2010b). These fish are more likely to spend days to weeks residing in tidal freshwater habitats with peak abundances occurring March through May (Hering et al. 2010; McNatt et al. 2016). Smaller sub-yearling salmonids will likely congregate along the nearshore areas in shallow water and extend into the channel margins (Bottom et al. 2011), but some research indicates there is higher use of the channel margins than previously thought (Carlson et al. 2001) and relative juvenile position in the water column suggests higher potential sub-yearling use in areas of 20- to 30-ft-deep.

4.1.3. Critical Habitat

The proposed action occurs within designated critical habitat for all five ESU Chinook salmon. Table 5 provides a brief summary of the critical habitat designations.

Table 5. Chinook Salmon Critical Habitat Designations and Descriptions

Species and ESU/DPS	Date of Designation	Description of Critical Habitat
Chinook Salmon		
Lower Columbia River ESU	2 September 2005	Columbia River to confluence with Hood River and tributaries.
Upper Willamette River ESU	2 September 2005	Columbia River to confluence with Willamette River. Willamette River, including Willamette Channel, and tributaries.
Upper Columbia River Spring-Run ESU	2 September 2005	Columbia River to Island Dam and tributaries.
Snake River Spring/Summer-Run ESU	25 October 1999	Columbia River to confluence with Snake River. Snake River and tributaries.
Snake River Fall-Run ESU	28 December 1993	Columbia River to confluence with Snake River. Snake River and tributaries.

Critical habitat is a specific geographic area that contains features essential to the conservation of the species. The primary constituent elements (PCEs) determined essential for to the conservation of salmon and steelhead and the presence or absence of these PCEs are discussed below. These PCEs are consistent for all ESU/DPS salmon and steelhead addressed in this BE and this Section will be referenced in discussion for those ESU/DPS below.

- ***Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development.***

The Action Area is situated at the mouth of the Columbia River where saline ocean water mixes with and is diluted by freshwater from the river system and does not provide suitable freshwater spawning habitat for salmon and steelhead.



- ***Freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.***

The Action Area does not provide suitable freshwater habitat necessary to support juvenile growth and mobility, or juvenile development because is situated within an estuarine environment where saline ocean water mixes with freshwater from the river system.

- ***Freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.***

The Action Area does not provide suitable freshwater migration habitat because it is situated within an estuarine environment where saline ocean water mixes with freshwater from the river system. It is possible that adult and juvenile salmon and steelhead migrate through the Action Area between their off-shore marine habitats and freshwater natal streams, however the nature of the estuarine environment within the Action Area is not a freshwater system.

- ***Estuarine areas free of obstruction with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh-and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.***

The Action Area provides only marginal estuarine rearing habitat for juvenile salmonids. The marina is enclosed by rock jetties with only limited natural cover or aquatic vegetation. Most of the shoreline consists of developed and/or armored areas with only short statured vegetation when present. West of the marina there is approximately 1,000 ft of more natural vegetated shoreline that provides cover, overhanging vegetation, and woody debris. The marina does not provide any side channel or off-channel habitat. The portion of the LCR that is within the Action Area does provide suitable habitat for juvenile growth, mobility, or forage, but offers very limited, suboptimal habitat for juvenile rearing, growth and maturation, and/or juvenile or adult forage.

- ***Nearshore marine areas free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.***

The Action Area provides only marginal nearshore habitat for salmonids. The enclosed marina does not provide natural cover, submerged or overhanging large wood, aquatic vegetation, rocks, boulders, or



side channels. Most of the shoreline consists of developed and/or armored areas with only short statured vegetation when present. West of the marina there is some naturally vegetated shoreline that provides cover, overhanging vegetation, and woody debris. The in-water Action Area likely provides suitable water quality and quantity conditions to support foraging behavior (aquatic invertebrates and fish) for adult and juvenile salmonids. The portion of the LCR that is within the Action Area does provide suitable habitat for juvenile growth, maturation, and forage, but available habitat is limited and suboptimal compared to better quality habitat immediately outside of the Action Area within Baker Bay.

- ***Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.***

The Action Area does not provide offshore marine habitat for salmon and steelhead. As mentioned previously, the Action Area consists of the estuarian and nearshore habitat of Baker Bay at the mouth of the LCR where ocean water mixes with freshwater from the river system.

4.2. Chum Salmon (*Oncorhynchus keta*)

The proposed Project area is located within the Columbia River ESU of chum salmon (*Oncorhynchus keta*). The Columbia River ESU of chum salmon includes all naturally spawning populations in all river reaches accessible to chum salmon in the Columbia River downstream from Bonneville Dam (70 FR 37160).

The majority of the populations in this ESU are at high to very high risk, with very low abundances (NWFSC 2015). Columbia River ESU chum salmon are essentially extirpated upstream of Bonneville Dam. Only three populations (Grays River, Hardy Creek, and Hamilton Creek) are at low to moderate risk. The ESU as a whole remains at moderate to high risk. Habitat loss and degradation due to dam placement, forest practices, and urbanization are the most significant causes of decline in this ESU (Johnson et al. 1991; LCFRB 2010a).

4.2.1. Distribution and Habitat Requirements

Historically, chum salmon were very abundant in the Columbia River. They have the broadest spawning distribution of Pacific salmon species. Chum salmon have a very short freshwater residency time, and require cool, clean water, and substrate for spawning. Migration to saltwater occurs immediately after emerging from the gravel. After three to five years in saltwater, Columbia River chum salmon return to spawn in the fall. Spawning typically takes place in the lower mainstems of rivers, including the Columbia River, frequently in locations within the tidal zone where there is an abundance of clean gravel.



4.2.2. Presence in Action Area

Adults likely use the Action Area only as a migration corridor. Adult fish enter freshwater and likely migrate through the Action Area from mid-October through November and spawn from early November to late December. Spawning occurs in low-gradient, low-elevation reaches of the LCR and major tributaries (LCFRB 2010b). Spawning habitat requirements include clean gravel and spawning sites are typically associated with areas of upwelling water (LCFRB 2010a). No suitable spawning habitat exists within the Action Area.

Juvenile out-migration to the Columbia River estuary for rearing occurs soon after emergence from spawning gravels, from mid-February to mid-June. Chum salmon usually spend more time in estuaries than do other anadromous salmonids (Dorcey et al. 1978 and Healey et al. 1982, as cited in NMFS 2013)—(up to weeks or months) (NMFS 2011). Shallow, protected habitats such as salt marshes, tidal creeks, and intertidal flats serve as rearing areas for juvenile chum salmon during estuarine residency (LCFRB 2010a). Juvenile chum salmon rear in the Columbia River estuary from February through June before beginning long-distance ocean migrations (LCFRB 2010a).

No backwater channels habitat suitable for rearing chum salmon occur within the Action Area and nearshore habitat that does occur within the Action Area is not optimal for rearing. Chum salmon may rear within the Action Area.

4.2.3. Critical Habitat

The proposed action occurs within designated critical habitat for all Columbia River ESU chum salmon. Table 6 provides a brief summary of the critical habitat designations.

Table 6. Chum Salmon Critical Habitat Designations and Descriptions

Species and ESU/DPS	Date of Designation	Description of Critical Habitat
Chum Salmon		
Columbia River ESU	2 September 2005	Columbia River to confluence with Hood River and tributaries.

Critical habitat is a specific geographic area that contain features essential to the conservation of the species. The PCEs determined essential to the conservation of salmon and steelhead that could be present within the Action Area are consistent for all ESU/DPS salmon and steelhead addressed in this BE. See Section 4.1.3 above for discussion of PCE presence within the Action Area.



4.3. Coho Salmon (*Oncorhynchus kisutch*)

The Action Area is located within the LCR ESU of Coho salmon (*Oncorhynchus kisutch*). This ESU includes all natural spawning populations in Columbia River tributaries below the Klickitat River in Washington and the Deschutes River in Oregon (including the Willamette River up to Willamette Falls) (70 FR 37160).

Of the 24 populations that make up this ESU, 21 populations are at very high risk, one population is at high risk, and two populations are at moderate risk. While recovery efforts have likely improved the status of a number of Coho salmon populations, abundance is still at low levels and the majority of the populations remain at moderate or high risk. Limiting factors for this ESU include degraded habitat and restricted access (e.g., altered flow regime in the Columbia River, sediment and nutrient changes in the estuary, fish passage barriers, reduced access to off-channel rearing habitat, and presence of contaminants), and over harvesting (LCFRB 2010b).

4.3.1. Distribution and Habitat Requirements

Historically, Coho salmon spawned in almost every accessible stream system in the LCR and typically occupy intermediate positions in tributaries relative to chum and fall-run Chinook (downstream) and steelhead and spring-run Chinook (upstream) (LCFRB 2010a). Coho salmon usually spawn in small to medium, low-to-moderate elevation streams and favor small, rain-driven, lower elevation streams characterized by late summer and early fall low flows, and increased river flows with cooler water temperatures in winter (LCFRB 2010a). Redds are constructed in gravel and small cobble substrate in pool tailouts, riffles, and glides and sufficient flow depth is required for spawning activity (NMFS 2013). Eggs incubate over late fall and winter for about 45 to 140 days, depending on water temperature, Fry typically emerge from early spring to early summer. Hatching success depends on clean gravel that is not choked with sediment or subject to extensive scouring by floods (LCFRB 2010a).

Juveniles rear in freshwater for more than a year. Fry move to shallow low-velocity environments (stream edges and side channels) after emergence. Juveniles favor pools and will congregate in backwaters and side channels (LCFRB 2010a). Most juvenile Coho salmon migrate seaward as smolts in April to June, (typically during their second year). Coho generally do not linger for extended periods in the LCR estuary, but it is a critical habitat used for feeding during the physiological adjustment to salt water. Juvenile Coho salmon are present in the LCR estuary from March to August (LCFRB 2010a). Adult Coho salmon return from the ocean to spawn during fall freshets in September and October.

The distribution and abundance of Coho salmon are most likely influenced by water temperature, stream size and flow, channel morphology, vegetation type and abundance, and channel substrate.



4.3.2. Presence in Action Area

There are two types of run timing associated with Coho, Type S, which are early run, and Type N, which are late run (Myers et al. 2006). Type S fish generally return to the Columbia River from August to October and spawn in October and November. Type N fish return to the Columbia River from October to November/ December and spawn in November through January. Some Type N Coho can spawn as late as mid-February (Myers et al. 2006).

Spawning in the tributaries of the LCR occurs roughly November through January (Weitkamp 1994). No suitable spawning habitat is present within the Action Area.

Juveniles rear in smaller tributaries and are not anticipated to rear in significant numbers within the Action Area. Juvenile out-migration occurs in the spring and summer of the second year, with the peak occurring in May (LCFRB 2010b). Depending on the degree of maturation, some juveniles may forage in the Action Area during out-migration.

4.3.3. Critical Habitat

The proposed action occurs within designated critical habitat for LCR ESU Coho salmon. Table 7 provides a brief summary of the critical habitat designations.

Table 7. Coho Salmon Critical Habitat Designations and Descriptions

Species and ESU/DPS	Date of Designation	Description of Critical Habitat
Coho Salmon		
Lower Columbia River ESU	24 February 2016	Columbia River to confluence with Hood River and tributaries.

Critical habitat is a specific geographic area that contain features essential to the conservation of the species. The PCEs determined essential for to the conservation of salmon and steelhead that could be present within the Action Area are consistent for all ESU/DPS salmon and steelhead addressed in this BE. See Section 4.1.3 above for discussion of PCE presence within the Action Area.

4.4. Sockeye Salmon (*Oncorhynchus nerka*)

The Action Area is located within the Snake River ESU of sockeye salmon (*Oncorhynchus nerka*). The Snake River ESU of sockeye salmon includes all river reaches and estuary areas presently or historically accessible to sockeye salmon in the Columbia River. This is defined as all river reaches east of a straight line connecting the west end of the Clatsop Jetty (Oregon side) and the west end of the Peacock Jetty (Washington side), and extending upstream to the confluence of the Snake River, upstream on the Snake River to the confluence of the Salmon River, and upstream on the Salmon River to the confluence of the



Alturas Lake Creek and Stanley, Redfish, Yellow Belly, Pettit, and Alturas Lakes (including their inlet and outlet tributaries) (70 FR 37160).

The Snake River ESU of sockeye salmon is extremely close to extinction. There has been substantial progress on developing hatchery program(s) to amply stock and facilitate reintroductions and captive brood programs have been successful in providing substantial numbers of hatchery produced fish for use in supplementation efforts, but this single population ESU is at very high risk due to small population size (NMFS 2016b). Limiting factors for this ESU include effects related to the hydropower system on the Columbia River, reduced water quality and elevated temperatures, water quality, and predation. The only extant sockeye salmon in the Snake River ESU spawn in lakes in the Stanley basin of Idaho.

4.4.1. Distribution and Habitat Requirements

Historically, adult sockeye salmon in the Snake River ESU enter the LCR in June and July and migrate upstream through the Snake and Salmon Rivers, arriving at their natal lakes in August and September. Spawning peaks in October and occurs in lakeshore gravels. Fry emerge in late April and May and move immediately to the open waters of the lakes where they feed on plankton for one to three years before migrating to the ocean (NMFS 2015). Juvenile sockeye generally leave Redfish Lake from late April through May and migrate to the Pacific Ocean. Snake River ESU sockeye salmon spend two to three years in the Pacific Ocean before returning to their natal lakes to spawn (NMFS 2015).

4.4.2. Presence in Action Area

Adult and juvenile sockeye salmon are expected to migrate through the Project vicinity. In the Columbia River basin, sockeye salmon spawn and rear in lakes in the upper Snake River watershed. Adults likely migrate through the Action Area in June and July. Juvenile out-migration begins in early spring after ice breakup on the lakes (LCFRB 2010c), and out-migrating juveniles are likely present within the Action Area between April and June.

4.4.3. Critical Habitat

The proposed action occurs within designated critical habitat for Snake River ESU sockeye salmon. Table 8 provides a brief summary of the critical habitat designations.

Table 8. Sockeye Salmon Critical Habitat Designations and Descriptions

Species and ESU/DPS	Date of Designation	Description of Critical Habitat
Sockeye Salmon		
Snake River ESU	28 December 1993	Columbia River to confluence with Snake River. Snake River and tributaries.



Critical habitat is a specific geographic area that contain features essential to the conservation of the species. The PCEs determined essential for to the conservation of salmon and steelhead that could be present within the Action Area are consistent for all ESU/DPS salmon and steelhead addressed in this BE. See Section 4.1.3 above for discussion of PCE presence within the Action Area.

4.5. Steelhead (*Oncorhynchus mykiss*)

The Action Area represents potential habitat for five ESUs of steelhead (*Oncorhynchus mykiss*): the LCR, UWR, Middle Columbia River (MCR), UCR, and Snake River Basin ESU. The LCR within the Action Area represents a migration corridor for these five ESUs.

Factors contributing to the decline of the steelhead ESU in the Columbia River include predation and competition, blocked access to historical habitat, habitat degradation, hatchery practices, and urbanization. Despite the ability of steelhead to use a diversity of habitats, very few healthy stocks remain within the Columbia River basin (LCFRB 2010c).

4.5.1. Distribution and Habitat Requirements

Steelhead is the most widely distributed anadromous salmonid. The life history pattern of steelhead can be very complex, involving repeated spawnings, and continuous reversals of freshwater to ocean phases (LCFRB 2010c). The distribution and abundance of steelhead are thought to be influenced by water temperature, stream size, flow, channel morphology, vegetation type and abundance, and channel substrate size and quality (LCFRB 2010c). Steelhead use a wide range of habitat types from low-order tributaries to river mainstems depending upon the specific requirements of a particular life stage (61 FR 41541). Steelhead ESU that migrate within the LCR return in the spring and fall to spawn. Spawning occurs in small to large gravel of tributaries and smaller rivers (LCFRB 2010b). Fry emergence typically occurs from March into July, with peak emergence time generally in April and May (NMFS 2015). Fry usually move to the shallow margins of streams following emergence and begin inhabiting deeper, higher velocity environments as they grow. Juvenile steelhead rear in freshwater streams for 1 to 4 years before migrating to the ocean. Outmigration generally occurs from March to June. Catch data suggest that juvenile steelhead migrate directly offshore during their first summer.

4.5.2. Presence in Action Area

Adult and juvenile steelhead most likely use the Action Area as a migration corridor. Adults likely migrate through the Action Area year-round, depending on the run type. Summer steelhead migrate upstream within the Columbia River between roughly May and October, with spawning occurring in tributaries



between late February and early April. Winter-run adults enter the LCR between December and May, spawning in tributaries in late April and early May.

Peak adult spawning for both summer and winter runs occurs in the spring. Spawning occurs in the tributaries throughout the Columbia River basin (LCFRB 2010b). In streams that support both summer and winter steelhead runs, summer steelhead tend to spawn higher in the watershed. No suitable steelhead spawning habitat occurs within the Action Area.

The peak juvenile out-migration through the LCR occurs in the spring. Over-wintering and out-migrating juvenile steelhead occupy the nearshore habitat within the Project area. Juvenile steelhead may be present in high numbers during migration periods.

4.5.3. Critical Habitat

The proposed action occurs within designated critical habitat for all five ESU of listed steelhead. Table 9 provides a brief summary of the critical habitat designations.

Table 9. Steelhead Critical Habitat Designations and Descriptions

Species and ESU/DPS	Date of Designation	Description of Critical Habitat
Steelhead		
Lower Columbia River DPS	2 September 2005	Columbia River to confluence with Hood River and tributaries.
Upper Willamette River DPS	2 September 2005	Columbia River to confluence with Willamette River, Willamette River, including Willamette Channel, and tributaries.
Middle Columbia River DPS	2 September 2005	Columbia River to confluence with Yakima River and tributaries.
Upper Columbia River DPS	2 September 2005	Columbia River to Chief Joseph Dam and tributaries.
Snake River Basin DPS	2 September 2005	Columbia River to confluence with Snake River, Snake River and tributaries.

Critical habitat is a specific geographic area that contain features essential to the conservation of the species. The PCEs determined essential for to the conservation of salmon and steelhead that could be present within the Action Area are consistent for all ESU/DPS salmon and steelhead addressed in this BE. See Section 4.1.3 above for discussion of PCE presence within the Action Area.

4.6. Bull Trout (*Salvelinus confluentus*)

The Project area is located within the Columbia River DPS of bull trout (*Salvelinus confluentus*). Excluding one Nevada population, the Columbia River DPS includes all natural spawning populations in the Columbia River basin within the U.S. and its tributaries (FR 63 31647). Bull trout in the Columbia River DPS are listed as threatened under the ESA. Bull trout are piscivorous and are the only native char.



Key factors in the decline of bull trout populations include harvest by anglers, impacts to watershed biological integrity, and the isolation and fragmentation of populations. Changes in sediment delivery (particularly to spawning areas), degradation and scouring, shading (high water temperature), water quality, and low hydrologic cycles adversely affect bull trout. Therefore, impacted watersheds are negatively associated with current populations. Bull trout also appear to be affected negatively by non-native trout species through competition and hybridization.

4.6.1. Distribution and Habitat Requirements

Bull trout were once widely distributed throughout the Pacific Northwest but have been reduced to approximately 44 percent of their historical range (LCFRB 2010c). Bull trout are thought to have more specific habitat requirements in comparison to other salmonids and are most often associated with undisturbed habitat with diverse cover and structure. Spawning and rearing are thought to be primarily restricted to relatively pristine cold streams, often within headwater reaches (Rieman and McIntyre 1993). Adults can reside in lakes, reservoirs, and coastal areas or they can migrate to saltwater (63 FR 31647). Juveniles are typically associated with shallow backwater or side-channel areas, while older individuals are often found in deeper pools sheltered by large organic debris, vegetation, or undercut banks (63 FR 31647). Water temperature is also a critical factor for bull trout and areas where water temperature exceeds 59°F (15°C) are thought to limit distribution (Rieman and McIntyre 1993).

4.6.2. Presence in Action Area

In southwest Washington, bull trout have been reported in the North Fork Lewis, White Salmon, and Klickitat River systems (USFWS 1998). Historically, bull trout were found in the Cowlitz and Kalama basins but are not believed to be present there today. Bull trout populations occur in two drainages downstream of Bonneville Dam: the Willamette River and the Lewis River (USFWS 1998). Because bull trout in the LCR basin are not usually anadromous, they are primarily regulated by local habitat conditions, and not directly affected by conditions in the mainstem Columbia River and estuary (LCFRB 2010c).

The only core areas presently supporting anadromous populations of bull trout are located within the Puget Sound and Olympic Peninsula regions. Although bull trout in the LCR region share a genetic past with the Puget Sound and Olympic Peninsula regions, it is unclear to what extent the LCR core areas supported the anadromous life history in the past or could in the future (Ardren et al. 2011 in USFWS 2015a).



Bull trout prefer the upper reaches of cold, clear running streams with clean gravel and cobble substrate for spawning. Adult bull trout in the Columbia River basin spawn in headwater tributaries and forage in mainstem freshwater reaches of larger rivers. It is unlikely that bull trout would occur in the Action Area because it is located within the marine/mixing zone of the Columbia River estuary.

4.6.3. Critical Habitat

The critical habitat designation and description for Columbia River DPS bull trout are summarized in Table 10.

Table 10. Bull Trout Critical Habitat Designation and Descriptions

Species and ESU/DPS	Date of Designation	Description of Critical Habitat
Bull Trout		
Columbia River DPS	17 November 2010	Mainstem Columbia River and major tributaries from mouth to Chief Joseph Dam.

The PCEs determined essential to the conservation of Columbia River DPS bull trout are as follows:

- *Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.*

The Action Area does not provide these habitat characteristics and will not impact these PCEs of bull trout critical habitat.

- *Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.*

The Action Area may serve as a migratory corridor for bull trout. However, habitat conditions within the Action Area severely limit its suitability. No natural cover, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, or large rocks and boulders exist within the active marina. As previously discussed there is more natural shoreline on the west side of the Action Area that may provide limited marginal resources for bull trout mobility and survival.

- *An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.*

The Action Area does provide habitat for native and non-native juvenile fishes and aquatic macroinvertebrates that serve as prey for bull trout.

- *Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.*



The Action Area includes a developed marina that is dredged to maintain vessel access and shorelines that are engineered. As previously discussed, the west side of the marina does provide some more natural shoreline characteristics. The Action Area does not provide these habitat characteristics and the will not impact these PCEs of bull trout critical habitat.

- ***Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.***

The LCR downstream of Bonneville Dam does not typically achieve water temperatures that would be suitable for bull trout (USACE 2011a). Summer water temperatures frequently exceed thresholds considered necessary for salmonid growth and survival (Tanner et al. 2012). The Action Area may provide suitable conditions for bull trout survival throughout the year but in general this PCE is not present within the Action Area and the Project will not impact this PCE of bull trout critical habitat.

- ***In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system.***

The Action Area does not provide these habitat characteristics and the Project will not impact these PCEs of bull trout critical habitat.

- ***A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.***

Freshwater flows of the Columbia River are controlled for hydroelectric operations of the Bonneville Dam. Hydrologic control of the Columbia River at Bonneville Dam has altered the natural hydrograph of the river system, however, operations at the dam implement “target flows” to ensure adequate instream flows to support salmon and steelhead life stages including smolt outmigration. At the mouth of the Columbia River (including the Action Area) hydrologic forces are primarily dominated by tidal forces. This PCE is functioning within the river system, though as previously stated, the Action Area is primarily dominated by tidal forces. The Project would not impact this PCE of bull trout critical habitat.

- ***Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.***

Water quality within the Action Area is moderately impaired, but likely suitable for survival of migrating adults and out-migrating juveniles. Portions of the LCR within the Action Area are listed on the Ecology’s

303(d) list for bacteria (fecal coliform) (Ecology 2022). Water quantity, while artificially maintained by upstream control structures, is assumed to be sufficient for survival of migrating adults and out-migrating juveniles. Minor, localized, and temporary effects from increased suspended sediment due to construction activities are likely, however, BMPs will be implemented to reduce turbidity and/or any incidental impacts to water quality as the result of leaks or spills.

- ***Sufficiently low levels of occurrence of nonnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.***

Northern pike, small mouth bass, and brown trout have been documented in the Columbia River, however these freshwater species are not likely to occur in the saline mixing zone that defines the Action Area. Catch reports indicate that these areas are primarily inhabited by saltwater species such as Pacific halibut and black seabass, and anadromous salmon species. The Project will not alter the presence or absence of non-native predatory, interbreeding, or competing species.

4.7. North American Green Sturgeon (*Acipenser medirostris*)

The Southern DPS of North American green sturgeon (*Acipenser medirostris*) are listed as threatened under the ESA. The LCR estuary below RM 46 has been designated as critical habitat (74 FR 52299).

The most recent 5-year Status Review for this species was conducted in 2021 (NMFS 2021). The review indicates that there has not been significant change in the status of Southern DPS green sturgeon. Threats include commercial and sport fisheries, modification of spawning habitats (e.g., as a result of logging, agriculture, mining, road construction, and urban development in coastal watersheds), entrainment in water Project diversions, and pollution. All known spawning rivers have flow regimes affected by water Projects (NMFS 2018).

4.7.1. Distribution and Habitat Requirements

The green sturgeon is distributed throughout Alaska, Washington, California, and Oregon (McCabe and Tracy 1994). The Southern DPS of North American green sturgeon includes individuals from coastal and Central Valley populations south of the Eel River in California. At the time of listing there was only one known spawning population in the Sacramento River (71 FR 17757). Spawning has since been documented in the Feather and Yuba rivers, which are tributaries to the Sacramento River (Seesholtz et al. 2015; Beccio 2018, 2019). The Columbia River does not support spawning populations of green sturgeon (71 FR 17757). Adults and subadults from this DPS migrate up the coast and use coastal estuaries, including the LCR, for resting and feeding during the summer. In the mid-1930s, before

Bonneville Dam was constructed, green sturgeon were found in the Columbia River up to the Cascades Rapids; today, they occur upriver to Bonneville Dam but are predominantly found in the lower reach of the river. The estuaries of Willapa Bay, the Columbia River, and Grays Harbor are late summer concentration areas (NMFS 2018).

4.7.2. Presence in Action Area

Adult and subadult green sturgeon are typically present in the LCR from June through August, with August the peak month (McCabe and Tracy 1994). It is possible that during the months of June through August green sturgeon could be present in the Action Area.

4.7.3. Critical Habitat

The proposed action occurs within designated critical habitat for the Southern DPS of North American green sturgeon. Table 11 shows the date of the designation and gives a general description of the area designated (NMFS 2009a).

Table 11. North American Green Sturgeon Critical Habitat Descriptions

Species and ESU/DPS	Date of Designation	Description of Critical Habitat
North American Green Sturgeon		
Southern DPS	9 October 2009	Columbia River mouth to RM 74.

The specific PCEs determined essential to the conservation of Southern DPS of North American green sturgeon in estuarine and coastal marine areas include:

- ***Abundant prey items within estuarine habitats and substrates for juvenile, subadult, and adult life stages.***

The Action Area represents habitat providing suitable prey items for adult green sturgeon. Juvenile green sturgeon are not likely to be present within the Action Area. Migrating adults and subadults typically feed on benthic species such as shrimp, clams, and benthic fishes (NMFS 2018). The Action Area likely provides an adequate source of prey items for migrating adult and subadult green sturgeon.

- ***Within bays and estuaries adjacent to the Sacramento River (i.e., the Sacramento-San Joaquin Delta and the Suisun, San Pablo, and San Francisco bays), sufficient flow into the bay and estuary to allow adults to successfully orient to the incoming flow and migrate upstream to spawning grounds.***

The Action Area is not located within the specified estuarine areas identified for the PCE. Green sturgeon are not known to spawn in the Columbia River or its tributaries and the Action Area does not represent

habitat between marine/estuarine habitat and spawning grounds. This PCE of green sturgeon habitat is not present within the Action Area and the Project will not impact this PCE.

- ***Water quality, including temperature, salinity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages.***

Water quality conditions are adequate to support migrating adult and subadult green sturgeon that may be present within the Action Area.

- ***A migratory pathway necessary for the safe and timely passage of Southern DPS fish within estuarine habitats and between estuarine and riverine or marine habitats.***

Green sturgeon are not known to spawn in the Columbia River or its tributaries and the Action Area does not represent habitat between marine/estuarine habitat and spawning grounds. As the Columbia River does not represent suitable spawning habitat, the Action Area is most likely used as foraging habitat for migrating adult green sturgeon. The deep-water habitat is largely unobstructed, and likely is adequate to allow the safe and timely passage of migrating green sturgeon. High levels of shipping traffic on the Columbia River likely influence the usability of the shipping channel as a migratory corridor.

- ***Diversity of depths necessary for shelter, foraging, and migration of juvenile, subadult, and adult life stages.***

The Action Area has limited complexity regarding diversity of depths because the marina is dredged to maintain vessel access. The Action Area likely represents marginally suitable nearshore estuarine habitat for shelter, foraging, and migration of adult life stages of green sturgeon.

- ***Sediment quality (i.e., chemical characteristics) necessary for normal behavior, growth, and viability of all life stages.***

Sediments within the Action Area are expected to meet this criterion. At minimum, the Action Area does likely provide sediment quality conditions that are suitable for the normal behavior, growth, and viability of migrating adult green sturgeon, which is the only life stage that is expected to occur within the Action Area.

- ***A migratory pathway necessary for the safe and timely passage of Southern DPS fish within marine and between estuarine and marine habitats.***

The Columbia River does not represent suitable spawning habitat, but the Action Area is most likely used as foraging habitat for migrating adult green sturgeon. The deep-water habitat is largely unobstructed, and likely is adequate to allow the safe and timely passage of migrating green sturgeon.

- ***Coastal marine waters with adequate dissolved oxygen levels and acceptably low levels of contaminants (e.g., pesticides, PAHs, heavy metals that may disrupt the normal behavior, growth, and viability of subadult and adult green sturgeon).***



Water quality conditions are adequate to support migrating adult and subadult green sturgeon that may be present within the Action Area. Portions of the Columbia River within the Action Area are listed on the Ecology's 303(d) list for bacteria (fecal coliform) (Ecology 2022). Water quantity, while artificially maintained by upstream control structures, is assumed to be sufficient for survival

- ***Abundant prey items for subadults and adults, which may include benthic invertebrates and fish.***

The Action Area represents habitat providing suitable prey items for adult green sturgeon. Migrating adults and subadults typically feed on benthic species such as shrimp, clams, and benthic fishes (NMFS 2018). The Action Area likely provides an adequate source of prey items for migrating adult and subadult green sturgeon.

4.8. Pacific Eulachon (*Thaleichthys pacificus*)

Pacific eulachon (*Thaleichthys pacificus*) are small anadromous fish that occur offshore in marine waters and return to tidal areas of rivers to spawn in late winter and early spring (WDFW and Oregon Department of Fish and Wildlife [ODFW] 2001). Pacific eulachon (commonly called smelt) in the LCR are considered part of the southern DPS and is a threatened species under the ESA (NMFS 2010).

Eulachon abundance in monitored rivers has generally improved (particularly in the 2013-2015 return years), but recent poor ocean conditions and the likelihood that these conditions will persist into the near future suggest that population declines may be widespread in the upcoming return years (Gustafson et. al. 2016). Key threats to eulachon are overfishing in subsistence and commercial fisheries, continued/increased by catch in commercial groundfish and shrimp fisheries, industry pollution of freshwater and marine habitats, human impact on spawning habitat through logging, dredging, and diversions, and climate change (Hay and McCarter 2000).

4.8.1. Distribution and Habitat Requirements

Pacific eulachon are endemic to the eastern Pacific Ocean and range from northern California to southwest Alaska and into the southeastern Bering Sea. Eulachon typically spend three to five years in saltwater before returning to freshwater to spawn from late winter through early summer. Spawning runs in the Columbia River typically occur in January, February, and March. Spawning grounds are typically in the lower reaches of larger rivers fed by snowmelt and spawning typically occurs at night. Spawning occurs at temperatures from 39°F to 50°F (4°C to 10°C) in the Columbia River over sand, coarse gravel, or detrital substrates. Eulachon eggs hatch in 20 to 40 days, and then are carried downstream and dispersed by estuarine and ocean currents. Therefore, it is unlikely that eulachon life stages would occur

in the Action Area during proposed construction. In addition, the Project area lacks nearshore habitat in which eulachon would spawn.

4.8.2. Presence in Action Area

Most Pacific eulachon production for the southern DPS occurs in the Columbia River basin according to NMFS (2010). Spawning runs return to the mainstem of the Columbia River from RM 25 (near the estuary) to immediately downstream of Bonneville Dam (river miles [RM] 146). The Washougal River, which empties into the Columbia River at RM 122, is known to support smelt (NMFS 2010). The Sandy River, also located at RM 122 in Oregon, also supports a smelt run (NMFS 2010). In the Columbia River and its tributaries, spawning usually begins in January or February (Beacham et al. 2005). It is unlikely that Pacific eulachon spawning occurs within the Action Area because of the saline water conditions. Larvae are carried downstream and are dispersed by estuarine and ocean currents shortly after hatching. Larval forms outmigrate through the estuary and juvenile forms rear in marine waters extending out along the continental shelf (NMFS 2008a). While information on juvenile distribution is limited, it is likely that juveniles rear in near-shore marine areas at moderate or shallow depth (Barraclough 1964) feeding on pelagic species and krill. Pacific eulachon tend to use waters of greater depths as they grow in the marine environment and have been found as deep as 2,051 ft (Allen and Smith 1988).

It is likely that adult eulachon will be migrating through the Action Area during the in-water work period. It is not likely that spawning could occur in the Action Area and it is not likely that any spawning adults or incubating eggs would be present within the Action Area. Larval stage eulachon could be present within the Action Area.

4.8.3. Critical Habitat

The proposed action occurs within the designated critical habitat for southern DPS of Pacific eulachon. Table 12 shows the date of the designation and gives a general description of the area designated.

Table 12. Pacific Eulachon Critical Habitat Descriptions

Species and ESU/DPS	Date of Designation	Description of Critical Habitat
Pacific Eulachon		
Southern DPS	5 January 2011	Lower Columbia River and tributaries

The PCEs determined essential to the conservation of Southern DPS Pacific eulachon that could be present within the Action Area are:



- ***Freshwater spawning and incubation sites with water flow, quality and temperature conditions and substrate supporting spawning and incubation, and with migratory access for adults and juveniles.***

The Action Area does not represent suitable freshwater spawning and/or incubation habitat for eulachon.

This PCE is not present within the Action Area and the Project will not impact this PCE of Pacific eulachon.

- ***Freshwater and estuarine migration corridors associated with spawning and incubation sites that are free of obstruction and with water flow, quality and temperature conditions supporting larval and adult mobility, and with abundant prey items supporting larval feeding after the yolk sac is depleted.***

The Action Area does not represent a suitable freshwater migration corridor but does represent estuarine migration habitat for Pacific eulachon. The Action Area likely provides suitable water and conditions and prey availability to support larval and adult mobility and larval survival.

- ***Nearshore and offshore marine foraging habitat with water quality and available prey, supporting juveniles and adult survival.***

The Action Area represents suitable nearshore habitat with suitable water quality and prey availability for Pacific eulachon.

4.9. Leatherback Sea Turtle (*Dermochelys coriacea*)

The leatherback turtle (*Dermochelys coriacea*) is listed as Endangered throughout its range. In the Pacific, leatherback populations are in severe decline and recovery actions must be given the highest priority. Primary threats to the species are incidental take in coastal and high seas fisheries, and the killing of nesting females and collecting of eggs at the nesting beaches (WDFW 2022b). The U. S. does not have any nesting of leatherbacks in its jurisdiction in the Pacific but has important foraging areas on the continental U.S. west coast and near the Hawaiian Islands.

4.9.1. The Distribution and Habitat Requirements

Leatherback sea turtles are most widely distributed in tropical and sub-tropical waters in the Pacific. Leatherback sea turtles spend nearly their entire lifespan at sea. Five consistent conditions characterize nesting beaches: coarse-grained sand; steep, sloping littoral zone; an obstacle-free approach; proximity to deep water; and oceanic currents affecting the coast (Hendrickson and Balasingam 1966). Foraging habitat for leatherback sea turtles has been known to extend in subpolar oceans (Sato 2017). Western Pacific leatherbacks often forage in the coastal and shelf waters adjacent to the Columbia River Plume and satellite telemetry data indicates that the state's outer coast (especially the area near the Columbia River plume) is an important foraging area for the species (Benson et al. 2011)

4.9.2. The Presence in Action Area

Other species of sea turtles have occasionally been documented in marine waters at the mouth of the LCR or found washed ashore on coastal beaches in Oregon and Washington. These are typically juvenile individuals that have been driven off course by storms or are sick and found stranded. Off the West Coast of North America, western Pacific leatherback sea turtles are distributed most commonly off central California (Benson et al. 2007). Within Washington waters, western Pacific leatherbacks occur along the entire outer coast outward to pelagic waters but are most commonly found in continental shelf and slope habitat (200–2000 m) (Benson et. al. 2011). While it is possible that this species could occur in the vicinity of the project area it is unlikely.

4.9.3. Critical Habitat

The proposed Action Area does not occur within designated critical habitat for the leatherback sea turtles. Table 13 shows the date of the designation and gives a general description of the area designated.

Table 13. Leatherback Sea Turtle Critical Habitat Descriptions

Species and ESU/DPS	Date of Designation	Description of Critical Habitat
Leatherback Sea Turtle		
NA	27 February 2012	Oregon/Washington. The area bounded by Cape Blanco, Oregon (42°50'4" N./124°33'44" W.) north along the shoreline following the line of extreme low water to Cape Flattery, Washington (48°23'10" N./124°43'32" W.) then north to the U.S./Canada boundary at 48°29'38" N./124°43'32" W. then west and south along the line of the U.S. Exclusive Economic Zone to 47° 57'38" N./126° 22'54" W. then south along a line approximating the 2,000 meter isobath that passes through points at 47° 39'55" N./126°13'28" W., 45°20'16" N./125°21' W. to 42°49'59" N./125°8'10" W. then east to the point of origin at Cape Blanco.

4.10. Killer Whale (*Orcinus orca*)

The Southern Resident killer whale (SRKW, *Orcinus orca*) DPS was ESA-listed as endangered in 2005 (NMFS 2016). The SRKW population is made up of the J, K, and L pods.

4.10.1. Distribution and Habitat Requirements

Southern resident killer whales are found in the Salish Sea during fall, spring, and summer. Less is known about their winter habitat; however, they are known to travel along the Oregon and Washington coast. Southern Resident killer whales consume fish, particularly salmon. Their preferred prey is Chinook salmon, particularly in the summer (NMFS 2014)

4.10.2. The Presence in Action Area

Southern Resident killer whales have been repeatedly observed feeding off the Columbia River plume in the vicinity of the LCR jetties in March and April during peak spring Chinook salmon runs (USACE 2011b). Salmon returning to the Columbia River mouth may have been an important part of SRKW diet previously; however with declines in prey availability (salmon) in Columbia River stocks it is possible that the current movement patterns of the SRKW are somewhat different from those of several centuries ago (NMFS 2008b).

Southern Resident Killer whale presence in the Columbia River mouth is rare and it is unlikely that this species would be present in the Action Area.

4.10.3. Critical Habitat

The proposed Action Area does not occur within designated critical habitat for SRKWs. Table 14 shows the date of the designation and gives a general description of the area designated.

Table 14. Southern Resident Killer Whale Critical Habitat Descriptions

Species and ESU/DPS	Date of Designation	Description of Critical Habitat
Killer Whale		
Southern Resident DPS	9 October 2009	<i>Coastal Washington/Northern Oregon Inshore Area.</i> U.S. marine waters west of a line connecting Cape Flattery, Washington (48°23'10" N/124°43'32" W), Tatoosh Island, Washington (48°23' N/124°44'12" W), and Bonilla Point, British Columbia (48°35'30" N/124°43'00" W), from the U.S. international border with Canada south to Cape Meares, Oregon (45°29'12" N), between the 6.1-m and 50-m isobath contours. This includes waters off Clallam, Jefferson, Grays Harbor, and Pacific counties in Washington and Clatsop and Tillamook counties in Oregon.

4.11. Humpback Whale (*Megaptera novaeangliae*)

Humpback whales (*Megaptera novaeangliae*) were listed under the ESA as endangered in 1970. In 2016 NMFS revised the listing status and divided the globally endangered species into 14 distinct population segments, removed the species-level listing, and revised the listing status of the individual DPSs (81 FR 62259).

4.11.1. Distribution and Habitat Requirements

Humpback whales in the California/Oregon/Washington "stock" include multiple DPSs. These populations are recognized based on their low-latitude breeding areas. The California/Oregon/Washington stock primarily includes whales from the endangered Central America DPS and the threatened Mexico DPS, in addition to a small number of whales from the Hawaii DPS (which is not



currently listed under the ESA). The Marine Mammal Protect Act considers the California/Oregon/Washington stock endangered and depleted for management purposes.

The Mexico DPS breeds along the Pacific coast of Mexico during winter months and then migrates to feeding areas that range from California to the Aleutian Islands. The Central American DPS breeds along the Pacific coast of Central America and has feeding grounds of the west coast of the U.S. extending to British Columbia (86 FR 21082). Feeding areas in the North Pacific are broadly distributed, but are usually over the continental shelf or near the shelf edge at shallow (approximately 10m) to moderate water depths (approximately 50-200m). Feeding areas are also typically associated with oceanographic, bathymetric, and/or biological features that concentrate or aggregate prey species.

The Central America DPS breed in waters off Central America (Panama north to Guatemala, and possibly into southern Mexico (Bettridge *et al.* 2015, Calambokidis *et al.* 2017 as cited in 86 FR 21082) and feed off the West Coast of the U.S. and British Columbia. Foraging occurs most commonly off the coast of California with decreased numbers north to Washington and British Columbia.

The Mexico DPS breed in the area of mainland Mexico, transit off the coast of Baja California, and feed off coasts of California and Oregon, northern Washington and British Columbia, and Western Gulf of Alaska and Bering Sea 86 FR 21082.

For the remainder of this BE, the discussion of the “humpback whale” refers to either DPS.

4.11.2. The Presence in Action Area

Humpback whales are known to forage in the Columbia River plume system which supports foraging by many predators. This area is known to support an abundance of krill and seasonal/annual assemblages of forage fish. Habitat use by humpback whales is primarily continental shelf and shelf edge environments (Mate *et. al.* 2018). Humpback whales have occasionally been documented within the mouth of the Columbia River. It is thought that very near-shore habitat use may be driven by prey availability especially when targeting nearshore concentrations of fish like anchovies, has sometimes brought whales closer to shore and into new areas.

Humpback whale presence in the Columbia River mouth is rare and it is unlikely that this species would be present in the Action Area

4.11.3. Critical Habitat

The proposed action does not occur within designated critical habitat for the either the Mexico or Central America DPS of Humpback whales. Table 15 shows the date of the designation of critical habitat. Critical



habitat along the west coast is variable based on known use in coastal waters. Table 15 gives a general description of the area designated nearest to the Action Area.

Table 15. Humpback Whale Critical Habitat Descriptions

Species and ESU/DPS	Date of Designation	Description of Critical Habitat
Humpback Whale		
Mexico/Central America DPS	21 May 2021	extends southward from 46°50' N to 45°10' N and extends out to a seaward boundary corresponding to the 1,200-m isobath. The 50-m isobath forms the shoreward boundary. This area includes waters off of Pacific County, WA and Clatsop County, OR. This unit covers about 3,636 nmi ² of marine habitat..

4.12. Streaked Horned Lark (*Eremophila alpestris strigata*)

The streaked horned lark (*Eremophila alpestris strigata*) is endemic to the Pacific Northwest (British Columbia, Oregon, and Washington). It was listed as a threatened species under the ESA on 3 October 2013 (78 FR 61505).

The USFWS Periodic Status Review for Streaked Horned Lark (Stinson 2016) states:

“the factors currently influencing the streaked horned lark and anticipated to continue influencing larks in the future include ongoing loss and conversion of suitable habitats, land management activities at occupied sites and the related effects, and recreation. Survey data from some regularly monitored sites indicates that the subspecies appears to have increased in abundance from 198 breeding pairs in 2013 to 383 breeding pairs in 2019... Despite increases in abundance, a range-wide population estimate has not been reanalyzed since 2011. Therefore, we are unable to state conclusively that the range-wide population has increased based on survey data of local populations since larks were listed in 2013. In the foreseeable future, however, there is potential for a decline in resiliency of local populations across the range.”

The loss of preferred habitat will continue from plant succession and encroachment of woody vegetation, invasion of beach grasses, changes in land use, and changes in beneficial agricultural practices. The regular large-scale, human-caused disturbance (burning, mowing, cropping, chemical treatments, or placement of dredged materials) that now provides and maintains replacement habitat for the streaked horned lark will continue, as will the related effects of these activities that can negatively affect individual larks (nest destruction, mortality, disturbance, and aircraft strikes). Recreation will also continue. The cumulative negative effect from these factors will likely be amplified in some local populations due to the synergistic effects related to small population size and climate change over the next 30 years.

4.12.1. Distribution and Habitat Requirements

Nesting habitat for the streaked horned lark along the Willamette and Columbia Rivers was historically found on sandy beaches and spits (Stinson 2016). Streaked horned larks currently nest in a broad range of habitats, including native prairies, coastal dunes, fallow and active agricultural fields, wetland mudflats, sparsely vegetated edges of grass fields, recently planted Christmas tree farms with extensive bare ground, moderately to heavily grazed pastures, gravel roads or gravel shoulders of lightly traveled roads, airports, and dredge deposition sites, particularly islands in the LCR (USFWS 2012). Wintering streaked horned larks use habitats that are very similar to breeding habitats. Habitats on the Columbia River used by larks are typically adjacent to and in view of open water, which provides the open landscape context this species needs.

Streaked horned larks need expansive areas of flat, open ground to establish breeding territories. Horned larks forage on the ground in low vegetation or on bare ground (USFWS 2012). Adults feed mainly on grass and weed seeds but feed insects to their young. Introduced weedy grasses and forb seeds comprise the winter diet. Horned larks form pairs in spring and create nests in shallow depressions on the ground. The larks show strong natal fidelity to nesting sites and may return each year to the place they were born (USFWS 2012). The nesting season begins in mid-April and ends in the early part of August. Some streaked horned larks may re-nest in late June or early July. Wintering streaked horned larks use habitats that are very similar to breeding habitats.

4.12.2. Presence in Action Area

The Action Area does not represent optimal habitat for streaked horned lark. There are some shoreline areas within the Action Area that include wetland mudflats and dredge deposit sites and visual access to open water, however vegetation conditions are generally not optimal for streaked horned lark nesting habitat. Additionally, more suitable habitat for streaked horned lark breeding and nesting occurs outside of the Action Area but within the general vicinity of the mouth of the Columbia River. Any potential streaked horned lark present within the Action Area would likely be foraging and would not spend extended periods of time in the vicinity.

Streaked horned larks could potentially be present in the Action Area during all months of the year, though they are most likely to be present during the mid-April to early August nesting season.

4.12.3. Critical Habitat

The proposed action does not occur within the immediate vicinity of designated critical habitat for the southern DPS of streaked horned lark. Table 16 shows the date of the designation and gives a general description of the area designated (USFWS 2013).

Table 16. Streaked Horned Lark Critical Habitat Descriptions

Species and ESU/DPS	Date of Designation	Description of Critical Habitat
Streaked Horned Lark		
NA	3 October 2013	Critical habitat designation includes 2 units and 16 subunits located in both Oregon and Washington. The designation includes several sites in and adjacent to the LCR.

4.13. Western Snowy Plover (*Charadrius nivosus nivosus*)

The western snowy plover (*Charadrius alexandrinus nivosus*) was listed as a threatened species by the USFWS in 1993. The western snowy plover is a small shorebird found in coastal habitats. Several factors have been identified for population declines including human disturbance, predation, poor reproductive success, encroachment of non-native vegetative species into breeding areas, and urban development, among others (USFWS 2007).

4.13.1. The Distribution and Habitat Requirements

This species breeds in environments that include coastal beaches, sand spits, sparsely vegetated dunes, salt pans at lagoons and estuaries, and beaches at the mouths of creeks and rivers. Less frequent documented nesting habitats include dredged material disposal sites, bluff-backed beaches, dry salt ponds, and river bars (USFWS 2007). The historic range of this species included numerous nesting sites across the coasts of California, Oregon, and Washington, but current nesting inventories show a significant decline in the population.

The breeding season for this species (March through September) also coincides with high levels of human beach use, which is thought to result in nest abandonment and a reduction in nest density and success.

4.13.2. The Presence in Action Area

The Action Area does not represent optimal habitat for western snowy plover nesting or breeding habitat. The Pacific Coast western snowy plover breeds primarily above the high tide line on coastal beaches, sand spits, dune-backed beaches, sparsely vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries (77 FR 36727). In winter this species is found on many of the beaches used for nesting as well as on beaches where they do not nest (e.g., manmade salt ponds, on estuarine

sand and mud flats). Despite the variation in the types of habitat these habitats all share the same general characteristics of typically being flat, open areas with sandy or saline substrates, with usually sparse or absent vegetation or driftwood (Stenzel *et al.* 1981, p. 18; Service 2007 as cited in 77 FR 36727).

Any western snowy plover present in the Action Area would likely be foraging and are not expected to remain for a significant duration of time.

4.13.3. Critical Habitat

The proposed action does not occur within designated critical habitat for the Pacific Coast DPS of western snowy plover. The nearest designated critical habitat occurs more than 17 miles north of the Action Area along the outer coast and mouth of Willapa Bay. Table 17 shows the date of the designation and gives a general description of the area designated.

Table 17. Western Snowy Plover Critical Habitat Descriptions

Species and ESU/DPS	Date of Designation	Description of Critical Habitat
Western Snowy Plover		
Pacific Coast DPS	19 July 2012	Four units in Washington, totaling 6,077 acres (2,460 hectares)

4.14. Marbled Murrelet (*Brachyramphus marmoratus*)

The marbled murrelet (*Brachyramphus marmoratus marmoratus*) was listed as threatened under the ESA in 1992 in Washington, Oregon, and California as the result of nesting habitat loss from commercial timber harvest and mortality cause by net fisheries and oil spills. (57 FR 45328).

4.14.1. The Distribution and Habitat Requirements

This species is a small seabird that nests in mature and old growth coniferous forests and forages in marine environments (WDFW 2016). During the nesting season (approximately 1 April to 15 September), marbled murrelets forage in the marine environment and return to the nest at least once daily, carrying prey to their young. Both marine and terrestrial factors influence the survivorship of the species. A reduction in availability of successful nesting sites in proximity to foraging habitat (resulting from timber harvest) in combination with declines in forage fish species have impacted nest success and nestling survival (WDFW 2016).

Marbled murrelets nest in inland coastal forests dominated by western hemlock (*Tsuga heterophylla*), Sitka spruce (*Picea sitchensis*), Douglas fir (*Pseudotsuga menziesii*), and western red cedar (*Thuja plicata*). Nesting habitat requirements include a forest structure that is of sufficient height and depth to provide cover. Structure requirements are thought to provide enhanced microclimate conditions and reduce

predation (WDFW 2016). Foraging habitat has been documented as generally occurring within 2 to 8 km from shore. Marbled murrelets primarily feed on forage fish species (herring, anchovy, eulachon, sand lance, etc.) The largest concentrations of this species are found along the northern and outer coast of Puget Sound, where large areas of mature forest in close proximity to foraging habitat is still intact.

4.14.2. The Presence in Action Area

According to USFWS distribution of marbled murrelet habitat in Washington is currently disjunct with a major gap in distribution of habitat and occupied sites occurring along the southwest Washington coast from Grays Harbor south the Columbia River (USFWS 2019). The closest designated critical habitat to the Action Area is located approximately 8 miles to the east of the Project site, and the Action Area represents potential foraging habitat for this species, however murrelet occurrence at the mouth of the Columbia River is limited (ODFW 2017). Marbled murrelet have the potential to occur within the Action Area, however species presence at the mouth of the Columbia River is extremely limited and any individuals present within the Action Area are likely to be foraging and are not expected to be present for a sustained duration of time.

4.14.3. Critical Habitat

The proposed action does not occur within designated critical habitat for marbled murrelet. Table 18 shows the date of the designation and gives a general description of the area designated. The Action Area does not contain designated critical habitat for this species and the Project will not impact designated critical habitat or the PCEs necessary for the conservation of this species.

Table 18. Marbled Murrelet Critical Habitat Descriptions

Species and ESU/DPS	Date of Designation	Description of Critical Habitat
Marbled Murrelet		
N/A	4 November 2011	Approximately 3,698,100 acres (1,497,000 hectares) of critical habitat in the States of Washington, Oregon, and California.

5. Environmental Baseline

This Section outlines the presence and condition of aquatic and terrestrial habitat features within the Action Area as they pertain to the species addressed in this BE. The Section summarizes the baseline habitat conditions and then analyzes the likely effects that the proposed action will have on the baseline.

5.1. General Setting

The Project occurs at the Port of Ilwaco on the southwest coast of Washington State, located just inside the Columbia River bar at the Pacific Ocean.

5.2. Terrestrial and Riparian Habitat

Vegetation and terrestrial habitat conditions are limited within the in-water Action Area. The site is in an industrial area and is largely devoid of terrestrial vegetation. The Project would occur within the Port's marina at the existing wharf and associated bulkhead wall, retaining wall, and riprap shoreline. Little to no terrestrial and riparian habitat occurs here. The mudline at the base of the existing bulkhead is largely unvegetated and consists of a silty sand, sandy silt slope with riprap extending on the shore slope to the north and south of the bulkhead. The upland adjacent to the bulkhead is a paved driveway servicing the Safe Coast Seafood facility, which is located on the wharf. Existing vegetation consists of short-statured ruderal species behind the existing bulkhead wall (Figure 5) and in viable spaces along the riprap shoreline (Figure 6). Upland vegetation observed along the shoreline during a 2022 site survey included clover species (*Trifolium species*), Japanese knotweed (*Polygonum cuspidatum*), various grasses, dandelion (*tatxasum officinale*), and creeping buttercup (*Ranunculus repens*) (Geoengineers 2022).



Figure 5. Riprap Shoreline to the South of the Bulkhead Wall

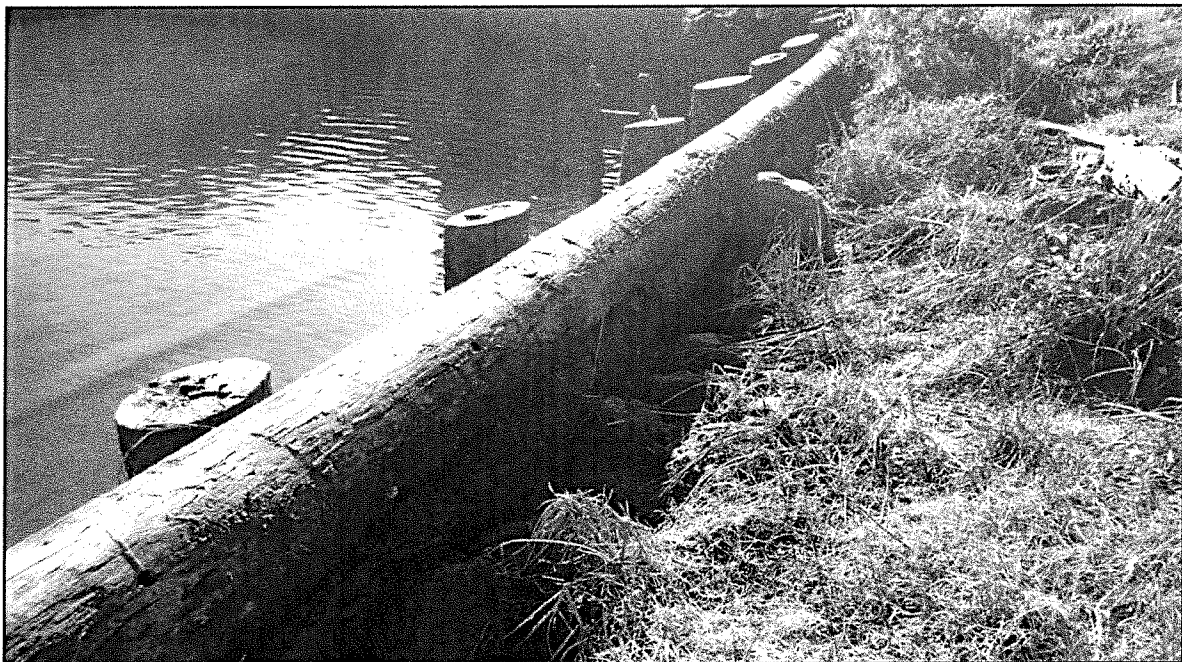
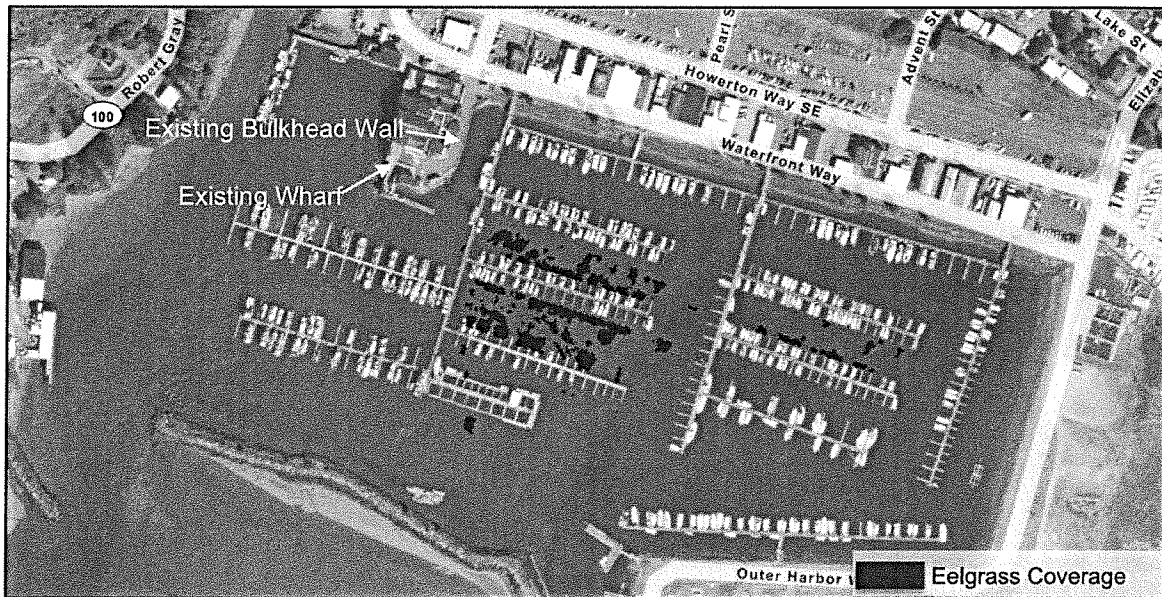


Figure 6. Retaining Wall to the North of the Bulkhead

5.3. Aquatic Habitat

An eelgrass and macroalgae survey and wetland and stream delineation was conducted within the marina for a separate dredging project (GeoEngineers 2022). The survey included the entire Project area. The survey results identified one main bed of eelgrass within the marina with smaller adjacent patches

(Figure 7). The eelgrass bed is not anticipated to be impacted by the proposed Project. No wetlands or streams were identified within the marina.



Source: GeoEngineers 2022

Figure 7. Eelgrass Identified During 2022 Eelgrass Survey (GeoEngineers 2022)

6. Effects of the Action

This Section outlines the potential effects of the proposed action as they pertain to the species identified as having potential to occur in the Action Area.

6.1. Direct Impacts

Direct impacts are generally defined as impacts that physically contact the species and have the potential to cause physical damage. Direct impacts are caused by the activity and occur at the same time and place. The Project has the potential to create the following discussed short-term direct adverse impacts.

6.1.1. Noise

In-water and in-air noise disturbances could occur as defined by the Action Area. The greatest potential for in-water noise impacts will occur during pile installation. Potential in-water noise impacts will be species specific and are further discussed in Sections 6.3 through 6.4 of this BE.

6.1.2. Water Quality

General localized and temporary water quality/turbidity impacts could occur. In general, water quality and turbidity impacts from sediment resuspension are anticipated to be minor, localized, and temporary. Removal of existing creosote-treated timber (associated with derelict creosote-treated structures and piles; up to 30 cy/20 tons) will result in water quality improvements by reducing toxicity potential. Potential water quality impacts are species specific and are further defined below in Sections 6.3 and 6.4 below.

6.1.3. Vessel Collision

Vessels will be used during construction to support Project activities and would travel to and from the site. Species that surface to breathe are susceptible to propeller strikes and vessel collisions. Potential vessel collision impacts are discussed in detail in Sections 6.3 and 6.4 below.

6.1.4. Habitat Disturbance

Temporary and permanent habitat disturbances could occur. Installation of the replacement bulkhead wall, drainage rock, and riprap will result in approximately 3,350 sf of fill in marine waters (measured below the HTL). Approximately 3,000 sf of the fill would come into contact with the bottom substrate and result in permanent impacts to the existing aquatic soft bottom habitat. Temporarily disturbed benthic habitat would be anticipated to be quickly recolonized by benthic species and in-benthic invertebrates (Thrush and Dayton 2002). The installation of a fender system along the new bulkhead will



result in approximately 200 sf of new overwater coverage. This increase in overwater coverage is anticipated to be negligible and would not result in substantial impacts to ESA-listed species. Fill and benthic habitat impacts are anticipated to be offset by the removal of creosote-treated timber from the marine environment. Potential benthic habitat disturbance impacts are discussed in further detail in Sections 6.3 and 6.4 below.

6.2. Indirect Effects

Indirect impacts are generally defined as ecosystem changes that could affect food web dynamics. Indirect impacts are caused by the activity and are later in time or farther removed in distance but are still reasonably foreseeable. The Project has the potential to cause the following indirect adverse impacts.

6.2.1. Prey Species

Adverse impacts to prey species are unlikely due to the minor, short-term, localized nature of the proposed activities. The Project will be anticipated to provide an overall long-term benefit to prey species by removing creosote treated wood and reducing toxicity potential. Potential impacts to prey species for the identified species are further discussed below in Section 6.3 and 6.4 below.

6.3. NMFS Listed Species

6.3.1. Salmonids (Chinook, Coho, Sockeye, Steelhead)

Direct and indirect adverse impacts could occur to salmonids but are unlikely given the extent of the proposed activities and proposed AMMs. As discussed in Sections 4.1 through 4.5, adult salmonids may occur in the Columbia River and Action Area during migrations, however there is no suitable spawning habitat within the Action Area. Juvenile salmonids may rear within the Action Area.

Direct impacts could occur due to noise, water quality, and benthic habitat disturbances. Indirect impacts could occur due to impacts to prey species. Potential impacts to salmonids from the proposed activities are discussed below in Sections 6.3.1.1 through 6.3.1.4.

6.3.1.1. Noise

The main hearing organ in fish is the lateral line system that is sensitive to particle motion. Pressure waves can cause changes in the swim bladder which may cause damage or reduced hearing sensitivity. Impulsive noise sources such as impact pile driving are known to result in adverse impacts to fish when noise thresholds are exceeded (NMFS 2008c). Noise produced during pile installation activities has the greatest potential to exceed noise thresholds. These thresholds, as well as the distances to these

thresholds for the proposed pile driving activities, are shown in Table 19. Continuous noise sources such as vibratory pile driving are not held to the thresholds presented in Table 19.

The Project proposes to install a 225 lf steel sheet pile wall and approximately 10, 12-inch diameter fiberglass fender piles external to the wall. It is anticipated that the steel sheet pile wall and fiberglass fender piles will be driven using vibratory hammers. The option for impact proofing has been included in the event that difficult driving conditions are encountered.

To install the sheet pile wall, up to 8 hours of vibratory pile driving and up to 600 blows per day could be required. Sheet pile wall installation could occur for up to 12 total days. To install the 12-inch fiberglass fender piles, up to 2.5 hours of vibratory pile driving and up to 30 blows per pile could be required with up to 4 piles being installed in a day. Fiberglass pile installation could take a total of 3 days.

Anticipated in-water noise levels for the proposed pile installations are reported in Section 2, Table 2 of this report. Anticipated noise levels were compared to established noise thresholds using the NMFS Interim Injury Criteria Threshold Spreadsheet (NMFS 2009). The sound levels from the impact installation of steel sheet piles could exceed thresholds in which physical injury may occur within a small area no larger than 24 meters around each pile (Table 19). Impact pile driving of 12-inch diameter fiberglass fender piles could exceed thresholds in which physical injury may occur within a small area no larger than 1 meter around each pile (Table 19).

It is unlikely that fish will occur within close proximity to the active construction area and within the small Interim Injury Criteria threshold areas. Additionally, the analysis presented in this section conservatively assumes the maximum number of blows per day that could occur. In actuality far less are likely. Pile installation activities will be short-term and would occur during the approved in-water work window when salmonid presence is anticipated to be low. Steel sheet pile installation would only occur for 12 total days and fiberglass pile installation would only occur for 3 total days. Impacts from noise exceedances over the Interim Injury Criteria thresholds are unlikely.

The behavioral threshold, although not a formal regulatory standard, is 150 dBrms (NMFS 2008c). The behavioral threshold guideline could be exceeded within 215 meters of steel sheet pile installation and 29 meters of fiberglass pile installation. Behavioral impacts could include fleeing of the area, and or ceasing of feeding or spawning in the area. Whether or not substantial impacts occur at noise levels exceeding this threshold relies heavily on project timing, project duration, species life history and other site-specific factors (WSDOT 2020). Pile installation activities would be short-term. Any potential



impacts associated with exceedances over the behavioral threshold are anticipated to be minor and temporary.

Table 19. Noise Criteria Thresholds for Fish

	Onset of Physical Injury			Behavioral Threshold
	Peak dB	Cumulative SEL dB		
		Fish > 2 Grams	Fish < 2 Grams	
Threshold Value	206 dB	187 dB	183 dB	150 dBrms
Fiberglass Pile Installation Threshold Distance	0 meters	0 meters	1 meter	29 meters
Steel Sheet Pile Installation Threshold Distance	7 meters	13 meters	24 meters	215 meters

Source: NMFS 2008c and NMFS 2009b

6.3.1.2. Water Quality

Decreased water quality including turbidity has the potential to directly impact fish. There are several mechanisms by which suspended sediment could potentially impact fish. These mechanisms include increased potential for gill tissue damage, physiological stress, direct mortality, and behavioral changes (NMFS 2002). The proposed action may create focused areas of minor temporary water quality impacts due to sediments becoming suspended in the water column during in-water construction activities. Activities with the potential to cause turbidity include, structure removal, pile installation, drainage rock placement, and riprap placement. Potential turbidity plumes would be small in scale, temporary, and localized to the immediate vicinity of the Project activities.

Adverse turbidity impacts to fish do not typically occur until turbidity concentrations reach 1,000 milligrams (mg)/liter (l) or 580 mg/l for more sensitive species (Burton 1993 and Sherk et al. 1975). Suspended sediment concentrations during pile driving would be anticipated to range from 5 to 10 mg/l above background levels at approximately 300 ft from the pile driving activities (FHWA 2012). Although salmonids may alter their movements to avoid these turbid areas, changes in movement are anticipated to be too small to be meaningfully detected. The proposed Project activities would not be anticipated to result in turbidity concentrations that could cause adverse impacts. Any potential direct water quality adverse impacts are anticipated to be minor and temporary. The AMMs in Section 1.4 such as the implementation of spill prevention measures and compliance with the in-water work window will further reduce the potential for adverse water quality impacts.

The removal of approximately 30 cy/20 tons of creosote-treated timber is anticipated to result in long-term water quality benefits by reducing toxicity potential. AMMs such as the use of a containment boom to protect water quality during creosote-treated timber removal would be implemented.



6.3.1.3. Benthic Habitat Disturbance

The Project will result in temporary and permanent benthic habitat impacts. Temporarily disturbed benthic habitat would be anticipated to be quickly recolonized by benthic species and in-benthic invertebrates (Thrush and Dayton 2002). Permanent benthic habitat impacts include the conversion of approximately 3,000 sf of aquatic soft bottom habitat to hard shoreline armoring (bulkhead wall and riprap). The existing soft bottom habitat occurs within an active marina and adjacent to creosote-treated structures. Therefore, the existing habitat is not anticipated to be of high habitat value to salmonids.

Benthic habitat impacts to salmonids are anticipated to be minor and offset by the removal of the creosote-treated timber as part of the existing retaining wall, bulkhead, and derelict piles. The removal of approximately 64, 12-inch creosote-treated timber piles, 3, 12-inch steel piles, 70 lf of creosote-treated timber retaining wall, and 40 lf of derelict creosote-treated timber pile caps, will restore approximately 165 sf of benthic habitat and remove approximately 30 cy or 20 tons of creosote-treated timber.

6.3.1.4. Prey Species

Impacts to prey species have the potential to cause indirect impacts to their predators through reduced food supply. Salmonid prey that could occur in the Action Area includes crustaceans, invertebrates, and small fish. The active marina/port area in which the Project is located is not anticipated to provide optimal foraging habitat for salmonids.

As discussed in Section 6.3.1.3, the Project will result in temporary disturbance of and permanent impacts to benthic sediments. Benthic prey species would be anticipated to quickly recolonize temporarily disturbed benthic habitats (Thrush and Dayton 2002). However, the installation of the bulkhead wall and riprap shoreline may result in approximately 3,000 sf of reduced soft bottom foraging habitat. This area is anticipated to be of low habitat value to salmonids due to its presence within an active marina/port area and proximity to creosote-treated timber structures. Therefore, foraging impacts are anticipated to be minor. Fish prey species could be impacted by noise emitted during in-water construction activities. As discussed in Section 6.3.1.1, Project related noise would only exceed the Interim Injury Criteria Injury threshold for fish within a small area where salmonids would be unlikely to occur foraging (Table 19).

To reduce the potential for impacts to foraging, the Project would comply with the in-water work window for the area (anticipated to be November 1 through February 28) when salmonid foraging presence is anticipated to be low. Substantial impacts to salmonids due to a reduced food supply are not anticipated given the nature and location of the proposed Project and proposed AMMs. The removal of creosote-treated timber could improve foraging habitat.



6.3.1.5. Determination

Due to a lack of identified substantial direct and indirect impacts the Project may affect, but is ***not likely to adversely affect (NLAA)***, Chinook, Coho, sockeye, and steelhead salmon. Critical habitat for Chinook, Coho, sockeye, and steelhead salmon occurs in the Action Area. The Project is ***NLAA*** Chinook, Coho, sockeye, and steelhead salmon critical habitat within the Action Area for the reasons given above.

6.3.2. Eulachon

Direct and indirect adverse impacts could occur to eulachon but are considered unlikely given the extent of the proposed activities and proposed minimization measures. As discussed in Section 4.8 adult Pacific DPS eulachon could occur migrating through the Action Area. Larval state eulachon could also occur in the Action Area. Spawning is unlikely given the saline water conditions in the Action Area.

Direct impacts could occur due to noise, water quality, and benthic habitat disturbances. Indirect impacts could occur due to impacts to prey species. Potential impacts to salmonids from the proposed activities are discussed below in Sections 6.3.2.1 through 6.3.2.4.

6.3.2.1. Noise

As discussed in additional detail in Section 6.3.1.1, The sound levels from the impact installation of steel sheet piles could exceed thresholds in which physical injury may occur within a small area no larger than 24 meters around each pile installation activity (Table 19). Impact pile driving of 12-inch diameter fiberglass fender piles could exceed thresholds in which physical injury may occur within a small area no larger than 1 meter around each pile (Table 19). Impacts due to exceedances over the Interim Injury Criteria threshold are anticipated to be unlikely given the small threshold area, short-term nature of the pile driving activities, and compliance with the in-water work window.

The behavioral threshold guideline could be exceeded within 215 meters during steel sheet pile installation and 29 meters during fiberglass fender pile installation. Impacts due to exceedances over the behavioral threshold are anticipated to be minor given the short-term nature of the pile driving activities, and compliance with the in-water work window. Pile installation activities would be short-term.

6.3.2.2. Water Quality

As discussed in additional detail in Section 6.3.1.2, decreased water quality including turbidity has the potential to directly impact fish. Project activities with the potential to cause turbidity include, structure removal, pile installation, drainage rock placement, and riprap placement. However, potential turbidity plumes would be small in scale, temporary, and localized to the immediate vicinity of the Project

activities. Any potential direct water quality adverse impacts are anticipated to be minor and temporary. The AMMs in Section 1.4 such as the implementation of spill prevention measures and compliance with the in-water work window will further reduce the potential for adverse water quality impacts.

The removal of approximately 30 cy/20 tons, of creosote-treated timber is anticipated to result in long-term water quality benefits. AMMs such as the use of a containment boom to protect water quality during creosote-treated timber removal would be implemented.

6.3.2.3. Benthic Habitat Disturbance

As discussed in additional detail in Section 6.3.1.3, the Project will result in temporary and permanent benthic habitat impacts. Temporarily disturbed benthic habitat would be anticipated to be quickly recolonized by benthic species and in-benthic invertebrates. Permanent benthic habitat impacts include the conversion of approximately 3,000 sf of aquatic soft bottom habitat to hard shoreline armoring. Benthic habitat impacts to eulachon are anticipated to be minor and offset by the removal of the creosote-treated timber retaining wall, portions of the existing bulkhead, and derelict piles.

6.3.2.4. Prey Species

As discussed in additional detail in Section 6.3.1.4, direct impacts to prey species have the potential to cause indirect impacts to their predators through reduced food supply. Eulachon prey that could occur in the Action Area includes small crustaceans and krill. The Project may result in minor benthic habitat impacts that could result in impacts to benthic food supply for a short period of time. The active marina/port area in which the Project is located is not anticipated to provide optimal foraging habitat for eulachon and foraging impacts are anticipated to be minor. The removal of creosote-treated timber could also improve foraging habitat by removing toxins from the marine environment.

6.3.2.5. Determination

Due to a lack of identified substantial direct and indirect impacts, the Project may affect, but is **NLAA** eulachon. Critical habitat for eulachon occurs in the Action Area. The Project is **NLAA** eulachon critical habitat within the Action Area for the reasons given above.

6.3.3. Green Sturgeon

Direct and indirect adverse impacts could occur to green sturgeon but are considered unlikely given the extent of the proposed activities and proposed AMMs. As discussed in Section 4.7, adult and subadult green sturgeon could occur in the Action Area from June to August.



Direct impacts could occur due to noise, water quality, entrainment, and benthic habitat disturbances. Indirect impacts could occur due to impacts to prey species. Potential impacts to green sturgeon from the proposed activities are discussed below in Sections 6.3.3.1 through 6.3.3.4.

6.3.3.1. Noise

As discussed in additional detail in Section 6.3.1.1, The sound levels from the impact installation of steel sheet piles could exceed thresholds in which physical injury may occur within a small area no larger than 24 meters around each pile installation activity (Table 19). Impact pile driving of 12-inch diameter fiberglass fender piles could exceed thresholds in which physical injury may occur within a small area no larger than 1 meter around each pile (Table 19). Impacts due to exceedances over the Interim Injury Criteria threshold are unlikely given the small threshold area, short-term nature of the pile driving activities, and compliance with the in-water work window.

The behavioral threshold guideline could be exceeded within 215 meters during steel sheet pile installation and 29 meters during fiberglass fender pile installation. Impacts due to exceedances over the behavioral threshold are anticipated to be minor given the short-term nature of the pile driving activities and compliance with the in-water work window.

6.3.3.2. Water Quality

As discussed in additional detail in Section 6.3.1.2, decreased water quality including turbidity has the potential to directly impact fish. Project activities with the potential to cause turbidity include, structure removal, pile installation, drainage rock placement, and riprap placement. However, potential turbidity plumes would be small in scale, temporary, and localized to the immediate vicinity of the Project activities. Any potential direct water quality adverse impacts are anticipated to be minor and temporary. The AMMs in Section 1.4 such as the implementation of spill prevention measures and compliance with the in-water work window will further reduce the potential for adverse water quality impacts.

The removal of approximately 30 cy/20 tons of creosote-treated timber is anticipated to result in long-term water quality benefits by reducing toxicity potential. AMMs such as the use of a containment boom to protect water quality during creosote-treated timber removal would be implemented.

6.3.3.3. Benthic Habitat Disturbance

Green sturgeon are bottom dwelling fish that that may use subtidal soft bottom habitat within the Action Area. The existing soft bottom habitat occurs within an active marina/port area and adjacent to creosote-treated structures. Therefore, the existing habitat is not anticipated to be of high habitat value to green



sturgeon. As discussed in additional detail in Section 6.3.1.3, the Project will result in temporary and permanent benthic habitat impacts. Temporarily disturbed benthic habitat would be anticipated to be quickly recolonized by benthic species and in-benthic invertebrates. Permanent benthic habitat impacts include the conversion of approximately 3,000 sf of aquatic soft bottom habitat to hard shoreline armoring. Benthic habitat impacts to green sturgeon are anticipated to be minor and offset by the removal of the creosote-treated timber retaining wall, portions of the existing bulkhead, and derelict piles.

6.3.3.4. Prey Species

As discussed in additional detail in Section 6.3.1.4, impacts to prey species have the potential to cause indirect impacts to their predators through reduced food supply. Green sturgeon prey that could occur in the Action Area includes crustaceans, invertebrates. The Project may result in minor benthic habitat impacts that could result in impacts to benthic food supply. However, the active marina/port area in which the Project is located is not anticipated to provide optimal foraging habitat for green sturgeon. Therefore, foraging impacts are anticipated to be minor. The removal of creosote-treated timber could improve foraging habitat.

6.3.3.5. Determination

Due to a lack of identified substantial direct and indirect impacts the Project may affect, but is **NLAA** green sturgeon. Critical habitat for green sturgeon occurs in the Action Area. The Project is **NLAA** green sturgeon critical habitat within the Action Area for the reasons given above.

6.3.4. Sea Turtles (Leatherback)

Direct and indirect adverse impacts to leatherback sea turtles could occur, but are considered unlikely given the location and extent of the proposed activities and proposed minimization measures. As discussed in Section 4.9 although leatherback sea turtles could occur in the Columbia River and in the Action Area on rare occasions, their presence within the enclosed marina is not anticipated.

Noise, water quality, habitat, and foraging impacts are not anticipated given that sea turtles would not be anticipated to occur within the enclosed marina/port area where construction activities are proposed. The potential for direct impacts due to vessel collision during transportation of materials to the site is evaluated below in Section 6.3.4.1.



6.3.4.1. Vessel Collision

Because sea turtles surface to breathe, they are susceptible to propeller strikes and vessel collisions. Vessels will be used during construction to support Project activities and would travel to and from the site. Although sea turtles are not anticipated to occur within the enclosed marina, there is potential for them to occur along the routes that vessels may travel when accessing the site. Vessels proposed for use during construction could include barges and smaller support vessels. These types of vessels are typical throughout the Action Area and do not pose a substantial deviation from normal vessel activity. The increased risk of vessel collision due to construction related boating activity is considered negligible given the rare occurrence of leatherback sea turtles in the Columbia River and typical nature of the types of construction vessels proposed. There is no proposed long-term increase in vessel use in Action Area as a result of Project. Therefore, long-term operational vessel collision risks are not anticipated.

6.3.4.2. Determination

Due to a lack of identified direct and indirect impacts the Project is **NLAA** leatherback sea turtles. Critical habitat for leatherback sea turtles does not occur in the Action Area. The Project would have **No Effect** on leatherback sea turtle critical habitat.

6.3.5. Marine Mammals (Killer Whale, Humpback Whale)

Direct and indirect adverse impacts to SRKW and humpback whales could occur, but are considered unlikely given the location and extent of the proposed activities and proposed AMMs. As discussed in Section 4.10 and 4.11, SRKWs and humpback whales occur on rare occasions at the Columbia River mouth and it is considered unlikely that these species would be present in the Action Area.

Direct impacts could occur due to noise and/or decreased water quality. Indirect impacts could occur due to impacts to prey species. Potential impacts to SRKW and humpbacks from the proposed activities are discussed below in Sections 6.3.5.1 through 6.3.5.4.

6.3.5.1. Noise

Noise has the potential to directly impact marine mammals by causing physical injury or altering behaviour when noise threshold levels are exceeded. NMFS has identified Level A (potential injury) and Level B (potential disturbance) thresholds for marine mammals based on their hearing class. Potential noise impacts would be confined to the marina/port area by the rubble breakwaters. Noise impacts are not anticipated given that whales would not be anticipated to occur within the enclosed marina where construction activities are proposed. Although it is extremely unlikely that SRKW or humpback whales



would occur within the enclosed marina/ port area, a shutdown zone would be implemented to further protect whales from noise impacts. The shutdown zone would include the entire enclosed port/marina area. This shutdown zone would also be applied to all marine mammals. With the proposed shutdown zone, noise impacts to SRKW and humpbacks would be avoided.



Figure 8. Marine Mammal Shutdown Zone

6.3.5.2. Water Quality

Decreased water quality has the potential to directly impact SRKWs and humpback whales. The Project may create focused areas of minor temporary water quality impacts due to suspended sediments during in-water construction activities, however any potential water quality would be anticipated to be confined to the marina/port area. Water quality impacts are therefore not expected given that whales would not be anticipated to occur within the enclosed marina/port area where construction activities are proposed. The AMMs in Section 1.4 such as the implementation of spill prevention measures and the proposed shutdown zone will further reduce the potential for adverse water quality impacts.

The removal of approximately 30 cy/20 tons of creosote-treated timber is anticipated to result in long-term water quality benefits. AMMs such as the use of a containment boom to protect water quality during creosote-treated timber removal would be implemented.

6.3.5.3. Vessel Collision

Because whales surface to breathe, they are susceptible to propeller strikes and vessel collisions. Vessels will be used during construction to support Project activities and would travel to and from the site. Although whales are not anticipated to occur within the enclosed marina, there is the potential for them to occur along the routes that vessels may travel when accessing the site. Vessels proposed for use during construction could include barges and smaller support vessels. These types of vessels are typical throughout the Action Area and do not pose a substantial deviation from normal vessel activity. The increased risk of vessel collision due to construction related vessel activity is considered negligible given the rare occurrence of SRKW and humpback whales in the LCR and typical nature of the types of vessels proposed. There is no proposed long-term increase in vessel use in Action Area as a result of Project. Therefore, long-term operational vessel collision risks are not anticipated.

6.3.5.4. Prey Species

Direct impacts to prey species such as fish, for reasons outlined in section 6.3.1 are unlikely. Additionally, the marina is not anticipated to be used as foraging habitat for SRKW or humpback whales. Therefore, the Project is not anticipated to indirectly impact SRKW and humpback whales by impacting prey species.

6.3.5.5. Determination



Due to a lack of identified direct and indirect impacts the Project is **NLAA** SRKW and humpback whales. Critical habitat for humpback whales or SRKW does not occur in the Action Area. The Project would have **No Effect** on SRKW or humpback whale critical habitat.

6.4. USFWS Listed Species

6.4.1. Fish Species (Bull Trout)

Direct and indirect adverse impacts could occur to bull trout but are considered unlikely given the extent of the proposed activities and proposed AMMs. As discussed in Section 4.6, it is unlikely that bull trout would occur in that Action Area because it is located within the marine/mixing zone of the LCR estuary and this species is typically associated with freshwater habitats.

Direct impacts could occur due to noise, water quality, and benthic habitat disturbances. Indirect impacts could occur due to impacts to prey species. Potential impacts to bull trout from the proposed activities are discussed below in Sections 6.4.1.1 through 6.4.1.4.

6.4.1.1. Noise

As discussed in additional detail in Section 6.3.1.1, The sound levels from the impact installation of steel sheet piles could exceed thresholds in which physical injury may occur within a small area no larger than 24 meters around each pile installation (Table 19). Impact pile driving of 12-inch diameter fiberglass fender piles could exceed thresholds in which physical injury may occur within a small area no larger than 1 meter around each pile (Table 19). Impacts due to exceedances over the Interim Injury Criteria threshold are anticipated to be unlikely given the small threshold area, short-term nature of the pile driving activities, and compliance with the in-water work window.

The behavioral threshold guideline could be exceeded within 215 meters during steel sheet pile installation and 29 meters during fiberglass fender pile installation. Impacts due to exceedances over the Level B threshold are anticipated to be minor given the short-term nature of the pile driving activities and compliance with the in-water work window.

6.4.1.2. Water Quality

As discussed in additional detail in Section 6.3.1.2, decreased water quality including turbidity has the potential to directly impact fish. Project activities with the potential to cause turbidity include, structure removal, pile installation, drainage rock placement, and riprap placement. However, potential turbidity plumes would be small in scale, temporary, and localized to the immediate vicinity of the Project



activities. Any potential direct water quality adverse impacts are anticipated to be minor and temporary. The AMMs in Section 1.4 such as the implementation of spill prevention measures and compliance with the in-water work window will further reduce the potential for adverse water quality impacts.

The removal of approximately 30 cy/20 tons of creosote-treated timber is anticipated to result in long-term water quality benefits by reducing toxicity potential. AMMs such as the use of a containment boom to protect water quality during creosote-treated timber removal would be implemented.

6.4.1.3. Benthic Habitat Disturbance

As discussed in additional detail in Section 6.3.1.3, the Project will result in temporary and permanent benthic habitat impacts. Temporarily disturbed benthic habitat would be anticipated to be quickly recolonized by benthic species and in-benthic invertebrates. Permanent benthic habitat impacts include the conversion of approximately 3,000 sf of aquatic soft bottom habitat to hard shoreline armoring (bulkhead wall and riprap shoreline). As discussed previously, it is unlikely that bull trout would occur in that Action Area because it is located within the marine/mixing zone of the LCR estuary and this species is typically associated with freshwater habitats. Benthic habitat Impacts to bull trout are anticipated to be minor and any potential impacts are anticipated to be offset by the removal of the creosote-treated timber retaining wall, existing bulkhead, and derelict piles which would restore approximately 165 sf of benthic habitat and remove approximately 30 cy or 20 tons of creosote.

6.4.1.4. Prey Species

As discussed in additional detail in Section 6.3.1.4, direct impacts to prey species have the potential to cause indirect impacts to their predators through reduced food supply. Bull trout prey that could occur in the Action Area includes crustaceans, invertebrates, and small fish. The Project may result in minor benthic habitat impacts that could result in impacts to benthic food supply. However, the active marina/port area in which the Project is located is not anticipated to provide optimal foraging habitat for bull trout. Fish prey species could be impacted by noise emitted during in-water construction activities. As discussed in Section 6.3.1.1, Project related noise would only exceed the Interim Injury Criteria Injury threshold for fish within a small area where salmonids would be unlikely to occur foraging (Table 19).

Substantial impacts to bull trout due to a reduced food supply are not anticipated given the nature and location of the proposed Project and proposed AMMs. The removal of creosote-treated timber could also improve foraging habitat.

6.4.1.5. Determination

Due to a lack of identified direct and indirect impacts the Project is **NLAA** bull trout. Critical habitat for bull trout does not occur in the Action Area. The Project would have **No Effect** on bull trout critical habitat.

6.4.2. Bird Species (Western Snowy Plover, Marbled Murrelet)

Direct and indirect adverse impacts could occur to western snowy plover and marbled murrelet could occur but are considered unlikely given the extent of the proposed activities and proposed AMMs. As discussed in Section 4.12, streaked horned lark are unlikely to occur in the Action Area and any potential streaked horned lark present within the Action Area would likely be foraging and would not spend extended periods of time in the vicinity of the project area. As discussed in Section 4.13, optimal western snowy plover habitat does not occur in the Action Area and any western snowy plover present in the Action Area would likely be foraging and are not expected to remain for a significant duration of time. As discussed in Section 4.14, marbled murrelet have the potential to occur foraging within the Action Area.

Direct impacts could occur due to noise, water quality, and benthic habitat disturbances. Indirect impacts could occur due to impacts to prey species. Potential impacts to bull trout from the proposed activities are discussed below in Sections 6.4.2.1 through 6.4.2.4.

6.4.2.1. Noise

Noise has the potential to directly impact marbled murrelets, western snowy plover, and streaked horned lark. The Project could create in-air noise levels of up to 105 dBA at 50 ft from the source (WSDOT 2020). In-water noise levels of up to 170 dBrms, 161 dBSEL, and 204 dBpeak during the impact installation of steel sheet piles (Table 2). In-water noise levels of up to 157 dBrms, 146 dBSEL, and 183 dBpeak during the impact installation of fiberglass fender piles (Table 2).

Noise thresholds have not been developed for western snowy plover or streaked horned lark, but have been developed for marbled murrelets. In the absence of noise thresholds for western snowy plover and streaked horned lark, noise thresholds developed for marbled murrelets were used to consider potential noise impacts to all three bird species.

In-air

The USFWS completed a biological opinion (BO) on potential in-air noise impacts to marbled murrelets from the use of heavy machinery (USFWS 2015b). The BO establishes threshold distances to certain activities to help determine potential impacts to marbled murrelets during construction activities.



According to this BO, pile driving at a distance greater than 0.25 miles from a known occupied nest tree or suitable nesting tree in an un-surveyed area would have no effect on marbled murrelets. Suitable nesting habitat does not occur within 0.25 miles of the proposed Project activities. The nearest suitable nesting habitat for marbled murrelets as defined by the critical habitat, is approximately 8 miles east of the Action Area (USFWS 2016). Therefore, noise impacts to nesting individuals are not anticipated.

In addition, the USFWS has developed thresholds for pile driving projects which when exceeded would result in masking impacts that could result in impaired essential communication between foraging murrelets. The USFWS determined that air-borne noise from 'typical' pile driving projects, results in insignificant masking impacts (USFWS 2013b). A 'typical' pile driving project involves the installation of up to 36-inch diameter steel piles and is defined as "a project which vibes in the piles as much as possible before impact driving to proof the piles". Piles proposed for installation under this Project are less than 36-inches in diameter and would be vibrated in as much as possible for impact proofing. Therefore, the Project is considered a 'typical' pile driving project that would have insignificant impacts on masking.

In-water

The USFWS has developed in-water auditory thresholds for marbled murrelets (Table 20). These auditory thresholds apply to repetitive impulsive noise sources such as impact pile driving (USFWS 2014a). There are currently no thresholds for continuous noise sources such as vibratory pile installation. The USFWS considers 150 dBrms a guideline, not a threshold. Marbled murrelets may respond to noise levels above this guideline, but the response may not constitute an adverse impact (USFWS 2014a). Potential impacts from noise exceedances above the behavioral guideline include masking, delayed or interrupted foraging, interference with mate identifications, courtship, and bonding. The USFWS Sound Exposure Level Calculator for Marbled Murrelet and Bull Trout was used to calculate the distance in which pile driving noise may exceed the established threshold (USFWS 2014b Table 20).

Noise levels would not exceed injury thresholds, but could exceed behavioral thresholds within 215 meters of the pile driving activities. It is unlikely that ESA-listed birds species will occur within close proximity to the active construction site and within the behavioral threshold area. Any potential behavioral impacts are anticipated to be minor and temporary.

Table 20. Marbled Murrelet In-water Noise Thresholds

	Injury		Behavioral
	Auditory	Non auditory	
Threshold Value	202 dB SEL	208 dB SEL	150 dBrms
Distance to Threshold (Steel Sheet)	Does not exceed	Does not exceed	215 meters
Distance to Threshold (12-inch fiberglass)	Does not exceed	Does not exceed	29 meters

Source: USFWS 2014a and USFWS 2014b

6.4.2.2. Water Quality

Marbled murrelets forage in subtidal areas and therefore decreased water quality has the potential to directly impact foraging marbled murrelets. Western snowy plover and streaked horned larks are not known to use subtidal areas and therefore water quality impacts are unlikely.

The Project may create focused areas of minor temporary water quality impacts due to suspended sediments during in-water construction activities. Project activities with the potential to cause turbidity include, structure removal, pile installation, drainage rock placement, and riprap placement. However, potential turbidity plumes would be small in scale, temporary, and localized to the immediate vicinity of the Project activities. Any potential direct water quality adverse impacts are anticipated to be minor and temporary. The AMMs in Section 1.4 such as the implementation of spill prevention measures will further reduce the potential for adverse water quality impacts.

The removal of approximately 30 cy/20 tons of creosote-treated timber is anticipated to result in long-term water quality benefits by reducing toxicity potential. AMMs such as the use of a containment boom to protect water quality during creosote-treated timber removal would be implemented.

6.4.2.3. Benthic Habitat Disturbance

Marbled murrelets, western snowy plover, and streaked horned lark could use soft bottom habitat within the Project area for foraging. However, the existing soft bottom habitat occurs within an active marina/port area and adjacent to creosote-treated structures. Therefore, the existing habitat is not anticipated to be of high habitat value to marbled murrelet, western snowy plover, or streaked horned lark.

The Project will result in temporary and permanent benthic habitat impacts. Temporarily disturbed benthic habitat would be anticipated to be quickly recolonized by benthic species and in-benthic invertebrates. Permanent benthic habitat impacts include the conversion of approximately 3,000 sf of aquatic soft bottom habitat and 350 sf of upland soft bottom habitat to hard shoreline armoring. Benthic habitat Impacts to marbled murrelets, western snowy plover, and streaked horned larks are anticipated



to be minor and any potential impacts are anticipated to be offset by the removal of the creosote-treated retaining wall, existing bulkhead, and derelict piles.

6.4.2.4. Prey Species

Impacts to prey species have the potential to cause indirect impacts to their predators through reduced food supply. Marbled murrelet prey that could occur in the Action Area includes invertebrates and forage fish. Western snowy plover prey that could occur in the Action Area includes invertebrates. Streaked horned lark prey that could occur in the Action Area includes insects and small areas of vegetation. The Project may result in minor benthic habitat impacts that could result in impacts to benthic food supply. However, the active marina/port area in which the Project is located is not anticipated to provide optimal foraging habitat for marbled murrelets, western snowy plover, or streaked horned lark. Fish prey species could be impacted by noise emitted during in-water construction activities. As discussed in Section 6.3.1.1, Project related noise would only exceed the Interim Injury Criteria Injury threshold for fish within a small area where salmonids would be unlikely to forage (Table 20).

Substantial impacts to marbled murrelets, western snowy plover, or streaked horned lark due to a reduced food supply are not anticipated given the nature and location of the proposed Project and proposed AMMs. The removal of creosote-treated timber could improve foraging habitat.

6.4.2.5. Determination

Due to a lack of identified direct and indirect impacts the Project is **NLAA** marbled murrelets and western snowy plover. Critical habitat for marbled murrelets and western snowy plover does not occur in the Action Area. The Project would have **No Effect** on marbled murrelet and western snowy plover critical habitat.

7. Conclusion

Direct and indirect adverse impacts could occur to protected species but are unlikely to occur given the extent of the proposed repairs and proposed AMMs. The Project could result in direct impacts from construction related noise, water quality, vessel collision, and benthic habitat disturbances. The Project could also result in indirect impacts due to impacts to prey species. Given the extent of the repairs proposed any potential direct or indirect impacts are anticipated to be minor and temporary. Additionally, the AMMs proposed in Section 1.4 of this BE will further reduce the potential for adverse



impacts to protected species and critical habitat. Potential ESA effects determinations are summarized in Table 21.

Table 21. Effect Determination

Species	Scientific Name	Federal Status	Effect Determination	Critical Habitat Determination
NMFS ESA-listed Species				
Chinook Lower Columbia River ESU	<i>Oncorhynchus tshawytscha</i>	Threatened	NLAA	NLAA
Chinook Snake River fall-run ESU		Threatened	NLAA	NLAA
Chinook Snake River spring/summer-run ESU		Threatened	NLAA	NLAA
Chinook Upper Columbia River spring-run ESU		Endangered	NLAA	NLAA
Chinook Upper Willamette River ESU		Threatened	NLAA	NLAA
Chum Columbia River ESU	<i>O. keta</i>	Threatened	NLAA	NLAA
Coho Lower Columbia River ESU	<i>O. kisutch</i>	Threatened	NLAA	NLAA
Sockeye Snake River ESU	<i>O. nerka</i>	Endangered	NLAA	NLAA
Steelhead Lower Columbia River DPS	<i>O. myskiss</i>	Threatened	NLAA	NLAA
Steelhead Middle Columbia River DPS		Threatened	NLAA	NLAA
Steelhead Snake River Basin DPS		Threatened	NLAA	NLAA
Steelhead Upper Columbia River DPS		Threatened	NLAA	NLAA
Steelhead Upper Willamette River DPS		Threatened	NLAA	NLAA
Green Sturgeon Southern DPS	<i>Acipenser medirostris</i>	Threatened	NLAA	NLAA
Eulachon Southern DPS	<i>Thaleichthys pacificus</i>	Threatened	NLAA	NLAA
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	Endangered	NLAA	No Effect
Southern Resident Killer Whale	<i>Orcinus orca</i>	Endangered	NLAA	No Effect
Humpback Whale Central America DPS	<i>Megaptera novaeangliae</i>	Endangered	NLAA	No Effect
Humpback Whale Mexico DPS		Threatened	NLAA	No Effect
USFWS ESA-listed Species				
Bull Trout	<i>Salvelinus confluentus</i>	Threatened	NLAA	No Effect
Western Snowy Plover	<i>Charadrius alexandrinus nivosus</i>	Threatened	NLAA	No Effect
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	Threatened	NLAA	No Effect
Streaked Horned Lark	<i>Eremophila alpestris strigata</i>	Threatened	NLAA	No Effect

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Appendix A: Design Drawings



PORT OF ILWACO
MARINA STRUCTURES REPLACEMENT

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INDEX NO.	SHEET REF. NO.	SHEET TITLE
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2	G-002	GENERAL NOTES
3	G-003	STRUCTURAL NOTES & DESIGN CRITERIA
4	G-004	STRUCTURAL SPECIAL INSPECTION REQUIREMENTS & DETAILS
5	G-005	ABBREVIATIONS & LEGEND & DETAILS
6	G-006	BULKHEAD LOADING DIAGRAMS
7	V-100	EXISTING SITE PLAN
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15	S-201	BULKHEAD TYPICAL SECTIONS
16	S-202	BULKHEAD DETAILS (1 OF 3)
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18	S-401	BULKHEAD DETAILS (3 OF 3)
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21	S-510	MOORING HARDWARE DETAILS
22	S-511	MISCELLANEOUS DETAILS (1 OF 2)
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24	S-530	MISCELLANEOUS DETAILS (3 OF 3)
25	S-531	MISCELLANEOUS DETAILS (4 OF 4)

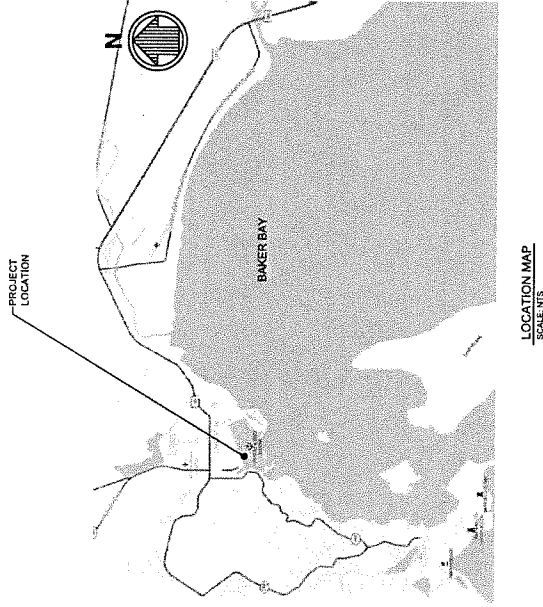
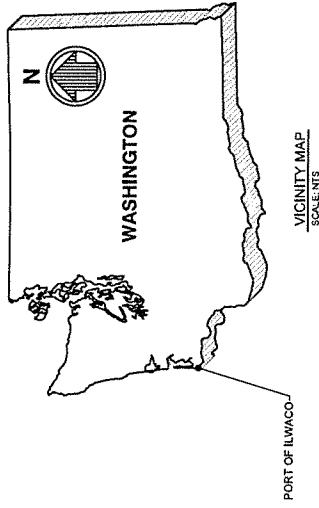
VICINITY MAP
SCALE: NTS

LOCATION MAP
SCALE: NTS

PROJECT LOCATION

50% DESIGN SUBMITTAL
ISSUED: 2022-10-07
NOT TO BE USED FOR CONSTRUCTION

SHEET INDEX	
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1. THESE NOTES CONTAIN GENERAL INFORMATION AND ARE NOT COMPLETE FOR CONSTRUCTION PURPOSES. VERIFY INFORMATION GIVEN HERE WITH SPECIFICATIONS, REFERENCE DRAWINGS, AND OTHER DOCUMENTS AND BRING ANY CONFLICTS TO THE ATTENTION OF THE PORT BEFORE BEGINNING AFFECTED WORK INCLUDING FABRICATION, INSTALLATION, OR CONSTRUCTION. THE PORT WILL RESOLVE ANY SUCH CONFLICT.
2. VERIFY LOCATIONS OF EXISTING UTILITIES AND RELATED FEATURES IN A MANNER SIMILAR TO NOTE 1 ABOVE. USE A LOCATOR SERVICE AND EXCAVATE TO EXPOSE UTILITY LINES. BRING ANY CONFLICTS BETWEEN EXISTING UTILITIES OR RELATED FEATURES AND NEW CONSTRUCTION TO THE ATTENTION OF THE PORT.
3. IMMEDIATELY REPAIR ANY DAMAGE TO EXISTING UTILITIES OR RELATED FEATURES BY THE CONTRACTOR TO THE SATISFACTION OF THE PORT AND AT NO EXPENSE TO THE PORT. DRAWING G-003 CONTAINS THE PROJECT STRUCTURAL NOTES ASSOCIATED WITH THE PORT. NOTES ON ALL OTHER DRAWINGS ARE SUPPLEMENTAL.
4. AREAS OF THE FACILITY NOT UNDER CONSTRUCTION SHALL REMAIN IN OPERATION DURING THIS PROJECT. KEEP ALL CONSTRUCTION ACTIVITIES AND PERSONNEL CLEAR OF FACILITY OPERATIONS.
5. DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONFLICTS ARE IDENTIFIED, THE CONTRACTOR SHALL IDENTIFY THE AREAS OF SIMILAR CHARACTER TO THE DETAILS SHOWN. USE SIMILAR DETAILS OF CONSTRUCTION. SUBJECT TO REVIEW AND APPROVAL BY THE PORT.
6. VERIFY ALL SITE CONDITIONS, FEATURES, DIMENSIONS, AND ELEVATIONS PRIOR TO CONSTRUCTION. LOCATE ALL UTILITIES OR CONSTRUCTION. COORDINATE THE SIZE AND LOCATION OF OPENINGS, AS WELL AS THE LOCATION OF ALL STRUCTURES, WITH THE PORT AND WITH OTHER TRADES. THE CONDITIONS SHOWN ON THESE DRAWINGS AND REQUIREMENTS REQUIRED ARE BASED ON AVAILABLE EXISTING DATA. NOTIFY THE PORT IN WRITING OF ANY DISCREPANCIES BEFORE BEGINNING THE AFFECTED WORK. RESOLVE DISCREPANCIES AS AGREED BY THE PORT BEGINNING THE AFFECTED WORK. RESOLVE DISCREPANCIES AS APPROVED BY THE PORT. THE CONTRACTOR SHALL MAINTAIN RECORDS OF DIMENSIONS AND GRADES. ESTABLISH AND MAINTAIN THE DATUM AND CONSTRUCTION BASELINE.
7. SUBMIT SHOP DRAWINGS AND OTHER SUBMITTALS FOR REVIEW TO THE PORT PRIOR TO FABRICATION OF COMPONENTS. INCLUDE DEVOLUTION PLANS, CONSTRUCTION JOINT LOCATIONS, AND CONSTRUCTION JOINT DETAILS. THE PORT WILL REVIEW THE SUBMITTALS, SHOP DRAWING AND OTHER SUBMITTAL REVIEWS: REVIEW, VERIFY, AND STAMP BY BOTH THE CONTRACTOR AND THE CONTRACTORS QUALITY CONTROL MANAGER BEFORE SUBMITTING TO THE PORT. VERIFY CONFORMANCE WITH THE MEANS AND METHODS; SEQUENCES, AND OPERATIONS OF CONSTRUCTION AND ALL SAFETY PRECAUTION PROGRAMS INCIDENTAL THERE TO. SUBMIT TO THE PORT FOR REVIEW WHEN COMPLETE.
8. BRING ALL OMISSIONS OR CONFLICTS BETWEEN THE VARIOUS ELEMENTS OF THE STRUCTURAL DRAWINGS OR BETWEEN THE STRUCTURAL DRAWINGS AND THE DRAWINGS OF THE PORT TO THE ATTENTION OF THE PORT BEFORE PROCEEDING WITH ANY WORK INVOLVED, ETC.) TO THE ATTENTION OF THE PORT BEFORE PROCEEDING WITH ANY WORK INVOLVED.
9. DO NOT SCALE WORKING DIMENSIONS FROM PLANS. SECTIONS OR DETAILS ON THE STRUCTURAL DRAWINGS.
10. SUBMIT CONTRACTOR-INITIATED CHANGES IN WRITING TO THE PORT FOR APPROVAL PRIOR TO SUBMITTAL OF SHOP DRAWINGS.
11. JOBSITE SAFETY: MEANS AND METHODS OF PERFORMING THE WORK AND TECHNIQUES. THE CONTRACTOR'S PROCEDURES OF CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE WORK. NEGATE THE CONTRACTORS RESPONSIBILITY FOR JOBSITE SAFETY OR THE CONTRACTORS RESPONSIBILITY TO PERFORM ITS WORK IN COMPLIANCE WITH THE CONTRACT.
12. VERIFY THE STRUCTURAL CAPACITY OF EXISTING STRUCTURES FOR THE ANTICIPATED LOADS OF CONSTRUCTION EQUIPMENT AND OPERATIONS TO BE USED.
13. PROVIDE TEMPORARY BRACING TO UNFINISHED PORTIONS OF THE STRUCTURE. REMOVE TEMPORARY BRACING ONLY AFTER STABILITY OF THE FINISHED STRUCTURE IS ASSURED.
14. CONTRACTOR SHALL BE RESPONSIBLE TO PROTECT ALL EXISTING STRUCTURES THAT WILL REMAIN.

SURVEY NOTES:

1. EXISTING SITE INFORMATION SHOWN ON THESE DRAWINGS IS BASED ON SURVEY INFORMATION PROVIDED BY SOLMAR HYDRO, DATED 15 APRIL, 2022.
2. DATE OF SURVEY: TOPOGRAPHIC AND BATHYMETRIC SURVEYS CONDUCTED BETWEEN 15 FEB. 2022 AND 14 MARCH 2022
3. HORIZONTAL DATUM FOR THIS PROJECT IS NAD83(11) WITH PROJECTION STATE PLANE COORDINATE SYSTEM WASHINGTON SOUTH ZONE.
4. VERTICAL DATUM FOR THIS PROJECT IS MLLW BASED ON PUBLISHED NOAA TIDAL BENCHMARK 344 0581 C
5. UNITS: U.S. FEET.
6. CONTOUR INTERVAL: 1 FOOT.
7. ALL UNDERGROUND UTILITY LOCATIONS ARE BASED ON OBSERVED EVIDENCE OF STRUCTURES, NO GUARANTEES IS MADE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED OR THAT THE UNDERGROUND UTILITIES ARE SHOWN IN THEIR EXACT LOCATION. FIELD VERIFY THE LOCATION, SIZE, MATERIAL, AND DEPTH OF UTILITIES.
8. CONTRACTOR IS RESPONSIBLE FOR REQUESTING AND MAINTAINING LOCATES ON ALL UNDERGROUND UTILITIES WITHIN THE PROJECT LIMITS.

CONTROL NOTES:

BASED STATION: SWLSILWACO
NORTHING = 373487.13 FT
EASTING = 746918.05 FT
ELEVATION = 14.23 FT (NAVC88)

DATUM:

ELEVATION DATUM FOR THIS PROJECT IS 0.0' MEAN LOWER LOW WATER (MLLW).

TIDAL DATA:

VERTICAL ELEVATIONS BASED ON NOAA TIDES AND CURRENTS DATUM
FOR STATION 944 0581 CAPE DISAPPOINTMENT, WA EPOCH 1983.
2001

ELEV(FT)	DATE	DESCRIPTION
1.50	HOWL	HIGHEST OBSERVED WATER LEVEL
2.07	MHRW	MEAN HIGH WATER
2.17	MHW	MEAN HIGH WATER
2.36	MSL	MEAN SEA LEVEL
2.50	MFL	MEAN LOW WATER
2.55	MFL	MEAN LOW WATER
2.55	NAV208	NORTH AMERICAN VERTICAL DATUM OF 1988
4.68	MHW	MEAN HIGH WATER
6.00	MFL	MEAN LOW WATER
9.25	LOWL	LOWEST OBSERVED WATER LEVEL

CODES AND STANDARDS

ALL DESIGN AND CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF THE FOLLOWING CODES AND STANDARDS.

1. AMERICAN CONCRETE INSTITUTE (ACI) 318-14, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE & COMMENTARY.
2. ACI 301-20, SPECIFICATIONS FOR CONCRETE CONSTRUCTION.
3. ACI DETAILING MANUAL, MN/661-20.
4. AISC 360-16, SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS.
5. AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) STANDARD 7-16, MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA FOR BUILDINGS AND OTHER STRUCTURES.
6. AMERICAN WELDING SOCIETY (AWS), AWS D1.1-2020, STRUCTURAL WELDING CODE - STEEL.
7. AWS D14-2018, STRUCTURAL WELDING CODE - REINFORCING STEEL.
8. AWS D1.6-2017, STRUCTURAL WELDING CODE - STAINLESS STEEL.
9. INTERNATIONAL CODE COUNCIL (ICC), INTERNATIONAL BUILDING CODE (IBC), 2018.
10. US ARMY CORPS OF ENGINEERS - DESIGN OF SHEET PILE WALLS, EM 1110-2-2504
11. UFC 4-152-07, DESIGN SMALL CRAFT BERTHING FACILITIES, 1 SEPTEMBER 2012.
12. UFG 4-195-03, DESIGN: MOORINGS, 12 MARCH 2020.
13. WASHINGTON DEPARTMENT OF TRANSPORTATION (WSDOT), STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION, 2021.
14. CRSI: MANUAL OF STANDARD PRACTICE 23TH EDITION, 2018.

PERMIT REQUIREMENTS AND BMPs:

1. CONTRACTOR SHALL COMPLY WITH ALL PROJECT PERMIT CONDITIONS AND APPLICABLE BMPs IDENTIFIED BELOW AND IDENTIFIED IN THE SPECIFICATIONS. THE PROJECT STORM WATER POLLUTION PREVENTION PLAN, AND WATER QUALITY PROTECTION AND MONITORING PLAN, DURING ANY IN-WATER AND EMBANKMENT WORK. CONTAMNANT BOOMS SHALL BE USED TO SURROUND THE WORK AREAS OR SEPARATE EMBANKMENT WORK FROM SURFACE WATER. THE BOOMS SHALL SERVE TO CONTAIN AND COLLECT ANY OILY MATERIAL RELEASED AS WELL AS FLOATING DEBRIS. OIL-ABSORBENT MATERIALS SHALL BE USED TO PREVENT OIL FROM ENTERING THE WATER. EXCESS OILY MATERIALS AND DEBRIS SHALL BE COLLECTED DAILY AND DISPOSED OF AT AN EXTENDED UP-AND SITE APPROVED BY THE PORT.
2. STEEL PILING SHALL BE INSTALLED WITH A VIBRATORY HAMMER WHEN POSSIBLE. IMPACT HAMMERING SHALL START WITH LIGHT TAPPING, THEN INCREASE TO FULL FORCE GRADUALLY.
3. A RUBBLE CURTAIN AND ONE OR MORE OTHER NOISE ATTENUATION METHODS SHALL BE USED DURING IMPACT INSTALLATION OR PROOFING OF ALL STEEL PILING.
4. HYDRAULIC WATER JETS SHALL NOT BE USED TO INSTALL PILES.
5. WORK BARGES, CONTAMNANT BOOMS, AND SILT CURTAINS SHALL NOT BE GROUNDED DURING CONSTRUCTION.
6. EXCESS AND/OR WASTE MATERIALS GENERATED DURING CONSTRUCTION SHALL NOT BE EXPOSED TO OR ENTER STATE WATERS, EXCESS OR WASTE MATERIALS SHALL BE COLLECTED AND REUSED OR STORED IN A CONTAINED MANNER. THE FACILITY PROTECTED BY THE PORT DEMOLITION AND CONSTRUCTION MATERIALS SHALL NOT BE STORED WHERE WAVE ACTION OR URLE AND RUNOFF CAN CAUSE MATERIALS TO ENTER SURFACE WATERS.
7. WATER QUALITY STANDARDS AND PROCEDURES THAT LIMIT THE IMPACT OF POLLUTANTS SHALL BE OBSERVED (IMC4127-2014/2-101(VI)).
8. LAND-BASED STAGING AREAS FOR ACTIVITIES, SUCH AS STORAGE OF MACHINERY, EQUIPMENT, MATERIALS, AND STOCKPILED SOILS SHALL BE ESTABLISHED LANDWARD OF THE PORT OR BANK IN ACCORDANCE WITH REQUIREMENTS IN THE SPECIFICATIONS. A SILT FENCE SHALL BE INSTALLED TO PREVENT EROSION AND SEDIMENT FROM WORK AREAS AND LOCATIONS WHERE MACHINERY, MATERIALS, AND STOCKPILED SOILS ARE STAGED. ANY TEMPORARY STOCKPILES SHALL BE COVERED AND BERMED WHEN NOT IN USE.

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5.00	MFL	MEAN LOW WATER
5.25	LOWL	LOWEST OBSERVED WATER LEVEL
5.95		

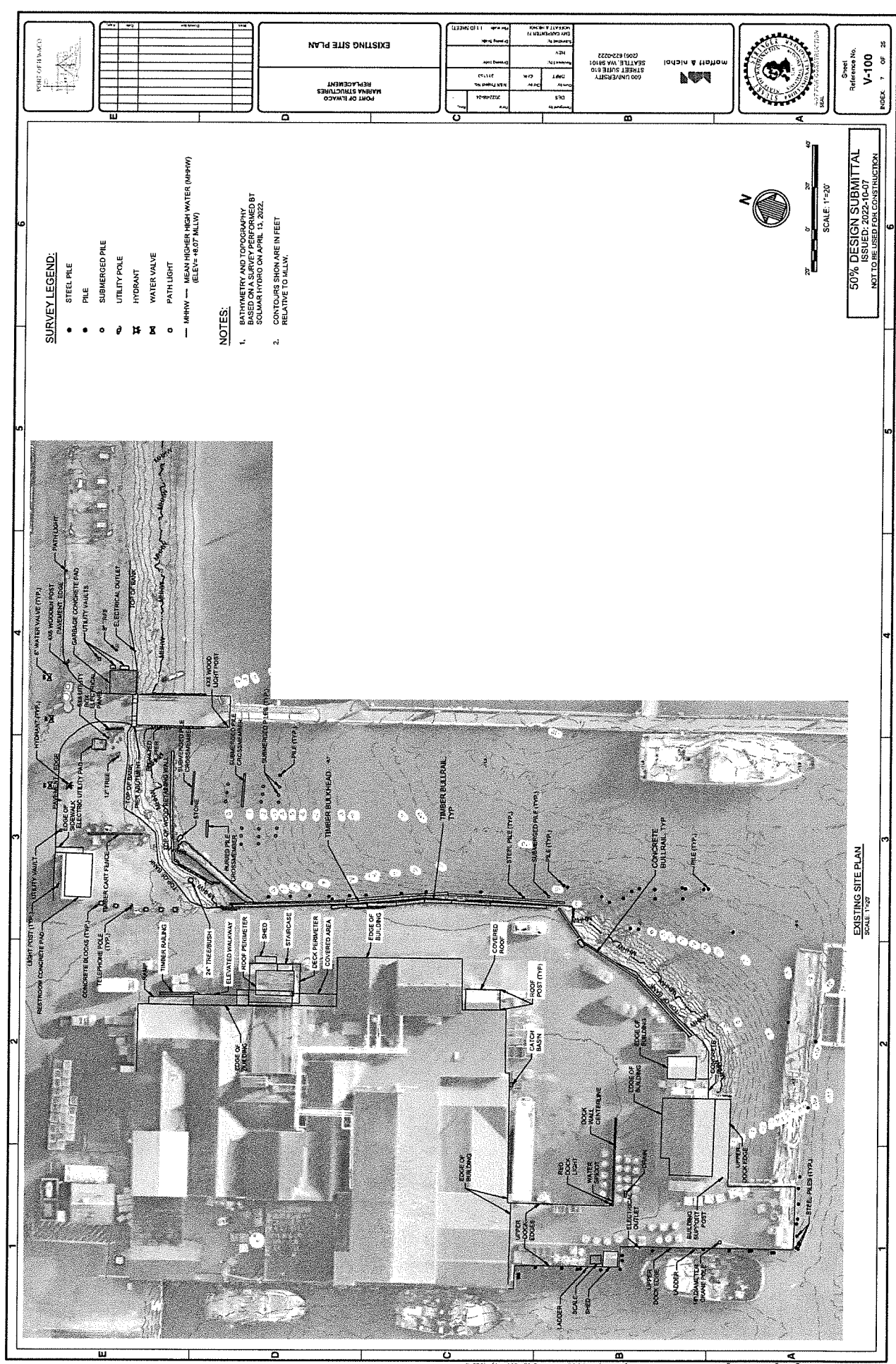
CODES AND STANDARDS




ALL DESIGN AND CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF THE FOLLOWING CODES AND STANDARDS.

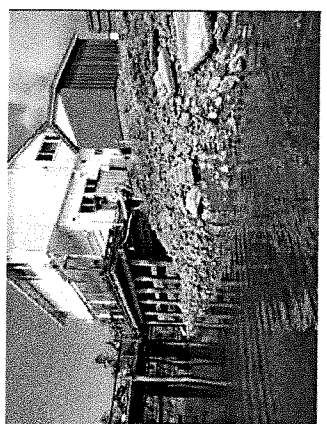
1. AMERICAN CONCRETE INSTITUTE (ACI) 318-14, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE & COMMENTARY.
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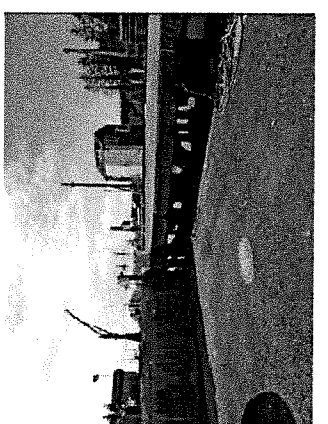
	DEMOLITION PHOTOS (1 OF 2) PORT OF LAKO MARINE STRUCTURES REPAIRMENT	000 UNIVERSITY SEATTLE WA 98101 STREET NAME 610 (000) 610-0022 Mottoli & Nichol			Sheet Reference No. CD-901 PAGE 9 OF 25
DEMOLITION PHOTOS (1 OF 2)	DEMOLITION PHOTOS (1 OF 2)	DEMOLITION PHOTOS (1 OF 2)	DEMOLITION PHOTOS (1 OF 2)	DEMOLITION PHOTOS (1 OF 2)	DEMOLITION PHOTOS (1 OF 2)



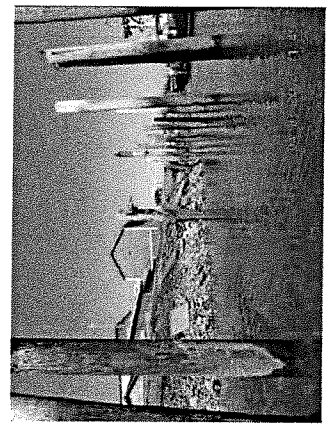
P1 SOUTH SHORLINE
CD-100 LOOKING NORTHWEST



P4 NORTH END OF BULKHEAD
CD-100 LOOKING NORTH-WEST



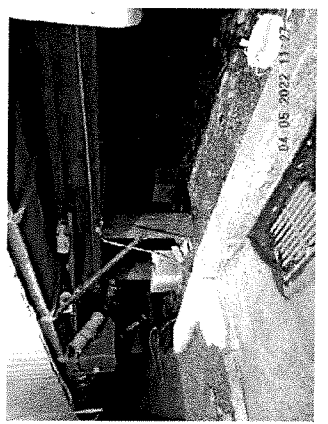
P7 **LOADING DOCK**
CD-100
LOOKING SOUTHWEST



P2 SOUTH SHORLINE
CD-100 LOOKING NORTH



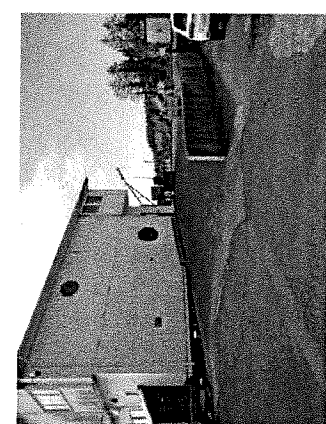
P5 SHED
CD-100 LOOKING SOUTH



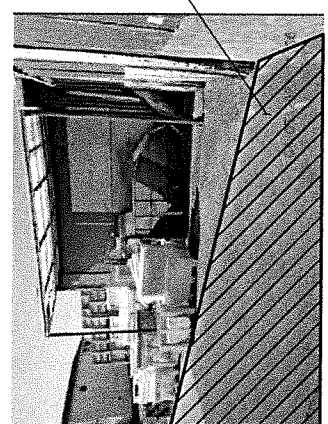
P8 **CATCH BASIN**
CD-100 LOOKING NORTHWEST



P3 SOUTH END OF BULKHEAD



P6 OFFICE BUILDING AND RAMP
D-100 LOOKING SOUTH



RECESSED EQUIPMENT

LEGEND

 **DENOLITION AREAS**

50% DESIGN SUBMITTAL
ISSUED: 2022-10-07
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

[illegible]

DEMOLITION PHOTOS
(2 OF 2)

From	2022-08-24	
DATE PROJECT END	20192	
COMPONENT CODE		
COMPONENT DESCRIPTION		
THIS WORK IS TO BE		

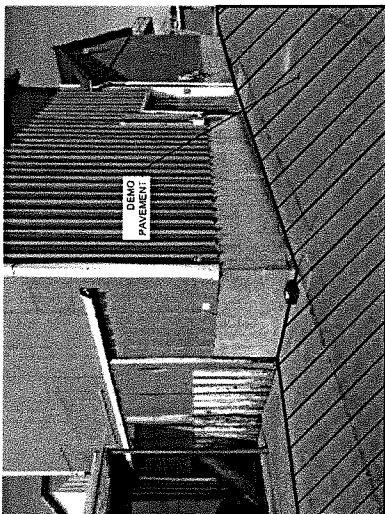
600 UNIVERSITY
STREET SUITE 610
SEATTLE, WA 98101
(206) 622-0222



Sheet
Reference No.
CD-902

50% DESIGN SUBMITTAL
ISSUED: 2022-10-07
NOT TO BE USED FOR CONSTRUCTION

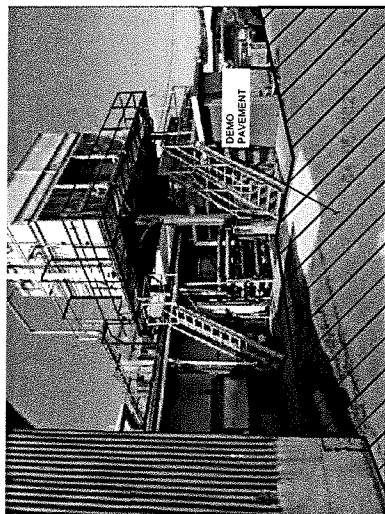
6
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



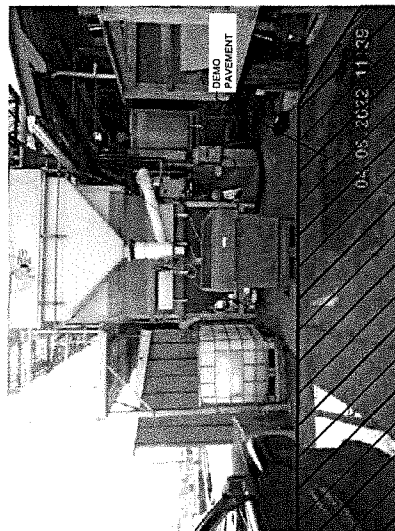
P10 SE CORNER OF BLDG
CD-100 LOOKING NORTHWEST



P11 NE CORNER OF BLDG
CD-102 LOOKING SOUTHWEST



P12 **EQUIPMENT TOWER AND UTILITIES**
CD-107 LOOKING NORTHWEST




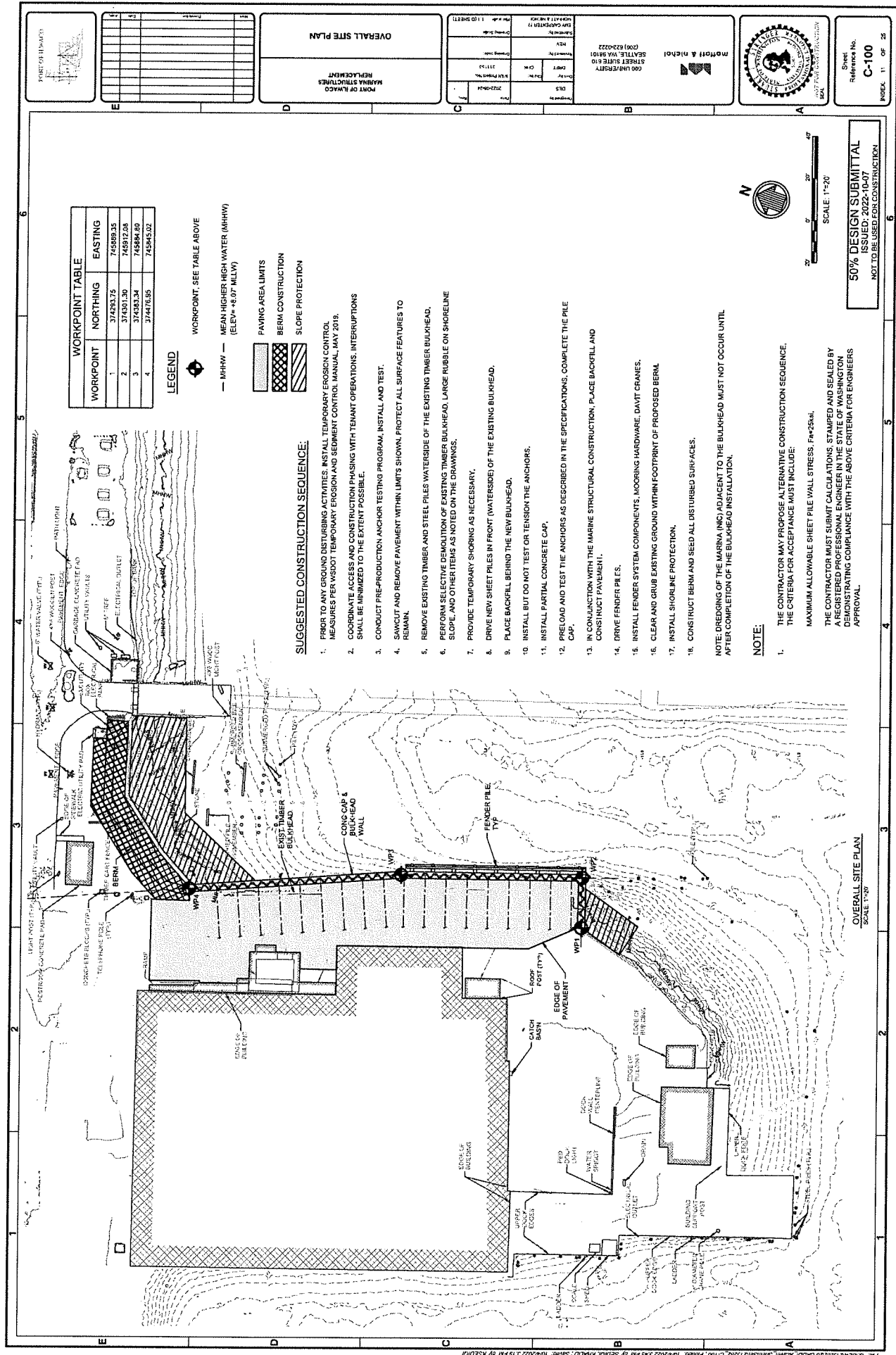
P13 **EQUIPMENT**
CD-100 LOOKING SOUTHEAST

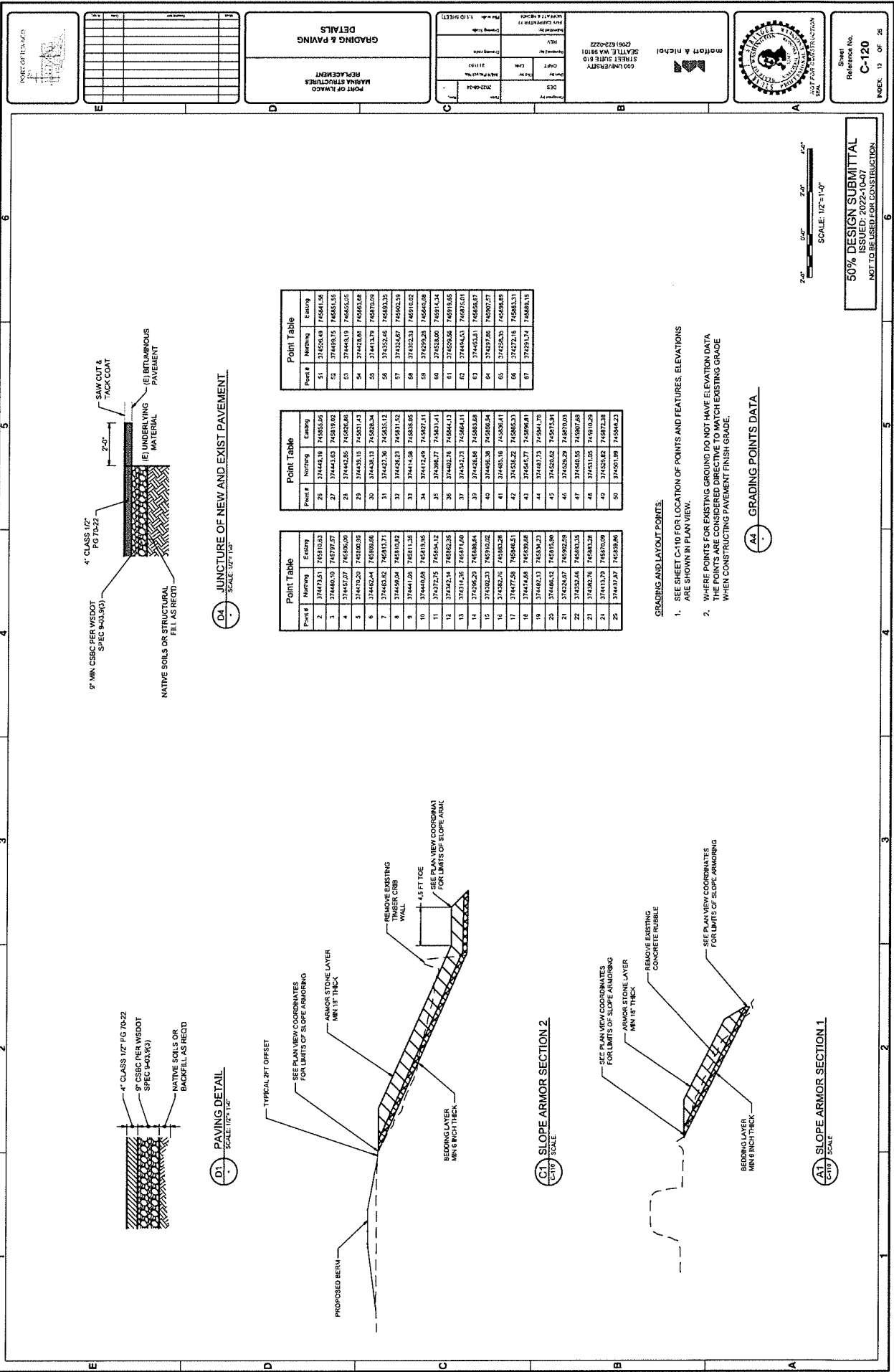


P14 BLDG FOUNDATION AND UTILITIES
CD-103 LOOKING WEST

LEGEND

 DEMOLITION AREAS





Point #	Northing	Easting
201	374483.19	745855.05
202	374443.03	745815.02
203	374442.86	745826.86
204	374439.13	745833.43
205	374438.13	745838.34
206	374427.36	745833.12
207	374426.23	745831.52
208	374414.08	745835.05
209	374412.69	745827.11
210	374386.77	745831.41
211	374402.76	745844.13
212	374342.33	745864.13
213	374428.08	745868.88
214	374466.38	745865.54
215	374465.18	745864.41
216	374538.22	745865.33
217	374545.77	745866.81
218	374487.73	745841.76
219	374525.02	745975.54
220	374525.02	745975.54
221	374525.02	745975.54
222	374525.02	745975.54
223	374525.02	745975.54
224	374525.02	745975.54
225	374525.02	745975.54

Point #	Northing	Easting
226	374483.19	745855.05
227	374443.03	745815.02
228	374442.86	745826.86
229	374439.13	745833.43
230	374438.13	745838.34
231	374427.36	745833.12
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233	374414.08	745835.05
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244	374525.02	745975.54
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246	374525.02	745975.54
247	374525.02	745975.54
248	374525.02	745975.54
249	374525.02	745975.54
250	374525.02	745975.54

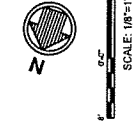
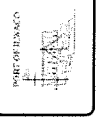
Point #	Northing	Easting
251	374483.19	745855.05
252	374443.03	745815.02
253	374442.86	745826.86
254	374439.13	745833.43
255	374438.13	745838.34
256	374427.36	745833.12
257	374426.23	745831.52
258	374414.08	745835.05
259	374412.69	745827.11
260	374386.77	745831.41
261	374402.76	745844.13
262	374342.33	745864.13
263	374428.08	745868.88
264	374466.38	745865.54
265	374465.18	745864.41
266	374538.22	745865.33
267	374545.77	745866.81
268	374487.73</	



600 UNIVERSITY
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Reviewed by	Date		2023-04-24	-
Done by	Chk by	DATE	2023-04-24	
DATE	Chk by	2023-04-24		
Reviewed by	Reviewed by			
Reviewed by				
Reviewed by				

PORT OF ILWACO MARINA STRUCTURES REPLACEMENT	BULKHEAD LAYOUT
--	-----------------



50% DESIGN SUBMITTAL
ISSUED: 2022-10-07
NOT TO BE USED FOR CONSTRUCTION

TRAINING SCALES SHOWN BASED ON 22"x34" DRAWING

MINIMUM SHEET PILE PROPERTIES						
SHEET PILE TYPE	ELASTIC MODULUS (IN²/FT)	PLASTIC MODULUS (IN²/FT)	FLANGE THICKNESS (IN)	WEB THICKNESS (IN)	CROSS SECTIONAL AREA (IN²/FT)	MOMENT OF INERTIA (IN⁴/FT)
Z-SHAPE	78.0	90.0	0.70	0.50	12.0	760

THE BASIS FOR THE BULKHEAD DESIGN IS A Z-SHAPE SHEET PILE WITH THE MINIMUM SECTION PROPERTIES PROVIDED IN THIS TABLE. ALTERNATIVE BULKHEAD CONFIGURATIONS MAY BE ACCEPTABLE. SUBJECT TO REVIEW AND APPROVAL BY THE PORT.

GROUTED TIE-BACK ANCHOR SCHEDULE						
MARK	TENDON	TOTAL LENGTH**	ANCHOR ZONE LENGTH**	MINIMUM BOND LENGTH INTO ROCK**	ULTIMATE ANCHOR FORCE (KIPS)	QUANTITY**
TYPE 1	19.0" DIA STAINLESS STEEL	142'-0"		65'-0"		

** TOTAL LENGTH, MINIMUM BOND LENGTH INTO ROCK, AND QUANTITY ARE PROVIDED FOR BID PURPOSES ONLY. PROVIDE COMPLETE GROUTED TIE-BACK ANCHOR DESIGN PER STRUCTURAL NOTES AND PROJECT SPECIFICATIONS.

LEGEND

BULKHEAD LAYOUT
SCALE: 1/8" = 1'-0"

NOTES:

1. EXISTING TRENCH BULKHEAD WALL LOCATION IS APPROXIMATE. THE EXISTING STEEL CABLE TIE-BACK LOCATION VARY. THE EXISTING BULKHEAD ANCHOR SYSTEMS UNKNOWN. PRIOR TO START OF CONSTRUCTION ACTIVITIES, LOCATIONS/ELEVATIONS OF EXISTING BULKHEAD COMPONENTS MUST BE FIELD VERIFIED.
2. PROVIDE FINAL GROUTED TIE-BACK ANCHOR AS-BUILT, LOCATIONS, LENGTHS, AND GROUT VOLUMES TO THE PORT AND INDICATE ON THE RECORD DRAWINGS.
3. PROVIDE TIE-BACK INSTALLATION PROCEDURES TO THE PORT FOR APPROVAL PRIOR TO INSTALLATION.
4. COAT BOTH SIDES OF ALL SHEET PILE ELEMENTS PER THE SPECIFICATIONS. EXTEND THE COATING TO A FINAL ELEVATION OF EL +26 MILLION OR DEEPER.

[illegible]

HEAD PLAN &
SECTION (1 OF 2)

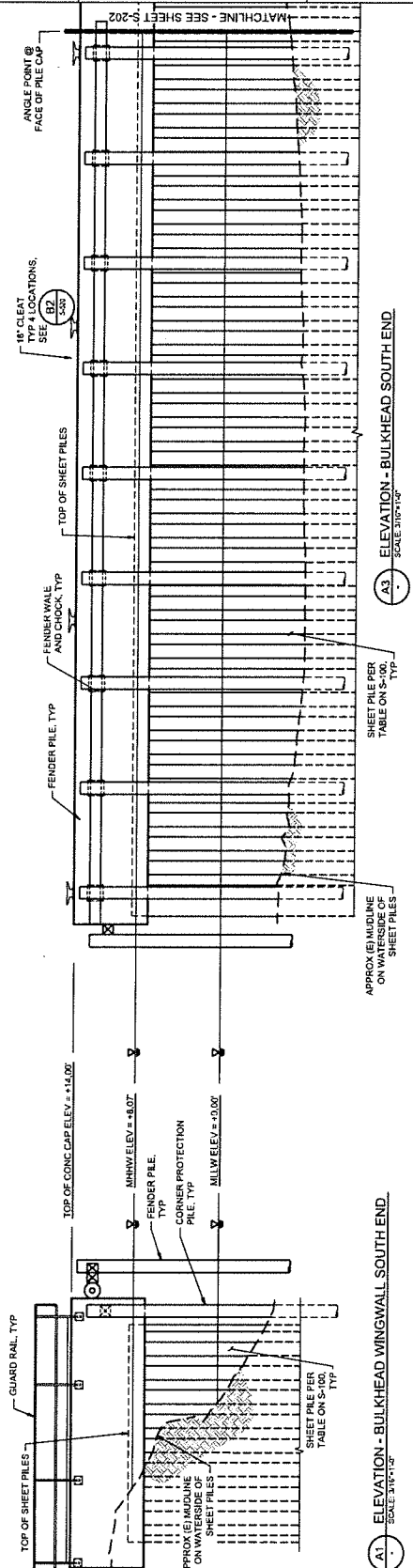
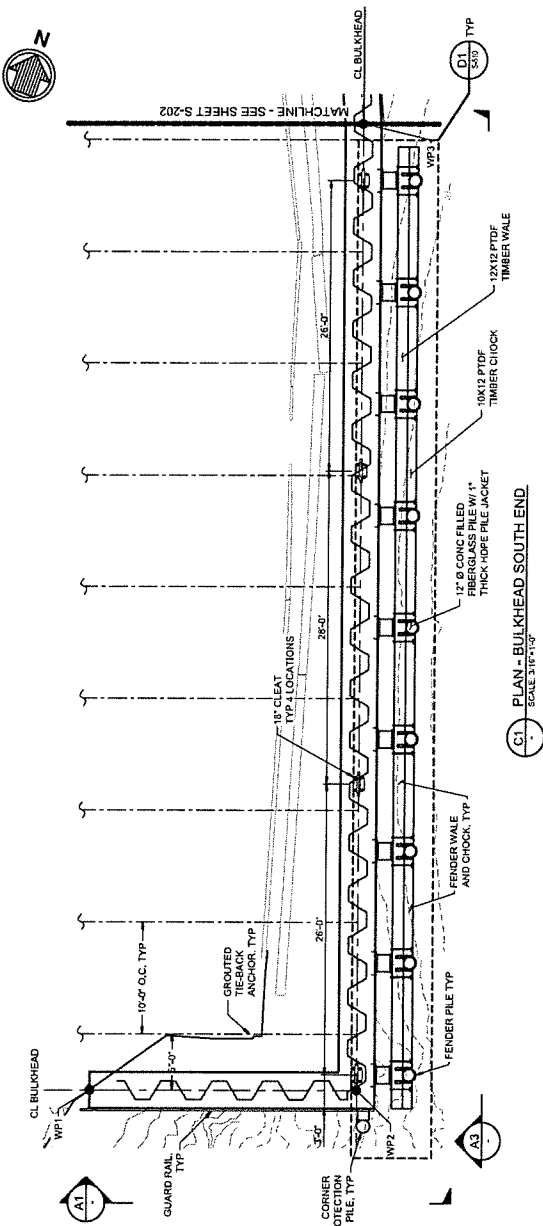
2023-08-24	1	WALSH PROJECT NO.	241150	Drawing code	Drawing Scale	Plot with 1:1 (DWG/ET)
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For more information, contact:



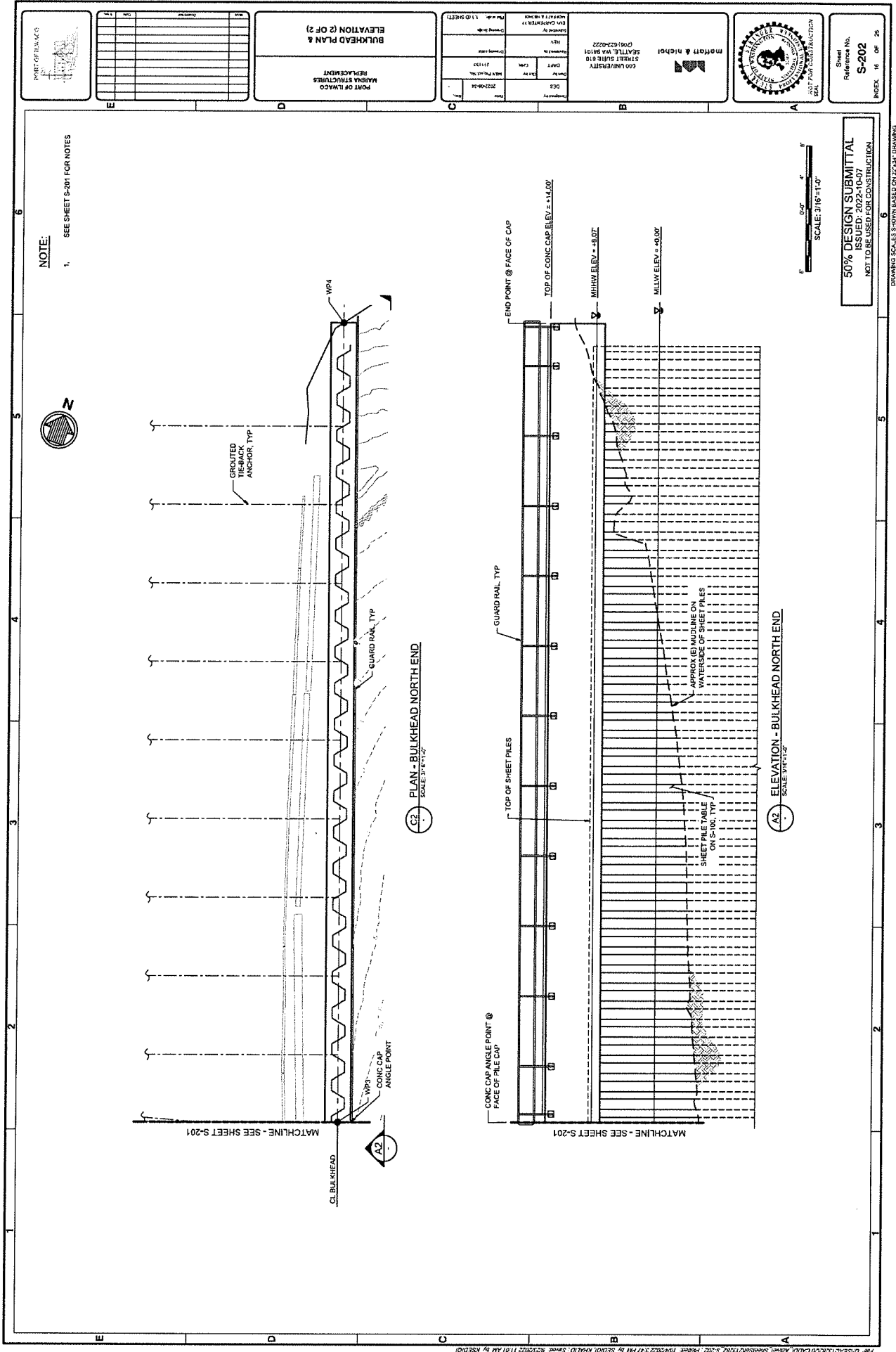
INDEX: 15 OF 26

1. SEE SHEET S-530 FOR TYPICAL GUARDRAIL DETAILS AND POST SPACING.
2. BULKHEAD DEVELOPED ELEVATION AS VIEWED FROM THE WATERSIDE.
3. SEE SHEET C-100 FOR WORK POINT COORDINATES.



50% DESIGN SUBMITTAL
ISSUED: 2022-10-07
NOT TO BE USED FOR CONSTRUCTION

WING SCALES SHOWN BASED ON 22"x34" DRAWING



THE U.S. AIR FORCE OFFICE OF SPECIAL INVESTIGATION HAS BEEN ADVISED BY THE FBI THAT THE ABOVE NAMED PERSONS ARE CURRENTLY IN THE UNITED STATES AND ARE BEING MONITORED BY THE FBI.

[illegible]

PORT OF ILWACO
MARINA STRUCTURES
REPLACEMENT

Drawn	2022-08-24	SCALE PROJECT WALL 201702	Drawing Index Drawing Sheet	Title Block 1:1 (D SHEET)
Rev.				

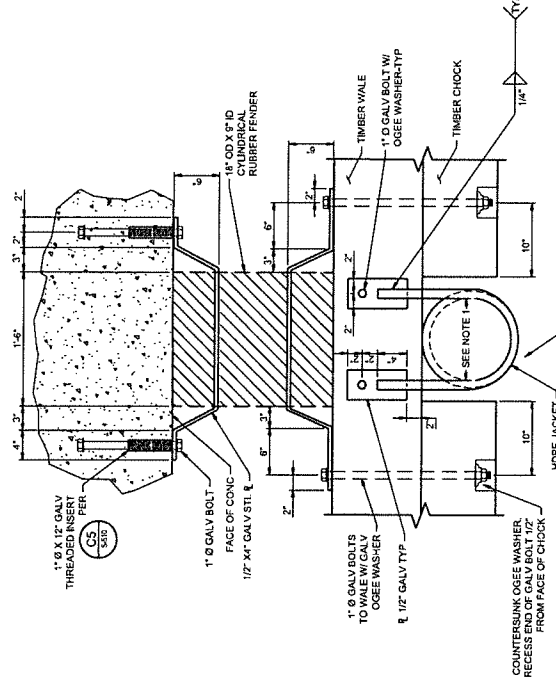
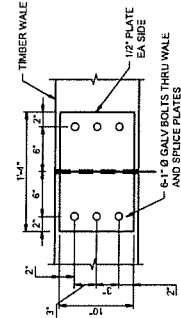
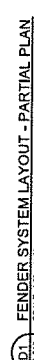
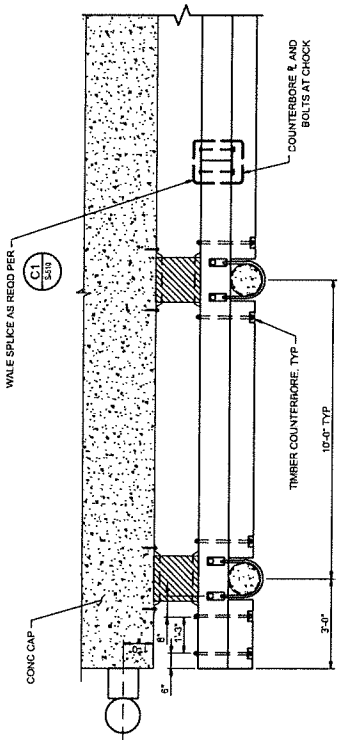
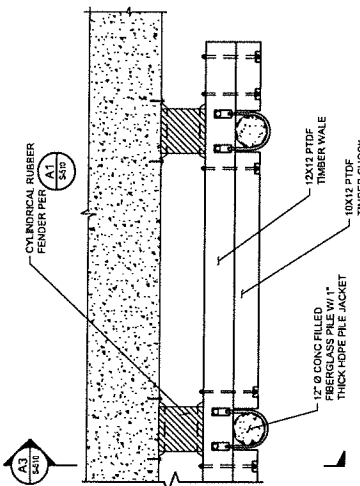
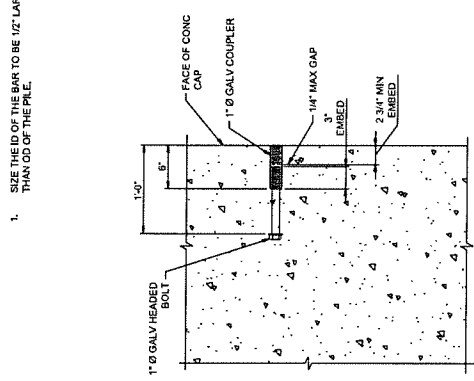
600 UNIVERSITY
STREET SUITE 610
SEATTLE, WA 98101
(206) 622-0222



Sheet
Reference No.
S-510
INDEX: 21 OF 25

NOTE:

1. SIZE THE ID OF THE BAR TO BE 1/2" LARGER THAN OD OF THE PILE.



DRAWING SCALE: AS SHOWN BASED ON 12" x 14" DRAWING

50% DESIGN SUBMITTAL
ISSUED: 2022-10-07
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 20" x 30" DRAWING

Appendix B: Essential Fish Habitat Assessment



9. Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) includes a mandate that NOAA Fisheries must identify essential fish habitat (EFH) for federally managed marine fish, and federal agencies must consult on all activities, or proposed activities, authorized, funded, or undertaken by the agency that may adversely affect EFH. The Pacific Fishery Management Council (PFMC) has designated EFH for the Pacific salmon fishery, federally managed ground fishes, and coastal pelagic fisheries (PFMC 1999). This assessment has been prepared to provide documentation that this project has been analyzed for its potential to affect EFH.

A. Description of the Proposed Action *(may refer to BE/BA project description)*

Please refer to Sections 1 of the BE.

B. Addresses EFH for Appropriate Fisheries Management Plans (FMP)

Three Fisheries Management Plans (FMPs) have been identified for the Action Area covering groundfish, coastal pelagic species and Pacific salmon. General impacts are anticipated to be similar to those described in the BE (minor, localized and short-term).

C. Effects of the Proposed Action

i. Effects on EFH (groundfish, coastal pelagic, and salmon EFH should be discussed separately)

Pacific Groundfish: The Pacific Groundfish FMP protects a variety of bottom dwelling fish and is composed of 90 different fish species, including flatfish, round fish, sharks and skates, and other species such as ratfish, finescale codling, and Pacific rattail grenadier. Groundfish species could occur within the Action Area. Temporary and permanent benthic habitat disturbance could occur. Temporarily disturbed benthic habitat would be anticipated to be quickly recolonized by benthic species and in-benthic invertebrates (Thrush and Dayton 2002). The proposed bulkhead installation and riprap installation will result in the permanent conversion of approximately 3,000 sf of aquatic soft bottom habitat to hard shoreline armoring. Impacts to benthic habitat are anticipated to be offset by the removal of creosote-treated timber from the marine environment. Any potential impacts to Pacific groundfish EFH are anticipated to be minor and localized and will not be anticipated to substantially impact Pacific groundfish.

Coastal Pelagic Species: The Coastal Pelagic Fisheries Management Plan (FMP) protects a variety of fish associated with open water coastal habitats. The Coastal Pelagic FMP is composed of six species including northern anchovy, market squid, pacific sardine, Pacific (chub) mackerel, jack mackerel and



krill. Construction of the bulkhead wall could cause minor impacts to coastal pelagic EFH. The removal of creosote-treated structures and piles would be anticipated to improve coastal pelagic Species EFH.

Salmon EFH: The Pacific Salmon FMP protects a variety of salmonid species. The main species managed by the council include chinook and Coho salmon. Salmon could occur within the Action Area. Construction of the replacement bulkhead wall could cause minor impacts to salmon EFH. The removal of creosote-treated structures and piles would be anticipated to improve salmon EFH. Any potential impacts to salmonid EFH are anticipated to be minor, temporary, and localized.

ii. Effects on Managed Species (unless effects to an individual species are unique, it is not necessary to discuss adverse effects on a species-by species basis)

The project has the potential to create the following short-term direct adverse impacts:

Noise

In-water and in-air noise disturbances to managed species could occur. The greatest potential for in-water noise impacts will be during pile installations. Potential in-water noise impacts to fish species are discussed in Section 6.3.1.1 of this BE. In general, potential noise impacts are anticipated to be minor and temporary.

Water Quality

General localized water quality/turbidity impacts could occur to managed species. Potential water quality impacts from the proposed project are discussed in detail in Section 6.3.1.2. In general, water quality and turbidity impacts from sediment resuspension are anticipated to be minor, localized, and temporary. The AMMs discussed in Section 1.4 of this BE will minimize the potential for this impact to be significant on aquatic species or habitat. Removal of creosote treated timber will result in water quality improvements by reducing toxicity potential.

Benthic Habitat Disturbance

Temporary and permanent benthic habitat disturbance could occur. Temporarily disturbed benthic habitat would be anticipated to be quickly recolonized by benthic species and in-benthic invertebrates (Thrush and Dayton 2002). The proposed bulkhead installation and riprap installation will result in the permanent conversion of approximately 3,000 sf of aquatic soft bottom habitat to hard shoreline armoring. Impacts to benthic habitat are anticipated to be offset by the removal of creosote-treated timber from the marine environment.



iii. Effects on Associated Species, Including Prey Species

Due to the proposed construction activities and methods, temporary nature of the project, and the implementation of the proposed AMMs (Section 1.4 of this BA) to reduce the risk of impacts to aquatic resources, the project is not anticipated to have substantial adverse impacts on prey species over the short or long term.

iv. Cumulative Effects

Cumulative effects are those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the Action Area. Maintenance dredging may occur within the Action Area as a separate, independent project. This maintenance dredging could result in localized temporary effects to water quality, but would not be anticipated to result in substantial cumulative impacts. All dredged material will be characterized and placed either upland or at a permitted open water placement site if the material is suitable for open water placement.

D. Proposed Conservation Measures

See Section 1.4 of this BE.

E. Conclusions by EFH *(taking into account proposed conservation measures)*

Due to the temporary nature of the project and the implementation of AMMs (Section 1.4 of this BE) to reduce the risk of impacts to marine resources, the project **may affect** EFH for groundfish, coastal pelagic species, or salmonids.





Allyson Brooks Ph.D., Director
State Historic Preservation Officer

May 26, 2023

Margaret Schwertner
Moffatt & Nichol
505 S 336th Street
Federal Way, WA 98422

In future correspondence please refer to:
Project Tracking Code: 2022-06-04226
Property: Port of Ilwaco East Bulkhead Resilience Project
Re: No Historic Properties Affected

Dear Margaret Schwertner:

Thank you for contacting the Washington State Department of Archaeology and Historic Preservation (DAHP) regarding the Port of Ilwaco East Bulkhead Resilience Project. This action has been reviewed on behalf of the State Historic Preservation Officer (SHPO) under provisions of Section 106 of the National Historic Preservation Act of 1966 (as amended) and 36 CFR Part 800. Our review is based upon documentation provided in your submittal: Addendum to the Cultural Resources Assessment for the Port of Ilwaco East Bulkhead Replacement Project.

First, we concur that the following properties are not eligible for listing in the National Register of Historic Places:

- Property ID: 728160 Port of Ilwaco Wharf East Bulkhead 113 Howerton Way SE, Ilwaco, Washington, 98624
- Property ID: 730624 Safe Coast Seafoods - Main Building 117 Howerton Ave, Ilwaco, Washington, 98624
- Property ID: 730625 Safe Coast Seafoods South Building 117 Howerton Ave, Ilwaco, Washington, 98624

We also concur that no historic resources will be affected by the current project as proposed.

As a result of our concurrence, further contact with DAHP on this proposal is not necessary. However, if new information about affected resources becomes available and/or the project scope of work changes significantly, please resume consultation as our assessment may be revised. Also, if any archaeological resources are uncovered during construction, please halt work immediately in the area of discovery and contact the appropriate Native American Tribes and DAHP for further consultation.

Thank you for the opportunity to review and comment. If you have any questions, please feel free to contact me.

Sincerely,

Maureen Elenga, M.A.
Transportation Reviewer
(360) 972-4539
Maureen.Elenga@dahp.wa.gov



From: Tom Hausmann - NOAA Federal
To: Gilson, Kristine (MARAD); Schwertner, Margaret; Bonnie Shorin - NOAA Federal; Consultationupdates WCR - NOAA Service Account
Subject: WCRO-2022-03087 Ilwaco East Bulkhead Resilience Project, Port of Ilwaco, Pacific County, Washington
Date: Thursday, October 5, 2023 8:34:34 AM

CAUTION: This email originated from outside of the organization.

On August 16, 2023, we concurred with your conclusion that the Ilwaco East Bulkhead Resilience Project (WCRO-2022-03087) is not likely to adversely affect CR chum salmon, LCR coho salmon, SR sockeye salmon, LCR Chinook salmon, UCR spring Chinook salmon, SR spring/summer Chinook salmon, SR fall Chinook salmon, UWR Chinook salmon, LCR steelhead, MCR steelhead, UCR steelhead, UWR steelhead, Southern DPS green sturgeon or Southern DPS eulachon or their designated critical habitat in the Columbia River estuary. On August 30, 2023 you informed us of 4 changes to the proposed action

1. You will not install 10 fiberglass fender piles
2. You will place 6 inch thick layer of fish mix gravel over the north shoreline riprap
3. You will remove floating timber debris from the south portion of the marina
4. These changes result in minor changes to your fill calculations

You determined that these changes do not change your determination that the proposed action is not likely to adversely affect the salmon, steelhead, green sturgeon or eulachon listed above or critical habitat for these species.

We've reviewed these changes to the proposed action and agree that they do not change our concurrence with your NLAA determinations and reinitiation of this consultation is not necessary. We will add Margaret Schwertner's August 30, 2023 email with the description of the proposed action changes and a copy of this email to the administrative record for this consultation.

Thank you,

Tom Hausmann

Biologist, Washington Coast, Lower Columbia River Branch

Oregon Washington Coastal Office

--

Tom Hausmann

Schwertner, Margaret

From: Schwertner, Margaret
Sent: Wednesday, August 30, 2023 8:24 AM
To: Jennifer Carlson - NOAA Federal; Tom Hausmann - NOAA Federal; Bonnie Shorin - NOAA Federal
Cc: Gilson, Kristine (MARAD); England, Victoria
Subject: RE: Ilwaco East Bulkhead Resilience Project letter of concurrence
Attachments: rev2023June_213282 ILWACO-BH_JARPA figs.pdf

Hi Tom, Jennifer, and Bonnie,

Thank you very much for the LOC.

We have a short project update for the Port of Ilwaco East Bulkhead Resilience Project. There have been a few changes to the project description (removal of pile fender system due to cost) and some additional mitigation elements required as a result of ongoing coordination with the City of Ilwaco and Washington State Department of Fish and Wildlife (WDFW). This email provides a detailed summary of those recent project changes. The changes are minor in nature and do not impact the species Effect Determinations made for the project nor are they anticipated to warrant changes to the LOCs received (NMFS WCRO-2022-03087, FWS 2023-0025807). All proposed avoidance, minimization, and mitigation measures will still be implemented as described in the permit documents.

The project modifications are described below and are reflected in the attached revised design drawings.

Fender Pile System

The installation of 10, 12-inch fiberglass fender piles external to the bulkhead to support temporary berthing is no longer proposed.

Fish Mix Placement

A 6-inch layer (approximately 34 cy) of fish mix gravel will be placed over the north shoreline riprap below the high tide line (HTL) to provide beach nourishment and improved habitat for fish passing through the marina.

Debris Removal

Floating timber debris will be removed from the south portion of the marina. This will remove approximately 2,510 sf of overwater coverage currently present in that portion of the marina.

Fill Impacts

Minor fill impact changes have occurred due the removal of the fender pile system from the project, the addition of fish mix on the north shoreline, and changes to the way in which fill quantities are calculated including an update to the High Tide Line elevation used to calculate fill impacts. Fill impact changes are summarized in Table 1 and Table 2 below.

Table 1. Fill Impacts Provided in Biological Evaluation Dated December 12, 2022 and Submitted for ESA Consultations

Activity	Fill below HTL (sf)	Fill below HTL (cy)	Fill above HTL (sf)	Fill above HTL (cy)
<i>Bulkhead wall and shoreline protection installation</i>				
Sheetpile and fender pile installation	500 sf	40 cy	0 sf	0 cy
Bulkhead drainage rock placement	1,000 sf	400 cy	0 sf	0 cy
Rip-rap placement (north shoreline)	1,850 sf	140 cy	350 sf	25 cy
Rubble/ rip-rap removal (south shoreline)	-350 sf	-14 cy	-50 sf	-2 cy
Rip-rap replacement (south shoreline)	350 sf	30 cy	50 sf	5 cy
<i>Structure removal</i>				
Pile removal adjacent to existing bulkhead	-12 sf	-6 cy	0 sf	0 cy

North shoreline- creosote-treated timber retaining wall removal	-85 sf	-12 cy	0 sf	0 cy
Derelict pile/timber removal	-68 sf	-12 cy	0 sf	0 cy

Table 2. Revised Fill Impacts

Activity	Fill below HTL (sf)	Fill below HTL (cy)	Fill above HTL (sf)	Fill above HTL (cy)
<i>Bulkhead wall and shoreline protection installation</i>				
Sheetpile installation	400 sf	80 cy	0 sf	0 cy
Bulkhead drainage rock placement	1,000 sf	450 cy	0 sf	0 cy
Rip-rap shore protection and Fish Mix placement (north shoreline)	1,850 sf	172 cy	350 sf	26 cy
Concrete rubble removal (south shoreline)	-350 sf	-14 cy	-50 sf	-2 cy
Rip-rap replacement (south shoreline)	350 sf	30 cy	50 sf	5 cy
<i>Subtotal</i>	<i>3,250 sf</i>	<i>718 cy</i>	<i>350 sf</i>	<i>29 cy</i>
<i>Structure removal</i>				
Pile removal adjacent to existing bulkhead	-12 sf	-6 cy	0 sf	0 cy
North shoreline- retaining wall removal	-85 sf	-12 cy	0 sf	0 cy
Derelict pile/timber removal	-68 sf	-12 cy	0 sf	0 cy
Derelict Timber Structure/Debris Removal -South Marina	-2,510 sf	-350 cy	0 sf	0 cy
<i>Subtotal</i>	<i>-2,675 sf</i>	<i>-380 cy</i>	<i>0 sf</i>	<i>0 cy</i>
<i>Creosote removal from the Environment</i>	<i>34 tons</i>			

We do not anticipate that these minor modifications will change the overall assessment of potential impacts but would like to confirm that the LOCs do not need to be updated nor consultation reinitiated based on these minor revisions. Please reach out if you require any additional information or have any questions or concerns.

Thank you.

Regards,
Margaret

Margaret Schwertner

Senior Environmental Scientist
505 S. 336th St. | Federal Way, WA 98422
P 253.237.5928 | M 206.818.2600



From: Jennifer Carlson - NOAA Federal <jennifer.carlson@noaa.gov>

Sent: Wednesday, August 16, 2023 8:00 AM

To: kristine.gilson@dot.gov

Cc: Schwertner, Margaret <mschwertner@moffattnichol.com>; Tom Hausmann - NOAA Federal

<Tom.Hausmann@noaa.gov>; Bonnie Shorin - NOAA Federal <bonnie.shorin@noaa.gov>; Consultationupdates WCR - NOAA Service Account <consultationupdates.wcr@noaa.gov>

Subject: Ilwaco East Bulkhead Resilience Project letter of concurrence

CAUTION: This email originated from outside of the organization.

Please find the letter of concurrence attached. This electronic copy is for your records and files. This email is part of a consultation response for WCRO-2022-03087.

Thank you.

Jennifer McDonald Carlson (she/her)
Oregon Washington Coastal Office
NOAA Fisheries West Coast Region
U.S. Department of Commerce

jennifer.carlson@noaa.gov

www.westcoast.fisheries.noaa.gov



NOAA FISHERIES
West Coast Region

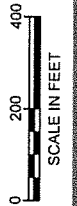
S33 T10N R11W

LEGEND

POI PORT OF ILWACO OWNED PARCEL
--- TAX PARCEL
--- OWN --- ORDINARY HIGH WATER MARK

SITE PLAN

EXISTING MARINA



FLOOD

EBB

BAKER BAY



PURPOSE: PORT OF ILWACO BULKHEAD REPLACEMENT AND SEA LEVEL RISE RESILIENCE .

DATUM: MLLW

ADJACENT PROPERTY OWNERS:

1. CITY OF ILWACO
2. STATE OF WASHINGTON
3. STARLIGHT ONE LLC.

**Port of Ilwaco East Bulkhead
Resilience Project**

Parcel Map

APPLICATION BY:
Port of Ilwaco

PROPOSED: DERELICT ILWACO E. BULKHEAD REPLACEMENT, DRIVEWAY REGRADING/ REPAVING, & SHORE PROTECTION REPLACEMENT

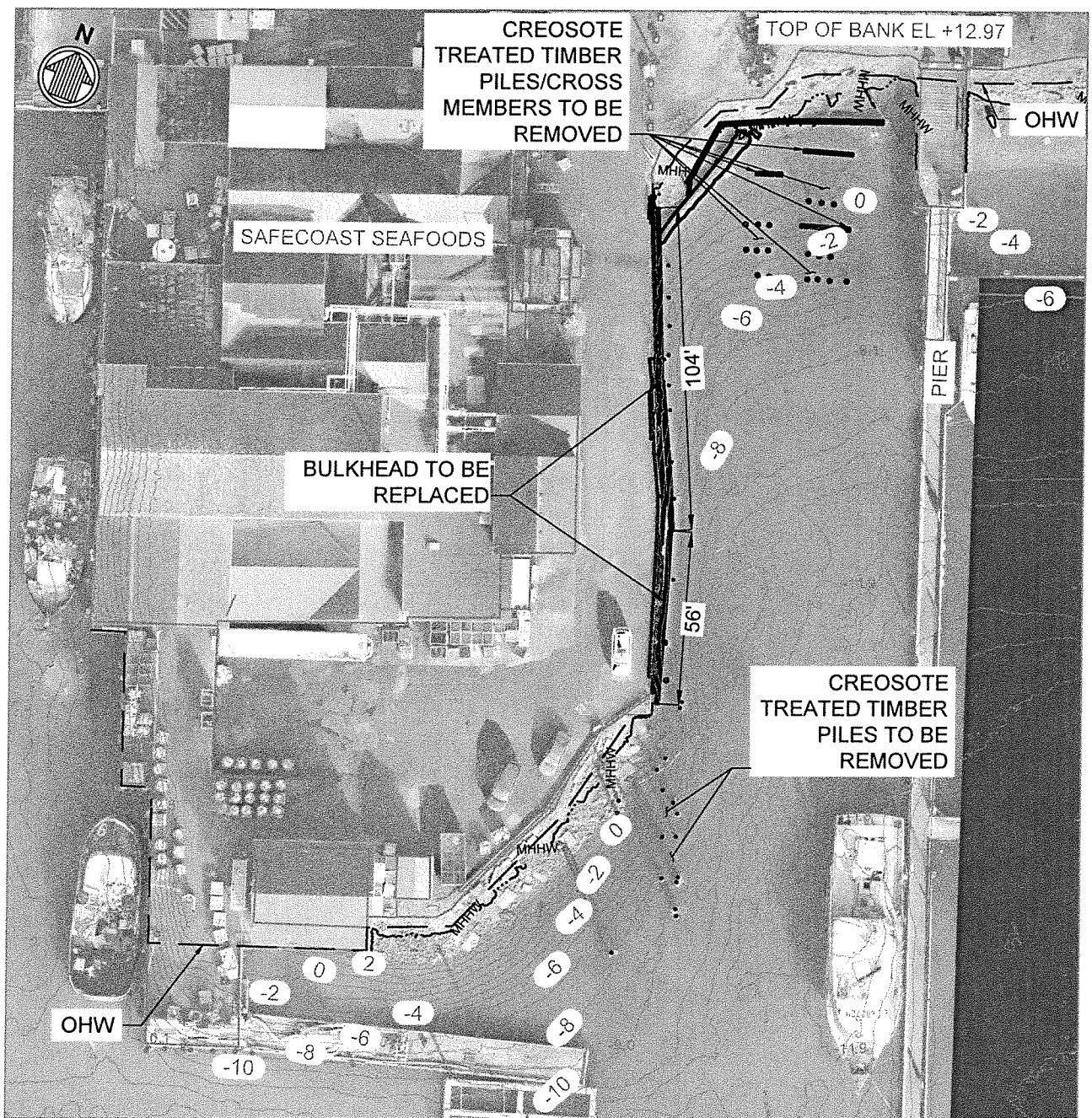
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AT: ILWACO

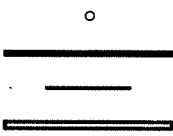
COUNTY: PACIFIC

SHEET 2 OF 9

DATE: JUNE 2023



LEGEND



PILES

CREOSOTE-TREATED REVETMENT (TO BE REMOVED)

CREOSOTE-TREATED LOG (TO BE REMOVED)

BULKHEAD (TO BE REMOVED)



PLAN - EXISTING CONDITIONS
SCALE: 1" = 50'

SCALE: 1" = 50'

LEVELS:

MHHW: +8.07'

MLW: 1.35'

OHW (DELINEATED):

MHW: +7.37'

MLLW: +0.00'

APPROX. +11.50'



SCALE: 1"=50'

APPLICANT:
PORT OF ILWACO

ADJACENT PROPERTY OWNERS:
1) PORT OF ILWACO

LOCATION: PORT OF ILWACO
117 HOWERTON AVE SE
ILWACO, WA 98624

LAT/LONG: 46.30442 N, -124.03852 W

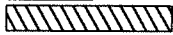
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SHEET: 3 OF 9 DATE: JUNE 2023

PROPOSED PROJECT: PORT OF ILWACO
EAST BULKHEAD RESILIENCE PROJECT

IN: BAKER BAY
NEAR/AT: ILWACO
COUNTY: PACIFIC
SEC: 33/34 T: 10 N R: 11 W



LEGEND



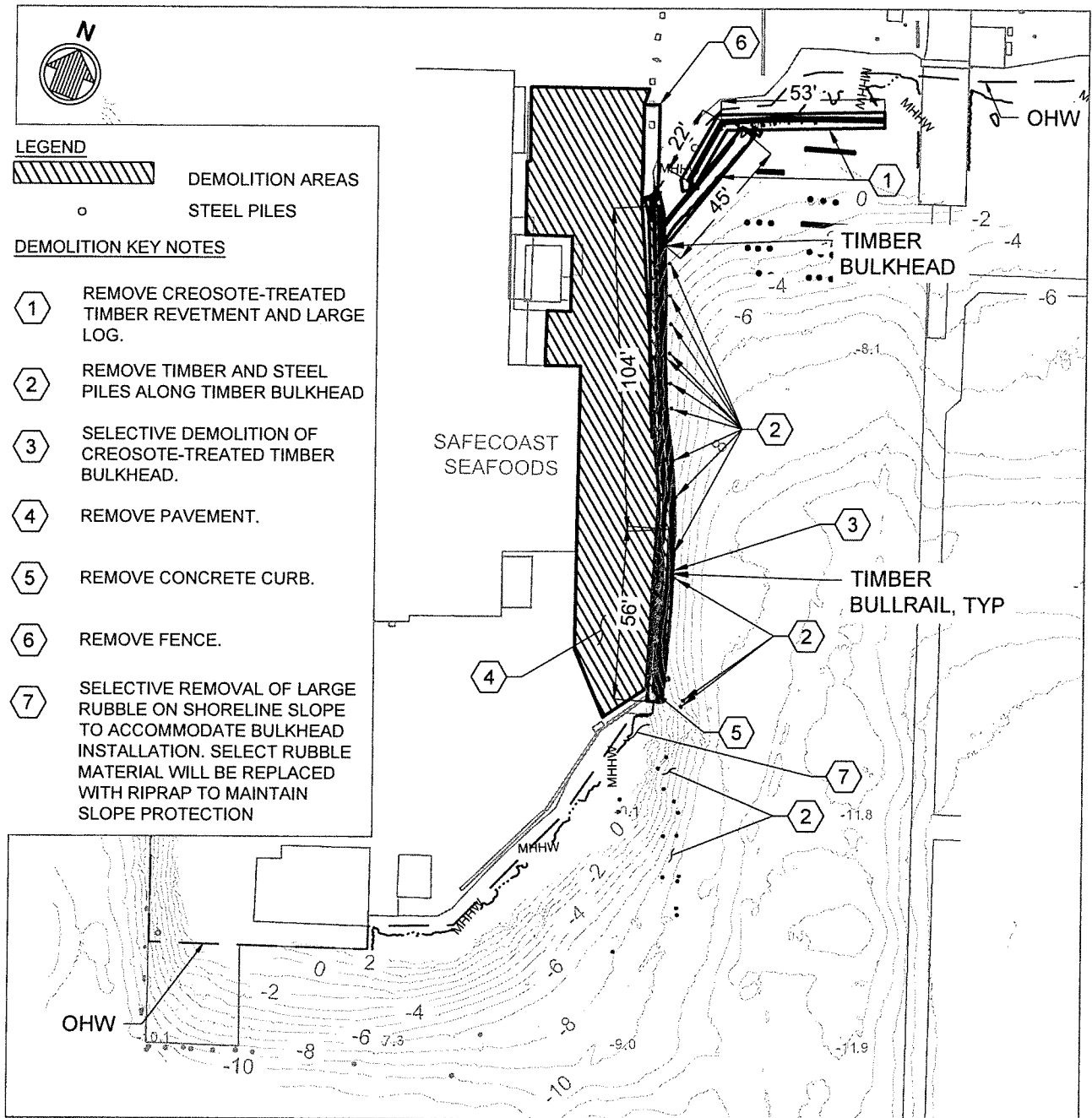
DEMOLITION AREAS



STEEL PILES

DEMOLITION KEY NOTES

- 1 REMOVE CREOSOTE-TREATED TIMBER REVETMENT AND LARGE LOG.
- 2 REMOVE TIMBER AND STEEL PILES ALONG TIMBER BULKHEAD
- 3 SELECTIVE DEMOLITION OF CREOSOTE-TREATED TIMBER BULKHEAD.
- 4 REMOVE PAVEMENT.
- 5 REMOVE CONCRETE CURB.
- 6 REMOVE FENCE.
- 7 SELECTIVE REMOVAL OF LARGE RUBBLE ON SHORELINE SLOPE TO ACCOMMODATE BULKHEAD INSTALLATION. SELECT RUBBLE MATERIAL WILL BE REPLACED WITH RIPRAP TO MAINTAIN SLOPE PROTECTION



PLAN - DEMOLITION
SCALE: 1" = 50'

LEVELS:

MHHW: +8.07'

MHW: +7.37'

MLW: 1.35'

MLLW: +0.00'

OHW (DELINEATED):

APPROX. +11.50'



SCALE: 1"=50'

APPLICANT:
PORT OF ILWACO

ADJACENT PROPERTY OWNERS:
1) PORT OF ILWACO

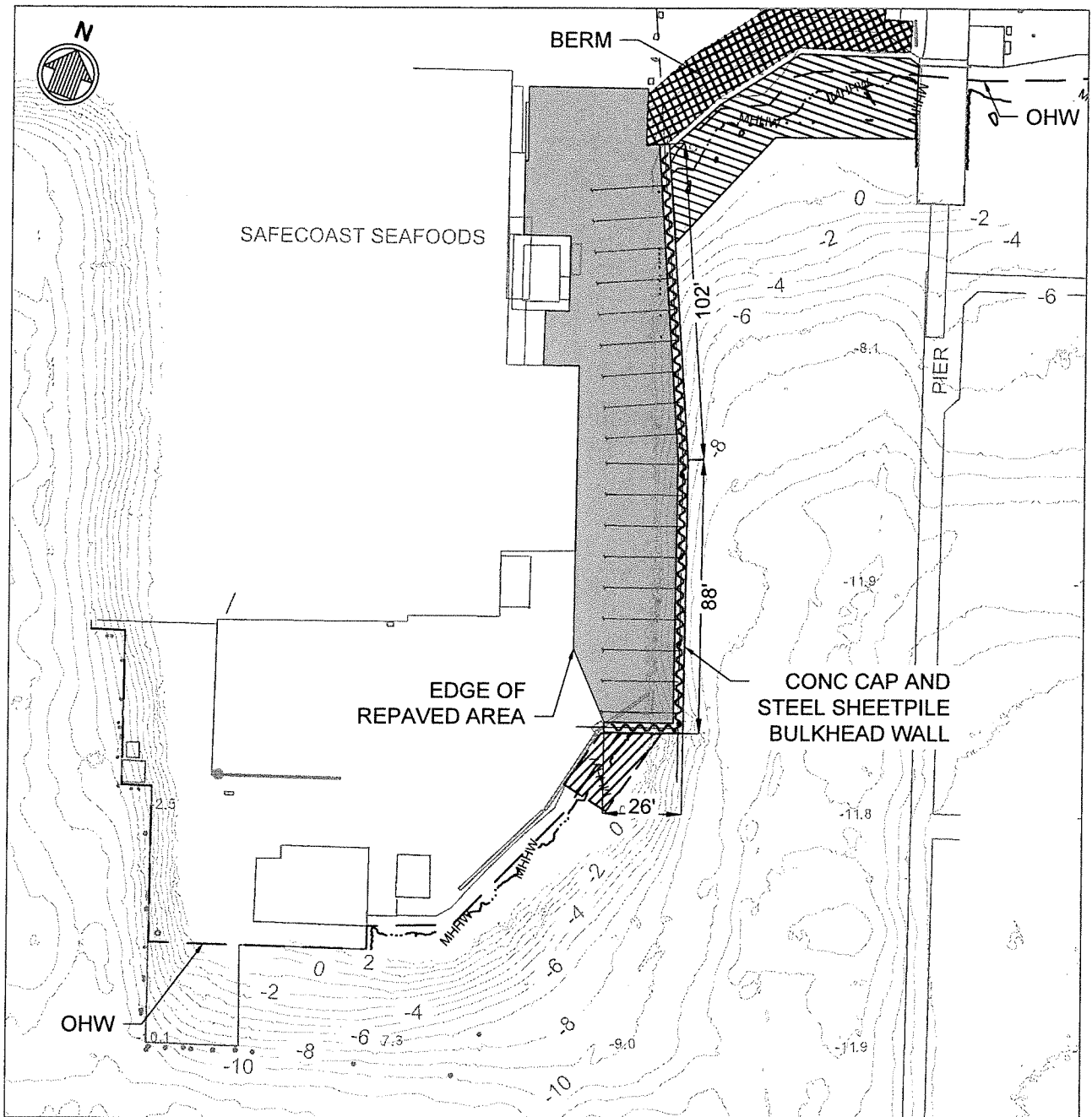
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117 HOWERTON AVE SE
ILWACO, WA 98624

LAT/LONG: 46.30442 N, -124.03852 W

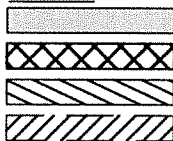
DATUM: MLLW
SHEET: 4 OF 9 **DATE:** JUNE 2023

PROPOSED PROJECT: PORT OF ILWACO
EAST BULKHEAD RESILIENCE PROJECT

IN: BAKER BAY
NEAR/AT: ILWACO
COUNTY: PACIFIC **STATE:** WA
SEC: 33/34 **T:** 10 N **R:** 11 W



LEGEND



PAVING AREA LIMITS

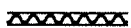
BERM CONSTRUCTION

SLOPE PROTECTION

APPROXIMATE AREA OF SLOPE PROTECTION REPLACEMENT



TIEBACKS



PROPOSED BULKHEAD



PILES



PLAN - PROPOSED
SCALE: 1" = 50'

LEVELS:

MHHW: +8.07'

MLW: 1.35'

OHW (DELINEATED):

MHW: +7.37'

MLLW: +0.00'

APPROX. +11.50'



SCALE: 1"=50'

APPLICANT:
PORT OF ILWACO

ADJACENT PROPERTY OWNERS:
1) PORT OF ILWACO

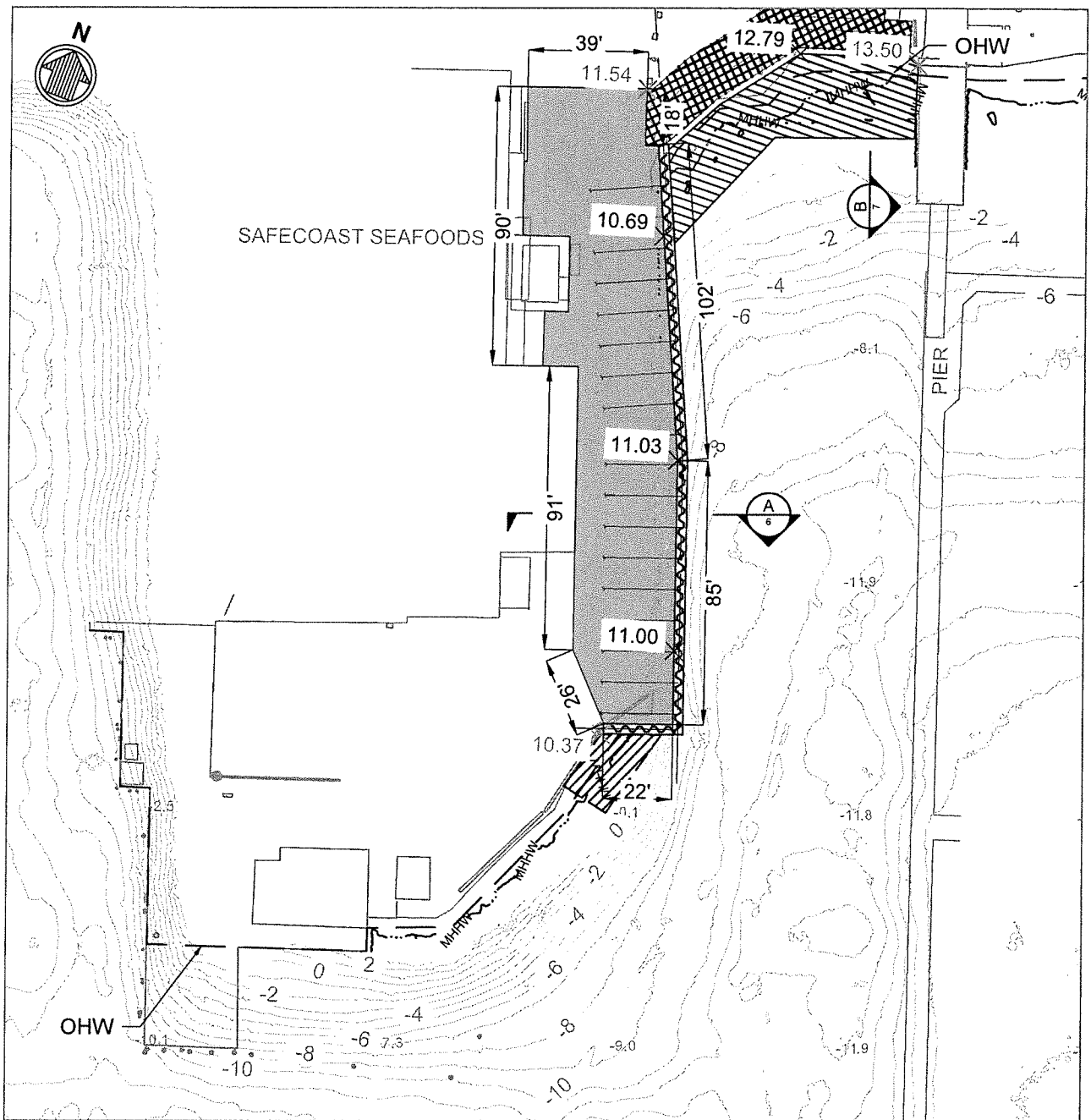
LOCATION: PORT OF ILWACO
117 HOWERTON AVE SE
ILWACO, WA 98624

LAT/LONG: 46.30442 N, -124.03852 W

DATUM: MLLW
SHEET: 5 OF 9 DATE: JUNE 2023

PROPOSED PROJECT: PORT OF ILWACO
EAST BULKHEAD RESILIENCE PROJECT

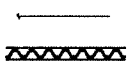
IN: BAKER BAY
NEAR/AT: ILWACO
COUNTY: PACIFIC STATE: WA
SEC: 33/34 T: 10 N R: 11 W



LEGEND



PAVING AREA LIMITS
 BERM CONSTRUCTION
 SLOPE PROTECTION
 APPROXIMATE AREA OF SLOPE PROTECTION REPLACEMENT



TIEBACKS
 PROPOSED BULKHEAD

0.00 X
 0.00 X

EXISTING ELEVATION
 PROPOSED ELEVATION



PLAN - GRADING
 SCALE: 1" = 50'

LEVELS:
 MHHW: +8.07' MHW: +7.37'
 MLW: 1.35' MLLW: +0.00'
 OHW (DELINEATED): APPROX. +11.50'

50' 0' 50' 100'
 SCALE: 1"=50'

APPLICANT:
 PORT OF ILWACO

ADJACENT PROPERTY OWNERS:
 1) PORT OF ILWACO

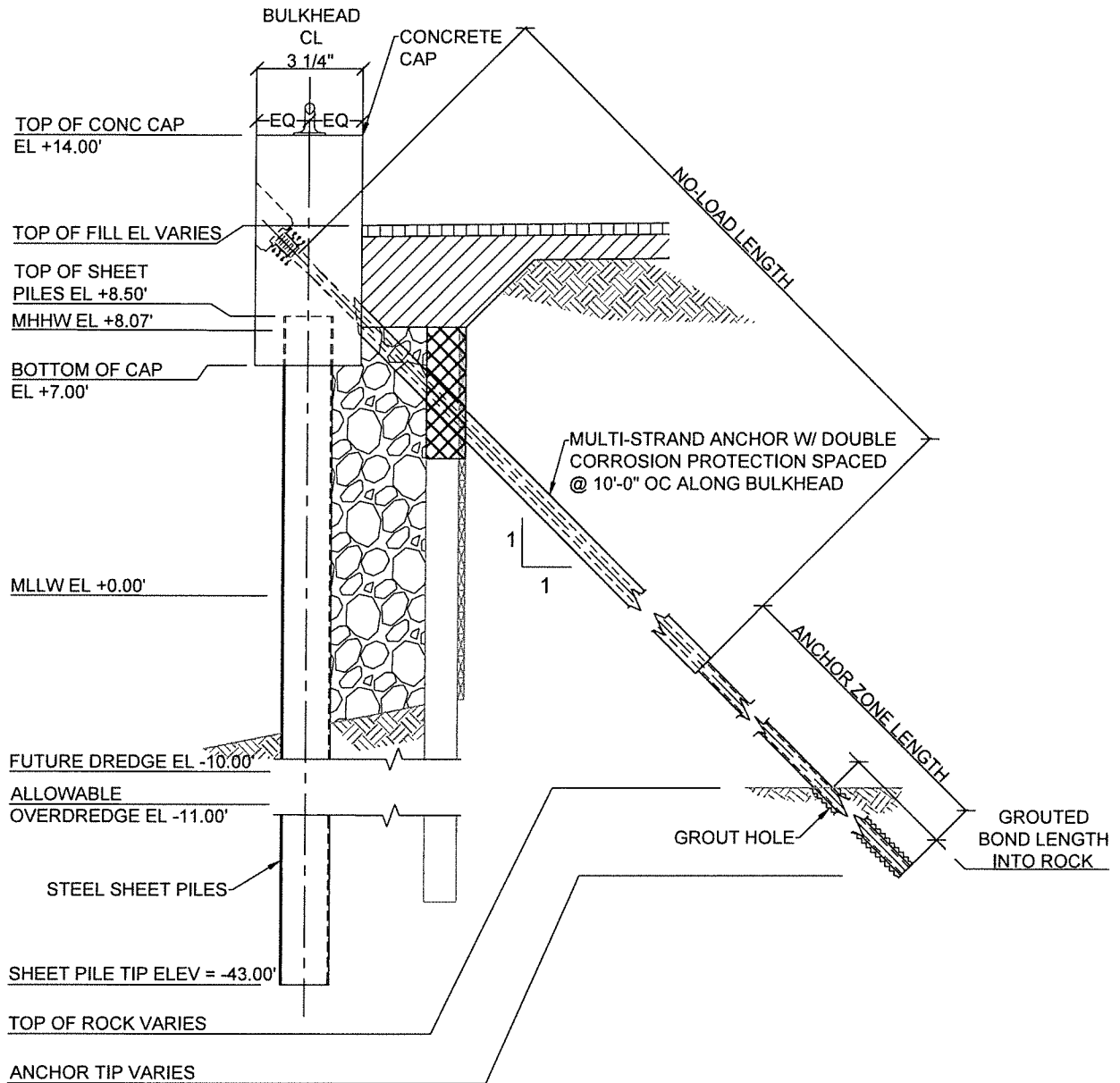
LOCATION: PORT OF ILWACO
 117 HOWERTON AVE SE
 ILWACO, WA 98624

LAT/LONG: 46.30442 N, -124.03852 W




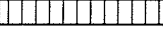
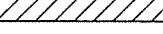

DATUM: MLLW
 SHEET: 6 OF 9 DATE: JUNE 2023

PROPOSED PROJECT: PORT OF ILWACO
 EAST BULKHEAD RESILIENCE PROJECT

IN: BAKER BAY
 NEAR/AT: ILWACO
 COUNTY: PACIFIC STATE: WA
 SEC: 33/34 T: 10 N R: 11 W



LEGEND

-  CLEAT
-  EXISTING CREOSOTE-TREATED TIMBER BULKHEAD, LAGGING TO REMAIN
-  DRAIN ROCK BACKFILL
-  ASPHALT PAVING
-  STRUCTURAL FILL
-  LOCAL DEMOLITION/REMOVAL OF CREOSOTE-TREATED TIMBER BULKHEAD FOR INSTALLATION OF GROUND ANCHORS

SECTION - TYP BULKHEAD
SCALE: NTS

APPLICANT:
PORT OF ILWACO

ADJACENT PROPERTY OWNERS:
1) PORT OF ILWACO

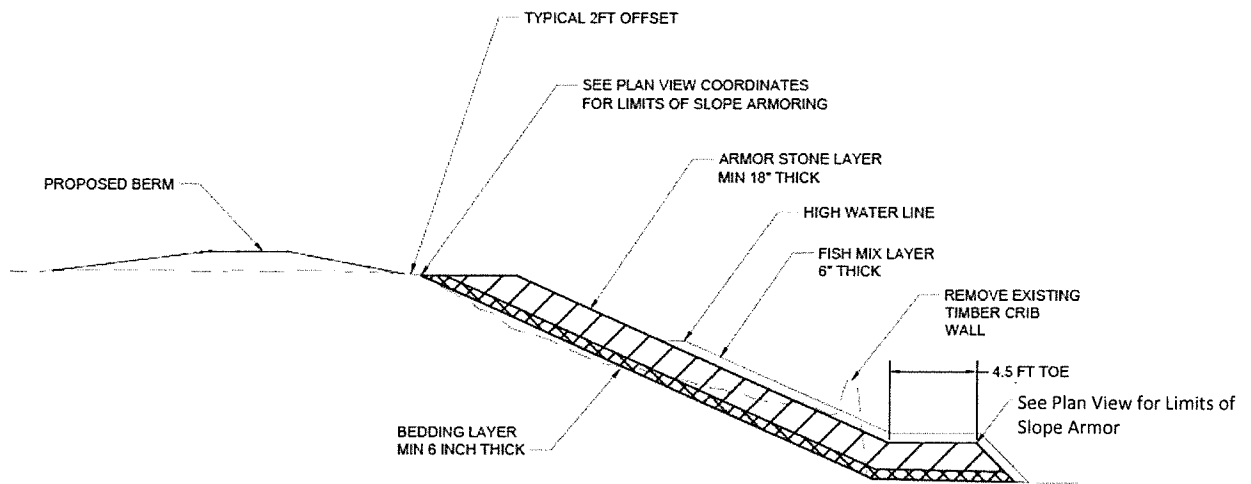
LOCATION: PORT OF ILWACO
117 HOWERTON AVE SE
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C1 SLOPE ARMOR SECTION 2
C-110 SCALE:

APPLICANT:
PORT OF ILWACO

ADJACENT PROPERTY OWNERS:
1) PORT OF ILWACO

LOCATION: PORT OF ILWACO
117 HOWERTON AVE SE
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DATUM: MLLW
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SEC: 33/34 **T:** 10 N **R:** 11 W

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APPLICANT:
PORT OF ILWACO



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1201 NE Lloyd Boulevard, Suite 1100
PORTLAND, OR 97232-1274

Refer to NMFS No:
WCRO-2022-03087

August 16, 2023

Kristine Gilson
Director, Office of Environmental Compliance
U.S. Department of Transportation
Maritime Administration
1200 Ney Jersey Avenue, SE
Washington, D.C. 20590

Re: Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens
Fishery Conservation and Management Act Essential Fish Habitat Response for the
Ilwaco East Bulkhead Resilience Project, Port of Ilwaco, Pacific County, Washington
HUC 170800060500

Dear Ms. Gilson:

On December 13, 2022, NOAA's National Marine Fisheries Service (NMFS) received your request for a written concurrence that U.S. Department of Transportation Maritime Administration (MARAD) funding of the Port of Ilwaco Resilience Project under the Port Infrastructure Development Program is not likely to adversely affect (NLAA) species listed as threatened or endangered or critical habitats designated under the Endangered Species Act (ESA). This response to your request was prepared by NMFS pursuant to section 7(a)(2) of the ESA and implementing regulations at 50 CFR 402.

On July 5, 2022, the U.S. District Court for the Northern District of California issued an order vacating the 2019 regulations that were revised or added to 50 CFR part 402 in 2019 ("2019 Regulations," see 84 FR 44976, August 27, 2019) without making a finding on the merits. On September 21, 2022, the U.S. Court of Appeals for the Ninth Circuit granted a temporary stay of the district court's July 5 order. On November 14, 2022, the Northern District of California issued an order granting the government's request for voluntary remand without vacating the 2019 regulations. The District Court issued a slightly amended order two days later on November 16, 2022. As a result, the 2019 regulations remain in effect, and we are applying the 2019 regulations here. For purposes of this consultation and in an abundance of caution, we considered whether the substantive analysis and conclusions articulated in the letter of concurrence would be any different under the pre-2019 regulations. We have determined that our analysis and conclusions would not be any different.

Thank you also for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1855(b)) for this action.

WCRO-2022-03087



This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available in the Environmental Consultation Organizer [<https://eco.fisheries.noaa.gov>]. A complete record of this consultation is on file at Lacey, Washington.

Consultation History

We received the consultation request and biological evaluation on December 15, 2022. We had a conference call to discuss the project with the Port of Ilwaco, MARAD, the USACE and USFWS on May 10, 2023. We initiated consultation on May 10, 2023.

Proposed Action and Action Area

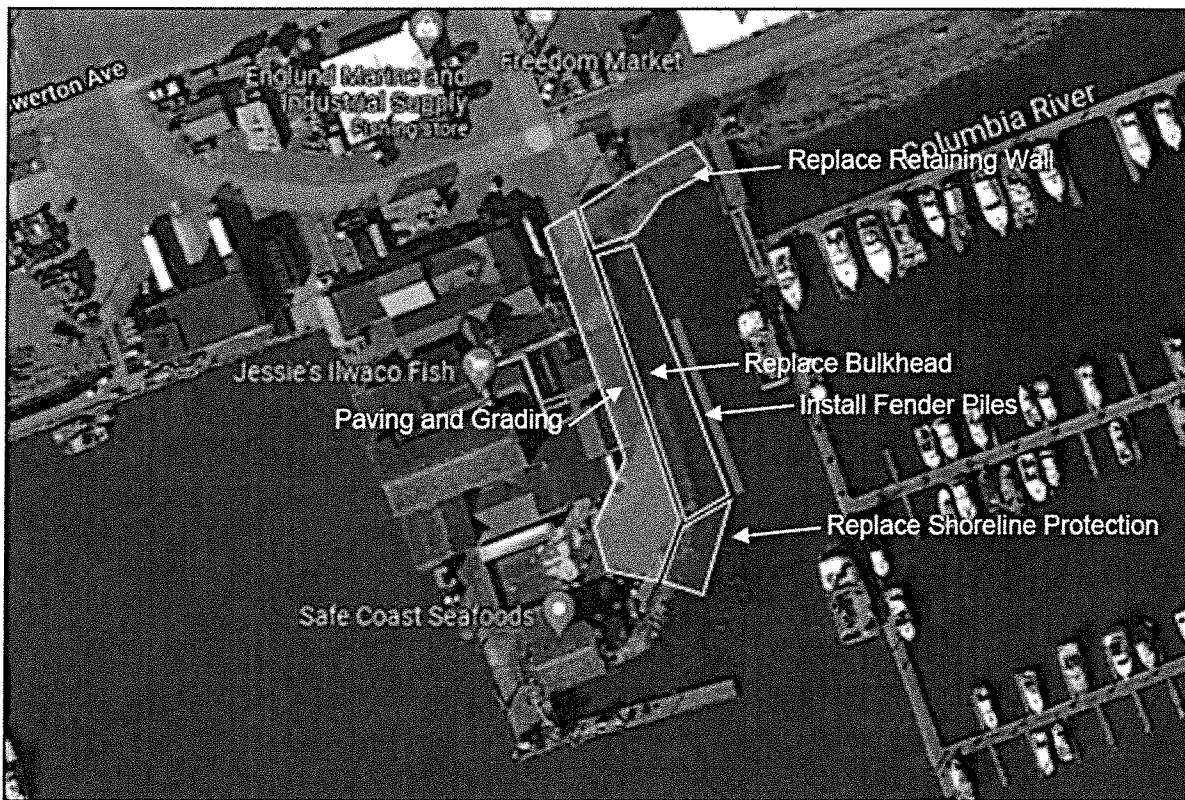


Figure 1. Project area and project elements

MARAD proposes to find modifications to a commercial fishing wharf within the Port of Ilwaco Marina (Figure 1 from BA).

Replace bulkhead: The eastern bulkhead of the wharf is creosote timbers supported by creosote piles. This bulkhead is failing and too low to protect the wharf from king tides and storm surges. A Port of Ilwaco contractor will remove 12 of the creosote timber piles and 3 steel pipe piles on the exterior of the bulkhead. The contractor will install a steel sheet pile bulkhead in front of the existing bulkhead. The new bulkhead is 225 feet long and its construction will take up to 8 hours of vibratory pile driver per day and up to 600¹ impact pile driver blows per day for 12 days. The contractor will fill the space between the new bulkhead and the old bulkhead with about 400 cubic yards of drainage rock. The contractor will cast a 7 foot tall by 3.25 foot wide concrete pile cap on top of the sheet pile. The top of the new bulkhead will be 3 feet higher than the existing bulkhead to accommodate storms and sea level rise. The contractor will stabilize the new bulkhead with 22 steel anchor cables from the pile cap to grout filled holes drilled into the bedrock beneath the wharf. The contractor will install twelve 12 inch diameter fiberglass coated concrete fender piles at the southern end of the new bulkhead with a vibratory pile driver and impact pile driver as needed.

Replace shoreline protection: The contractor will remove 16 cubic yards of riprap and concrete debris from the shoreline south of the bulkhead and replace it with 36 cubic yards of riprap to maintain slope stability.

Replace retaining wall: The contractor will remove 16 creosote treated timber piles and the creosote treated timbers of the retaining wall at the north end of the bulkhead and replace them with 165 cubic yards of riprap to maintain slope stability.

Mitigation: The contractor will remove an additional 36 derelict creosote treated piles from the wharf as mitigation for sacrificing 372 square yards of the soft benthic habitat between the old bulkhead and the new bulkhead and beneath the new riprap north and south of the new bulkhead.

Action area: The action area of the proposed action for aquatic species is defined by the point in space where the sound pressure level from pile driving decreases below 150 dB_{RMS}. Since the marina is surrounded by a riprap breakwater (

Figure 2), all noise from the wharf construction is contained within the marina.

¹ BA notes that 600 strikes are a worst case estimate.

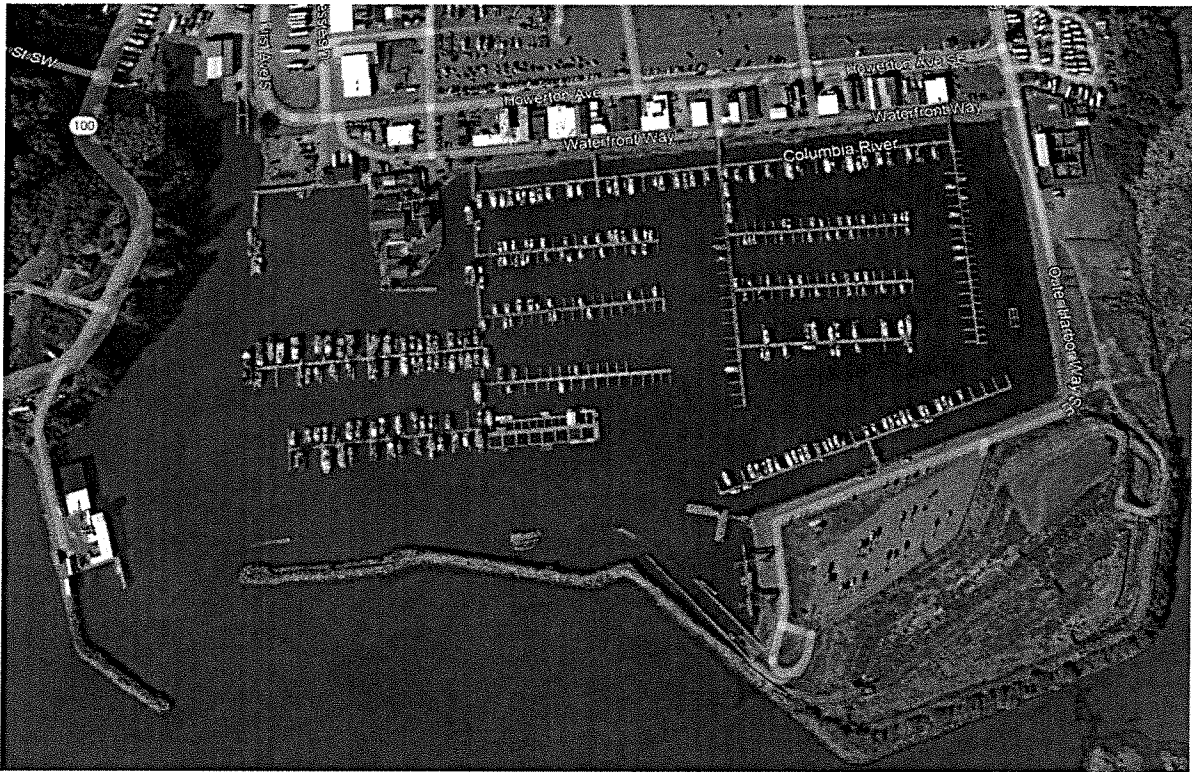


Figure 2. East bulkhead resilience project action area

Avoidance and Minimization Measures:

- Containment booms will be used to surround in-water work areas or separate embankment work from surface water. The booms will serve to contain and collect any oily material and or floating debris potentially released during construction. Oil-absorbent materials will be employed immediately if visible sheen is observed. Accumulated debris will be collected daily and disposed of at a permitted upland site approved by the owner.
- Water quality standards and procedures that limit the impact of pollutants will be observed
- Land based staging areas for activities, such as storage of machinery, equipment, materials, and stockpiled soils will be established landward of the top of bank. A silt fence will be installed around the perimeter of the upland work areas and locations where machinery, materials, and stockpiled soils are situated. Any temporary stockpiles will be covered and bermed when not in use.
- All federal, state, and/or local construction permit requirements will be followed during demolition and construction activities.
- In water construction activities will comply with the in water construction window November 1 through February 28.
- Checking equipment for leaks and other problems that could result in the discharge of petroleum-based products or other material into waters of Baker Bay.

- Corrective actions will be taken in the event of any discharge of oil, fuel, or chemicals in the water including:
 - Containment and cleanup efforts will begin immediately upon discovery of a spill and will be completed in an expeditious manner in accordance with all local, state, and federal regulations. Cleanup will include proper disposal of any spilled material and used cleanup material.
 - The cause of any spill will be ascertained, and appropriate actions taken to prevent further incidents of environmental damage.
 - Spills will be reported to the Washington State Department of Ecology Southwest Regional Spill Response Office pursuant to WAC 173-303-145 and WAC 173-182-260.
 - Work barges will not be allowed to ground out.
 - Excess or waste materials will not be disposed of or abandoned waterward of ordinary high water or allowed to enter waters of the state. Waste materials will be disposed of in an appropriate manner consistent with applicable local, state, and federal regulations.
 - Demolition and construction materials will not be stored where wave action or upland runoff can cause materials to enter surface waters.
 - Oil absorbent materials will be present on site for use in the event of a spill or if any oil product is observed in the water.
 - Removal of creosote treated piles will be conducted consistent with the BMPs established in U.S. Environmental Protection Agency (EPA) Region 10, Best Management Practices for Piling Removal and Placement in Washington State, dated February 18, 2016.
 - While creosote treated piles are being removed, a containment boom will surround the work area to contain and collect any floating debris and sheen. Debris will be retrieved and disposed of properly.
 - The piles will be dislodged with a vibratory hammer when possible and will not be intentionally broken by twisting or bending.
 - The piles will be removed in a single, slow, and continuous motion in order to minimize sediment disturbance and turbidity in the water column.
 - If a pile breaks above or below the mudline, it will be cut or pushed in the sediment consistent with agency approved BMPS (USACE, DNR, Ecology and EPA).
 - Removed piles, stubs, and associated sediments (if any) will be contained on a barge. If piles placed directly on the barge and not in a container, the storage area will consist of a row of hay or straw bales, filter fabric or similar material placed around the perimeter of the barge.
 - All creosote-treated material, pile stubs, and associated sediments (if any) will be disposed of by the contractor in a landfill approved to accept those types of materials.
- Steel piling will be installed with a vibratory hammer when possible. Impact hammering will start with light tapping, then increase to full force gradually.
 - A bubble curtain and one or more other noise attenuation methods such as wood cushion block will be used during impact installation or proofing of all steel piling.

- Pile driving will commence with soft start procedure (ramping up) in order to alert nearby wildlife, allowing them to move out of the area prior to construction activities. For impact pile driving, contractors will be required to provide an initial set of strikes from the hammer at reduced percent energy, each strike followed by no less than a 30 second waiting period. This procedure will be conducted a total of two times before impact pile driving begins.
- To avoid impacts to marine mammals, an exclusion zone will be monitored during and immediately before pile driving activities. The exclusion zone will include the entire marina area shoreward of the breakwaters. Although ESA listed species, including Southern Resident killer whales and humpback whales are not anticipated to occur with the marina where noise impacts could occur, this avoidance measure would provide further protections against potential noise impacts to these species.
- During pile driving activities a qualified observer will monitor the exclusion zone, if any marine mammals are observed within the exclusion zone, all in water Project activities shall cease. Project activities shall not commence or continue until the marine mammal has either been observed having left the exclusion zone, or at least 15 minutes have passed since the last sighting whereby it is assumed the marine mammal has voluntarily left the exclusion zone.
- Wet concrete will not contact surface waters.
- Forms for any concrete structure will be constructed to prevent leaching of wet concrete.
- Concrete process water will not be allowed to enter surface waters. Any process water/contact water will be routed to a contained area for treatment and will be disposed of at an upland location.

Background and Action Agency's Effects Determination

MARAD concluded that the proposed action is not likely to adversely affect ESA listed species or their critical habitat in Table 1:

Table 1. MARAD effects determinations

Species	Listing Classification, Date and Federal Register Notice	Critical Habitat Designation Date and Federal Register Notice	Action Agency Species Determination	Action Agency Critical Habitat Determination
1. Columbia River Chum Salmon	Threatened 6/28/05 70 FR 37160	9/02/05 70 FR 52630	NLAA	NLAA
2. Lower Columbia River Coho Salmon	Threatened 6/28/05 70 FR 37160	2/24/16 81 FR 9252	NLAA	NLAA
3. Snake River Sockeye Salmon	Endangered 6/28/05 70 FR 37160	10/25/99 64 FR 57399	NLAA	NLAA
4. Lower Columbia River Chinook Salmon	Threatened 6/28/05 70 FR 37160	9/02/05 70 FR 52630	NLAA	NLAA
5. Upper Columbia River Spring Chinook	Endangered 6/28/05 70 FR 37160	9/02/05 70 FR 52630	NLAA	NLAA
6. Snake River Spring/Summer run Chinook Salmon	Threatened 6/28/05 70 FR 37160	10/25/99 64 FR 57399	NLAA	NLAA
7. Snake River Fall Run Chinook Salmon	Threatened 6/28/05 70 FR 37160	10/25/99 64 FR 57399	NLAA	NLAA
8. Upper Willamette River Chinook Salmon	Threatened 4/14/14 79 FR 20802	6/28/05 70 FR 37159	NLAA	NLAA
9. Lower Columbia River Steelhead	Threatened 1/05/06 71 FR 834	9/02/05 70 FR 52630	NLAA	NLAA
10. Mid Columbia River Steelhead	Threatened 1/05/06 71 FR 834	9/02/05 70 FR 52630	NLAA	NLAA
11. Upper Columbia River Steelhead	Threatened 1/05/06 71 FR 834	9/02/05 70 FR 52630	NLAA	NLAA
12. Snake River Basin Steelhead	Threatened 3/25/99 64 FR 14517	9/02/05 70 FR 52630	NLAA	NLAA
13. Upper Willamette River Steelhead	Threatened 4/14/14 79 FR 20802	9/02/05 70 FR 37159	NLAA	NLAA
14. Southern DPS of Green Sturgeon	Threatened 4/7/06 71 FR 17757	10/09/09 74 FR 52300	NLAA	NLAA

Species	Listing Classification, Date and Federal Register Notice	Critical Habitat Designation Date and Federal Register Notice	Action Agency Species Determination	Action Agency Critical Habitat Determination
15. Southern DPS of Eulachon	Threatened 3/18/10 75 FR 13012	10/20/11 76 FR 65324	NLAA	NLAA

MARAD determined that based on migration timing windows, adult salmon and steelhead of each species except SR sockeye are likely to migrate past the action area during some part of the in water work window but are unlikely to enter the marina itself to be exposed to project effects. MARAD determined that very low numbers juveniles from each salmon and steelhead species except juvenile sockeye salmon may be migrating through or rearing in the estuary during the in water work window because the in water work window is set to minimize the exposure of juvenile salmon and steelhead to the effects of projects in the estuary.

MARAD determined that the direct effect of the proposed action on juvenile salmon and steelhead is noise from pile installation:

Noise from pile installation. MARAD estimated that noise from the maximum vibratory and impact pile driving for steel sheet pile exceeds 183 dB_{SEL} and 187 dB_{SEL} within 24 meters and 13 meters of the pile driver respectively and exceeds 150 dB_{rms} within 215 meters of the pile driver. MARAD concluded that the small noise effects radii, combined with the in water work window, make the likelihood of salmon and steelhead exposure to pile driving noise effects insignificant.

MARAD determined that the effects of the proposed action on salmon and steelhead critical habitat are temporary decrease in water quality during pile driving, permanent loss of benthic habitat covered by riprap and permanent reduction in sediment contaminant concentrations after creosote treated piles are removed.

Water quality from turbidity during pile installation and removal. MARAD estimated that suspended sediment concentrations associated with turbidity during pile driving and pile removal would be 5 to 10 milligrams per liter within 300 feet of the pile driver. MARAD concluded that the salmon and steelhead response to these low suspended sediment concentrations is insignificant.

Habitat disturbance from benthic habitat covered by riprap. MARAD estimated that 372 square yards of soft bottom benthic habitat would be permanently covered by riprap. MARAD concluded that the loss of this small area of low quality salmon and steelhead forage habitat within the marina and adjacent to the wharf is insignificant.

Reduced creosote compound contamination in prey species. MARAD concluded that reduced contaminant concentration in salmon and steelhead prey species following removal of 36 creosote treated piles is beneficial.

MARAD determined that based on life history, adult eulachon are likely to migrate past the action area during the in water work window. Larval eulachon are likely to be carried past the

action area by river currents and may be carried into the action area by tidal currents but eulachon larvae are very unlikely to still be in the estuary during the in water work window so all direct effects are discountable.

MARAD determined that the proposed action direct effects to adult eulachon are:

Noise from pile installation. MARAD concluded that the likelihood of migrating adult eulachon exposure to noise from pile driving is insignificant because they are unlikely to enter the marina.

Water quality from turbidity during pile installation and removal. MARAD concluded that adult eulachon response to estimated suspended sediment concentrations is insignificant.

Habitat disturbance from benthic habitat covered by riprap. MARAD concluded that the loss of low quality benthic habitat to eulachon is discountable.

Reduced creosote compound contamination in prey species. MARAD concluded that the decrease in creosote compounds in eulachon prey species is beneficial.

MARAD determined that based on their life history, green sturgeon are likely to be in the action area from June to August but are not likely to be in the action area during the in water work window. MARAD determined that the proposed action indirect effects to green sturgeon is a small decrease in benthic forage.

MARAD determined that the proposed action would affect EFH of groundfish, coastal pelagic species and salmonids.

MARAD determined that the proposed action would affect groundfish, coastal pelagic species and salmonid EFH by adding noise and suspended sediment to the water column and by converting 372 square yards of soft benthic habitat into hard shoreline armoring. MARAD determined that these effects would be minimized by Avoidance and Minimization Measures and offset by removing creosote created piles and timbers from the action area.

ENDANGERED SPECIES ACT

Effects of the Action

Under the ESA, “effects of the action” means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities caused by the proposed action (50 CFR 402.02). The applicable standard to find that a proposed action is not likely to adversely affect listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those that are extremely unlikely to occur.

The effects of the proposed action include:

1. Vibratory and impact pile driving noise (sound pressure waves)
2. Turbidity from pile driving
3. Benthic forage displaced by riprap

Likelihood of exposure

We concur with MARAD that all of the effects of pile driving to ESA listed species critical habitats are temporary changes to migration and rearing habitat water quality that returns to its baseline state shortly after the pile driver stops for the day and that riprap permanently changes the rearing substrate in a small part of the action area. We used our pile driving noise calculator to estimate that vibratory pile driving 10 24 inch wide steel sheet piles per day (for 12 days) results in noise greater than 150 dB_{RMS} within 22 meters of the pile driver. Impact proofing these piles with 60 blows per pile results in a single injurious peak sound pressure wave greater than 212 dB_{peak} within 3 meters of the pile driver and injurious cumulative sound pressure energy greater than 183 dB_{SEL} within 10 meters of the pile driver. We estimate that pile driving and pile extraction will result in a turbidity plume extending up to 20 feet from the pile driver with a suspended sediment concentration up to 42 milligrams per liter (Weston Solutions, 2006).

Salmon and steelhead

We concur with MARAD exposure of migrating adult salmon and steelhead to the temporary and permanent effects of the proposed action is discountable because they are extremely unlikely to detour from their migration path to swim into the marina action area.

We concur with MARAD that the exposure of stream type juvenile salmonids (LCR steelhead, LCR coho, UCR chinook, UCR steelhead, UWR steelhead, MCR steelhead, SR sockeye, SR spring/summer Chinook, SR steelhead) to pile driving noise and turbidity is discountable. This is because their downstream migration times do not overlap the IWWW. We concur with MARAD that the permanent change to benthic forage from riprap is insignificant to these species because they migrate and forage in deeper, faster flowing water than is present in the marina action area. Thus the effects of the proposed action are NLAA juveniles from these ten species.

We concur with MARAD that the IWWW minimizes the likelihood that CR chum juveniles will be exposed to the temporary effects of the proposed action because their downstream migration times do not overlap the IWWW. We concur with MARAD that any change in the benthic food web from the conversion of 372 square yards of soft benthic habitat to hard rocky habitat is insignificant to CR chum because they are fry migrants to the ocean (Roegner et al., 2012) and do not search for forage at the channel margins, instead rearing in the lower estuary where available resources are more abundant.

Ocean type juvenile fall Chinook (SR fall chinook, LCR fall Chinook and UWR fall Chinook) are present in the estuary during the work window. However, in the winter their abundance is inversely related to salinity. For example, of 500 juvenile Chinook salmon captured by Roegner et al. (2012) just 25 were captured at the lower estuary sites, while 200 we captured in the middle estuary sites and 275 were captured in the tidal freshwater sites (catch per unit effort equal 1, 8 and 12 respectively). Furthermore, virtually all of the Chinook captured in lower estuary sites were early fry being passively transported to the ocean by the river current and thus they would

be very unlikely to drift through the narrow marina opening into the action area (Morrice et al., 2020). Therefore, we concur with MARAD that the likelihood of juvenile Chinook salmon exposure to pile driving effects is insignificant. We also concur that the effect of a small decrease in forage in the lower estuary is insignificant to juvenile Chinook growth and energy.

We concur with MARAD that adult eulachon are likely to swim past the action area during the IWWE but are unlikely to detour from their migratory path to swim into the marina action area and their exposure to temporary and permanent effects of the proposed action are discountable. Because larval eulachon outmigrate passively by drifting, it is unlikely that they will enter the marina to encounter the structural changes, and if they did, the modified habitat would not modify this migration pattern.

We concur with MARAD that green sturgeon are unlikely to be exposed to the temporary effects of the proposed action because they are not present in the Columbia River estuary during the IWW. We concur with MARAD that any change to the estuary food web from the conversion of 372 square yards of benthic sandy habitat to rocky habitat inside the marina is discountable to green sturgeon foraging in the large Columbia River estuary.

Conclusion

Based on this analysis, NMFS concurs with MARAD that the proposed action is not likely to adversely affect the subject listed species and designated critical habitats.

Reinitiation of Consultation

Reinitiation of consultation is required and shall be requested by [*name of action agency*] or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law and (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this concurrence letter; or (3) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16). This concludes the ESA consultation.

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. The MARAD also has the same responsibilities, and informal consultation offers action agencies an opportunity to address their conservation responsibilities under section 7(a)(1).

MAGNUSON-STEVEN'S FISHERY CONSERVATION AND MANAGEMENT ACT

Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. Under the MSA, this consultation is intended to promote the conservation of EFH as necessary to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. For the purposes of the MSA, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity",

and includes the associated physical, chemical, and biological properties that are used by fish (50 CFR 600.10). Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects may result from actions occurring within EFH or outside of it and may include direct, indirect, site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) of the MSA also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH. Such recommendations may include measures to avoid, minimize, mitigate, or otherwise offset the adverse effects of the action on EFH (50 CFR 600.905(b)).

NMFS determined the proposed action would adversely affect Pacific Coast Salmon, groundfish and coastal pelagic species EFH as follows:

1. Pile driving noise temporarily degrades EFH aquatic habitat conditions.
2. Turbidity during pile driving temporarily degrades EFH water quality.
3. Riprap permanently displaces EFH benthic forage.

NMFS does not identify any additional measures to further reduce effects on EFH. This concludes the MSA consultation.

Please direct questions regarding this letter to Tom Hausmann, Natural Resource Specialist in Portland, Oregon, at tom.hausmann@noaa.gov, or 503-231-2315.

Sincerely,



Bonnie Shorin
Chief, Washington Coast, Lower Columbia
River Branch
Oregon Washington Coastal Office

cc: Margaret Schwertner, Non-Federal Representative, Moffatt and Nichol

LITERATURE CITED

- Morrice, K.J., Baptista, A.M., and Burke, B.J. (2020). Environmental and behavioral controls on juvenile Chinook salmon migration pathways in the Columbia River estuary. *Ecol Model* 427.
- Roegner, G.C., McNatt, R., Teel, D.J., and Bottom, D.L. (2012). Distribution, Size, and Origin of Juvenile Chinook Salmon in Shallow-Water Habitats of the Lower Columbia River and Estuary, 2002-2007. *Mar Coast Fish* 4, 450-472.
- Weston Solutions (2006). Jimmycomelately Piling Removal Monitoring Project (Port Gamble, WA: Weston Solutions).

From: [Dennis, Mitchell \(Mitch\)](#)
To: [McReynolds, Ryan](#); [Gilson, Kristine \(MARAD\)](#); [Schwertner, Margaret](#)
Cc: [England, Victoria](#)
Subject: RE: (FWS/R1/2023-0026807) Port of Ilwaco, East Bulkhead Resilience Project
Date: Wednesday, September 6, 2023 2:44:42 PM
Attachments: [image001.png](#)

Margaret,

Those modifications were part of the analysis and I'm fine with it. If anything, you have it more fleshed out here and it continues to lessen the impact to the species, always appreciated. If you any more questions, feel free to reach out to me. I'm hoping that the next time I go down to the Salt Pub for albacore and chips that there is a nice looking bulkhead to go look at.

Thanks,
Mitch

^^

Mitch Dennis
(he/his/him)
Fish and Wildlife Biologist
US Fish and Wildlife Service - Lacey, WA
Phone – 564-669-0716
Email – Mitchell_Dennis@fws.gov

From: McReynolds, Ryan <ryan_mcreynolds@fws.gov>
Sent: Wednesday, September 6, 2023 9:25 AM
To: Gilson, Kristine (MARAD) <kristine.gilson@dot.gov>; Schwertner, Margaret <mschwertner@moffattnichol.com>; Dennis, Mitchell (Mitch) <mitchell_dennis@fws.gov>
Cc: McReynolds, Ryan <ryan_mcreynolds@fws.gov>; England, Victoria <vengland@moffattnichol.com>
Subject: Re: (FWS/R1/2023-0026807) Port of Ilwaco, East Bulkhead Resilience Project

Hello,

On Aug. 28 we issued a Letter of Concurrence -- (FWS/R1/2023-0026807) Port of Ilwaco, East Bulkhead Resilience Project.

Thank you for providing updates ,,, There are quite a few! ,,, And, It appears to me, the 'changes' further reduce impacts and improve long term nearshore habitat functions.

If Mitch agrees, And we do not have questions ,,, We will place a copy of these correspondence in our files; Please do the same.

Answer To Process Question: No, if there are no changed or additional effects/ consequences of concern (and here I see improvements), Reinitiation of consultation is not warranted. Changes that further reduce impacts and improve long term functions, can be addressed with these records retained for our files.

Thank You --Ryan--

Ryan McReynolds
Zone Team Supervisor
Coastal, Lowland Aquatic, and Marine Zone
U.S. Fish and Wildlife Service, Lacey WA
ryan_mcreynolds@fws.gov
360.480.2336 (Work Cell)

*Working with others to conserve, protect, and enhance
fish, wildlife, plants, and their habitats for the continuing
benefit of the American people.*

From: Schwertner, Margaret <mschwertner@moffattnichol.com>
Sent: Wednesday, August 30, 2023 8:49 AM
To: Dennis, Mitchell (Mitch) <mitchell_dennis@fws.gov>; Rhodes, Darold <darold_rhodes@fws.gov>
Cc: McReynolds, Ryan <ryan_mcreynolds@fws.gov>; Gilson, Kristine (MARAD) <kristine.gilson@dot.gov>; England, Victoria <vengland@moffattnichol.com>
Subject: [EXTERNAL] RE: Port of Ilwaco East Bulkhead

<p>This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.</p>
--

Hi Mitch and Darold,

Thank you very much for the LOC.

We have a short project update for the Port of Ilwaco East Bulkhead Resilience Project. There have been a few changes to the project description (removal of pile fender system due to cost) and some

additional mitigation elements required as a result of ongoing coordination with the City of Ilwaco and Washington State Department of Fish and Wildlife (WDFW). This email provides a detailed summary of those recent project changes. The changes are minor in nature and do not impact the species Effect Determinations made for the project nor are they anticipated to warrant changes to the LOCs received (NMFS WCRO-2022-03087, FWS 2023-0025807). All proposed avoidance, minimization, and mitigation measures will still be implemented as described in the permit documents.

The project modifications are described below and are reflected in the attached revised design drawings.

Fender Pile System

The installation of 10, 12-inch fiberglass fender piles external to the bulkhead to support temporary berthing is no longer proposed.

Fish Mix Placement

A 6-inch layer (approximately 34 cy) of fish mix gravel will be placed over the north shoreline riprap below the high tide line (HTL) to provide beach nourishment and improved habitat for fish passing through the marina.

Debris Removal

Floating timber debris will be removed from the south portion of the marina. This will remove approximately 2,510 sf of overwater coverage currently present in that portion of the marina.

Fill Impacts

Minor fill impact changes have occurred due the removal of the fender pile system from the project, the addition of fish mix on the north shoreline, and changes to the way in which fill quantities are calculated including an update to the High Tide Line elevation used to calculate fill impacts. Fill impact changes are summarized in Table 1 and Table 2 below.

Table 1. Fill Impacts Provided in Biological Evaluation Dated December 12, 2022 and Submitted for ESA Consultations

Activity	Fill below HTL (sf)	Fill below HTL (cy)	Fill above HTL (sf)	Fill above HTL (cy)
<i>Bulkhead wall and shoreline protection installation</i>				
Sheetpile and fender pile installation	500 sf	40 cy	0 sf	0 cy
Bulkhead drainage rock placement	1,000 sf	400 cy	0 sf	0 cy
Rip-rap placement (north shoreline)	1,850 sf	140 cy	350 sf	25 cy
Rubble/ rip-rap removal (south shoreline)	-350 sf	-14 cy	-50 sf	-2 cy
Rip-rap replacement (south shoreline)	350 sf	30 cy	50 sf	5 cy
<i>Structure removal</i>				
Pile removal adjacent to existing bulkhead	-12 sf	-6 cy	0 sf	0 cy
North shoreline- creosote-treated timber retaining wall removal	-85 sf	-12 cy	0 sf	0 cy
Derelect pile/timber removal	-68 sf	-12 cy	0 sf	0 cy

Table 2. Revised Fill Impacts

Activity	Fill below HTL (sf)	Fill below HTL (cy)	Fill above HTL (sf)	Fill above HTL (cy)
<i>Bulkhead wall and shoreline protection installation</i>				
Sheetpile installation	400 sf	80 cy	0 sf	0 cy
Bulkhead drainage rock placement	1,000 sf	450 cy	0 sf	0 cy

Rip-rap shore protection and Fish Mix placement (north shoreline)	1,850 sf	172 cy	350 sf	26 cy
Concrete rubble removal (south shoreline)	-350 sf	-14 cy	-50 sf	-2 cy
Rip-rap replacement (south shoreline)	350 sf	30 cy	50 sf	5 cy
<i>Subtotal</i>	<i>3,250 sf</i>	<i>718 cy</i>	<i>350 sf</i>	<i>29 cy</i>
<i>Structure removal</i>				
Pile removal adjacent to existing bulkhead	-12 sf	-6 cy	0 sf	0 cy
North shoreline- retaining wall removal	-85 sf	-12 cy	0 sf	0 cy
Derelict pile/timber removal	-68 sf	-12 cy	0 sf	0 cy
Derelict Timber Structure/Debris Removal - South Marina	-2,510 sf	-350 cy	0 sf	0 cy
<i>Subtotal</i>	<i>-2,675 sf</i>	<i>-380 cy</i>	<i>0 sf</i>	<i>0 cy</i>
<i>Creosote removal from the Environment</i>	<i>34 tons</i>			

We do not anticipate that these minor modifications will change the overall assessment of potential impacts but would like to confirm that the LOCs do not need to be updated nor consultation reinitiated based on these minor revisions. Please reach out if you require any additional information or have any questions or concerns.

Thank you.

Regards,
Margaret

Margaret Schwertner
Senior Environmental Scientist
505 S. 336th St. | Federal Way, WA 98422
P 253.237.5928 | M 206.818.2600



From: Rhodes, Darold darold_rhodes@fws.gov
Sent: Monday, August 28, 2023 1:57 PM
To: kristine.gilson kristine.gilson@dot.gov
Cc: Schwertner, Margaret mschwertner@moffattnichol.com; England, Victoria vengland@moffattnichol.com; tlofstrom@portofilwaco.org; Dennis, Mitchell (Mitch) mitchell_dennis@fws.gov; McReynolds, Ryan ryan_mcreynolds@fws.gov
Subject: Port of Ilwaco East Bulkhead

CAUTION: This email originated from outside of the organization.

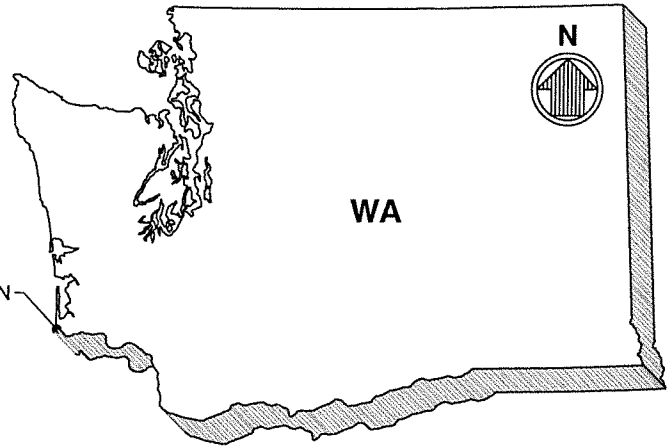
Kris,

Attached is the signed concurrence for the above project.

No hard copy will follow but should you require one please respond to this email and one will be provided.

Darold Rhodes

Administrative Assistant
US Fish and Wildlife Service
500 Desmond DR SE
Suite 102
Lacey, WA
cell: 360-480-6921



PROJECT LOCATION

DIRECTIONS TO SITE FROM SEATTLE:

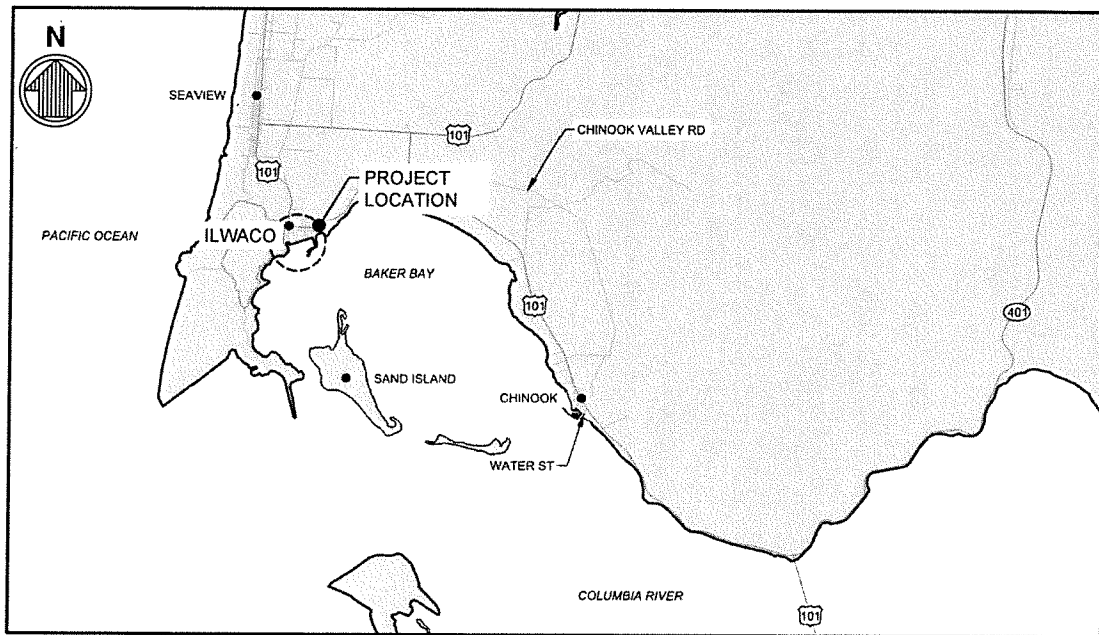
1. I-5 S, US-101, WA-8 AND US-12 TO 98 MILES
WA-107 S/S MAIN ST IN MONTESANO
2. TAKE US-101 TO ILWACO 72 MILES
3. ARRIVE AT PROJECT SITE

PROJECT ADDRESS:

PORT OF ILWACO
117 HOWERTON AVE SE
ILWACO, WA 98624

VICINITY MAP

SCALE: NTS



LOCATION MAP

SCALE: NTS

APPLICANT:
PORT OF ILWACO

ADJACENT PROPERTY OWNERS:
1) PORT OF ILWACO

LOCATION: PORT OF ILWACO
117 HOWERTON AVE SE
ILWACO, WA 98624

LAT/LONG: 46.30442 N, -124.03852 W

DATUM: MLLW
SHEET: 1 OF 9 DATE: JUNE 2023

PROPOSED PROJECT: PORT OF ILWACO
EAST BULKHEAD RESILIENCE PROJECT

IN: BAKER BAY
NEAR/AT: ILWACO
COUNTY: PACIFIC
SEC: 33/34 T: 10 N
STATE: WA
R: 11 W

S33 T10N R11W

LEGEND

POI PORT OF ILWACO OWNED PARCEL
 --- TAX PARCEL
 --- ORDINARY HIGH WATER MARK

SITE PLAN

EXISTING MARINA
 0 200 400
 SCALE IN FEET

FLOOD
 EBB

BAKER BAY



PURPOSE: PORT OF ILWACO BULKHEAD REPLACEMENT AND SEA LEVEL RISE RESILIENCE .

DATUM: MLLW

ADJACENT PROPERTY OWNERS:

1. CITY OF ILWACO
2. STATE OF WASHINGTON
3. STARLIGHT ONE LLC.

Port of Ilwaco East Bulkhead Resilience Project

Parcel Map

APPLICATION BY:
 Port of Ilwaco

PROPOSED: DERELICT ILWACO E. BULKHEAD REPLACEMENT, DRIVEWAY REGRADING/ REPAVING, & SHORE PROTECTION REPLACEMENT

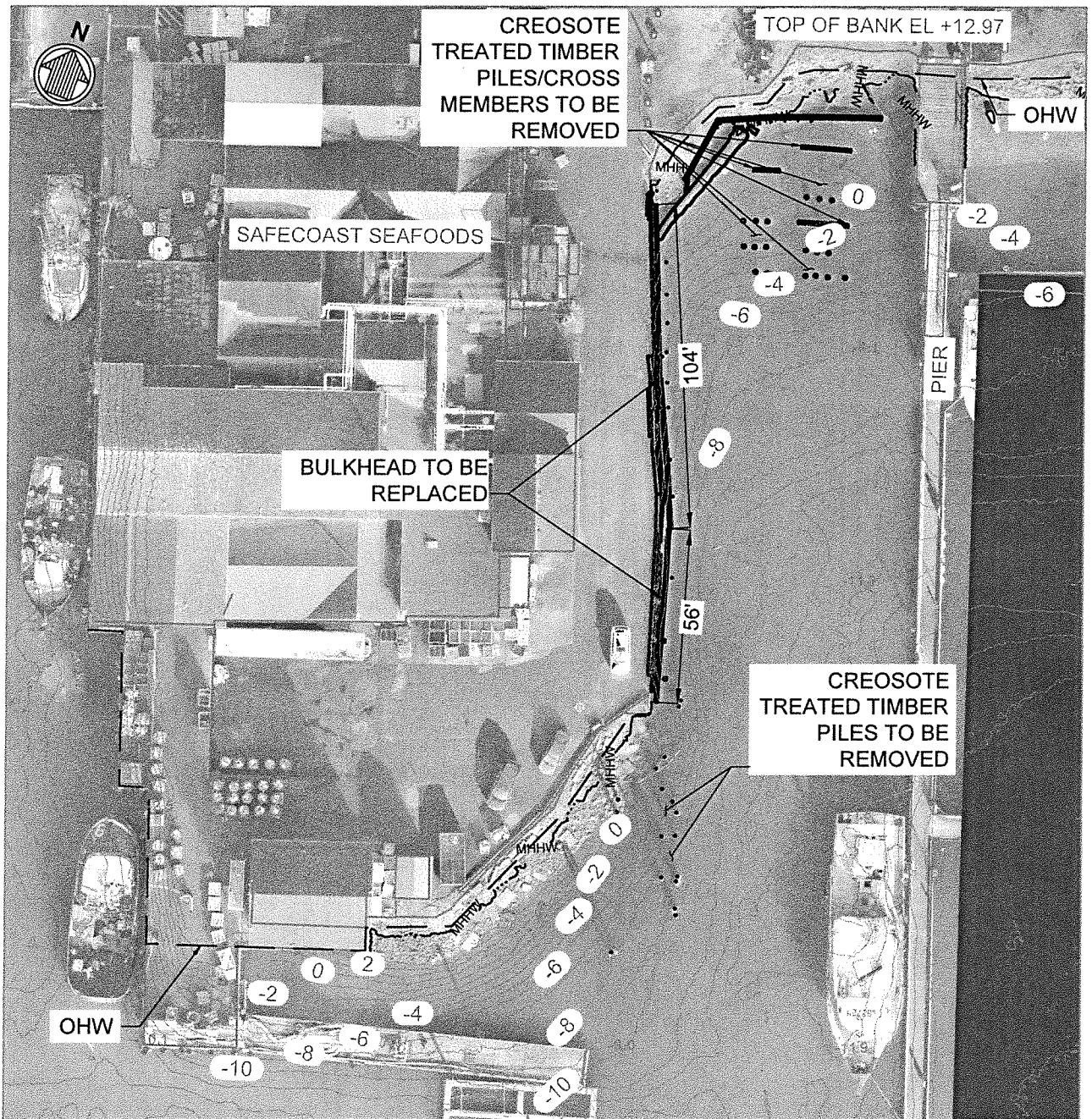
IN: BAKER BAY

AT: ILWACO

COUNTY: PACIFIC

SHEET 2 OF 9

DATE: JUNE 2023



LEGEND

- PILES
- CREOSOTE-TREATED REVETMENT (TO BE REMOVED)
- CREOSOTE-TREATED LOG (TO BE REMOVED)
- BULKHEAD (TO BE REMOVED)

PLAN - EXISTING CONDITIONS
SCALE: 1" = 50'

LEVELS:
MHHW: +8.07' MHW: +7.37'
MLW: 1.35' MLLW: +0.00'
OHW (DELINEATED): APPROX. +11.50'

50' 0' 50' 100'
SCALE: 1"=50'

APPLICANT:
PORT OF ILWACO

ADJACENT PROPERTY OWNERS:
1) PORT OF ILWACO

LOCATION: PORT OF ILWACO
117 HOWERTON AVE SE
ILWACO, WA 98624

LAT/LONG: 46.30442 N, -124.03852 W

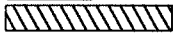
DATUM: MLLW
SHEET: 3 OF 9 DATE: JUNE 2023

PROPOSED PROJECT: PORT OF ILWACO
EAST BULKHEAD RESILIENCE PROJECT

IN: BAKER BAY
NEAR/AT: ILWACO
COUNTY: PACIFIC STATE: WA
SEC: 33/34 T: 10 N R: 11 W



LEGEND



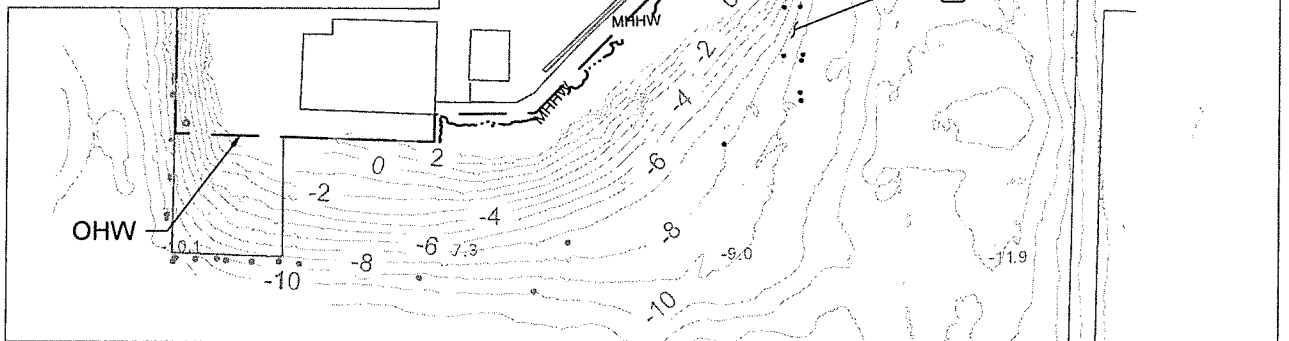
DEMOLITION AREAS



STEEL PILES

DEMOLITION KEY NOTES

- 1 REMOVE CREOSOTE-TREATED TIMBER REVETMENT AND LARGE LOG.
- 2 REMOVE TIMBER AND STEEL PILES ALONG TIMBER BULKHEAD
- 3 SELECTIVE DEMOLITION OF CREOSOTE-TREATED TIMBER BULKHEAD.
- 4 REMOVE PAVEMENT.
- 5 REMOVE CONCRETE CURB.
- 6 REMOVE FENCE.
- 7 SELECTIVE REMOVAL OF LARGE RUBBLE ON SHORELINE SLOPE TO ACCOMMODATE BULKHEAD INSTALLATION. SELECT RUBBLE MATERIAL WILL BE REPLACED WITH RIPRAP TO MAINTAIN SLOPE PROTECTION



PLAN - DEMOLITION

SCALE: 1" = 50'

LEVELS:

MHHW: +8.07'

MLW: 1.35'

OHW (DELINEATED):

MHW: +7.37'

MLLW: +0.00'

APPROX. +11.50'



SCALE: 1"=50'

APPLICANT:
PORT OF ILWACO

ADJACENT PROPERTY OWNERS:
1) PORT OF ILWACO

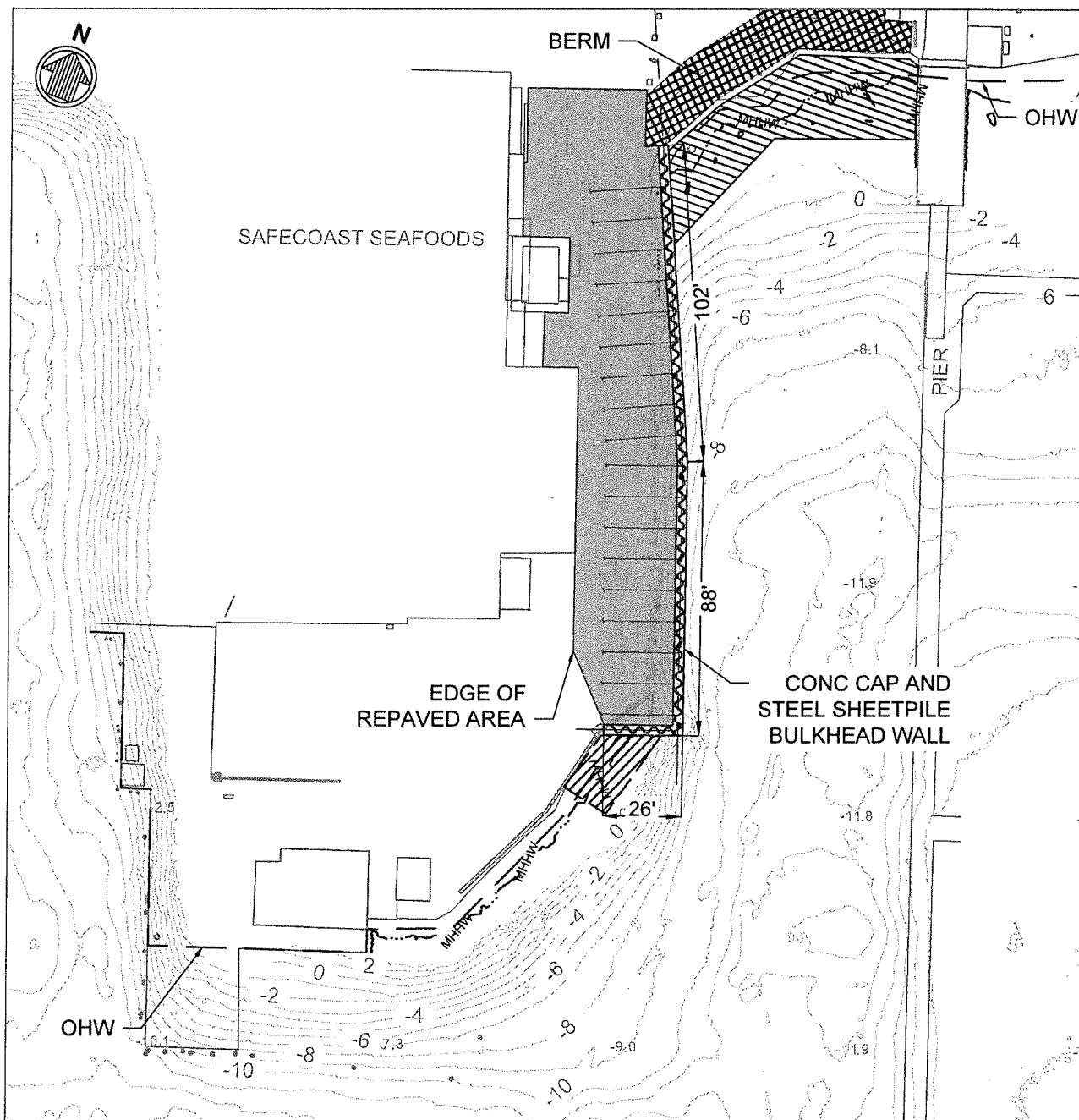
LOCATION: PORT OF ILWACO
117 HOWERTON AVE SE
ILWACO, WA 98624

LAT/LONG: 46.30442 N, -124.03852 W

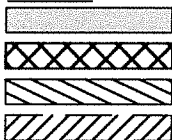
DATUM: MLLW
SHEET: 4 OF 9 **DATE:** JUNE 2023

PROPOSED PROJECT: PORT OF ILWACO
EAST BULKHEAD RESILIENCE PROJECT

IN: BAKER BAY
NEAR/AT: ILWACO
COUNTY: PACIFIC **STATE:** WA
SEC: 33/34 **T:** 10 N **R:** 11 W



LEGEND



PAVING AREA LIMITS

BERM CONSTRUCTION

SLOPE PROTECTION

APPROXIMATE AREA OF SLOPE PROTECTION REPLACEMENT



TIEBACKS



PROPOSED BULKHEAD



PILES



PLAN - PROPOSED

SCALE: 1"=50'

LEVELS:

MHHW: +8.07'

MLW: 1.35'

OHW (DELINEATED):

MHW: +7.37'

MLLW: +0.00'

APPROX. +11.50'



SCALE: 1"=50'

APPLICANT:
PORT OF ILWACO

ADJACENT PROPERTY OWNERS:
1) PORT OF ILWACO

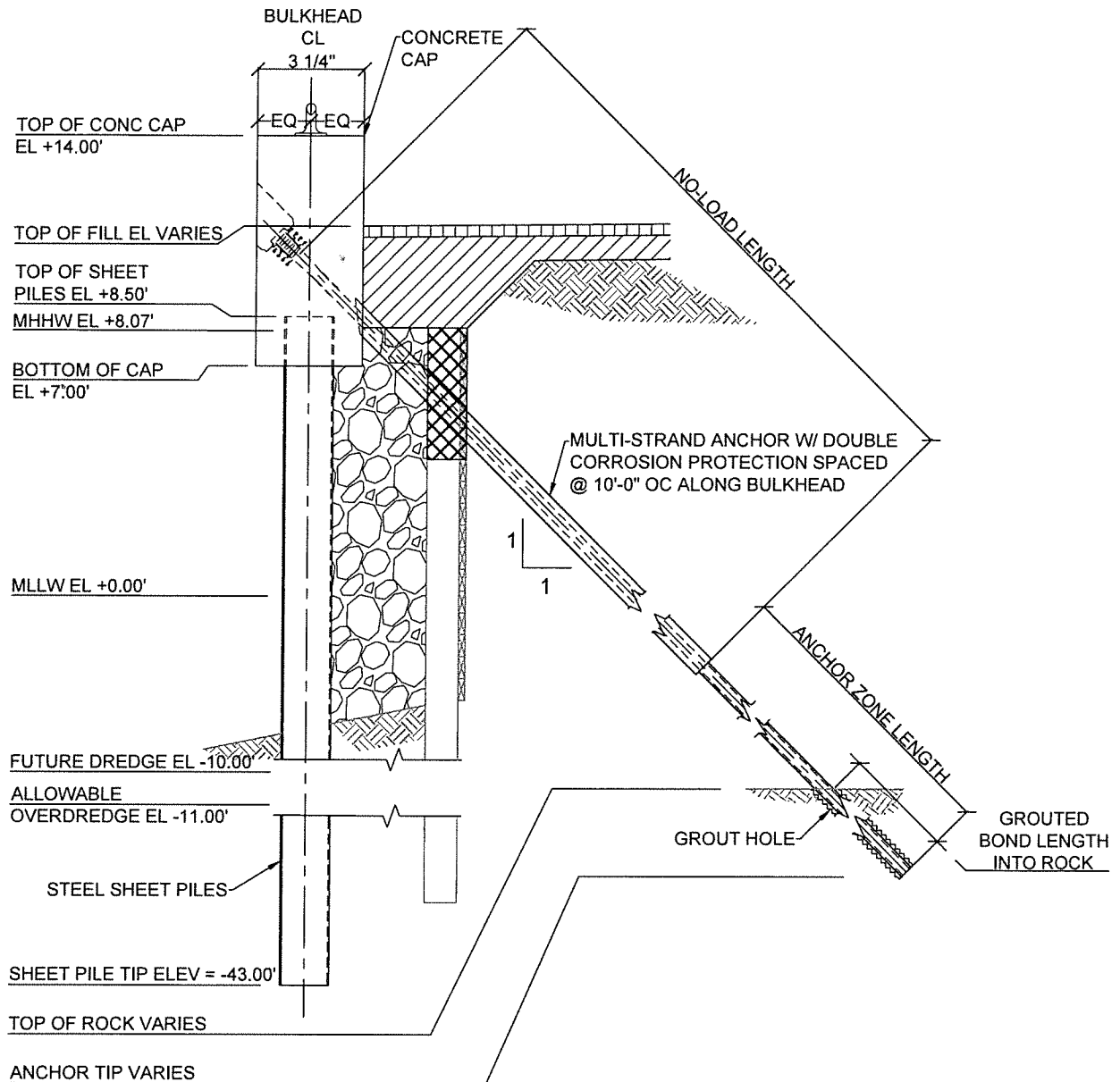
LOCATION: PORT OF ILWACO
117 HOWERTON AVE SE
ILWACO, WA 98624

LAT/LONG: 46.30442 N, -124.03852 W

DATUM: MLLW
SHEET: 5 OF 9 DATE: JUNE 2023

PROPOSED PROJECT: PORT OF ILWACO
EAST BULKHEAD RESILIENCE PROJECT

IN: BAKER BAY
NEAR/AT: ILWACO
COUNTY: PACIFIC STATE: WA
SEC: 33/34 T: 10 N R: 11 W



LEGEND

	CLEAT
	EXISTING CREOSOTE-TREATED TIMBER BULKHEAD, LAGGING TO REMAIN
	DRAIN ROCK BACKFILL
	ASPHALT PAVING
	STRUCTURAL FILL
	LOCAL DEMOLITION/REMOVAL OF CREOSOTE-TREATED TIMBER BULKHEAD FOR INSTALLATION OF GROUND ANCHORS

SECTION - TYP BULKHEAD

SCALE: NTS

APPLICANT:
PORT OF ILWACO

ADJACENT PROPERTY OWNERS:
1) PORT OF ILWACO

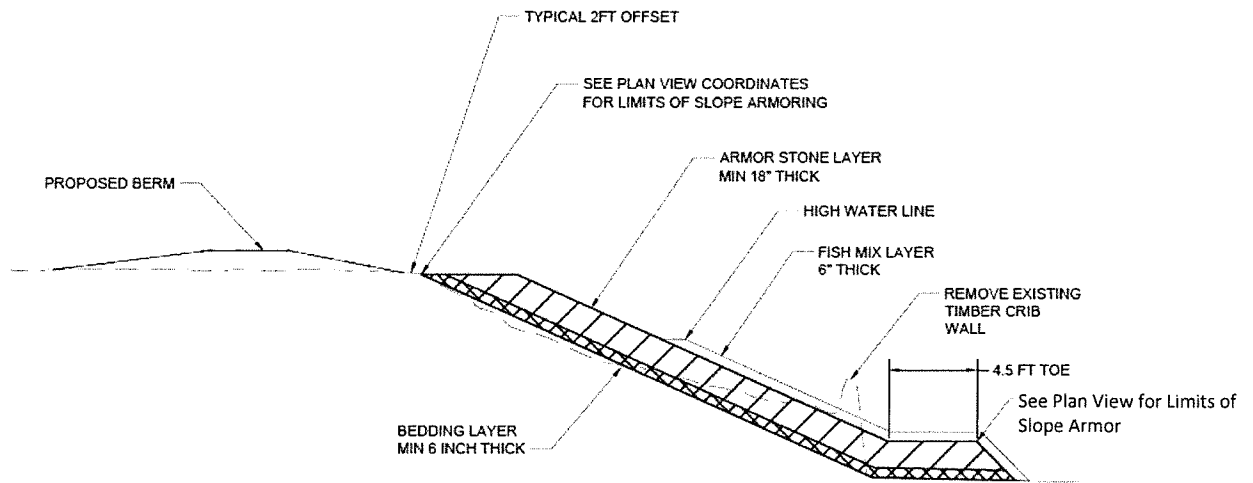
LOCATION: PORT OF ILWACO
117 HOWERTON AVE SE
ILWACO, WA 98624

LAT/LONG: 46.30442 N, -124.03852 W

DATUM: MLLW
SHEET: 7 OF 9 DATE: JUNE 2023

PROPOSED PROJECT: PORT OF ILWACO
EAST BULKHEAD RESILIENCE PROJECT

IN: BAKER BAY
NEAR/AT: ILWACO
COUNTY: PACIFIC STATE: WA
SEC: 33/34 T: 10 N R: 11 W



C1 SLOPE ARMOR SECTION 2
C-110 SCALE:

APPLICANT:
PORT OF ILWACO

ADJACENT PROPERTY OWNERS:
1) PORT OF ILWACO

LOCATION: PORT OF ILWACO
117 HOWERTON AVE SE
ILWACO, WA 98624

LAT/LONG: 46.30442 N, -124.03852 W

DATUM: MLLW
SHEET: 8 OF 9 **DATE:** JUNE 2023

PROPOSED PROJECT: PORT OF ILWACO
EAST BULKHEAD RESILIENCE PROJECT

IN: BAKER BAY
NEAR/AT: ILWACO
COUNTY: PACIFIC **STATE:** WA
SEC: 33/34 **T:** 10 N **R:** 11 W

File: C:\S7\1215282\20 C492\1 Active\Permit\5 Shoreset\210902_P7



Legend

— Additional Mitigation

N

0 300 600 Feet

Scale: 1" = 300'

<u>APPLICANT:</u> PORT OF ILWACO	<u>LOCATION:</u> PORT OF ILWACO 117 HOWERTON AVE SE ILWACO, WA, 98624	<u>PROPOSED:</u> PORT OF ILWACO EAST BULKHEAD RESILIENCE PROJECT
<u>ADJACENT PROPERTY OWNERS:</u> 1) PORT OF ILWACO	<u>LAT/LONG:</u> 46.20442 N, -124.03852 W	<u>IN:</u> BAKER BAY <u>NEAR/AT:</u> PORT OF ILWACO
	<u>DATUM:</u> MLLW	<u>COUNTY:</u> PACIFIC
	<u>SHEET:</u> 9 OF 9	<u>SEC:</u> 33/34
	<u>DATE:</u> JUNE, 2023	<u>STATE:</u> WA <u>R:</u> 11 W

D:\SEA\110124\21 GIS\mapa\110124 Ilwaco\Figure 20230616 210242 Ilwaco\Figure 20230616 210242



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Washington Fish and Wildlife Office
510 Desmond Dr. S.E., Suite 102
Lacey, Washington 98503



In Reply Refer to:
FWS/R1/2023-0026807

August 28, 2023

Kris Gilson
Maritime Administration
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

Dear Ms. Gilson:

Subject: Port of Ilwaco, East Bulkhead Resilience Project

This letter is in response to your December 14, 2022, request for our concurrence with your determination that the proposed action in Ilwaco, Pacific County, Washington, “may affect, but is not likely to adversely affect” federally listed species. We received your letter and Biological Evaluation (BE), providing information in support of “may affect, not likely to adversely affect” determinations, on December 14, 2022. On June 14, 2023, an email from Margaret Schwertner (Consultant or Agent) was received, describing minor changes and updates for the proposed action.

Specifically, you requested informal consultation pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (ESA) for the federally listed species and designated critical habitat identified below:

Bull trout (*Salvelinus confluentus*)
Designated bull trout critical habitat
Marbled murrelet (*Brachyramphus marmoratus*)
Streaked horned lark (*Eremophila alpestris strigata*)

The U.S. Department of Transportation, Maritime Administration (MARAD) has determined that the proposed action will have “no effect” on additional listed species and designated critical habitat that are known to occur in Pacific County. The determination of “no effect” to listed

PACIFIC REGION 1

IDAHO, OREGON*, WASHINGTON,
AMERICAN SAMOA, GUAM, HAWAII, NORTHERN MARIANA ISLANDS

*PARTIAL

resources rests with the action agency. The U.S. Fish and Wildlife Service (Service) has no regulatory or statutory authority for concurring with “no effect” determinations, and no consultation with the Service is required. We recommend that the action agency document their analyses on effects to listed species and maintain that documentation as part of their project files.

Project Description:

The proposed action has two goals: 1) To repair the failing bulkhead and restore serviceability and safety; and, 2) To increase the overall height of the structure, to better accommodate high tides and projected sea level rise. To accomplish these goals, MARAD and the Port of Ilwaco (Port) will replace the failing east bulkhead, repair/replace the slope protection north and south of the bulkhead, and pave and re-grade the upland wharf area directly landward, to mitigate the effects of sea level rise.

The east bulkhead has reached the end of its serviceable life, is failing, and requires replacement. To preserve the stability of some of the existing structures, a steel sheet pile wall will be constructed two to five feet waterward of the existing bulkhead, and the gap will be backfilled with rock (approximately 400 cubic yards, cy). Wherever possible, existing creosote-treated wood piles will be removed by direct pulling or with a vibratory hammer. Sheet piles will be driven with a vibratory hammer; an impact hammer may be required, if/where difficult driving conditions are encountered. When complete, the top of the bulkhead will be approximately three feet higher vertically than the current features, to withstand high tides and future sea level rise. The bulkhead repairs/ replacement will encroach on approximately 200 square feet (sf) of marine bed and waters (i.e., in excess of the original footprint of the bulkhead).

Slope protection repairs/replacement will be completed at two locations (north and south shoreline), and will include removal of creosote-treated wood piles and removal, adjustment, and augmentation of riprap armor and retaining walls. On the south shoreline, approximately 400 sf (16 cy) of riprap and concrete debris will be removed, and replaced with approximately 35 cy of riprap within the same approximate footprint (including approximately 30 cy placed waterward of the High Tide Line, HTL). On the north shoreline, approximately 2,200 sf (165 cy) of riprap will be placed on the embanked shoreline (including approximately 140 cy placed waterward of HTL), to replace the removed creosote-treated timber retaining wall and provide shore protection. The riprap slope protection will serve as grade transition, from the vertical bulkhead structure to the adjacent sloped shorelines north and south. Once complete, the top of the constructed/ re-constructed shoreline protection features will be raised to approximately +14 ft Mean Lower Low Water.

Approximately sixteen (16) 12-inch diameter creosote-treated wood or timber piles will be removed. If complete removal is not possible or the piles break during removal, the piles will be cut at the mudline. Additional debris removal is proposed and will be completed as mitigation. Grading and paving will be completed landward of the bulkhead. Approximately 8,000 sf of existing hard surface will be repaved with positive drainage away from buildings. The bulkhead will be fitted with scuppers.

Sufficient information has been provided to determine the effects of the proposed action and to conclude whether it would adversely affect federally listed species and/or designated critical habitat. Our concurrence is based on information provided by the action agency, best available science, and complete and successful implementation of the conservation measures included by the action agency.

EFFECTS SPECIFIC TO BULL TROUT AND MARBLED MURRELET

I. Temporary Exposures and Effects

Exposures are extremely unlikely (discountable) because of the following:

- The action is located in the lower Columbia River (downstream of Bonneville Dam), where at present, bull trout occurrence is rare and exposure to construction activities is extremely unlikely.
- The Port's facilities include a substantially altered, degraded, artificial embayment, and provide little or no suitable habitat for marbled murrelets. Exposure to construction activities is extremely unlikely.

II. Effects to Bull Trout and Marbled Murrelet Habitats and Prey

With successful implementation of the conservation measures included by the action agency as part of the proposed action, effects will not be measurable, will not significantly disrupt normal behaviors (i.e., the ability to successfully feed, move, and/or shelter), and are therefore considered insignificant. We expect that the effects of the action will not measurably degrade or diminish habitat functions or prey resources in the action area. Therefore, the effects of the action are considered insignificant:

- Construction at or below Mean Higher High Water will be completed during the recommended in-water work window (November 1 to February 28).
- Construction activities and proposed permanent features may impact habitat that supports the species and/or their prey. These impacts will be limited in physical extent and/or duration, and will not measurably or significantly degrade habitat functions, including prey resources that are important to the species within the action area.
- The action will result in temporary impacts to water quality, including potential temporary increases in levels of turbidity and contaminants (e.g., compounds found in treated wood). These effects will be intermittent and limited in physical extent and duration. The action will remove and properly dispose of creosote-treated wood, and thereby provide benefits in the form of improved water and sediment quality.

- The action includes replacing bank armor within a slightly larger footprint, and will install a steel sheet pile wall waterward of the existing bulkhead. The action will continue to impair some natural shoreline processes. However, with the substantial removal of creosote-treated wood and debris, we conclude that the action will provide a net improvement to habitat conditions for the species and their prey.
- The action includes operations that will produce stormwater discharges. Approximately 8,000 sf of existing hard surface will be repaved. Discharges will be infrequent, episodic, and are unlikely to measurably affect water or sediment quality in the Port's artificial embayment.

EFFECTS TO DESIGNATED BULL TROUT CRITICAL HABITAT

The final revised rule designating bull trout critical habitat (75 FR 63898 [October 18, 2010]) identifies nine Primary Constituent Elements (PCEs) essential for the conservation of the species. The 2010 designation of critical habitat for bull trout uses the term PCE. The new critical habitat regulations (81 FR 7214) replace this term with physical or biological features (PBFs). This shift in terminology does not change the approach used in conducting our analyses, whether the original designation identified PCEs, PBFs, or essential features. In this letter, the term PCE is synonymous with PBF or essential features of designated critical habitat.

The following PCEs are in the action area. Of the PCEs present, some will not be affected by the proposed action.

PCE 2: Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.

- The action may temporarily introduce an impediment or barrier within migration habitat. However, it will not preclude bull trout movement through the area, either during or after construction, and any effects will be temporary. Migration habitat will not be permanently altered, destroyed, or degraded.

PCE 3: An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.

- The action may temporarily reduce the food base via a small reduction of prey resources. However, the impacts will be temporary and/or components of the project design will avoid, reduce, or compensate for them.

PCE 4: *Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.*

- The action will maintain degraded habitat conditions by continuing to preclude and/or degrade natural shoreline processes, but will not result in further declines in shoreline complexity.

PCE 8: *Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.*

- The action may impact water quantity and/or quality. However, the effects will be temporary; components of the project design include actions to avoid, reduce, or compensate for the effects; and/or we would be unable to measure, detect, or evaluate the effects. The action will remove and properly dispose of creosote-treated wood, and thereby provide benefits in the form of improved water and sediment quality.

EFFECTS TO STREAKED HORNED LARK

The action will not significantly disrupt normal streaked horned lark behaviors (i.e., the ability to successfully feed, move, and/or shelter). The effects of the action will not measurably degrade or diminish habitat functions. Therefore, the effects the action are considered insignificant.

- There is no suitable breeding habitat in the action area. Construction exposures and effects are extremely unlikely, and therefore considered discountable.

CONCLUSION

This concludes consultation pursuant to the regulations implementing the ESA (50 CFR 402.13). Our review and concurrence with your effect determinations is based on implementation of the project as described. It is the responsibility of the federal action agency to ensure that the projects they authorize or carry out are in compliance with the regulatory permit and ESA. If a permittee or the federal action agency deviates from the measures outlined in a permit or project description, the federal action agency has the obligation to reinitiate consultation and comply with section 7(d).

This action should be re-analyzed and re-initiation may be necessary if 1) new information reveals effects of the action that may affect listed species or critical habitat in a manner, or to an extent, not considered in this consultation, 2) if the action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this consultation, and/or 3) a new species is listed or critical habitat is designated that may be affected by this action.

This letter constitutes a complete response by the Service to your request for informal consultation. A record of this consultation is on file at the Washington Fish and Wildlife Office, in Lacey, Washington. If you have any questions about this letter or our shared responsibilities under the ESA, please contact the consulting biologist identified below.

U.S. Fish and Wildlife Service Consultation Biologist:
Mitchell Dennis (564-669-0716; mitchell_dennis@fws.gov)

Sincerely,

for Brad Thompson, State Supervisor
Washington Fish and Wildlife Office

cc:

Moffatt & Nichol, Federal Way and Vancouver, WA (M. Schwertner; V. England)
Port of Ilwaco, Ilwaco, WA (T. Lofstrom)

PORT OF ILWACO
Marine Structures Replacement
Ilwaco, WA

Appendix B

**US DOT MARAD General Terms and Conditions,
and Exhibits**

PORT OF ILWACO
Marine Structures Replacement
Ilwaco, WA

Appendix B1

U.S. Department of Transportation Maritime Administration
General Terms and Conditions Under the Fiscal Year 2021 Port Infrastructure
Development Program (PIDP) Grants
October 27, 2023

U.S. DEPARTMENT OF TRANSPORTATION

GENERAL TERMS AND CONDITIONS UNDER THE

FISCAL YEAR 2021 PORT INFRASTRUCTURE DEVELOPMENT PROGRAM (PIDP)

GRANTS

October 27, 2023

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GENERAL TERMS AND CONDITIONS

The Consolidated Appropriations Act, 2021, Pub. L. No. 116-260 (Dec. 27, 2020) appropriated funds to the United States Department of Transportation (“USDOT”) Maritime Administration (“MARAD”) under the heading “Port Infrastructure Development Program.” The funds are available to provide Federal financial assistance to make grants to improve port facilities at coastal seaports, inland river ports, or Great Lakes ports. The MARAD program administering those funds is the Port Infrastructure Development Program (PIDP).

MARAD published a “Notice of Funding Opportunity for the Maritime Administration’s Port Infrastructure Development Program (PIDP) Under the Consolidated Appropriations Act, 2021,” 86 Fed. Reg. 20231 (April 16, 2021) (the “NOFO”) to solicit applications for Federal financial assistance.

These general terms and conditions are incorporated by reference in a project-specific agreement under the fiscal year 2021 PIDP grant program. Articles 1–7 are in the project-specific portion of the agreement. The term “Recipient” is defined in the project-specific portion of the agreement. Attachments A through E are project-specific attachments.

ARTICLE 8 PURPOSE

8.1 Purpose. The purpose of this award is to make grants to improve port facilities at coastal seaports, inland river ports, or Great Lakes ports. The parties will accomplish that purpose by achieving the following objectives:

- (1) timely completing the Project; and
- (2) ensuring that this award does not substitute for non-Federal investment in the Project, except as proposed in the Technical Application, as modified by section 3.3 and Attachment B.

ARTICLE 9 USDOT ROLE

9.1 Operating Administration. MARAD will administer this agreement on behalf of the USDOT.

9.2 MARAD Program Contacts.

David Bohnet
Supervisory Grant Management Specialist
DOT – Maritime Administration
1200 New Jersey Ave, SE
Washington, DC 20590
MAR-510

W21-226
Mailstop 3
(202) 366-0586
david.bohnet@dot.gov

and

MARAD PIDP Grants Coordinator
DOT – Maritime Administration
1200 New Jersey Avenue, SE
Washington, DC 20590
PIDPGrants@dot.gov

ARTICLE 10 RECIPIENT ROLE

10.1 Statements on the Project. The Recipient states that:

- (1) all material statements of fact in the Technical Application were accurate when that application was submitted; and
- (2) Attachment D documents all material changes in the information contained in that application.

10.2 Statements on Authority and Capacity. The Recipient states that:

- (1) it has the authority to receive Federal financial assistance under this agreement;
- (2) it has the legal authority to complete the Project;
- (3) it has the capacity, including institutional, managerial, and financial capacity, to comply with its obligations under this agreement;
- (4) not less than the difference between the “Total Eligible Project Cost” and the “PIDP Grant Amount” listed in section 3.3 are committed to fund the Project;
- (5) it has sufficient funds available to ensure that infrastructure completed or improved under this agreement will be operated and maintained in compliance with this agreement and applicable Federal law; and

- (6) the individual executing this agreement on behalf of the Recipient has authority to enter this agreement and make the statements in this article 10 and in section 23.7 on behalf of the Recipient.

10.3 MARAD Reliance. The Recipient acknowledges that:

- (1) MARAD relied on statements of fact in the Technical Application to select the Project to receive this award;
- (2) MARAD relied on statements of fact in both the Technical Application and this agreement to determine that the Recipient and the Project are eligible under the terms of the NOFO;
- (3) MARAD relied on statements of fact in both the Technical Application and this agreement to establish the terms of this agreement; and
- (4) MARAD's selection of the Project to receive this award prevented awards under the NOFO to other eligible applicants.

10.4 Project Delivery.

- (a) The Recipient shall complete the Project under the terms of this agreement.
- (b) The Recipient shall ensure that the Project is financed, constructed, operated, and maintained in accordance with all Federal laws, regulations, and policies that are applicable to projects of MARAD.

10.5 Rights and Powers Affecting the Project.

- (a) The Recipient shall not take or permit any action that deprive it of any rights or powers necessary to the Recipient's performance under this agreement without written approval of MARAD.
- (b) The Recipient shall act, in a manner acceptable to MARAD, to promptly to acquire, extinguish, or modify any outstanding rights or claims of right of others that would interfere with the Recipient's performance under this agreement.

10.6 Notification of Changes to Key Personnel. The Recipient shall notify all MARAD representatives who are identified in section 5.4 in writing within 30 calendar days of any change in key personnel who are identified in section 5.3.

ARTICLE 11 AWARD AMOUNT, OBLIGATION, AND TIME PERIODS

11.1 Federal Award Amount MARAD hereby awards a PIDP Grant to the Recipient in the amount listed in section 2.2 as the PIDP Grant Amount.

- 11.2 Federal Obligation.** This agreement obligates for the budget period the amount listed in section 2.2 as the PIDP Grant Amount.
- 11.3 Budget Period.** The budget period for this award begins on the date of this agreement and ends on the budget period end date that is listed in section 2.3. In this agreement, “budget period” is used as defined at 2 C.F.R. 200.1.
- 11.4 Period of Performance.** The period of performance for this award begins on the date of this agreement and ends on the period of performance end date that is listed in section 2.3. In this agreement, “period of performance” is used as defined at 2 C.F.R. 200.1.

ARTICLE 12

STATEMENT OF WORK, SCHEDULE, AND BUDGET CHANGES

- 12.1 Notification Requirement.** The Recipient shall notify all MARAD representatives who are identified in section 5.4 in writing within 30 calendar days of any change in circumstances or commitments that adversely affect the Recipient’s plan to complete the Project. In that notification, the Recipient shall describe the change and what actions the Recipient has taken or plans to take to ensure completion of the Project. This notification requirement under this section 12.1 is separate from any requirements under this article 12 that the Recipient request modification of this agreement.
- 12.2 Statement of Work Changes.** If the Project’s activities differ from the statement of work that is described in section 3.1 and Attachment A, then the Recipient shall request a modification of this agreement to update section 3.1 and Attachment A.
- 12.3 Schedule Changes.** If one or more of the following conditions are satisfied, then the Recipient shall request a modification of this agreement to update the relevant dates:
- (1) a substantial completion date for the Project or a component of the Project is listed in section 3.2 and the Recipient’s estimate for that milestone changes to a date that is more than six months after the date listed in section 3.2;
 - (2) a schedule change would require the budget period to continue after the budget period end date listed in section 2.3; or
 - (3) a schedule change would require the period of performance to continue after the period of performance end date listed in section 2.3.

For other schedule changes, the Recipient shall request a modification of this agreement unless MARAD has consented, in writing, to the change.

12.4 Budget Changes.

- (a) The Recipient acknowledges that if the cost of completing the Project increases:

- (1) that increase does not affect the Recipient's obligation under this agreement to complete the Project; and
 - (2) MARAD will not increase the amount of this award to address any funding shortfall.
- (b) The Recipient shall request a modification of this agreement to update section 3.3 and Attachment B if, in comparing the Project's budget to the amounts listed in section 3.3:
- (1) the "Other Federal Funds" amount increases; or
 - (2) one or more of the "State Funds," "Local Funds," "Other Funds," or "Total Eligible Project Cost" amounts decrease.
- (c) For budget changes that are not identified in section 12.4(b), the Recipient shall request a modification of this agreement to update section 3.3 and Attachment B unless MARAD has consented, in writing, to the change.
- (d) If the actual eligible project costs are less than the "Total Eligible Project Cost" that is listed in section 3.3, then the Recipient may propose to MARAD, in writing, specific additional activities that are within the scope of this award, as defined in sections 8.1 and 3.1, and that the Recipient could complete with the difference between the "Total Eligible Project Cost" that is listed in section 3.3 and the actual eligible project costs.
- (e) If the actual eligible project costs are less than the "Total Eligible Project Cost" that is listed in section 3.3 and either the Recipient does not make a proposal under section 12.4(d) or MARAD does not accept the Recipient's proposal under section 12.4(d), then:
- (1) in a request under section 12.4(b), the Recipient shall reduce the Federal Share by the difference between the "Total Eligible Project Cost" that is listed in section 3.3 and the actual eligible project costs; and
 - (2) if that modification reduces this award and MARAD had reimbursed costs exceeding the revised award, the Recipient shall refund to MARAD the difference between the reimbursed costs and the revised award.

In this agreement, "**Federal Share**" means the sum of the "PIDP Grant Amount" and the "Other Federal Funds" amounts that are listed in section 3.3.

- (f) The Recipient acknowledges that amounts that are required to be refunded under section 12.4(e)(2) constitute a debt to the Federal Government that MARAD may collect under 2 C.F.R. 200.346 and the Federal Claims Collection Standards (31 C.F.R. parts 900–999).

12.5 MARAD Acceptance of Changes. MARAD may accept or reject modifications requested under this article 12, and in doing so may elect to consider only the interests of the PIDP grant program and MARAD. The Recipient acknowledges that requesting a modification under this article 12 does not amend, modify, or supplement this agreement

unless MARAD accepts that modification request and the parties modify this agreement under section 22.1.

ARTICLE 13 GENERAL REPORTING TERMS

- 13.1 Report Submission.** The Recipient shall send all reports required by this agreement to all MARAD contacts who are listed in section 5.4 and all MARAD contacts who are listed in section 9.2.
- 13.2 Alternative Reporting Methods.** MARAD may establish processes for the Recipient to submit reports required by this agreement, including electronic submission processes. If the Recipient is notified of those processes in writing, the Recipient shall use the processes required by MARAD.
- 13.3 Paperwork Reduction Act Notice.** Under 5 C.F.R. 1320.6, the Recipient is not required to respond to a collection of information that does not display a currently valid control number issued by the Office of Management and Budget (the “OMB”). Collections of information conducted under this agreement are approved under OMB Control No. 2133-0552.

ARTICLE 14 PROGRESS AND FINANCIAL REPORTING

- 14.1 Quarterly Project Progress Reports and Recertifications.** On or before the 20th day of the first month of each calendar year quarter and until the end of the budget period, the Recipient shall submit to MARAD a Quarterly Project Progress Report and Recertification in the format and with the content described in Exhibit C. If the date of this agreement is in the final month of a calendar year quarter, then the Recipient shall submit the first Quarterly Project Progress Report and Recertification in the second calendar year quarter that begins after the date of this agreement.
- 14.2 Final Progress Reports and Financial Information.** No later than 120 days after the end of the budget period, the Recipient shall submit
- (1) a Final Project Progress Report and Recertification in the format and with the content described in Exhibit C for each Quarterly Project Progress Report and Recertification, including a final Federal Financial Report (SF-425); and
 - (2) any other information required under MARAD’s award closeout procedures.

ARTICLE 15
OUTCOME PERFORMANCE MEASUREMENT REPORTING AND PORT
PERFORMANCE REPORTING

15.1 Baseline Performance Measurement. If the Capital-Planning Designation in section 2.5 is “Capital,” then:

- (1) the Recipient shall collect data for each performance measure that is identified in the Outcome Performance Measure Table in Attachment C, accurate as of the Baseline Measurement Date that is identified in Attachment C; and
- (2) on or before the Baseline Report Date that is stated in Attachment C, the Recipient shall submit a Baseline Performance Measurement Report that contains the data collected under this section 15.1 and a detailed description of the data sources, assumptions, variability, and estimated levels of precision for each performance measure that is identified in the Outcome Performance Measure Table in Attachment C.

15.2 Post-construction Performance Measurement. If the Capital-Planning Designation in section 2.5 is “Capital,” then

- (1) for each of 12 consecutive calendar quarters, beginning with the first calendar quarter that begins after the Project substantial completion date, at least once during the quarter, the Recipient shall collect data for each performance measure that is identified in the Outcome Performance Measure Table in Attachment C; and
- (2) not later than January 31 of each year that follows a calendar year during which data was collected under this section 15.2, the Recipient shall submit to MARAD a Post-construction Performance Measurement Report containing the data collected under this section 15.2 in the previous calendar year and stating the dates when the data was collected.

If an external factor significantly affects the value of a performance measure collected under this section 15.2, then the Recipient shall identify that external factor in the Post-construction Performance Measurement Report and discuss its influence on the performance measure.

15.3 Project Outcomes Report. If the Capital-Planning Designation in section 2.5 is “Capital,” then the Recipient shall submit to MARAD, not later than January 31 of the year that follows the final calendar year during which data was collected under section 15.2, a Project Outcomes Report that contains:

- (1) a narrative discussion detailing project successes and the influence of external factors on project expectations;

- (2) all baseline and post-construction performance measurement data that the Recipient reported in the Baseline Performance Measurement Report and the Post-construction Performance Measurement Reports; and
- (3) an *ex post* examination of project effectiveness relative to the baseline data that the Recipient reported in the Baseline Performance Measurement Report.

15.4 Port Performance Reporting.

[Reserved]

ARTICLE 16 NONCOMPLIANCE AND REMEDIES

16.1 Noncompliance Determinations.

- (a) If MARAD determines that the Recipient may have failed to comply with the United States Constitution, Federal law, or the terms and conditions of this agreement, MARAD may notify the Recipient of a proposed determination of noncompliance. For the notice to be effective, it must be written and MARAD must include an explanation of the nature of the noncompliance, describe a remedy, state whether that remedy is proposed or effective at an already determined date, and describe the process through and form in which the Recipient may respond to the notice.
- (b) If MARAD notifies the Recipient of a proposed determination of noncompliance under section 16.1(a), the Recipient may, not later than 7 calendar days after the notice, respond to that notice in the form and through the process described in that notice. In its response, the Recipient may:
 - (1) accept the remedy;
 - (2) acknowledge the noncompliance, but propose an alternative remedy; or
 - (3) dispute the noncompliance.

To dispute the noncompliance, the Recipient must include in its response documentation or other information supporting the Recipient's compliance.

- (c) MARAD may make a final determination of noncompliance only:
 - (1) after considering the Recipient's response under section 16.1(b); or
 - (2) if the Recipient fails to respond under section 16.1(b), after the time for that response has passed.
- (d) To make a final determination of noncompliance, MARAD must provide a notice to the Recipient that states the bases for that determination.

16.2 Remedies.

- (a) If MARAD makes a final determination of noncompliance under section 16.1, MARAD may impose a remedy, including:
 - (1) additional conditions on the award;
 - (2) any remedy permitted under 2 C.F.R. 200.339–200.340, including withholding of payments; disallowance of previously reimbursed costs, requiring refunds from the Recipient to MARAD; suspension or termination of the award; or suspension and disbarment under 2 C.F.R. part 180; or
 - (3) any other remedy legally available.
- (b) To impose a remedy, MARAD must provide a written notice to the Recipient that describes the remedy, but MARAD may make the remedy effective before the Recipient receives that notice.
- (c) If MARAD determines that it is in the public interest, MARAD may impose a remedy, including all remedies described in section 16.2(a), before making a final determination of noncompliance under section 16.1. If it does so, then the notice provided under section 16.1(d) must also state whether the remedy imposed will continue, be rescinded, or modified.
- (d) In imposing a remedy under this section 16.2 or making a public interest determination under section 16.2(c), MARAD may elect to consider the interests of only MARAD.
- (e) The Recipient acknowledges that amounts that MARAD requires the Recipient to refund to MARAD due to a remedy under this section 16.2 constitute a debt to the Federal Government that MARAD may collect under 2 C.F.R. 200.346 and the Federal Claims Collection Standards (31 C.F.R. parts 900–999).

16.3 Other Oversight Entities. Nothing in this article 16 limits any party’s authority to report activity under this agreement to the United States Department of Transportation Inspector General or other appropriate oversight entities.

ARTICLE 17 AGREEMENT TERMINATION

17.1 MARAD Termination.

- (a) MARAD may terminate this agreement and all of its obligations under this agreement if any of the following occurs:
 - (1) the Recipient fails to obtain or provide any non-PIDP Grant contribution or alternatives approved by MARAD as provided in this agreement and consistent with article 3;
 - (2) a construction start date for the Project or a component of the Project is listed in

section 3.2 and the Recipient fails to meet that milestone by six months after the date listed in section 3.2;

- (3) a substantial completion date for the Project or a component of the Project is listed in section 3.2 and the Recipient fails to meet that milestone by six months after the date listed in section 3.2;
- (4) the Recipient fails to meet a milestone listed in section 4.1 by the deadline date listed in that section for that milestone;
- (5) the Recipient fails to comply with the terms and conditions of this agreement, including a material failure to comply with the schedule in section 3.2 even if it is beyond the reasonable control of the Recipient; or,
- (6) MARAD determines that termination of this agreement is in the public interest.

(b) In terminating this agreement under this section, MARAD may elect to consider only the interests of MARAD.

(c) This section 17.1 does not limit MARAD's ability to terminate this agreement as a remedy under section 16.2.

(d) The Recipient may request that MARAD terminate the agreement under this section 17.1.

17.2 Closeout Termination.

(a) This agreement terminates on Project Closeout.

(b) In this agreement, "**Project Closeout**" means the date that MARAD notifies the Recipient that the award is closed out. Under 2 C.F.R. 200.344, Project Closeout should occur no later than one year after the end of the period of performance.

17.3 Post-Termination Adjustments. The Recipient acknowledges that under 2 C.F.R. 200.345–200.346, termination of the agreement does not extinguish MARAD's authority to disallow costs, including costs that MARAD reimbursed before termination, and recover funds from the Recipient.

17.4 Non-Terminating Events.

(a) The end of the budget period described under section 11.3 does not terminate this agreement or the Recipient's obligations under this agreement.

(b) The end of the period of performance described under section 11.4 does not terminate this agreement or the Recipient's obligations under this agreement.

17.5 Other Remedies. The termination authority under this article 17 supplements and does not limit the MARAD's remedial authority under article 16 or 2 C.F.R. part 200, including 2 C.F.R. 200.339–200.340.

ARTICLE 18
MONITORING, FINANCIAL MANAGEMENT, CONTROLS, AND RECORDS

18.1 Recipient Monitoring and Record Retention.

- (a) The Recipient shall monitor activities under this award, including activities under subawards and contracts, to ensure:
 - (1) that those activities comply with this agreement; and
 - (2) that funds provided under this award are not expended on costs that are not allowable under this award or not allocable to this award.
- (b) If the Recipient makes a subaward under this award, the Recipient shall monitor the activities of the subrecipient in compliance with 2 C.F.R. 200.332(d).
- (c) The Recipient shall retain records relevant to the award as required under 2 C.F.R. 200.334.

18.2 Financial Records and Audits.

- (a) The Recipient shall keep all project accounts and records that fully disclose the amount and disposition by the Recipient of the award funds, the total cost of the Project, and the amount or nature of that portion of the cost of the Project supplied by other sources, and any other financial records related to the project.
- (b) The Recipient shall keep accounts and records described under section 18.2(a) in accordance with a financial management system that meets the requirements of 2 C.F.R. 200.301–200.303 and 2 C.F.R. 200 subpart F and will facilitate an effective audit in accordance with 31 U.S.C. 7501–7506.
- (c) The Recipient shall separately identify expenditures under the fiscal year 2021 PIDP grants program in financial records required for audits under 31 U.S.C. 7501–7506. Specifically, the Recipient shall:
 - (1) list expenditures under that program separately on the schedule of expenditures of Federal awards required under 2 C.F.R. 200 subpart F, including “FY 2021” in the program name; and
 - (2) list expenditures under that program on a separate row under Part II, Item 1 (“Federal Awards Expended During Fiscal Period”) of Form SF-SAC, including “FY 2021” in column c (“Additional Award Identification”).

18.3 Internal Controls. The Recipient shall establish and maintain internal controls as required under 2 C.F.R. 200.303.

18.4 MARAD Record Access. MARAD may access Recipient records related to this award under 2 C.F.R. 200.337.

ARTICLE 19

CONTRACTING AND SUBAWARDS

19.1 Minimum Wage Rates. The Recipient shall include, in all contracts in excess of \$2,000 for work on the Project that involves labor, provisions establishing minimum rates of wages, to be predetermined by the United States Secretary of Labor, in accordance with the Davis-Bacon Act, 40 U.S.C. 3141–3148, or 23 U.S.C. 113, as applicable, that contractors shall pay to skilled and unskilled labor, and such minimum rates shall be stated in the invitation for bids and shall be included in proposals or bids for the work.

19.2 Buy America.

- (a) For the purpose of the award term at exhibit B.5, the Project is “an infrastructure project.” The Recipient acknowledges that iron, steel, manufactured products, and construction materials used in the Project are subject to the Buy America preference in that award term and this agreement is not a waiver of that preference.
- (b) If the Recipient uses iron, steel, manufactured products, or construction materials that are not produced in the United States in violation of the award term at exhibit B.5, MARAD may disallow and deny reimbursement of costs incurred by the Recipient and take other remedial actions under article 17 and 2 C.F.R. 200.339–200.340.
- (c) Under 2 C.F.R. 200.322, as appropriate and to the extent consistent with law, the Recipient should, to the greatest extent practicable under this award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States. The Recipient shall include the requirements of 2 C.F.R. 200.322 in all subawards including all contracts and purchase orders for work or products under this award.

19.3 Small and Disadvantaged Business Requirements. If any funds under this award are administered by a State Department of Transportation, the Recipient shall expend those funds in compliance with the requirements at 49 C.F.R. part 26 (“Participation by disadvantaged business enterprises in Department of Transportation financial assistance programs”). The Recipient shall expend all other funds under this award in compliance with the requirements at 2 C.F.R. 200.321 (“Contracting with small and minority businesses, women’s business enterprises, and labor surplus area firms”).

19.4 Engineering and Design Services. The Recipient shall award each contract or sub-contract for program management, construction management, planning studies, feasibility studies, architectural services, preliminary engineering, design, engineering, surveying, mapping, or related services with respect to the project in the same manner that a contract for architectural and engineering services is negotiated under the Brooks Act, 40 U.S.C. 1101-1104, or an equivalent qualifications-based requirement prescribed for or by the Recipient and approved in writing by MARAD.

19.5 Foreign Market Restrictions. The Recipient shall not allow funds provided under this award to be used to fund the use of any product or service of a foreign country during the period in which such foreign country is listed by the United States Trade Representative

as denying fair and equitable market opportunities for products and suppliers of the United States in procurement and construction.

- 19.6 Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment.** The Recipient acknowledges that Section 889 of Pub. L. No. 115-232 and 2 C.F.R. 200.216 prohibit the Recipient and all subrecipients from procuring or obtaining certain telecommunications and video surveillance services or equipment under this award.
- 19.7 Pass-through Entity Responsibilities.** If the Recipient makes a subaward under this award, the Recipient shall comply with the requirements on pass-through entities under 2 C.F.R. parts 200 and 1201, including 2 C.F.R. 200.331–200.333.
- 19.8 Subaward and Contract Authorization.** [Reserved]

ARTICLE 20

COSTS, PAYMENTS, AND UNEXPENDED FUNDS

- 20.1 Limitation of Federal Award Amount.** Under this award, MARAD shall not provide funding greater than the amount obligated under section 11.2. The Recipient acknowledges that MARAD is not liable for payments exceeding that amount, and the Recipient shall not request reimbursement of costs exceeding that amount.
- 20.2 Projects Costs.** This award is subject to the cost principles at 2 C.F.R. 200 subpart E, including provisions on determining allocable costs and determining allowable costs.
- 20.3 Timing of Project Costs.**
- (a) The Recipient shall not charge to this award costs that are incurred after the budget period.
 - (b) The Recipient shall not charge to this award costs that were incurred before the date of this agreement unless those costs are identified in Attachment E and would have been allowable if incurred during the budget period. This limitation applies to pre-award costs under 2 C.F.R. 200.458. This agreement hereby terminates and supersedes any previous MARAD approval for the Recipient to incur costs under this award for the Project. Attachment E is the exclusive MARAD approval of costs incurred before the date of this agreement.
- 20.4 Recipient Recovery of Federal Funds.** The Recipient shall make all reasonable efforts, including initiating litigation, if necessary, to recover Federal funds if MARAD determines, after consultation with the Recipient, that those funds have been spent fraudulently, wastefully, or in violation of Federal laws, or misused in any manner under this award. The Recipient shall not enter a settlement or other final position, in court or otherwise, involving the recovery of funds under the award unless approved in advance in writing by MARAD.
- 20.5 Unexpended Federal Funds.** Any Federal funds that are awarded at section 11.1 but not

expended on allocable, allowable costs remain the property of the United States.

20.6 Timing of Payments to the Recipient.

- (a) Reimbursement is the payment method for the PIDP grant program.
- (b) The Recipient shall not request reimbursement of a cost before the Recipient has entered into an obligation for that cost.

20.7 Payment Method.

- (a) The Recipient shall complete all applicable forms and attach supporting documents, including the SF 270, in Delphi eInvoicing System, which is on-line and paperless, to request reimbursement. To obtain the latest version of these standard forms, visit <https://www.grants.gov/forms/post-award-reporting-forms.html/>. The Recipient shall review the training on using Delphi eInvoicing System before submitting a request for reimbursement. To guide the Recipient when reviewing this training, MARAD provides the following additional information, which may change after execution of this agreement:
 - (1) The Recipient may access the training from the USDOT “Delphi eInvoicing System” webpage at <https://einvoice.esc.gov>. The training is linked under the heading “Grantee Training.” The Recipient should click on “Grantee Training” to access the training.
 - (2) A username and password are not required to access the on-line training. It is currently available, will be accessible 24/7, and will take approximately 10 minutes to review.
 - (3) Once the above referenced training has been reviewed, Recipients must request and complete the External User Access Request form. Recipients can request the External User Access Request form by sending an email to a Grants/Contracting Officer who is identified in sections 5.4 or 9.2. A request to establish access will be sent once the External User Access Request form is received.
- (b) MARAD may deny a payment request that is not submitted using the method identified in this section 20.7.

20.8 Information Supporting Expenditures.

- (a) When requesting reimbursement of costs incurred or credit for cost share incurred, the Recipient shall electronically submit and attach the SF 270 (Request for Advance or Reimbursement), shall identify the Federal share and the Recipient’s share of costs, and shall submit supporting cost detail to clearly document all costs incurred. As supporting cost detail, the Recipient shall include a detailed breakout of all costs incurred, including direct labor, indirect costs, other direct costs, and travel.
- (b) If the Recipient submits a request for reimbursement that MARAD determines does not include or is not supported by sufficient detail, MARAD may deny the request or withhold processing the request until the Recipient provides sufficient detail.

20.9 Reimbursement Request Timing and Frequency.

- (a) The Recipient shall request reimbursement of a cost incurred as soon as practicable after incurring that cost. If the Recipient requests reimbursement for a cost more than 180 days after that cost was incurred, MARAD may deny the request for being untimely.
- (b) The Recipient shall not request reimbursement more frequently than monthly.

ARTICLE 21 LIQUIDATION AND ADJUSTMENTS

21.1 Liquidation of Recipient Obligations.

- (a) The Recipient shall liquidate all obligations of award funds under this agreement not later than 120 days after the end of the period of performance.
- (b) Liquidation of obligations and adjustment of costs under this agreement follow the requirements of 2 C.F.R. 200.344–200.346.

ARTICLE 22 AGREEMENT MODIFICATIONS

22.1 Bilateral Modifications. The parties may amend, modify, or supplement this agreement by mutual agreement in writing signed by MARAD and the Recipient. Either party may request to amend, modify, or supplement this agreement by written notice to the other party.

22.2 Unilateral Contact Modifications.

- (a) The Recipient may update the contacts who are listed in section 5.2 by written notice to all of MARAD contacts who are listed in sections 5.4 and 9.2.
- (b) MARAD may update the contacts who are listed in sections 5.4 and 9.2 by written notice to all of the Recipient contacts who are listed in section 5.2.

22.3 MARAD Unilateral Modifications.

- (a) MARAD may unilaterally modify this agreement to comply with Federal law, including the Program Statute.
- (b) To unilaterally modify this agreement under this section 22.3, MARAD must provide a notice to the Recipient that includes a description of the modification and state the date that the modification is effective.

22.4 Other Modifications. The parties shall not amend, modify, or supplement this agreement except as permitted under sections 22.1, 22.2, or 22.3. If an amendment, modification, or supplement is not permitted under section 22.1, not permitted under section 22.2, and not permitted under section 22.3, it is void.

ARTICLE 23
FEDERAL FINANCIAL ASSISTANCE, ADMINISTRATIVE, AND NATIONAL
POLICY REQUIREMENTS

23.1 Uniform Administrative Requirements for Federal Awards. The Recipient shall comply with the obligations on non-Federal entities under 2 C.F.R. parts 200 and 1201.

23.2 Federal Law and Public Policy Requirements.

- (a) The Recipient shall ensure that Federal funding is expended in full accordance with the United States Constitution, Federal law, and statutory and public policy requirements: including but not limited to, those protecting free speech, religious liberty, public welfare, the environment, and prohibiting discrimination.
- (b) The failure of this agreement to expressly identify Federal law applicable to the Recipient or activities under this agreement does not make that law inapplicable.

23.3 Federal Freedom of Information Act.

- (a) MARAD is subject to the Freedom of Information Act, 5 U.S.C. 552.
- (b) The Recipient acknowledges that the Technical Application and materials submitted to MARAD by the Recipient related to this agreement may become MARAD records subject to public release under 5 U.S.C. 552.

23.4 History of Performance. Under 2 C.F.R 200.206, any Federal awarding agency may consider the Recipient's performance under this agreement, when evaluating the risks of making a future Federal financial assistance award to the Recipient.

23.5 Whistleblower Protection.

- (a) The Recipient acknowledges that it is a "grantee" within the scope of 41 U.S.C. 4712, which prohibits the Recipient from taking certain actions against an employee for certain disclosures of information that the employee reasonably believes are evidence of gross mismanagement of this award, gross waste of Federal funds, or a violation of Federal law related this this award.
- (b) The Recipient shall inform its employees in writing of the rights and remedies provided under 41 U.S.C. 4712, in the predominant native language of the workforce.

23.6 External Award Terms and Obligations.

- (a) In addition to this document and the contents described in article 28, this agreement includes the following additional terms as integral parts:
 - (1) Appendix A to 2 C.F.R. part 25: System for Award Management and Universal Identifier Requirements;

- (2) Appendix A to 2 C.F.R. part 170: Reporting Subawards and Executive Compensation;
- (3) 2 C.F.R. 175.15(b): Trafficking in Persons; and
- (4) Appendix XII to 2 C.F.R. part 200: Award Term and Condition for Recipient Integrity and Performance Matters.

(b) The Recipient shall comply with:

- (1) 49 C.F.R. part 20: New Restrictions on Lobbying;
- (2) 49 C.F.R. part 21: Nondiscrimination in Federally-Assisted Programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act of 1964;
- (3) 49 C.F.R. part 27: Nondiscrimination on the Basis of Disability in Programs or Activities Receiving Federal Financial Assistance; and
- (4) Subpart B of 49 C.F.R. part 32: Governmentwide Requirements for Drug-free Workplace (Financial Assistance).

23.7 Incorporated Certifications. The Recipient makes the statements in the following certifications, which are incorporated by reference:

- (1) Appendix A to 49 CFR part 20 (Certification Regarding Lobbying).

ARTICLE 24 ASSIGNMENT

24.1 Assignment Prohibited. The Recipient shall not transfer to any other entity any discretion granted under this agreement, any right to satisfy a condition under this agreement, any remedy under this agreement, or any obligation imposed under this agreement.

ARTICLE 25 WAIVER

25.1 Waivers.

- (a) A waiver granted by MARAD under this agreement will not be effective unless it is in writing and signed by an authorized representative of MARAD.
- (b) A waiver granted by MARAD under this agreement on one occasion will not operate as a waiver on other occasions.

- (c) If MARAD fails to require strict performance of a provision of this agreement, fails to exercise a remedy for a breach of this agreement, or fails to reject a payment during a breach of this agreement, that failure does not constitute a waiver of that provision or breach.

ARTICLE 26

ADDITIONAL TERMS AND CONDITIONS

26.1 Disclaimer of Federal Liability. MARAD shall not be responsible or liable for any damage to property or any injury to persons that may arise from, or be incident to, performance or compliance with this agreement.

26.2 Relocation and Real Property Acquisition.

- (a) To the greatest extent practicable under State law, the Recipient shall comply with the land acquisition policies in 49 C.F.R. 24 subpart B and shall pay or reimburse property owners for necessary expenses as specified in that subpart.
- (b) The Recipient shall provide a relocation assistance program offering the services described in 49 C.F.R. 24 subpart C and shall provide reasonable relocation payments and assistance to displaced persons as required in 49 C.F.R. 24 subparts D–E.
- (c) The Recipient shall make available to displaced persons, within a reasonable period of time prior to displacement, comparable replacement dwellings in accordance with 49 C.F.R. 24 subpart E.

26.3 Equipment Disposition.

- (a) In accordance with 2 C.F.R. 200.313 and 1201.313, if the Recipient or a subrecipient acquires equipment under this award, then when that equipment is no longer needed for the Project:
 - (1) if the entity that acquired the equipment is a State or a subrecipient of a State, that entity shall dispose of that equipment in accordance with State laws and procedures; and
 - (2) if the entity that acquired the equipment is neither a State nor a subrecipient of a State, that entity shall request disposition instructions from MARAD.
- (b) In accordance with 2 C.F.R. 200.443(d), under both (a)(1) and (a)(2), above, the distribution of proceeds from the disposition of equipment must be made in accordance with 2 C.F.R. 200.310 through 200.316.
- (c) The Recipient shall ensure compliance with this section 26.3 for all tiers of subawards under this award.

ARTICLE 27

MANDATORY AWARD INFORMATION

27.1 Information Contained in a Federal Award. For 2 C.F.R. 200.211:

- (1) the “Federal Award Date” is the date of this agreement, as defined under section 29.2;
- (2) the “Assistance Listings Number” is 20.823 and the “Assistance Listings Title” is “Port Infrastructure Development Program”; and
- (2) this award is not for research and development.

ARTICLE 28

CONSTRUCTION AND DEFINITIONS

28.1 Attachments. This agreement includes the following attachments as integral parts:

Attachment A	Statement of Work
Attachment B	Estimated Project Budget
Attachment C	Outcome Performance Measurement Information
Attachment D	Changes from Application
Attachment E	Approved Pre-Award Costs

28.2 Exhibits. The following exhibits, which are located in the document titled “Exhibits to MARAD Grant Agreements Under the Fiscal Year 2021 Port Infrastructure Development Program (PIDP) Grants,” dated October 27, 2023, and available at <https://www.maritime.dot.gov/ports/office-port-infrastructure-development/port-and-terminal-infrastructure-development/pidp-fy21>, are part of this agreement.

Exhibit A	Applicable Federal Laws and Regulations
Exhibit B	Additional Standard Terms
Exhibit C	Quarterly Project Progress Reports and Recertifications: Format and Content

28.3 Construction. If a provision in the exhibits or the attachments conflicts with a provision in articles 1–29, then the provision in articles 1–29 prevails. If a provision in the attachments conflicts with a provision in the exhibits, then the provision in the attachments prevails.

28.4 Integration. This agreement constitutes the entire agreement of the parties relating to the PIDP grant program and awards under that program and supersedes any previous agreements, oral or written, relating to the PIDP grant program and awards under that program.

28.5 Definitions. In this agreement, the following definitions apply:

“Program Statute” means the statutory text at 46 U.S.C. 54301 and under the heading “Department of Transportation—Maritime Administration—Port Infrastructure Development Program” in title I of division L of the Consolidated Appropriations Act, 2021, Pub. L. No. 116-260 (Dec. 27, 2020), and all other provisions of that act that apply to amounts appropriated under that heading.

“Project” means the project proposed in the Technical Application, as modified by the negotiated provisions of this agreement, including article 3 and Attachments A–E.

“PIDP Grant” means an award of funds that were made available under the NOFO.

“Technical Application” means the application identified in section 2.1, including Standard Form 424 and all information and attachments submitted with that form through Grants.gov.

ARTICLE 29

AGREEMENT EXECUTION AND EFFECTIVE DATE

29.1 Counterparts. This agreement may be executed in counterparts, which constitute one document. The parties intend each countersigned original to have identical legal effect.

29.2 Effective Date. The agreement will become effective when all parties have signed it. The date of this agreement will be the date this agreement is signed by the last party to sign it. This instrument constitutes a PIDP Grant when MARAD’s authorized representative signs it.

PORT OF ILWACO
Marine Structures Replacement
Ilwaco, WA

Appendix B2

U.S. Department of Transportation
Exhibits to MARAD Grant Agreements Under the Fiscal Year 2021 Port Infrastructure
Development Program (PIDP) Grants
October 27, 2023

U.S. DEPARTMENT OF TRANSPORTATION

**EXHIBITS TO MARAD GRANT AGREEMENTS UNDER THE
FISCAL YEAR 2021 PORT INFRASTRUCTURE DEVELOPMENT PROGRAM (PIDP)
GRANTS**

October 27, 2023

EXHIBIT A

APPLICABLE FEDERAL LAWS AND REGULATIONS

By entering into this agreement for a FY 2021 PIDP Grant, the Recipient assures and certifies, with respect to this Grant, that it will comply with all applicable Federal laws, regulations, executive orders, policies, guidelines, and requirements as they relate to the application, acceptance, and use of Federal funds for this Project. Performance under this agreement shall be governed by and in compliance with the following requirements, as applicable, to the type of organization of the Recipient and any applicable sub-recipients. The applicable provisions to this agreement include, but are not limited to, the following:

General Federal Legislation

- a. Davis-Bacon Act - 40 U.S.C. §§ 3141, et seq.
- b. Federal Fair Labor Standards Act - 29 U.S.C. §§ 201, et seq.
- c. Hatch Act - 5 U.S.C. §§ 1501, et seq.
- d. Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 - 42 U.S.C. §§ 4601, et seq.
- e. National Historic Preservation Act of 1966 - 54 U.S.C. § 306108
- f. Archeological and Historic Preservation Act of 1974 - 54 U.S.C. §§ 312501, et seq.
- g. Native American Graves Protection and Repatriation Act - 25 U.S.C. §§ 3001, et seq.
- h. Clean Air Act – 42 U.S.C. §§ 7401, et seq.
- i. Clean Water Act - 33 U.S.C. §§ 1251, et seq.
- j. Endangered Species Act – 16 U.S.C. §§ 1531 et seq.
- k. Coastal Zone Management Act – 16 U.S.C. §§ 1451 et seq.
- l. Flood Disaster Protection Act of 1973 – 42 U.S.C. §§ 4001 et seq.
- m. Age Discrimination Act of 1975, as amended - 42 U.S.C. §§ 6101, et seq.
- n. American Indian Religious Freedom Act – 42 U.S.C. 1996
- o. Drug Abuse Office and Treatment Act of 1972, as amended – 21 U.S.C. §§ 1101, et seq.
- p. The Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970, P.L. 91-616, as amended - 42 U.S.C. §§ 4541, et seq.
- q. Sections 523 and 527 of the Public Health Service Act of 1912, as amended – 42 U.S.C. §§ 290dd through 290dd-2
- r. Architectural Barriers Act of 1968 - 42 U.S.C. §§ 4151, et seq.
- s. Power Plant and Industrial Fuel Use Act of 1978, P.L. 100-42 - Section 403 - 42 U.S.C. § 8373
- t. Contract Work Hours and Safety Standards Act - 40 U.S.C. §§ 3701, et seq.
- u. Copeland Anti-kickback Act, as amended - 18 U.S.C. § 874 and 40 U.S.C. § 3145
- v. National Environmental Policy Act of 1969 - 42 U.S.C. §§ 4321, et seq.
- w. Wild and Scenic Rivers Act – 16 U.S.C. §§ 1271, et seq.
- x. Single Audit Act of 1984 - 31 U.S.C. §§ 7501, et seq.
- y. Americans with Disabilities Act of 1990 - 42 U.S.C. § 12101, et seq.
- z. Title IX of the Education Amendments of 1972, as amended - 20 U.S.C. §§ 1681–1683 and §§ 1685–1687
- aa. Section 504 of the Rehabilitation Act of 1973, as amended - 29 U.S.C. § 794
- bb. Title VI of the Civil Rights Act of 1964 - 42 U.S.C. §§ 2000d, et seq.
- cc. Title IX of the Federal Property and Administrative Services Act of 1949 - 40 U.S.C. §§ 1101–1104

- dd. Limitation on Use of Appropriated Funds to Influence Certain Federal Contracting and Financial Transactions – 31 U.S.C. § 1352
- ee. Freedom of Information Act - 5 U.S.C. § 552, as amended
- ff. Magnuson-Stevens Fishery Conservation and Management Act – 16 U.S.C. §§ 1801, et seq.
- gg. Farmland Protection Policy Act of 1981 – 7 U.S.C. §§ 4201, et seq.
- hh. Noise Control Act of 1972 – 42 U.S.C. §§ 4901, et seq.
- ii. Fish and Wildlife Coordination Act of 1956 – 16 U.S.C. §§ 661, et seq.
- jj. Section 9 of the Rivers and Harbors Act and the General Bridge Act of 1946 - 33 U.S.C. §§ 401 and 525
- kk. Section 4(f) of the Department of Transportation Act of 1966 – 49 U.S.C. § 303 and 23 U.S.C. § 138
- ll. Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) – 42 U.S.C. §§ 9601, et seq.
- mm. Safe Drinking Water Act – 42 U.S.C. §§ 300f, et seq.
- nn. The Wilderness Act – 16 U.S.C. §§ 1131, et seq.
- oo. Migratory Bird Treaty Act – 16 U.S.C. §§ 703, et seq.
- pp. The Federal Funding Transparency and Accountability Act of 2006, as amended (Pub. L. 109–282, as amended by section 6202 of Public Law 110–252)
- qq. Cargo Preference Act of 1954 – 46 U.S.C. § 55305
- rr. Buy American Act – 41 U.S.C. §§ 8301–8305
- ss. Section 889 of the John D. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. 115-232

Executive Orders

- a. Executive Order 11246 – Equal Employment Opportunity
- b. Executive Order 11990 – Protection of Wetlands
- c. Executive Order 11988 – Floodplain Management
- d. Executive Order 12372 – Intergovernmental Review of Federal Programs
- e. Executive Order 12549 – Debarment and Suspension
- f. Executive Order 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- g. Executive Order 13166 – Improving Access to Services for Persons With Limited English Proficiency
- h. Executive Order 13985 – Advancing Racial Equity and Support for Underserved Communities Through the Federal Government
- i. Executive Order 14005 – Ensuring the Future is Made in All of America by All of America’s Workers
- j. Executive Order 14008 – Tackling the Climate Crisis at Home and Abroad

General Federal Regulations

- a. Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards – 2 C.F.R. Parts 200, 1201
- b. Non-procurement Suspension and Debarment – 2 C.F.R. Parts 180, 1200
- c. Investigative and Enforcement Procedures – 14 C.F.R. Part 13
- d. Procedures for predetermination of wage rates – 29 C.F.R. Part 1

- e. Contractors and subcontractors on public building or public work financed in whole or part by loans or grants from the United States – 29 C.F.R. Part 3
- f. Labor standards provisions applicable to contracts governing federally financed and assisted construction (also labor standards provisions applicable to non-construction contracts subject to the Contract Work Hours and Safety Standards Act) – 29 C.F.R. Part 5
- g. Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor (Federal and federally assisted contracting requirements) – 41 C.F.R. Parts 60, et seq.
- h. New Restrictions on Lobbying – 49 C.F.R. Part 20
- i. Nondiscrimination in Federally Assisted Programs of the Department of Transportation – Effectuation of Title VI of the Civil Rights Act of 1964 – 49 C.F.R. Part 21
- j. Uniform relocation assistance and real property acquisition for Federal and Federally assisted programs – 49 C.F.R. Part 24
- k. Nondiscrimination on the Basis of Sex in Education Programs or Activities Receiving Federal Financial Assistance – 49 C.F.R. Part 25
- l. Nondiscrimination on the Basis of Handicap in Programs and Activities Receiving or Benefiting from Federal Financial Assistance – 49 C.F.R. Part 27
- m. DOT's implementation of DOJ's ADA Title II regulations compliance procedures for all programs, services, and regulatory activities relating to transportation under 28 C.F.R. Part 35
- n. Enforcement of Nondiscrimination on the Basis of Handicap in Programs or Activities Conducted by the Department of Transportation – 49 C.F.R. Part 28
- o. Denial of public works contracts to suppliers of goods and services of countries that deny procurement market access to U.S. contractors – 49 C.F.R. Part 30
- p. Governmentwide Requirements for Drug-Free Workplace (Financial Assistance) – 49 C.F.R. Part 32
- q. DOT's implementing ADA regulations for transit services and transit vehicles, including the DOT's standards for accessible transportation facilities in Part 37, Appendix A – 49 C.F.R. Parts 37 and 38
- r. Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs – 49 C.F.R. Part 26 (as applicable under section 18.3 of this agreement)
- s. Preference for Privately Owned Commercial U.S. Flag Vessels – 46 C.F.R. Part 381

Specific assurances required to be included in the FY 2021 PIDP Grant agreement by any of the above laws, regulations, or circulars are hereby incorporated by reference into this agreement.

EXHIBIT B
ADDITIONAL STANDARD TERMS

TERM B.1
TITLE VI ASSURANCE
(Implementing Title VI of the Civil Rights Act of 1964, as amended)

**ASSURANCE CONCERNING NONDISCRIMINATION IN FEDERALLY-ASSISTED
PROGRAMS AND ACTIVITIES RECEIVING OR BENEFITING FROM FEDERAL
FINANCIAL ASSISTANCE**

(Implementing the Rehabilitation Act of 1973, as amended, and the Americans With Disabilities
Act, as amended)

49 C.F.R. Parts 21, 25, 27, 37 and 38

The United States Department of Transportation (USDOT)

Standard Title VI/Non-Discrimination Assurances

DOT Order No. 1050.2A

By signing and submitting the Technical Application and by entering into this agreement under the FY 2021 PIDP grant program, the Recipient **HEREBY AGREES THAT**, as a condition to receiving any Federal financial assistance from the U.S. Department of Transportation (DOT), through the Maritime Administration (MARAD), it is subject to and will comply with the following:

Statutory/Regulatory Authorities

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin);
- 49 C.F.R. Part 21 (entitled *Non-discrimination In Federally-Assisted Programs Of The Department Of Transportation—Effectuation Of Title VI Of The Civil Rights Act Of 1964*);
- 28 C.F.R. section 50.3 (U.S. Department of Justice Guidelines for Enforcement of Title VI of the Civil Rights Act of 1964);

The preceding statutory and regulatory cites hereinafter are referred to as the “Acts” and “Regulations,” respectively.

General Assurances

In accordance with the Acts, the Regulations, and other pertinent directives, circulars, policy, memoranda, and/or guidance, the Recipient hereby gives assurance that it will promptly take any measures necessary to ensure that:

“No person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity,” for which the Recipient receives Federal financial assistance from DOT, including MARAD.

The Civil Rights Restoration Act of 1987 clarified the original intent of Congress, with respect to Title VI and other Non-discrimination requirements (The Age Discrimination Act of 1975, and Section 504 of the Rehabilitation Act of 1973), by restoring the broad, institutional-wide scope and coverage of these non-discrimination statutes and requirements to include all programs and activities of the Recipient, so long as any portion of the program is Federally assisted.

Specific Assurances

More specifically, and without limiting the above general Assurance, the Recipient agrees with and gives the following Assurances with respect to its Federally assisted FY 2021 PIDP grant program:

1. The Recipient agrees that each “activity,” “facility,” or “program,” as defined in §§ 21.23 (b) and 21.23 (e) of 49 C.F.R. § 21 will be (with regard to an “activity”) facilitated, or will be (with regard to a “facility”) operated, or will be (with regard to a “program”) conducted in compliance with all requirements imposed by, or pursuant to the Acts and the Regulations.
2. The Recipient will insert the following notification in all solicitations for bids, Requests For Proposals for work, or material subject to the Acts and the Regulations made in connection with the FY 2021 PIDP Grant and, in adapted form, in all proposals for negotiated agreements regardless of funding source:

“The Recipient, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that for any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.”

3. The Recipient will insert the clauses of Appendix A and E of this Assurance in every contract or agreement subject to the Acts and the Regulations.
4. The Recipient will insert the clauses of Appendix B of this Assurance, as a covenant running with the land, in any deed from the United States effecting or recording a transfer of real property, structures, use, or improvements thereon or interest therein to a Recipient.

5. That where the Recipient receives Federal financial assistance to construct a facility, or part of a facility, the Assurance will extend to the entire facility and facilities operated in connection therewith.
6. That where the Recipient receives Federal financial assistance in the form, or for the acquisition of real property or an interest in real property, the Assurance will extend to rights to space on, over, or under such property.
7. That the Recipient will include the clauses set forth in Appendix C and Appendix D of this Assurance, as a covenant running with the land, in any future deeds, leases, licenses, permits, or similar instruments entered into by the Recipient with other parties:
 - a. for the subsequent transfer of real property acquired or improved under the applicable activity, project, or program; and
 - b. for the construction or use of, or access to, space on, over, or under real property acquired or improved under the applicable activity, project, or program.
8. That this Assurance obligates the Recipient for the period during which Federal financial assistance is extended to the program, except where the Federal financial assistance is to provide, or is in the form of, personal property, or real property, or interest therein, or structures or improvements thereon, in which case the Assurance obligates the Recipient, or any transferee for the longer of the following periods:
 - a. the period during which the property is used for a purpose for which the Federal financial assistance is extended, or for another purpose involving the provision of similar services or benefits; or
 - b. the period during which the Recipient retains ownership or possession of the property.
9. The Recipient will provide for such methods of administration for the program as are found by the Secretary of Transportation or the official to whom he/she delegates specific authority to give reasonable guarantee that it, other recipients, sub-recipients, contractors, subcontractors, consultants, transferees, successors in interest, and other participants of Federal financial assistance under such program will comply with all requirements imposed or pursuant to the Acts, the Regulations, and this Assurance.
10. The Recipient agrees that the United States has a right to seek judicial enforcement with regard to any matter arising under the Acts, the Regulations, and this Assurance.

By signing this ASSURANCE, the Recipient also agrees to comply (and require any sub-recipients, contractors, successors, transferees, and/or assignees to comply) with all applicable provisions governing MARAD's access to records, accounts, documents, information, facilities, and staff. You also recognize that you must comply with any program or compliance reviews, and/or complaint investigations conducted by MARAD. You must keep records, reports, and submit the material for review upon request to MARAD, or its designee in a timely, complete,

and accurate way. Additionally, you must comply with all other reporting, data collection, and evaluation requirements, as prescribed by law or detailed in program guidance.

The Recipient gives this ASSURANCE in consideration of and for obtaining any Federal grants, loans, contracts, agreements, property, and/or discounts, or other Federal-aid and Federal financial assistance extended after the date hereof to the recipients by the U.S. Department of Transportation under the FY 2021 PIDP grant program. This ASSURANCE is binding on the Recipient, other recipients, sub-recipients, contractors, subcontractors and their subcontractors', transferees, successors in interest, and any other participants in the FY 2021 PIDP grant program.

APPENDIX A

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “contractor”) agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Maritime Administration (MARAD), as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 C.F.R. Part 21.
3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor’s obligations under this contract and the Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin.
4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or MARAD to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the Recipient or MARAD, as appropriate, and will set forth what efforts it has made to obtain the information.
5. **Sanctions for Noncompliance:** In the event of a contractor’s noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or MARAD may determine to be appropriate, including, but not limited to:
 - a. withholding payments to the contractor under the contract until the contractor complies; and/or
 - b. cancelling, terminating, or suspending a contract, in whole or in part.
6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant

thereto. The contractor will take action with respect to any subcontract or procurement as the Recipient or MARAD may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

APPENDIX B

CLAUSES FOR DEEDS TRANSFERRING UNITED STATES PROPERTY

The following clauses will be included in deeds effecting or recording the transfer of real property, structures, or improvements thereon, or granting interest therein from the United States pursuant to the provisions of Specific Assurance 4:

NOW, THEREFORE, the U.S. Department of Transportation as authorized by law and upon the condition that the Recipient will accept title to the lands and maintain the project constructed thereon in accordance with the Consolidated Appropriations Act, 2021 (Pub. L. 116-260, Dec. 27, 2020), the Regulations for the Administration of FY 2021 PIDP grant program, and the policies and procedures prescribed by the Maritime Administration (MARAD) of the U.S. Department of Transportation in accordance and in compliance with all requirements imposed by Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation pertaining to and effectuating the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252; 42 U.S.C. § 2000d to 2000d-4), does hereby remise, release, quitclaim and convey unto the Recipient all the right, title and interest of the U.S. Department of Transportation in and to said lands described in Exhibit A attached hereto and made a part hereof.

(HABENDUM CLAUSE)

TO HAVE AND TO HOLD said lands and interests therein unto Recipient and its successors forever, subject, however, to the covenants, conditions, restrictions and reservations herein contained as follows, which will remain in effect for the period during which the real property or structures are used for a purpose for which Federal financial assistance is extended or for another purpose involving the provision of similar services or benefits and will be binding on the Recipient, its successors and assigns.

The Recipient, in consideration of the conveyance of said lands and interests in lands, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns, that (1) no person will on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination with regard to any facility located wholly or in part on, over, or under such lands hereby conveyed [,] [and]* (2) that the Recipient will use the lands and interests in lands and interests in lands so conveyed, in compliance with all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations and Acts may be amended[, and (3) that in the event of breach of any of the above-mentioned non-discrimination conditions, the Department will have a right to enter or re-enter said lands and facilities on said land, and that above described land and facilities will thereon revert to and vest in and become the absolute property of the U.S. Department of Transportation and its assigns as such interest existed prior to this instruction].*

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary in order to make clear the purpose of Title VI.)

APPENDIX C

CLAUSES FOR TRANSFER OF REAL PROPERTY ACQUIRED OR IMPROVED UNDER THE ACTIVITY, FACILITY, OR PROGRAM

The following clauses will be included in deeds, licenses, leases, permits, or similar instruments entered into by the Recipient pursuant to the provisions of Specific Assurance 7(a):

- A. The (Recipient, lessee, permittee, etc. as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree [in the case of deeds and leases add “as a covenant running with the land”] that:
 - 1. In the event facilities are constructed, maintained, or otherwise operated on the property described in this (deed, license, lease, permit, etc.) for a purpose for which a U.S. Department of Transportation activity, facility, or program is extended or for another purpose involving the provision of similar services or benefits, the (Recipient, licensee, lessee, permittee, etc.) will maintain and operate such facilities and services in compliance with all requirements imposed by the Acts and Regulations (as may be amended) such that no person on the grounds of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities.
- B. With respect to licenses, leases, permits, etc., in the event of breach of any of the above Non-discrimination covenants, Recipient will have the right to terminate the (lease, license, permit, etc.) and to enter, re-enter, and repossess said lands and facilities thereon, and hold the same as if the (lease, license, permit, etc.) had never been made or issued.*
- C. With respect to a deed, in the event of breach of any of the above Non-discrimination covenants, the Recipient will have the right to enter or re-enter the lands and facilities thereon, and the above described lands and facilities will there upon revert to and vest in and become the absolute property of the Recipient and its assigns.*

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

APPENDIX D

CLAUSES FOR CONSTRUCTION/USE/ACCESS TO REAL PROPERTY ACQUIRED UNDER THE ACTIVITY, FACILITY OR PROGRAM

The following clauses will be included in deeds, licenses, permits, or similar instruments/agreements entered into by Recipient pursuant to the provisions of Specific Assurance 7(b):

- A. The (Recipient, licensee, permittee, etc., as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree (in the case of deeds and leases add, “as a covenant running with the land”) that (1) no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities, (2) that in the construction of any improvements on, over, or under such land, and the furnishing of services thereon, no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or otherwise be subjected to discrimination, (3) that the (Recipient, licensee, lessee, permittee, etc.) will use the premises in compliance with all other requirements imposed by or pursuant to the Acts and Regulations, as amended, set forth in this Assurance.
- B. With respect to (licenses, leases, permits, etc.), in the event of breach of any of the above Non-discrimination covenants, Recipient will have the right to terminate the (license, permit, etc., as appropriate) and to enter or re-enter and repossess said land and the facilities thereon, and hold the same as if said (license, permit, etc., as appropriate) had never been made or issued.*
- C. With respect to deeds, in the event of breach of any of the above Non-discrimination covenants, Recipient will there upon revert to and vest in and become the absolute property of Recipient and its assigns.*

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

APPENDIX E

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “contractor”) agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

Pertinent Non-Discrimination Authorities:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 C.F.R. Part 21.
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 *et seq.*), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 C.F.R. Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 U.S.C. § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms “programs or activities” to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 – 12189) as implemented by Department of Transportation regulations at 49 C.F.R. Parts 37 and 38;
- The Federal Aviation Administration’s Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);

- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. § 1681 et seq).

TERM B.2
CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER
RESPONSIBILITY MATTERS -- PRIMARY COVERED TRANSACTIONS

2 C.F.R. Parts 180 and 1200

These assurances and certifications are applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring MARAD approval or that is estimated to cost \$25,000 or more – as defined in 2 C.F.R. Parts 180 and 1200.

By signing and submitting the Technical Application and by entering into this agreement under the FY 2021 PIDP grant program, the Recipient is providing the assurances and certifications for First Tier Participants and Lower Tier Participants in the FY 2021 PIDP Grant, as set out below.

1. Instructions for Certification – First Tier Participants:

- a. The prospective first tier participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.
- c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.
- d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
- e. The terms "covered transaction," "civil judgment," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 C.F.R. Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a Recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a Recipient or subrecipient of

Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers to any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled “Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions,” provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (<https://www.sam.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment, including a civil settlement, rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior MARAD approval or estimated to cost \$25,000 or more - 2 C.F.R. Parts 180 and 1200)

a. The prospective lower tier participant is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms “covered transaction,” “civil settlement,” “debarred,” “suspended,” “ineligible,” “participant,” “person,” “principal,” and “voluntarily excluded,” as used in this clause, are defined in 2 C.F.R. Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a Recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a Recipient or subrecipient of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered

transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled “Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction,” without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (<https://www.sam.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion -- Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

TERM B.3
REQUIREMENTS REGARDING DELINQUENT TAX LIABILITY OR A FELONY
CONVICTION UNDER ANY FEDERAL LAW

As required by sections 744 and 745 of Title VII, Division E of the Consolidated Appropriations Act, 2021 (Pub. L. 116-260), and implemented through USDOT Order 4200.6, the funds provided under this award shall not be used to enter into a contract, memorandum of understanding, or cooperative agreement with, make a grant to, or provide a loan or loan guarantee to, any corporation that:

- (1) Has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability, where the awarding agency is aware of the unpaid tax liability, unless a Federal agency has considered suspension or debarment of the corporation and made a determination that suspension or debarment is not necessary to protect the interests of the Government; or
- (2) Was convicted of a felony criminal violation under any Federal law within the preceding 24 months, where the awarding agency is aware of the conviction, unless a Federal agency has considered suspension or debarment of the corporation and made a determination that suspension or debarment is not necessary to protect the interests of the Government.

The Recipient therefore agrees:

1. **Definitions.** For the purposes of this exhibit, the following definitions apply:

“Covered Transaction” means a transaction that uses any funds under this award and that is a contract, memorandum of understanding, cooperative agreement, grant, loan, or loan guarantee.

“Felony Conviction” means a conviction within the preceding 24 months of a felony criminal violation under any Federal law and includes conviction of an offense defined in a section of the United States Code that specifically classifies the offense as a felony and conviction of an offense that is classified as a felony under 18 U.S.C. 3559.

“Participant” means the Recipient, an entity who submits a proposal for a Covered Transaction, or an entity who enters into a Covered Transaction.

“Tax Delinquency” means an unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

2. **Mandatory Check in the System for Award Management.** Before entering a Covered Transaction with another entity, a Participant shall check the System for Award Management (the “SAM”) at <http://www.sam.gov/> for an entry describing that entity.

3. **Mandatory Certifications.** Before entering a Covered Transaction with another entity, a Participant shall require that entity to:

(1) Certify whether the entity has a Tax Delinquency; and

(2) Certify whether the entity has a Felony Conviction.

4. **Prohibition.** If

(1) the SAM entry for an entity indicates that the entity has a Tax Delinquency or a Federal Conviction;

(2) an entity provides an affirmative response to either certification in section 3; or

(3) an entity’s certification under section 3 was inaccurate when made or became inaccurate after being made

then a Participant shall not enter or continue a Covered Transaction with that entity unless MARAD has determined in writing that suspension or debarment of that entity are not necessary to protect the interests of the Government.

5. **Mandatory Notice to the MARAD.**

(a) If the SAM entry for a Participant indicates that the Participant has a Tax Delinquency or a Felony Conviction, the Recipient shall notify MARAD in writing of that entry.

(b) If a Participant provides an affirmative response to either certification in section 1, the Recipient shall notify MARAD in writing of that affirmative response.

(c) If the Recipient knows that a Participant’s certification under section 1 was inaccurate when made or became inaccurate after being made, the Recipient shall notify MARAD in writing of that inaccuracy.

6. **Flow Down.** For all Covered Transactions, including all tiers of subcontracts and subawards, the Recipient shall:

(1) require the SAM check in section 2;

(2) require the certifications in section 3;

(3) include the prohibition in section 4; and

- (4) require all Participants to notify the Recipient in writing of any information that would require the Recipient to notify MARAD under section 5.

TERM B.4

RECIPIENT POLICY TO BAN TEXT MESSAGING WHILE DRIVING

(a) *Definitions.* The following definitions are intended to be consistent with the definitions in DOT Order 3902.10, Text Messaging While Driving (Dec. 30, 2009) and Executive Order 13513, Federal Leadership on Reducing Text Messaging While Driving (Oct. 1, 2009). For clarification purposes, they may expand upon the definitions in the executive order.

For the purpose of this Term B.4, “**Motor Vehicles**” means any vehicle, self-propelled or drawn by mechanical power, designed and operated principally for use on a local, State or Federal roadway, but does not include a military design motor vehicle or any other vehicle excluded under Federal Management Regulation 102-34-15.

For the purpose of this Term B.4, “**Driving**” means operating a motor vehicle on a roadway, including while temporarily stationary because of traffic congestion, a traffic signal, a stop sign, another traffic control device, or otherwise. It does not include being in your vehicle (with or without the motor running) in a location off the roadway where it is safe and legal to remain stationary.

For the purpose of this Term B.4, “**Text messaging**” means reading from or entering data into any handheld or other electronic device (including, but not limited to, cell phones, navigational tools, laptop computers, or other electronic devices), including for the purpose of Short Message Service (SMS) texting, e-mailing, instant messaging, obtaining navigational information, or engaging in any other form of electronic data retrieval or electronic data communication. The term does not include the use of a cell phone or other electronic device for the limited purpose of entering a telephone number to make an outgoing call or answer an incoming call, unless this practice is prohibited by State or local law. The term also does not include glancing at or listening to a navigational device that is secured in a commercially designed holder affixed to the vehicle, provided that the destination and route are programmed into the device either before driving or while stopped in a location off the roadway where it is safe and legal to remain stationary.

For the purpose of this Term B.4, the “**Government**” includes the United States Government and State, local, and tribal governments at all levels.

(b) *Workplace Safety.* In accordance with Executive Order 13513, Federal Leadership on Reducing Text Messaging While Driving (Oct. 1, 2009) and DOT Order 3902.10, Text Messaging While Driving (Dec. 30, 2009), the Recipient, subrecipients, contractors, and subcontractors are encouraged to:

(1) adopt and enforce workplace safety policies to decrease crashes caused by distracted drivers including policies to ban text messaging while driving—

(i) Company-owned or -rented vehicles or Government-owned, leased or rented vehicles; or

(ii) Privately-owned vehicles when on official Government business or when performing any work for or on behalf of the Government.

(2) Conduct workplace safety initiatives in a manner commensurate with the size of the business, such as—

(i) Establishment of new rules and programs or re-evaluation of existing programs to prohibit text messaging while driving; and

(ii) Education, awareness, and other outreach to employees about the safety risks associated with texting while driving.

(c) *Subawards and Contracts*. To the extent permitted by law, the Recipient shall insert the substance of this exhibit, including this paragraph (c), in all subawards, contracts, and subcontracts under this award that exceed the micro-purchase threshold, other than contracts and subcontracts for the acquisition of commercially available off-the-shelf items.

TERM B.5
**REQUIRED USE OF AMERICAN IRON, STEEL, MANUFACTURED PRODUCTS,
AND CONSTRUCTION MATERIALS**

This award term implements § 70914(a) of the Build America, Buy America Act, Pub. L. No. 117-58, div. G, tit. IX, subtit. A, 135 Stat. 429, 1298 (2021) and 2 C.F.R. part 184.

Requirement to Use Iron, Steel, Manufactured Products, and Construction Materials Produced in the United States.

The Recipient shall not use funds provided under this award for a project for infrastructure unless:

- (1) all iron and steel used in the project are produced in the United States—this means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States;
- (2) all manufactured products used in the project are produced in the United States—this means the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product; and
- (3) all construction materials are manufactured in the United States—this means that all manufacturing processes for the construction material occurred in the United States.

Inapplicability.

The Buy America preference only applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding, brought to the construction site and removed at or before the completion of the infrastructure project. Nor does a Buy America preference apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project, but are not an integral part of the structure or permanently affixed to the infrastructure project.

Waivers.

When necessary, the Recipient may apply for, and the USDOT may grant, a waiver from the Buy America preference in this award term.

A request to waive the application of the domestic content procurement preference must be in writing. The USDOT will provide instructions on the waiver process and on the format, contents,

and supporting materials required for any waiver request. Waiver requests are subject to public comment periods of no less than 15 days and must be reviewed by the Office of Management and Budget (OMB) Made in America Office.

When the USDOT has made a determination that one of the following exceptions applies, the awarding official may waive the application of the domestic content procurement preference in any case in which the USDOT determines that:

- (1) applying the domestic content procurement preference would be inconsistent with the public interest;
- (2) the types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality; or
- (3) the inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent.

There may be instances where an award qualifies, in whole or in part, for an existing waiver described at <https://www.transportation.gov/office-policy/transportation-policy/made-in-america>.

Definitions

“Component” means an article, material, or supply, whether manufactured or unmanufactured, incorporated directly into: a manufactured product; or, where applicable, an iron or steel product.

“Construction materials” means articles, materials, or supplies that consist of only one of the items listed in paragraph (1) of this definition, except as provided in paragraph (2) of this definition. To the extent one of the items listed in paragraph (1) contains as inputs other items listed in paragraph (1), it is nonetheless a construction material.

- (1) The listed items are:
 - (i) Non-ferrous metals;
 - (ii) Plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
 - (iii) Glass (including optic glass);
 - (iv) Fiber optic cable (including drop cable);
 - (v) Optical fiber;
 - (vi) Lumber;
 - (vii) Engineered wood; and
 - (viii) Drywall.
- (2) Minor additions of articles, materials, supplies, or binding agents to a construction material do not change the categorization of the construction material.

“Infrastructure project” means any activity related to the construction, alteration, maintenance, or repair of infrastructure in the United States regardless of whether infrastructure is the primary

purpose of the project. See also paragraphs (c) and (d) of 2 C.F.R. 184.4.

“Iron or steel products” means articles, materials, or supplies that consist wholly or predominantly of iron or steel or a combination of both.

“Buy America preference” means the “domestic content procurement preference” set forth in section 70914 of the Build America, Buy America Act, which requires the head of each Federal agency to ensure that none of the funds made available for a Federal award for an infrastructure project may be obligated unless all of the iron, steel, manufactured products, and construction materials incorporated into the project are produced in the United States.

“Manufactured products” means:

- (1) Articles, materials, or supplies that have been:
 - (i) Processed into a specific form and shape; or
 - (ii) Combined with other articles, materials, or supplies to create a product with different properties than the individual articles, materials, or supplies.
- (2) If an item is classified as an iron or steel product, a construction material, or a section 70917(c) material under 2 C.F.R. 184.4(e) and the definitions set forth in this section, then it is not a manufactured product. However, an article, material, or supply classified as a manufactured product under 2 C.F.R. 184.4(e) and paragraph (1) of this definition may include components that are construction materials, iron or steel products, or section 70917(c) materials.

“Manufacturer” means the entity that performs the final manufacturing process that produces a manufactured product.

Predominantly of iron or steel or a combination of both” means that the cost of the iron and steel content exceeds 50 percent of the total cost of all its components. The cost of iron and steel is the cost of the iron or steel mill products (such as bar, billet, slab, wire, plate, or sheet), castings, or forgings utilized in the manufacture of the product and a good faith estimate of the cost of iron or steel components.

“Produced in the United States” means:

- (1) In the case of iron or steel products, all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.
- (2) In the case of manufactured products:
 - (i) The product was manufactured in the United States; and
 - (ii) The cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard that meets or exceeds this standard has been established under applicable law or regulation for determining the

minimum amount of domestic content of the manufactured product. The costs of components of a manufactured product are determined according to 2 C.F.R. 184.5.

(3) In the case of construction materials, all manufacturing processes for the construction material occurred in the United States. *See* section 2 C.F.R. 184.6 for more information on the meaning of “all manufacturing processes” for specific construction materials.

“Section 70917(c) materials” means cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives. See section 70917(c) of the Build America, Buy America Act.

EXHIBIT C
QUARTERLY PROJECT PROGRESS REPORTS AND RECERTIFICATIONS:
FORMAT AND CONTENT

- 1. Purpose.** The purpose of the Quarterly Project Progress Reports and Recertifications under this agreement for the FY 2021 PIDP grant program are to ensure that the project scope, schedule, and budget will be maintained to the maximum extent possible.
- 2. Format and Content.** The Recipient shall produce a quarterly cost, schedule, and status report that contains the sections enumerated in the following list. At the discretion of MARAD, modifications or additions can be made to produce a quarterly reporting format that will most effectively serve both the Recipient and MARAD. Some projects will have a more extensive quarterly status than others. For smaller projects, MARAD may determine that the content of the quarterly reports will be streamlined and project status meetings will be held on a less-frequent basis. The first quarterly progress report should include a detailed description and, where appropriate, drawings of the items funded.
 - (a) Project Overall Status.** This section provides an overall status of the project's scope, schedule and budget. The Recipient shall note and explain any deviations from the scope of work, the schedule, or the budget that are described in this agreement.
 - (b) Project Significant Activities and Issues.** This section provides highlights of key activities, accomplishments, and issues occurring on the project during the previous quarter. Activities and deliverables to be reported on should include meetings, audits and other reviews, design packages submitted, advertisements, awards, construction submittals, construction completion milestones, submittals related to any applicable Recovery Act requirements, media or Congressional inquiries, value engineering/constructability reviews, and other items of significance.
 - (c) Action Items/Outstanding Issues.** This section should draw attention to, and track the progress of, highly significant or sensitive issues requiring action and direction in order to resolve. The Recipient should include administrative items and outstanding issues that could have a significant or adverse effect on the project's scope, schedule, or budget. Status, responsible person(s), and due dates should be included for each action item/outstanding issue. Action items requiring action or direction should be included in the quarterly status meeting agenda. The action items/outstanding issues may be dropped from this section upon full implementation of the remedial action, and upon no further monitoring anticipated.
 - (d) Project Scope Overview.** The purpose of this section is to provide a further update regarding the project scope. If the original scope contained in the grant agreement is still accurate, this section can simply state that the scope is unchanged.
 - (e) Project Schedule.** An updated master program schedule reflecting the current status of the program activities should be included in this section. A Gantt (bar) type chart is probably the most appropriate for quarterly reporting purposes, with the ultimate

format to be agreed upon between the Recipient and MARAD. It is imperative that the master program schedule be integrated, i.e., the individual contract milestones tied to each other, such that any delays occurring in one activity will be reflected throughout the entire program schedule, with a realistic completion date being reported. Narratives, tables, and/or graphs should accompany the updated master program schedule, basically detailing the current schedule status, delays and potential exposures, and recovery efforts. The following information should also be included:

- Current overall project completion percentage vs. latest plan percentage.
- Completion percentages vs. latest plan percentages for major activities such as right-of-way, major or critical design contracts, major or critical construction contracts, and significant force accounts or task orders. A schedule status description should also be included for each of these major or critical elements.
- Any delays or potential exposures to milestone and final completion dates. The delays and exposures should be quantified, and overall schedule impacts assessed. The reasons for the delays and exposures should be explained, and initiatives being analyzed or implemented in order to recover the schedule should be detailed.

(f) Project Cost. An updated cost spreadsheet reflecting the current forecasted cost vs. the latest approved budget vs. the baseline budget should be included in this section. One way to track project cost is to show: (1) Baseline Budget, (2) Latest Approved Budget, (3) Current Forecasted Cost Estimate, (4) Expenditures or Commitments to Date, and (5) Variance between Current Forecasted Cost and Latest Approved Budget. Line items should include all significant cost centers, such as prior costs, right-of-way, preliminary engineering, environmental mitigation, general engineering consultant, section design contracts, construction administration, utilities, construction packages, force accounts/task orders, wrap-up insurance, construction contingencies, management contingencies, and other contingencies. The line items can be broken-up in enough detail such that specific areas of cost change can be sufficiently tracked and future improvements made to the overall cost estimating methodology. A Program Total line should be included at the bottom of the spreadsheet. Narratives, tables, and/or graphs should accompany the updated cost spreadsheet, basically detailing the current cost status, reasons for cost deviations, impacts of cost overruns, and efforts to mitigate cost overruns. The following information should be provided:

- Reasons for each line item deviation from the approved budget, impacts resulting from the deviations, and initiatives being analyzed or implemented in order to recover any cost overruns.
- Transfer of costs to and from contingency line items, and reasons supporting the transfers.

- Speculative cost changes that potentially may develop in the future, a quantified dollar range for each potential cost change, and the current status of the speculative change. Also, a comparison analysis to the available contingency amounts should be included, showing that reasonable and sufficient amounts of contingency remain to keep the project within the latest approved budget.
- Detailed cost breakdown of the general engineering consultant (GEC) services (if applicable), including such line items as contract amounts, task orders issued (amounts), balance remaining for tasks, and accrued (billable) costs.
- Federal obligations and/or disbursements for the project, compared to planned obligations and disbursements.

(g) Federal Financial Report (SF-425). The Federal Financial Report (SF-425) is a financial reporting form used throughout the Federal Government Grant system. Recipients shall complete this form and attach it to each quarterly Project Progress and Monitoring Report. The form is available at <https://www.grants.gov/forms/post-award-reporting-forms.html>.

(h) Certifications.

- i. A certification that the Recipient is in compliance with 2 C.F.R. 200.303 (Internal Controls) and 2 C.F.R. 200 subpart F (Audit Requirements).
- ii. The certification required under 2 C.F.R. 200.415(a).

PORT OF ILWACO
Marine Structures Replacement
Ilwaco, WA

Appendix C

Geotechnical Report

Geotechnical Engineering Services Report Revision 3

Port of Ilwaco, Marina Structures Replacement and
Dredging, Engineering, and Permitting
1170 Howerton Avenue East
Ilwaco, Washington

for
Moffatt & Nichol Engineers

October 4, 2023



GEOENGINEERS 
Earth Science + Technology

**Geotechnical Engineering Services Report
Revision 3**

Port of Ilwaco, Marina Structures Replacement and
Dredging, Engineering, and Permitting
1170 Howerton Avenue East
Ilwaco, Washington

for
Moffatt & Nichol Engineers

October 4, 2023



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Geotechnical Engineering Services Report Revision 3

Port of Ilwaco, Marina Structures Replacement and Dredging, Engineering, and Permitting 1170 Howerton Avenue East Ilwaco, Washington

File No. 21551-003-00

October 4, 2023

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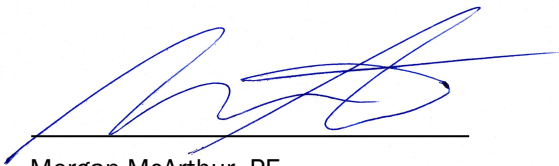
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APPENDICES

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Figures A-2 and A-3—Logs of Borings

Figure A-4—Atterberg Limits Test Results

Appendix B. Report Limitations and Guidelines for Use

1.0 INTRODUCTION AND PROJECT UNDERSTANDING

GeoEngineers, Inc. (GeoEngineers) is pleased to submit this report presenting the results of our geotechnical engineering services for the proposed Port of Ilwaco, Marina Structures Replacement and Dredging, Engineering, and Permitting Upgrades project. This report summarizes our understanding of subsurface conditions in the project area and provides geotechnical recommendations and design criteria for the project. The project site is located at 1170 Howerton Avenue East, Ilwaco, Washington 98624, as shown on the Vicinity Map, Figure 1.

The project includes designing repairs and improvements to the existing wharf east bulkhead. The existing bulkhead consists of creosote treated timber piles, lagging, and walers. Wire strand tiebacks connected to the timber waler are presumed to connect to buried deadman anchors in the upland area. Three steel pipe piles are located along the face of the existing bulkhead and are assumed to be used for mooring of vessels. We understand that a replacement bulkhead consisting of a sheet pile wall embedded into the underlying siltstone will be constructed in front of the existing wharf east bulkhead. We understand tiebacks will be used to secure the top of the wall.

Improvements to shoreline areas surrounding the wharf east bulkhead are also planned. The majority of the improvements consist of slope armoring using rip rap. We understand that within the shoreline area northeast of the proposed bulkhead a relic timber wall on the shoreline slope will be removed, rip rap slope protection will be installed, and a small berm will be constructed at the top of the slope. The berm will be on the order of 1 foot tall and is being included to mitigate the effects of future sea-level rise. At the south end of the bulkhead we understand that existing concrete rubble slope armoring will be removed and replaced in-kind with riprap on the order of 18 inches thick.

2.0 PURPOSE AND SCOPE OF SERVICES

The purpose of our services is to provide design recommendations to support replacement of the Port of Ilwaco (POI) wharf east bulkhead and installation of slope protection on the shoreline slope to the northeast of the new bulkhead. Design recommendations included in this report are based on available existing subsurface information, our site explorations conducted on March 14 and March 19, 2022, and our experience in the project vicinity.

Our specific scope of services is presented in our Scope and Fee Estimate dated December 13, 2019 and Service Agreement with Moffatt & Nichol dated January 25, 2022.

3.0 SITE CONDITIONS

3.1. Surface Conditions

The site is located at the west end of the Ilwaco marina on a wharf currently occupied by multiple buildings associated with a fish processing facility. The existing bulkhead, which will be repaired as part of this project, delineates the eastern edge of the wharf. The buildings are generally located along the western edge of the wharf. The retained area between the bulkhead and buildings is approximately 27 feet wide. The shoreline at the north end of the bulkhead consists of gravel and grasses at the surface sloping down at approximately 2H:1V (horizontal to vertical) to the shoreline. At the south end of the bulkhead, the shoreline is sloped at approximately 1H:1V and consists of fill and riprap.

3.2. Site Geology

We reviewed the Geologic Map of Washington-Southwest Quadrant (Walsh, et al. 1987) to develop an understanding of the site geology. The surface geology of the project site is mapped as “Beach Deposits,” and potentially underlain by bedrock mapped as “Oligocene to upper Eocene marine sedimentary rocks.” The Beach Deposits are described as fine to coarse sand. The marine sedimentary bedrock is described as siltstone, and/or fine sandstone. Based on the site history and human modification, we also anticipate that fill material is present in the project vicinity.

3.3. Subsurface Exploration

We explored site subsurface conditions by completing two borings (B-1D and B-2A) at the approximate locations shown on the Site Plan Figure 2. The borings were advanced to depths of 65 and 70 feet below ground surface (bgs) using subcontracted track-mounted drilling equipment and vacuum trucks operated by drillers subcontracted to GeoEngineers. During our initial site exploration effort, six attempts were made to use a hollow stem auger drilling method to drill within the wharf footprint, but each attempt met practical refusal at depths of less than 5 feet. Attempted borings B-1, B-1A, B-1B, B-1C are also shown on the attached Site Plan Figure 2. We were able to complete boring B-2A just upland of the wharf footprint during this initial visit. We returned to site at a second time and were able to successfully complete boring B-1D in the same location as the original B1-D attempt using a sonic drill rig. Additional details of the exploration program and summary logs of the explorations are included in Appendix A, Field Explorations.

Soil samples obtained from the borings were taken to our geotechnical laboratory for further evaluation. Testing included moisture content determinations, percent fines determination and gradation analyses. A description of the laboratory test procedures and test results are presented in Appendix A and/or on the boring logs.

TABLE 1. UNSUCCESSFUL BORING ATTEMPTS

Boring	Depth of Termination (ft)	Reason for Termination	Observed Soils	Comment
B-1	3	Refusal on pipe	GP-GM	Corrugated Steel pipe at 3 feet bgs
B-1A	4	Refusal In cobbles	GP-GM	Yellow Plastic pipe (approx. 2-inch-diameter) Patch of clean sand fill approximately 6 inches around pipe
B-1B	3.5	Refusal In cobbles	GP-GM	
B-1C	3.6	Refusal In cobbles	GM	Layer of sandy silt with gravel and cobbles around 2 to 2½ feet
B-1D	3.6	Refusal In cobbles	GP-GM	
B-2	4.3	Refusal In cobbles	GP-GM	

3.4. Soil Conditions

Alluvial deposits in the site vicinity generally consist of soils with high silt content. The predominant soil types are sandy silt and silt, but these are often closely interbedded and may include lenses of variable thickness and/or inclined layers as well as regions of cleaner sands. Soils observed in our explorations generally consist of fill overlying native alluvial deposits overlying the regional bedrock, as described in the following paragraphs.

3.4.1. Fill

All borings and attempts except B2-A were advanced through asphalt pavement. Thickness of asphalt observed ranged from 3 to 6 inches. Boring B-2A encountered about 2 inches of silty sand topsoil. Starting below the asphalt (or below the topsoil in B2-A) to approximately 5 feet bgs, we observed brown fine to coarse gravel with silt and cobbles in a loose and moist condition. Occasional lenses of higher silt and sand content were observed as well.

3.4.2. Submerged Fill

Underlying the fill unit we generally observed brown silty fine to medium sand in a loose and wet condition, which we interpret to be a separate fill unit. For differentiation purposes, we have identified this fill unit as submerged fill. The top of the unit was observed at 5 feet bgs and the base varied from 12 feet bgs in B-1D and 15 feet bgs in B-2A.

3.4.3. Alluvial Deposits

Beneath the submerged fill unit, we interpret soils to consist of native alluvial deposits. Alluvial deposits generally consisted of interbedded layers of clay, silt with varying sand content, and silty sand. During drilling of boring B-2A we observed a transition in stiffness/density and based upon this observation, we divided the alluvial deposits into an upper and lower unit.

3.4.3.1. Upper Alluvial Deposit

The upper alluvial deposits were observed directly below the submerged fill unit and extending to about 30 feet in B-1D and 40 feet in B-2A. Soils observed in this unit were typically silts and clays with varying sand content. We also observed occasional interbeds of silty sand, typically 5 feet thick or less. The unit is generally soft/loose and wet. In addition, wood debris was consistently observed throughout the unit.

3.4.3.2. Lower Alluvial Deposit

Below the upper alluvial deposits, we observed lower alluvial deposits in boring B-2A, which extend to approximately 60 feet bgs. Soils observed generally consist of soft to medium stiff silt and brown fat clay. The unit is soft at the top and ranges to medium stiff at its base. Wood organic debris was observed in the upper 5 feet of the unit. Note that the lower alluvial deposits unit was not observed in boring B-1D.

3.4.4. Weathered Siltstone

Below the alluvial deposits, both borings encountered what we interpret to be weathered siltstone bedrock, extending to depths of 55 feet in B-1D and 65 feet in B-2A. The samples retrieved typically consisted of wet medium stiff to very stiff silt, but the material was observed to break into a blocky texture when cut with a soil knife.

The upper and lower boundaries of this unit were somewhat indistinct because the general soil type was very similar in the alluvial deposit and the more intact siltstone (described below). The extent of the weathered siltstone unit was delineated through changes in standard penetration test (SPT) blow counts and observed texture of the samples retrieved. The interpreted degree of weathering is relatively high, based on the consistency and the ability to drill through the material using hollow stem auger drilling and collect samples using standard penetration testing.

3.4.5. Siltstone

Below the weathered siltstone, we observed what we interpret to be more intact, less weathered siltstone, extending to the full depths explored. The samples retrieved typically consisted of hard, moist silt. As with the weathered siltstone described above, the material was observed to break into a blocky texture when cut with a soil knife, but also exhibited significantly higher resistance to the soil knife and drilling and sampling efforts.

3.5. Groundwater

At the time of our explorations, groundwater was encountered at approximately 5 feet bgs. Given the site's proximity to the tidal-influenced water, the water table should be expected to vary with tide level—but given the silt content of the upper most soils—saturated soils should be expected up to the high tide elevation.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1. Seismic Design Considerations

4.1.1. Seismic Design Approach

Based on our explorations and analysis, the project site is underlain by liquefiable soils. Liquefaction could result in surface settlements, soil strength loss and movement of the waterway slope (lateral spreading). The following sections provide additional information regarding liquefaction and associated effects. Based on our discussion with the design team, we understand that, in order to resist seismic loading and limit liquefaction risk, the bulkhead sheet pile wall will be driven into the underlying siltstone and tiebacks will be anchored in the siltstone as well.

4.1.2. Seismic Design Parameters

We understand that seismic consideration for this project fall under the *International Building Code 2018* (IBC 2018) which references the 2016 *Minimum Design Loads for Buildings and Other Structures* (American Society of Civil Engineers [ASCE] 7-16).

As addressed in the sections below, our review of the existing data at the site indicates potentially liquefiable soils are present from the surface to the existing mudline (approximately Elevation -14 feet). In accordance with the design documents referenced above, sites with liquefiable soils shall be classified as Site Class F and a site-specific response analysis shall be performed. An exception is provided in Section 20.3.1 of ASCE 7-16, which states that for structures with a fundamental period of vibration less than or equal to 0.5 seconds, a site-specific seismic evaluation is not required. Our scope of services does not include site-specific response analysis.

As a basis for a simplified design and analysis we recommend using a response spectrum for Site Class D. Recommended Site Class D seismic design parameters are presented in Table 2 below.

TABLE 2. SEISMIC DESIGN CRITERIA

ASCE 7-16 Seismic Design Parameters¹	
Site Class	F
Spectral Response Acceleration at Short Periods (S_s)	1.427g
Spectral Response Acceleration at 1-Second Periods (S_1)	0.738g
Short-Period Site Coefficient (F_a)	1.20
Long-Period Site Coefficient (F_v)	1.7
Design Spectral Response Acceleration at Short Periods ($S_{DS} = 2/3 * F_a S_s$)	1.142g
Design Spectral Response Acceleration at 1-Second Periods ($S_{D1} = 2/3 * F_v S_1$)	1.255g ²
Design Peak Ground Acceleration (PGA_M)	0.798g

Notes:

¹ Parameters developed based on Latitude 46.3048196° and Longitude -124.0410238° using the ATC Hazards online tool.

² Per ASCE 7-16 Supplement 3 Section 11.4.8 item 1, parameter has been increased by 50 percent or has increased as a result of adjusted S_{m1} Value.

4.1.3. Liquefaction Potential

Liquefaction refers to the condition by which vibration or shaking of the ground, usually from earthquake forces, results in the development of excess pore pressures in saturated soils and the subsequent loss of strength in the affected soil deposit. In general, soils that are susceptible to liquefaction include very loose to medium dense clean to silty sands and some silts below the water table. Liquefaction effects on foundations can include a temporary loss of bearing capacity, settlement of the ground surface and downdrag loads on pile and shaft foundations.

We reviewed the “Liquefaction Susceptibility Map of Pacific County, Washington” (Palmer et al. 2004). According to the map, the potential for liquefaction at this site is high.

We evaluated the liquefaction potential of the site soil using simplified methods that utilize Atterberg limits to evaluate liquefaction potential (Idriss and Boulanger 2008 and Bray and Sancio 2006). These methods apply limits to liquefaction potential based on the plastic index and moisture content of the soil. Based on the results of our Atterberg limit testing and using the above methodology, the majority of native soils at the site are not expected to be liquefiable. There is, however, some potential for soil strength reduction due to seismic shaking. We have considered this reduction in development of our post-seismic design recommendations presented below.

The upper 15 feet (approximate Elevations 11 to -4 feet) consists of primarily fill and the upper portion of the alluvium shows interbedded silty sands and we consider this region to have some susceptibility to liquefaction.

Based on our review and analysis, it is our opinion potentially liquefiable soils are present at the site from the surface to 15 feet bgs (approximate Elevation -4 feet).

4.1.4. Liquefaction-Induced Settlement

Based on our explorations, lab data, and liquefaction susceptibility evaluation, we estimated liquefaction-induced settlement at the ground surface considering liquefaction to a depth of 15 feet. We

estimate liquefaction-induced settlement could range from about 1 to 2 inches at the ground surface as a result of the design level earthquake (Magnitude 9.08, $PGA_M = 0.798g$). Areas of liquefaction can be relatively discontinuous and separated by layers of non-liquefied soil. Due to the variability of soils in the upper 15 feet and the inherent unpredictability of seismic soil liquefaction, differential settlements could be as much as the total settlement.

4.1.5. Lateral Spreading Potential

Liquefaction-induced soil strength loss can also result in slope instability and lateral spreading. Lateral spreading related to seismic activity typically involves lateral displacement of large, surficial blocks of non-liquefied soil when an underlying soil layer loses strength during seismic shaking. Alternatively, when the majority of the soil profile loses strength a flow-type failure may occur. Lateral spreading usually develops in areas where sloping ground or large grade changes are present. Lateral spreading can induce significant lateral loads on embedded structures (kinematic loading).

Based on our understanding of the subsurface conditions, liquefaction risk and current site topography, it is our opinion there is a risk of lateral spreading during the design earthquake in regions not confined by the bulkhead.

4.1.6. Surface Rupture Potential

According to the Washington State Department of Natural Resources “Interactive Natural Hazards Map” (accessed online July 14, 2022), the nearest known major seismic feature is the Cascadia Subduction Zone (CSZ). The eastern most extent of this region is mapped approximately 11 miles west of the project site. In addition to the CSZ, there are two additional mapped faults approximately 8 miles from the site. The Willapa Bay Oblique-slip fault is located 8 miles north of the site and a strike-slip fault associated with the CSZ is located 8 miles southwest of the site. Based on this information it is our opinion the risk for seismic surface rupture at the site is low.

4.2. Soil Parameters

Based on our explorations and testing, we developed a generalized soil profile with associated parameters for use in engineering analysis completed as part of the project. Tables 3 and 4 below summarize our recommended design soil properties for static conditions and post-earthquake (liquefied) conditions. Elevation ranges for each soil unit are provided based on the explorations reviewed and are referenced to the elevation at the top of the existing pavement (approximate elevation 11 feet).

TABLE 3. RECOMMENDED STATIC SOIL PARAMETERS

Depth ^{1,2} (feet)	Soil Unit	USCS Soil Type	Total Unit Weight (pcf) ³	Effective Unit Weight (pcf) ³	Friction Angle (degrees)	Cohesion (pcf) ³	Ka ⁴	Kp ⁵	Active Equivalent Fluid Density ⁶ (pcf)	Allowable Equivalent Fluid Density ⁷ (pcf)	Allowable Passive Pressure ⁸ (psf)
0 to 5	Fill	GP-GM	120	--	30	--	0.33	3.0	40.0	240	--
5 to 12	Submerged Fill	SM	120	58	28	--	0.36	2.75	21	107	--
12 to 35	Upper Alluvium	ML/CH	105	43	--	250	--	--	--	--	335
35 to 55	Lower Alluvium and weathered Siltstone	ML/CH	110	48	--	800	--	--	--	--	1,067
55 and below	Siltstone	Rx	120	58	42	--	--	5.04	--	194	--

Notes:

- 1 Depths are referenced to the top of pavement behind existing bulkhead.
- 2 Mudline in front of bulkhead assumed to be at 15 feet.
- 3 Groundwater is assumed to be at 5 feet below ground surface.
- 4 Ka = Active earth pressure coefficient.
- 5 Kp=Passive earth pressure coefficient (ultimate, does not include a factor of safety).
- 6 Active equivalent fluid density provided for soils retained by the bulkhead and do not include hydrostatic pressures.
- 7 Allowable passive equivalent fluid densities include a FOS of 1.5. These values do not include hydrostatic pressures.
- 8 Allowable passive pressures (rectangular distribution) provided for cohesive soils and include a FOS of 1.5.

TABLE 4. RECOMMENDED POST-SEISMIC CONDITIONS

Depth ^{1,2} (feet)	Soil Unit	USCS Soil Type	Total Unit Weight (pcf) ³	Effective Unit Weight (pcf) ³	Friction Angle (degrees)	Cohesion (pcf) ³	Ka ⁴	Kp ⁵	Active Equivalent Fluid Density ⁶ (pcf)	Allowable Equivalent Fluid Density ⁷ (pcf)	Allowable Passive Pressure ⁸ (psf)
0 to 5	Fill	GP-GM	120	--	30	--	0.33	3.0	40.0	240	--
5 to 12	Liquified Fill	SM	120	58	22	--	0.45	2.2	26	107	--
12 to 35	Upper Alluvium (strain Softened)	ML/CH	105	43	--	200	--	--	--	--	335
35 to 55	Lower Alluvium and weathered siltstone (strain Softened)	ML/CH	110	48	--	640	--	--	--	--	1,067
55 and below	Siltstone	Rx	120	58	42	--	--	5.04	--	244	--

Notes:

1 Depths are referenced to the top of pavement behind existing bulkhead.

2 Mudline in front of bulkhead assumed to be at 15 feet.

3 Groundwater is assumed to be at 5 feet below ground surface.

4 Ka = Active earth pressure coefficient.

5 Kp=Passive earth pressure coefficient (ultimate, does not include a factor of safety).

6 Active equivalent fluid density provided for soils retained by the bulkhead and do not include hydrostatic pressures.

7 Allowable passive equivalent fluid densities include a FOS of 1.2. These values do not include hydrostatic pressures.

8 Allowable passive pressures (rectangular distribution) provided for cohesive soils and include a FOS of 1.2.

4.3. Geotechnical Pile Design Recommendations

4.3.1. Axial Pile Resistance

Based on our experience with driven piles in near shore environments, end bearing resistance can be highly variable, depending on the specific soil conditions at the tip of each pile. Therefore, we typically assume low end bearing resistance values for design if not driven into bedrock. However, it is our understanding that piles for this project will be driven into the underlying siltstone providing considerably more tip capacity than in alluvium sediment deposits. If it becomes desirable to drive piles to depths above the underlying siltstone we can provide further recommendations.

Based on our understanding of site conditions and planned development, we estimated axial resistance available for piles driven at the site, for static and post seismic conditions. Because pile sizes may need to vary, we provided estimated unit resistances for each soil layer. Estimated resistances are presented in Tables 5 and 6.

Mudline at the outboard edge of the existing bulkhead is currently at approximately Elevation -4 feet. We understand that the new mudline will be at approximate elevation -16 feet to account for future dredging activities. Skin friction above the planned future mudline should be disregarded when computing total pile capacities.

Because of the complex stratigraphy and variability of soils in the site vicinity, we anticipate that actual ultimate axial resistances may vary by as much as 20 to 25 percent. Allowable resistances should be used for designing the piles. Allowable static axial pile resistances presented in the table below include a factor of safety (FS) equal to 2 for end bearing, 3 for skin friction and 2.5 for uplift resistance. Allowable seismic axial pile resistances include a FS equal to 1.5 for end bearing, 3 for skin friction and 1.5 for uplift resistance.

TABLE 5. AXIAL PILE RESISTANCES (STATIC CONDITIONS)

Depth ^{1,2} (feet)	Soil Unit	USCS Soil Type	Allowable Unit Skin Resistance ^{3,4} (ksf)	Allowable Unit End Bearing Resistance ^{3,5} (ksf)	Allowable Unit Uplift Resistance ^{3,6} (ksf)
0 to 5	Fill	GP-GM	-	-	-
5 to 12	Submerged Fill	SM	-	-	-
12 to 35	Upper Alluvium	ML/CH	0.075	0.9	0.0625
35 to 55	Lower Alluvium and Siltstone	ML/CH	0.24	2.9	0.2
55 and below	Siltstone	RX	0.75	17	0.63

Notes:

- 1 Depths are referenced to the top of pavement behind existing bulkhead.
- 2 Mudline in front of bulkhead assumed to be at relative depth of 27 feet.
- 3 Resistances for fill not provided. Pile Resistance should be accounted for starting where pile becomes fully embedded (portion of pile below future mudline).
- 4 Includes a factor of safety of 2.5.
- 5 Includes a factor of safety of 2.5.
- 6 Includes a factor of safety of 3.0.
- 7 To calculate allowable skin and uplift resistance, multiply allowable skin/uplift resistance by the pile perimeter (ft) and the length of the pile embedded into the given layer.
- 8 To calculate allowable end bearing resistance, multiply unit end bearing resistance by pile tip area (sf) for the soil unit at the pile tip depth.

TABLE 6. AXIAL PILE RESISTANCES (POST SEISMIC CONDITIONS)

Depth ^{1,2} (feet)	Soil Unit	USCS Soil Type	Allowable Unit Skin Resistance ^{3,4} (ksf)	Allowable Unit End Bearing Resistance ^{3,5} (ksf)	Allowable Unit Uplift Resistance ^{3,6} (ksf)
0 to 5	Fill	GP-GM	-	-	-
5 to 12	Submerged Fill	SM	-	-	-
12 to 35	Upper Alluvium	ML/CH	0.075	0.9	0.0625
35 to 55	Lower Alluvium and Siltstone	ML/CH	0.24	2.9	0.19
55 and below	Siltstone	RX	0.75	17	0.63

Notes:

1 Depths are referenced to the top of pavement behind existing bulkhead.

2 Mudline in front of bulkhead assumed to be at relative depth of 27 feet.

3 Resistances for fill not provided. Pile Resistance should be accounted for starting where pile becomes fully embedded (portion of pile below future mudline).

4 Includes a factor of safety of 2.0.

5 Includes a factor of safety of 2.0.

6 Includes a factor of safety of 2.5.

7 To calculate allowable skin and uplift resistance, multiply allowable skin/uplift resistance by the pile perimeter (ft) and the length of the pile embedded into the given layer.

8 To calculate allowable end bearing resistance, multiply unit end bearing resistance by pile tip area (sf) for the soil unit at the pile tip depth.

4.3.2. Settlement

Based on our understanding of the project, soil profile and properties, and assuming the piles are embedded into the underlying siltstone unit, we anticipate settlement of piles should be on the order of 1 inch or less with differential settlement of ½ inch or less.

4.3.3. LPILE Soil Parameters

We understand that lateral load performance of the proposed piles will be evaluated using the computer software program LPILE produced by Ensoft, Inc. Our recommended LPILE soil parameters are presented in the tables below.

For the purpose of this report, we assume piles are spaced at least 5 diameters (5D) center to center in the direction of loading. If spacing is less than 5D, P multipliers will be required for the LPILE analysis and are available upon request.

TABLE 7. RECOMMENDED STATIC LPILE SOIL PARAMETERS (STATIC CONDITIONS)

Depth ^{1,2} (feet)	Soil Unit	USCS Soil Type	Friction Angle (degrees)	Undrained shear Strength/ Cohesion (psf)	Lateral Analysis Parameters – Static Conditions				
					P.Y Curve Model	Total Unit Weight ³ (pcf)	Effective Unit Weight ² (pcf)	Soil Modulus K (pci)	Strain Factor e ₅₀
0 to 12	Fill ⁴	GP-GM	-	-	-	-	-	-	-
12 to 35	Upper Alluvium	ML/CH	-	250	Soft Clay	105	43	-	0.02
35 to 55	Lower Alluvium and W. Siltstone	ML/CH	-	800	Soft Clay	110	48	-	0.02
55 and below	Siltstone	RX	42	-	Sand (Reese)	120	58	150	-

Notes:

1 Depths are referenced to the top of the pavement behind existing bulkhead.

2 Mudline in front of bulkhead assumed to be at relative depth of 27 feet.

3 Assume static groundwater levels at 5 feet below surface for design. Effective unit weights should be used for soil layers below the groundwater table.

4 Resistances for fill not provided. Pile Resistances should be accounted for starting where pile becomes fully embedded (portion of pile below mudline).

TABLE 8. RECOMMENDED STATIC LPILE SOIL PARAMETERS (POST SEISMIC CONDITIONS)

Depth ^{1,2} (feet)	Soil Unit	USCS Soil Type	Friction Angle (degrees)	Undrained shear Strength/ Cohesion (psf)	Lateral Analysis Parameters – Static Conditions				
					P.Y Curve Model	Total Unit Weight ³ (pcf)	Effective Unit Weight ² (pcf)	Soil Modulus K (pci)	Strain Factor e ₅₀
0 to 12	Fill ⁴	GP-GM	-	-	-	-	-	-	-
12 to 35	Upper Alluvium (strain softened)	ML/CH	-	200	Soft Clay	105	43	-	0.02
35 to 55	Lower Alluvium and W. Siltstone (strain softened)	ML/CH	-	640	Soft Clay	110	48	-	0.02
55 and below	Siltstone	RX	42	-	Sand (Reese)	120	58	150	-

Notes:

1 Depths are referenced to the top of pavement behind existing bulkhead.

2 Mudline in front of bulkhead assumed to be at relative depth of 27 feet.

3 Assume Static groundwater levels at 5 feet below ground surface for design. Effective unit weights should be used for soil layers below the groundwater table.

4 Resistances for fill not provided. Pile Resistance should be accounted for starting where pile becomes fully embedded (portion of pile below mudline).

4.3.4. Pile Installation Considerations

Provided subsurface conditions are as assumed, we anticipate conventional vibratory driving methods can be used to advance open-tip steel pipe piles through the overlying fill (if present at the mudline) and native alluvial deposits at the site. The reviewed explorations do not indicate the presence of gravel or other potential impediments to vibratory pile driving within the alluvial soils; however, very dense zones or other obstructions such as logs could be present. Vibratory pile driving equipment will need to be selected based on the pile size. If significant penetration into the siltstone unit is planned, impact driving is likely to be required. We recommend that project plans and specifications include selecting and providing an impact hammer of sufficient capacity to continue driving the pile if vibratory installation methods reach refusal before the design tip elevation.

We recommend that a GeoEngineers representative be present on site during pile installation, particularly if impact driving is used. Our representative can observe whether piles are installed in accordance with the project plans and specifications, check for consistency in pile resistance during vibratory installation and evaluate pile resistance during impact driving. We can also provide recommendations for sizing vibratory and impact hammers for installation, if requested.

4.4. Lateral Earth Pressures

We developed lateral earth pressure recommendations for use in design of the replacement sheet pile bulkhead. Recommended lateral earth pressures under static and post-seismic conditions are presented on Figures 3 to 8, respectively. Lateral earth pressures were developed for the purpose of the lateral loading analysis for the proposed sheet pile wall and are presented relative the proposed structures and their relationship with the site stratigraphy.

4.5. Tieback Anchors

Tieback anchors should extend far enough behind the wall to develop anchorage beyond the “no-load” zone (See Figures 3 through 8 for definition of the no-load zone) and within a stable soil mass. We recommend that spacing between tiebacks be at least five times the diameter of the anchor hole to minimize group interaction.

We understand that tieback anchors will be installed into the intact siltstone, which was encountered around 55 to 65 feet below ground surface. For tiebacks installed into siltstone we recommend using an ultimate bond strength of 50 psi for design. We recommend that tiebacks be designed using a factor of safety of at least 2.0 for static conditions, which can be reduced to 1.5 for seismic conditions. We recommend that tieback anchors have a minimum bond length of 10 feet.

4.6. Shoreline Slope Stability

4.6.1. General

We completed slope stability analyses to evaluate the proposed modifications to the shoreline slope to the northeast and south of the new bulkhead. Proposed slope modifications to the northeast of the bulkhead include removal of a relic timber wall, installation of rip rap and construction of a new berm at the top of the slope. We understand that the thickness of the rip rap armoring will be on the order of 18 inches. The proposed berm will be set back about 2 feet from the crest of the slope, will have a crest elevation of around 14 feet (about 1 foot above existing grade) and will be about 30 feet wide. The approximate location of the proposed berm and the area of slope armoring is shown on Figure 9.

No significant modifications to the existing slope geometry are proposed in the area to the south of the proposed bulkhead. We understand that concrete rubble on the slope will be removed, and new riprap slope armoring will be added. The riprap thickness is expected to be on the order of 18 inches. The approximate location of the proposed slope armoring area south of the bulkhead is shown in Figure 10.

Slope stability analyses were completed using the computer program SLOPE/W (GEO-SLOPE International, Ltd. 2020). SLOPE/W evaluates the stability of numerous trial shear surfaces using a vertical slice limit-equilibrium method. This method compares the ratio of forces and moments driving slope movement versus forces and moments resisting slope movement for each trial shear surface and presents the result as the factor of safety (FOS). The program then sorts the trial shear surfaces and identifies the surface with the lowest factor of safety, or the “critical” shear surface. We assumed a circular arc slip surface and used the Morgenstern-Price method to calculate the forces.

We did not consider pseudo-static (seismic) or post seismic (residual strength) conditions in our slope stability analyses because the considered slopes do not directly support the proposed bulkhead. Additionally, evaluating surrounding slopes for these conditions is beyond the scope of this project. Pseudo-static and post seismic slope stability will primarily be controlled by the magnitude of seismic inertial forces and the residual soil strength properties of the underlying soils. The proposed slope improvements will not impact either of these analysis inputs. In our opinion the existing slopes likely do not meet minimum seismic slope stability factor of safety values however, the proposed slope modifications are unlikely to significantly change the stability of the existing slope considering pseudo-static and post seismic conditions.

4.6.2. Slope Stability Results – Shoreline Slope Northeast of Bulkhead

The approximate location of the slope cross section considered in our stability analysis along with the analysis results are shown in Figure 9. Our slope stability analysis indicates that the proposed shoreline slope configuration meets target static factor of safety requirements presented in the Washington State Department of Transportation Geotechnical Design Manual (1.5 for static conditions). In our opinion the proposed slope modifications can be completed without destabilizing the shoreline slope.

4.6.3. Slope Stability Results – Shoreline Slope South of Bulkhead

The approximate location of the slope cross section considered in our stability analysis is shown in Figure 10. For our analysis of this slope, we considered static slope stability both before and after removal of the existing concrete rubble armoring and the installation of the riprap armoring. We limited our analysis to evaluating the impact that placing the riprap will have on shallow surficial slope stability.

Slope stability analysis results for the existing and proposed shoreline slope configuration south of the bulkhead are shown on Figure 10. Our analysis results indicate that replacement of the slope protection with riprap armoring will not significantly change the existing slope factor of safety (FOS=1.2) with respect to shallow surficial slope stability. The calculated FOS is less than the typical target FOS for new construction. Based on our assessment, a FOS of 1.2 does not imply that the slope is inherently unstable or at immediate risk of shallow surficial movement. In our opinion the proposed slope armoring can be completed without destabilizing the shoreline slope or impacting the proposed bulkhead and upland structures.

We did not evaluate global stability of the shoreline slope, as improving global slope stability is beyond the intent of the repairs and, in our opinion, replacement of the existing armoring with riprap will not significantly

affect global slope stability. We also did not evaluate stability of the slope for the temporary condition after concrete rubble removal but prior to new riprap placement as this condition is not expected to present a risk to upland structures. Maintaining excavation stability during construction is the responsibility of the contractor performing the work. The contractor should follow best practices during construction and applicable guidelines for temporary excavations to maintain a stable excavation.

4.7. Pavement Design

4.7.1. General

We understand that existing asphalt pavements behind the bulkhead and along the wharf will be replaced as part of this project. The replacement pavement areas are primarily used by standard duty vehicles, 1.5-ton pneumatic tire forklifts, delivery trucks and occasional semi-trucks with trailers. Specific vehicle loading and frequency of use was not provided to us.

4.7.2. Design Parameters

We completed our pavement design following the methodology presented in the American Association of State Highway Transportation Officials (AASHTO) 1991 Flexible Pavement Design Standards and the 1993 AASHTO Guide for Design of Pavement Structures.

The recommended pavement section is based on a 20-year design life assuming an annual growth percentage of 0.1 percent. A 20-year design life for a pavement means that it is expected to be worn to the point of requiring a full replacement after 20 years. Some crack sealing and minor patching could be required before that time. Typically, full crack sealing (chip seal or resurfacing) is required after about 10 years of use, to prevent water intrusion and accelerated deterioration.

The average daily traffic repetitions assumed in our analysis are summarized in Table 9 below. Other design input parameters necessary to complete the analysis such as reliability and serviceability index were selected based on our experience. We should be notified if specific traffic volumes or vehicle types should be considered as part of the pavement design.

TABLE 9. VEHICLE LOADING FREQUENCY

Vehicle Type	Assumed Daily Repetitions
Standard Duty Vehicle	30
1.5 Ton Pneumatic Tire Forklift	50
Delivery Truck <i>Single tandem axle box truck</i>	5
Semi-truck and trailer <i>100-ton gross vehicle weight, HS20-44 wheel configuration</i>	2

4.7.3. Recommended Pavement Section

Our recommended asphalt concrete pavement section is provided below. The recommended section is suitable for support of around 5,000,000 equivalent single axle loads (ESALs) over the assumed design life. In our opinion this is appropriate for a light industrial area. The provided pavement section may not be adequate for heavy construction traffic loads such as those imposed by concrete transit mixers, dump

trucks or cranes. Additional pavement thickness may be necessary to prevent pavement damage during construction if other loading types are planned.

Recommended Pavement Section

- 5 inches of hot mix asphalt, class ½ inch, PG 58-22
- 12 inches of compacted crushed surfacing base course (CSBC)
- Subgrade prepared as recommended in Section 4.7.4 below.

The top approximate 2 inches of the CSBC section may consist of crushed surfacing top course (CSTC) as a leveling layer and for more precise grade development. CSBC and CSTC should conform to applicable sections of 4-04 and 9-03.9(3) of the WSDOT Standard Specifications. Crushed surfacing materials should be moisture conditioned to near optimum moisture content and compacted to at least 95 percent of the theoretical MDD per ASTM D 1557.

Hot mix asphalt should conform to applicable sections of 5-04, 9-02 and 9-03 of the WSDOT Standard Specifications.

4.7.4. Subgrade Preparation

Subgrades for pavements should be thoroughly compacted to a uniformly firm and unyielding condition on completion of demolition/excavation and before placing structural fill. We recommend that subgrades be evaluated, as appropriate, to identify areas of yielding or soft soil. Probing with a steel probe rod or proof-rolling with a heavy piece of wheeled construction equipment are appropriate methods of evaluation.

If soft or otherwise unsuitable subgrade areas are revealed during evaluation that cannot be compacted to a stable and uniformly firm condition, we recommend that: (1) the unsuitable soils be scarified (e.g., with a ripper or farmer's disc), aerated and recompacted, if practical; or (2) the unsuitable soils be removed and replaced with compacted structural fill, as needed.

Based on the current condition of the wharf pavements, we expect that the majority of the existing subgrade areas will not be suitable for pavement support in their current condition. We recommend that the project budget and schedule include contingencies for subgrade remediation. For preliminary estimating purposes we recommend assuming that 40 percent of the existing subgrade area will require up to 12 inches of overexcavation and replacement during remediation, 40 percent of the existing subgrade area will require up to 6 inches of overexcavation and replacement during remediation and 20 percent of the existing subgrade can be prepared to a suitable condition without overexcavation.

Based on our conversations with the project team and our observations while onsite, it appears likely that relic timber piles will be exposed within the subgrade area. We recommend that relic piles (or other remnant structural elements) be cut off at least 12 inches below the bottom of the design pavement section during subgrade preparation. Voids caused by removal of the timber piles should be backfilled with compacted structural fill.

4.7.5. Additional Considerations

Pavement design life and durability can be impacted by factors outside of vehicle repetitions including impact loading and use by special vehicles. These factors were not considered as part of developing the recommended pavement section.

Impact loading can cause surface damage and full depth pavement cracking. Cracks provide a pathway for moisture to enter the pavement section which can saturate the base course and subgrade materials, reducing the pavement design life. If cracks form in the pavement section, they should be sealed, or the damaged area should be replaced as soon as possible.

We anticipate that the pavement areas may occasionally be used by unusual or special use vehicles. An example of this would be a “warehouse” forklift with small hard rubber tires. While these types of vehicles are typically not heavy, they can produce high concentrated loads. Additionally, certain tire types can shove and rut pavements. If the pavement area is expected to be regularly used by solid tire forklifts or other special use vehicles a different pavement type or a thicker pavement section may need to be considered.

5.0 LIMITATIONS

We have prepared this report for the exclusive use of Moffatt & Nichol, the Port of Ilwaco, and their authorized agents. Moffatt & Nichol and the Port of Ilwaco may distribute copies of this report authorized agents and regulatory agencies as may be required for the project.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. The conclusions, recommendations, and opinions presented in this report are based on our professional knowledge, judgment, and experience. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix B titled “Report Limitations and Guidelines for Use” for additional information pertaining to use of this report.

6.0 REFERENCES

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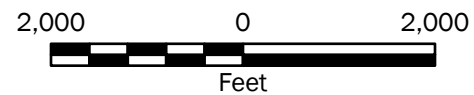
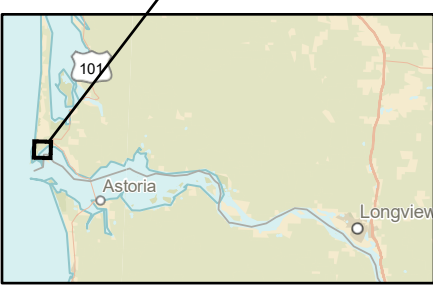
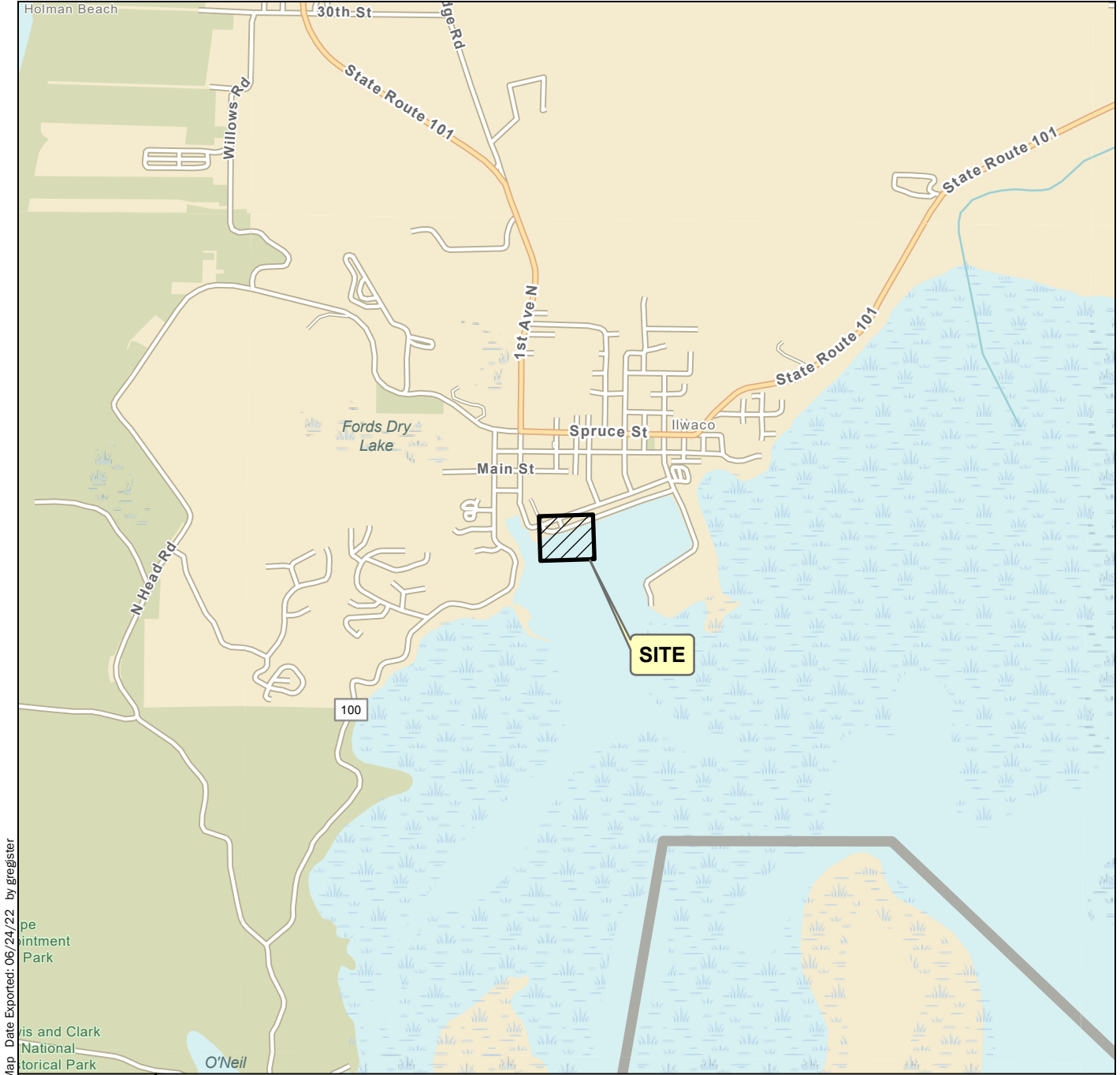
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Notes:

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: ESRI
 Projection: NAD 1983 UTM Zone 10N

Vicinity Map	
Port Ilwaco Bulkhead Replacement Ilwaco Washington Pacific County	
	Figure 1

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Legend

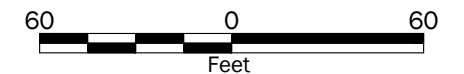
B-1  Boring by GeoEngineers, Inc., 2022

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: Aerial from Google Earth Pro dated 10/12/2018.

Projection: Washington State Plane, South Zone, NAD83, US Foot



Site Plan

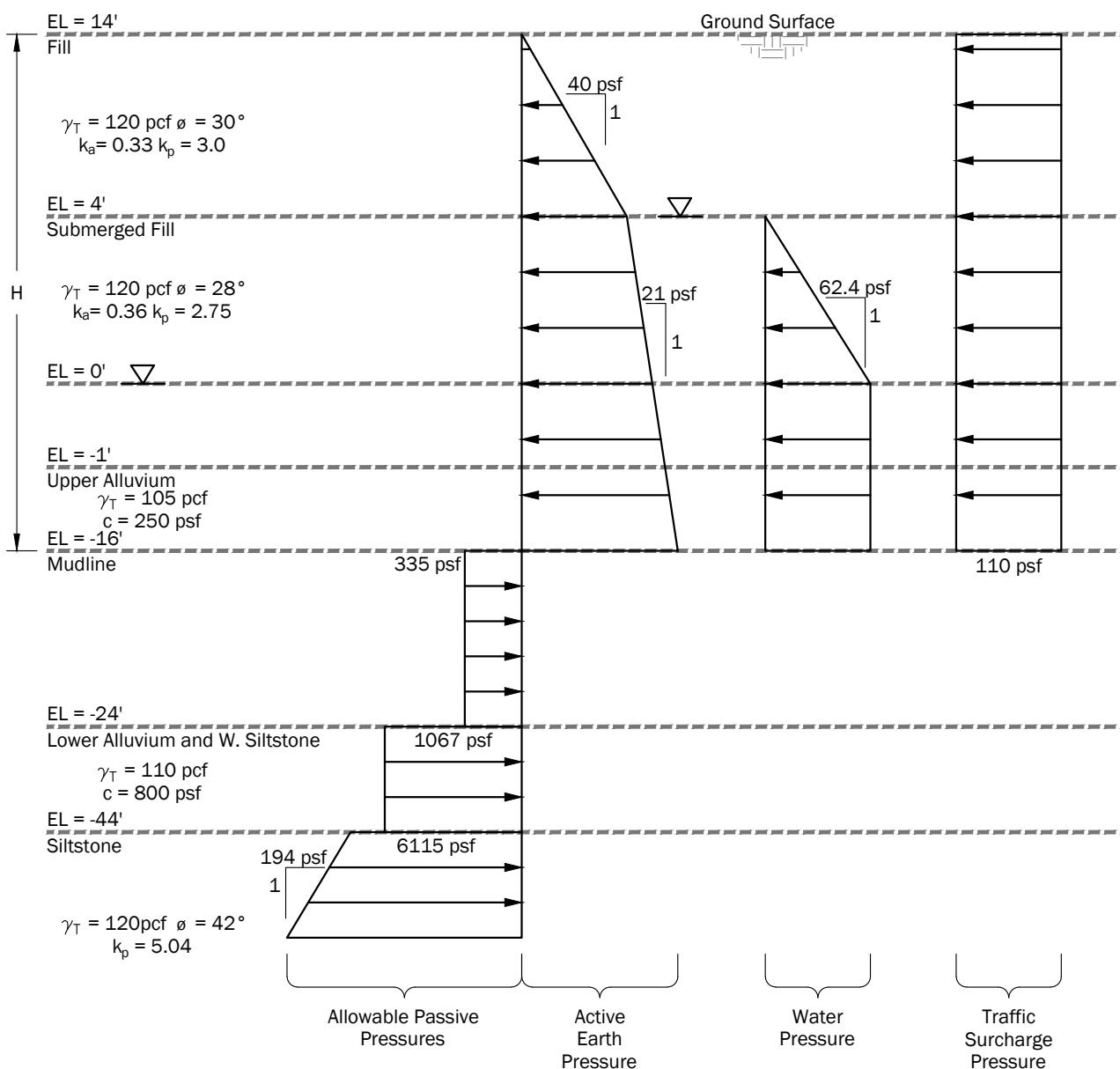
Port Ilwaco Bulkhead Replacement
Ilwaco, Washington
Pacific County



Figure 2

Static Conditions Cantilever Wall

Active Pressures



Legend

H = Exposed Wall Height

Not To Scale

Earth Pressure Diagram Static Conditions Cantilever Wall

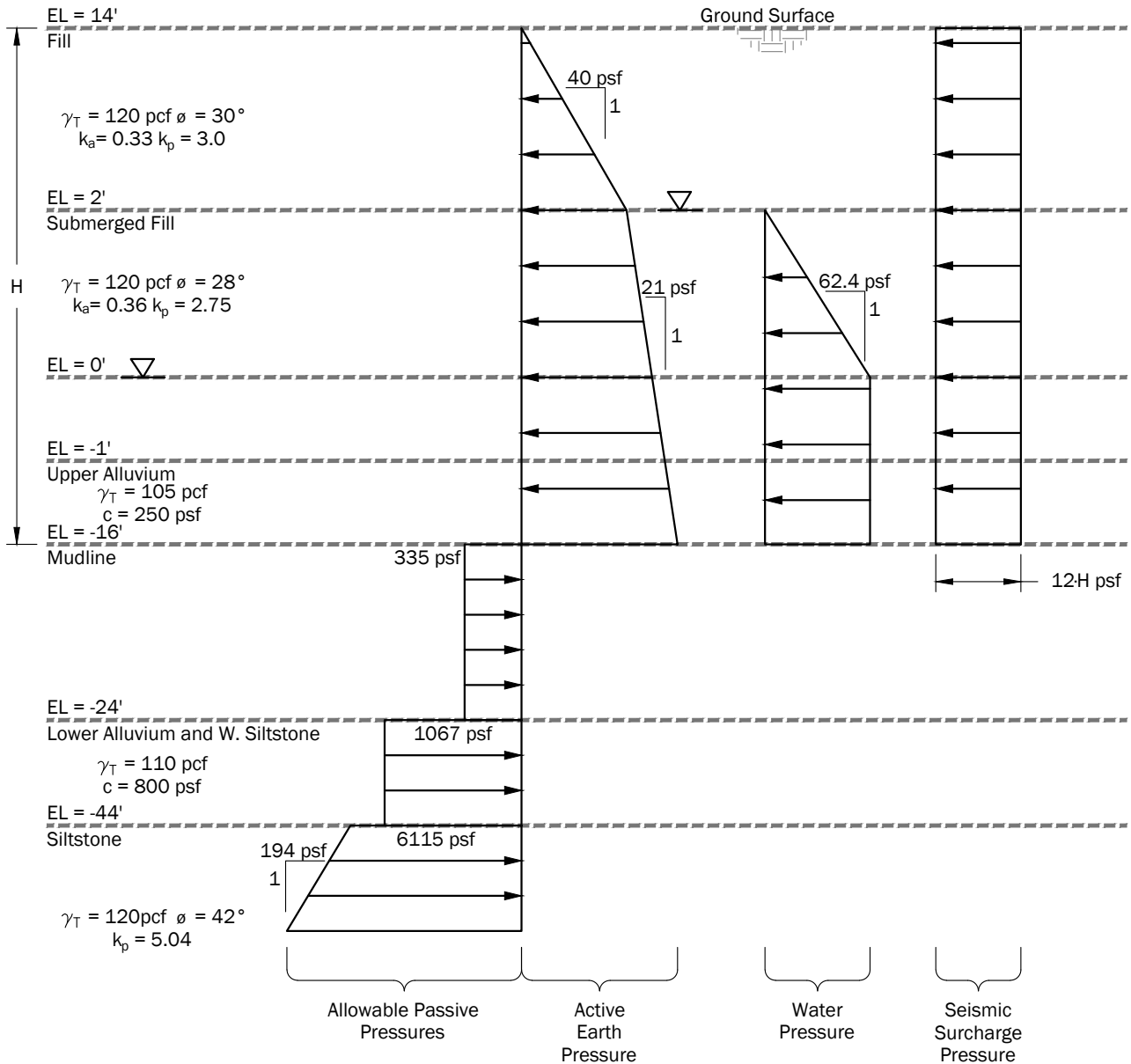
Port Ilwaco Bulkhead Replacement
Ilwaco, Washington
Pacific County

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Figure 3

Seismic Conditions Cantilever Wall

Active Pressures




Legend

H = Exposed Wall Height

Notes:

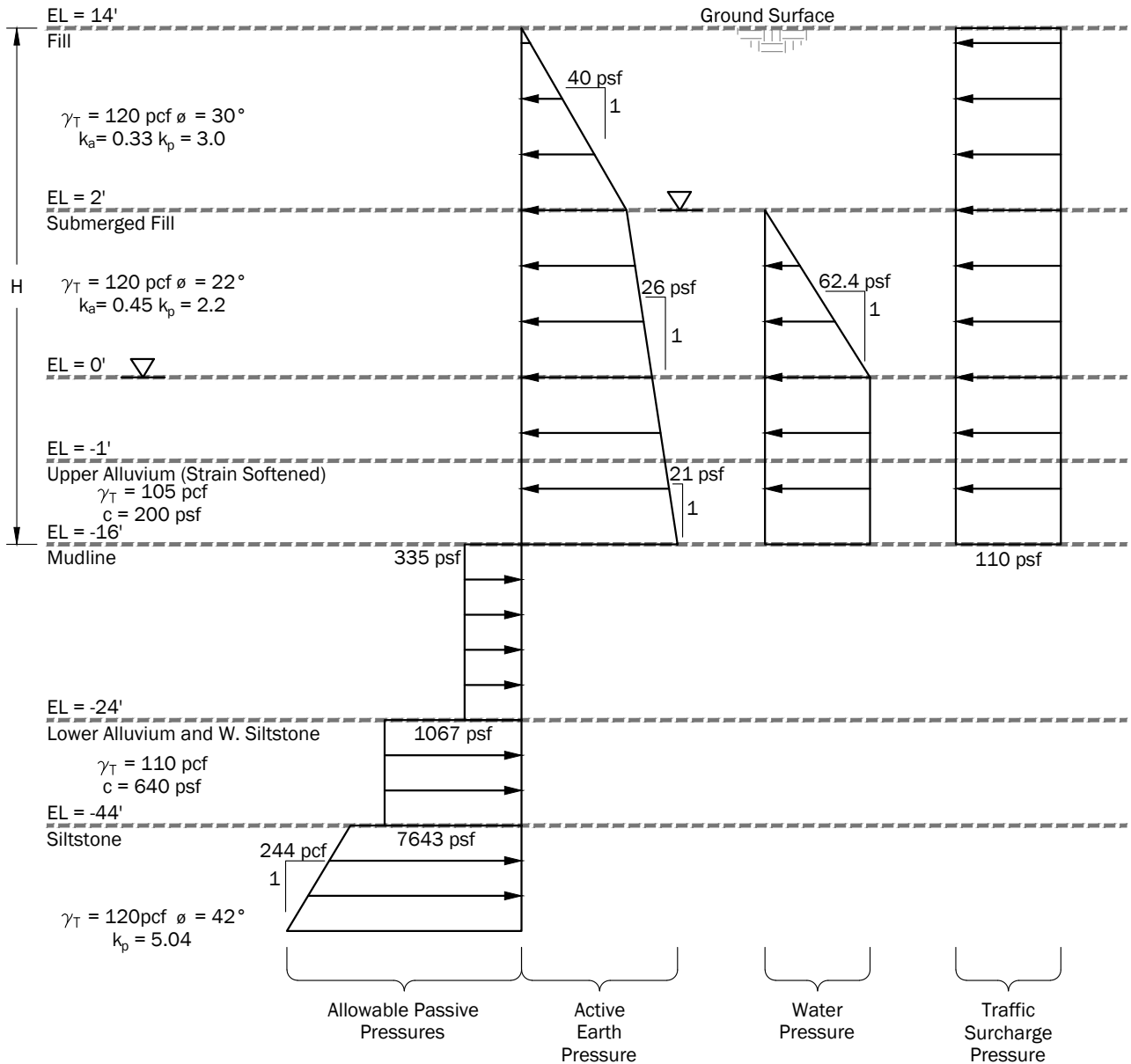
1. Apply uniform 110 psf lateral traffic surcharge over distance H.

Not To Scale

Earth Pressure Diagram Seismic Conditions Cantilever Wall	
Port Ilwaco Bulkhead Replacement Ilwaco, Washington Pacific County	
GEOENGINEERS 	Figure 4

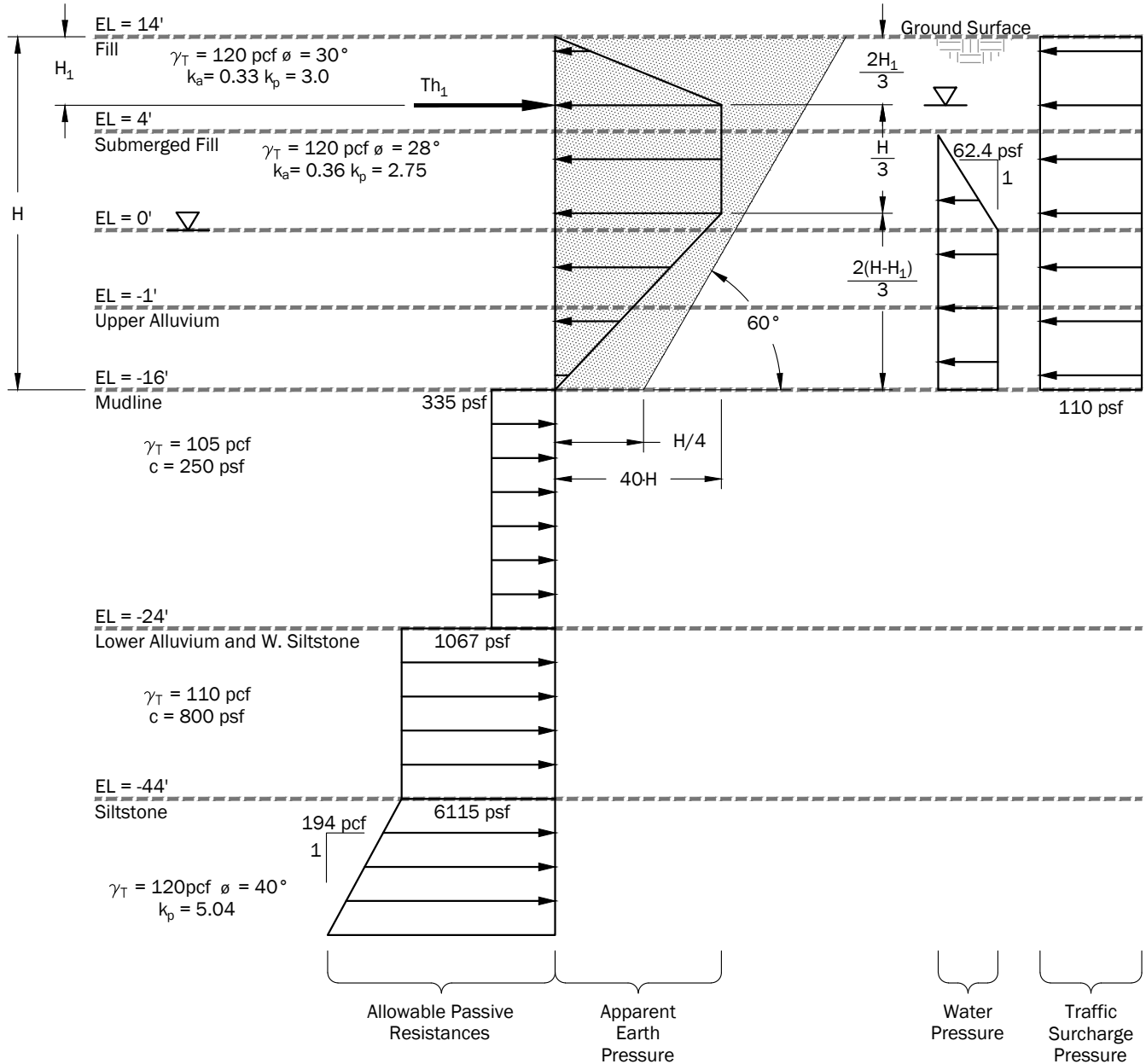
Post-Seismic Conditions Cantilever Wall

Active Pressures



Static Conditions Wall with Tieback

Active Pressures



Legend

- No Load Zone
- H = Exposed Wall Height
- H₁ = Distance from Ground Surface to Upper most Tieback
- Th₁ = Horizontal Load in Uppermost Ground Anchor

Not To Scale

Earth Pressure Diagram

Static Conditions Wall with Tieback

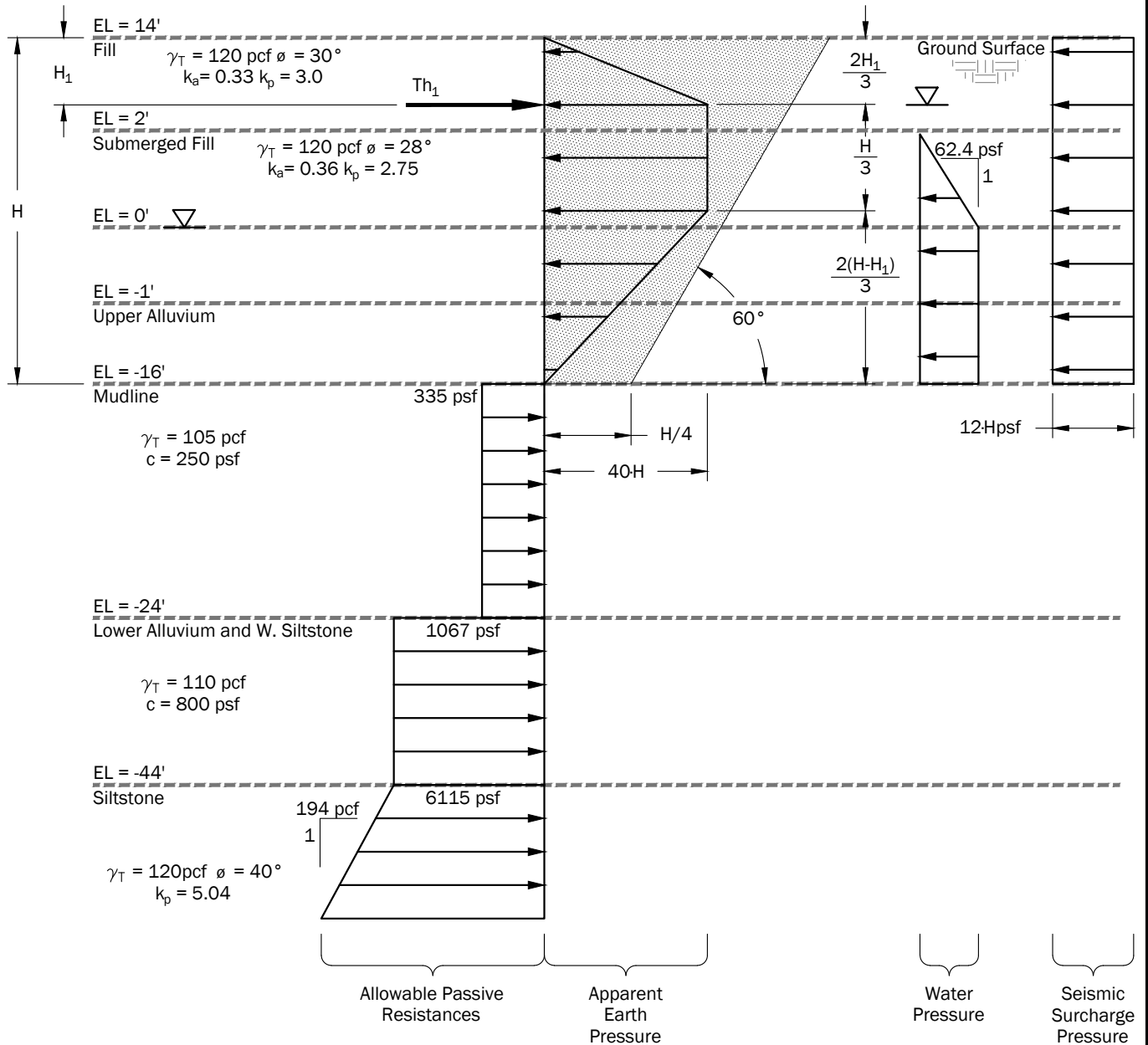
Port Ilwaco Bulkhead Replacement
Ilwaco, Washington
Pacific County

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Figure 6

Seismic Conditions Wall with Tieback

Active Pressures



Not To Scale

Earth Pressure Diagram Seismic Conditions Wall with Tieback

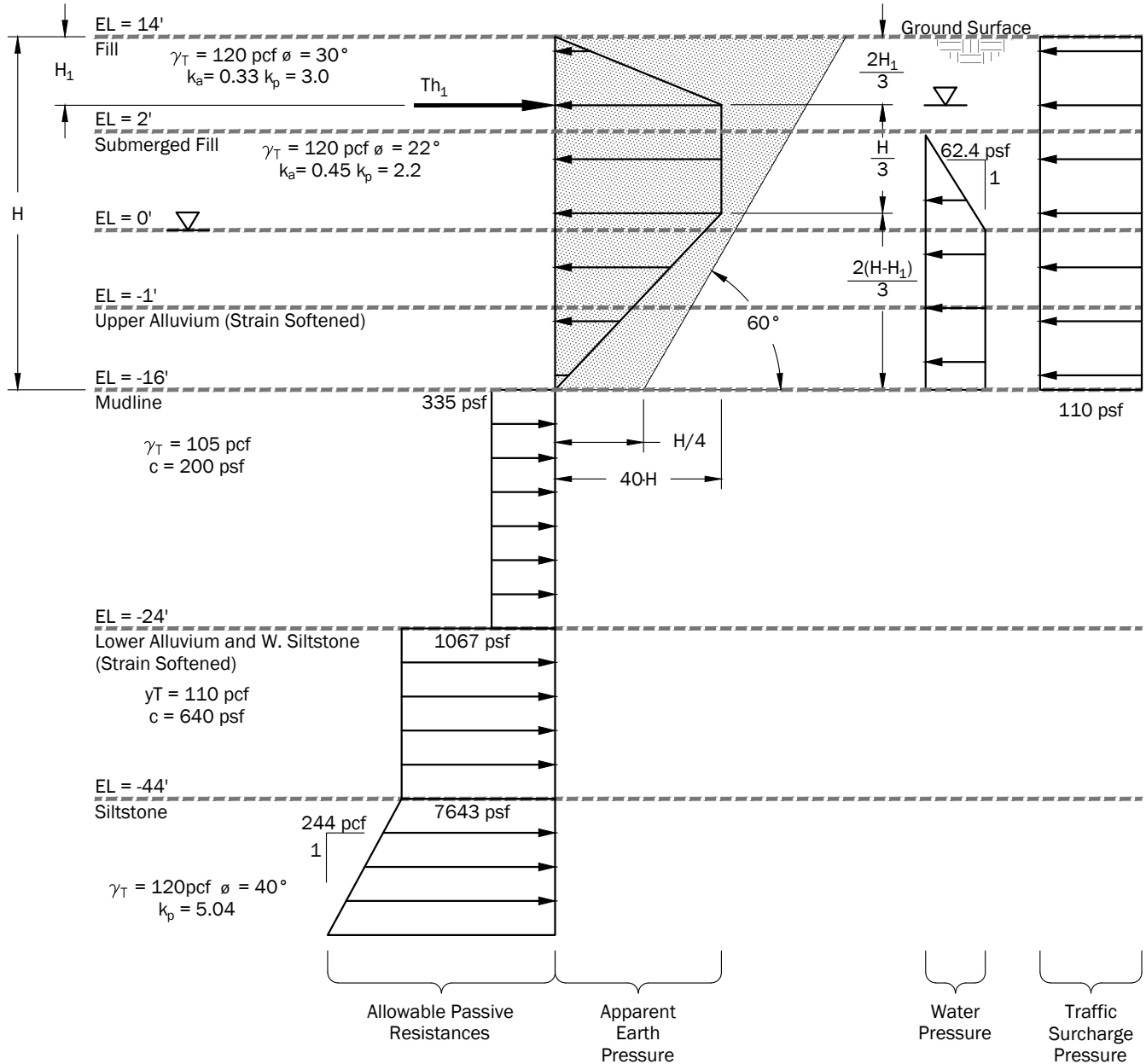
Port Ilwaco Bulkhead Replacement
Ilwaco, Washington
Pacific County

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Figure 7

Post-Seismic Conditions Wall with Tieback

Active Pressures



Legend



No Load Zone

H = Exposed Wall Height

H_1 = Distance from Ground Surface to Upper most Tieback

Th_1 = Horizontal Load in Uppermost Ground Anchor

Not To Scale

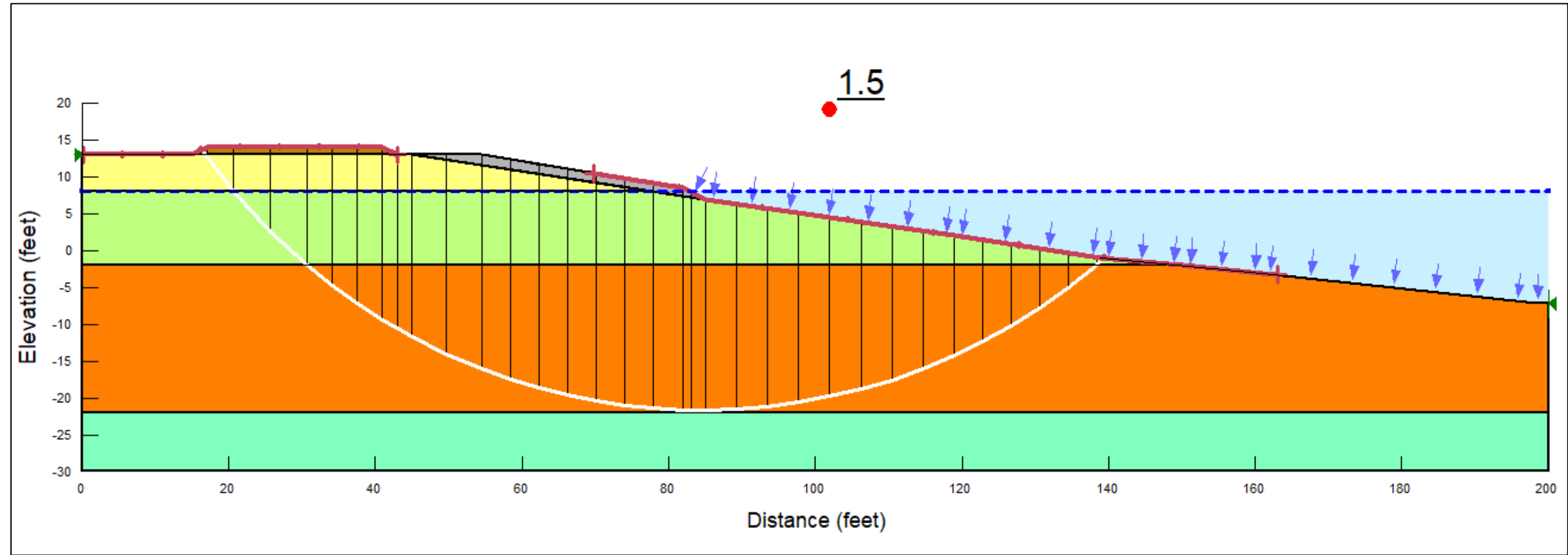
Earth Pressure Diagram

Post-Seismic Conditions Wall with Tieback

Port Ilwaco Bulkhead Replacement
Ilwaco, Washington
Pacific County

GEOENGINEERS

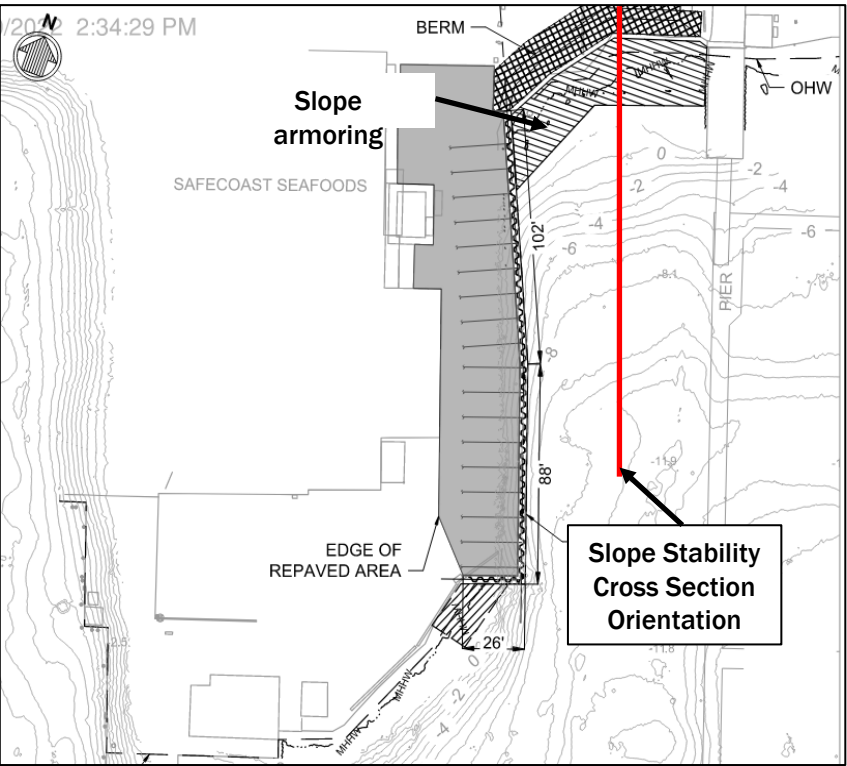
Figure 8



Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Berm	120	0	38
	Fill	120	0	30
	Lower Alluvium	110	800	0
	Lower Fill	120	0	28
	Rip Rap	105	0	48
	Upper Aluvium	105	250	0

Soil Properties Used in Slope Stability Analyses

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.

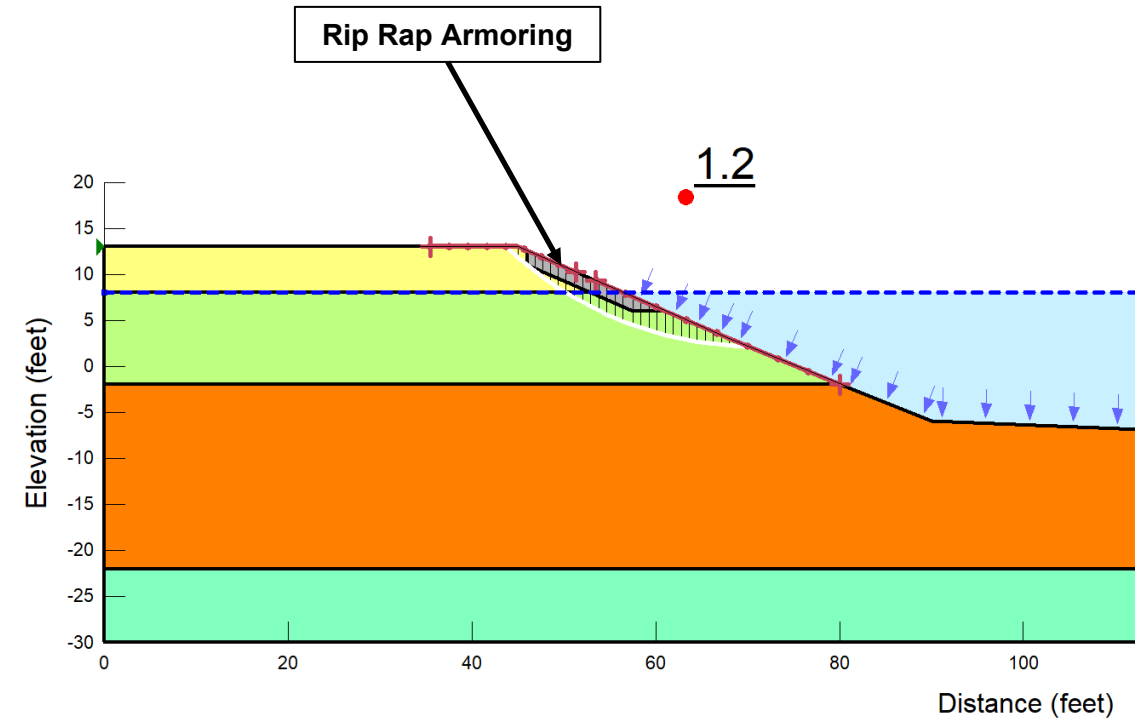
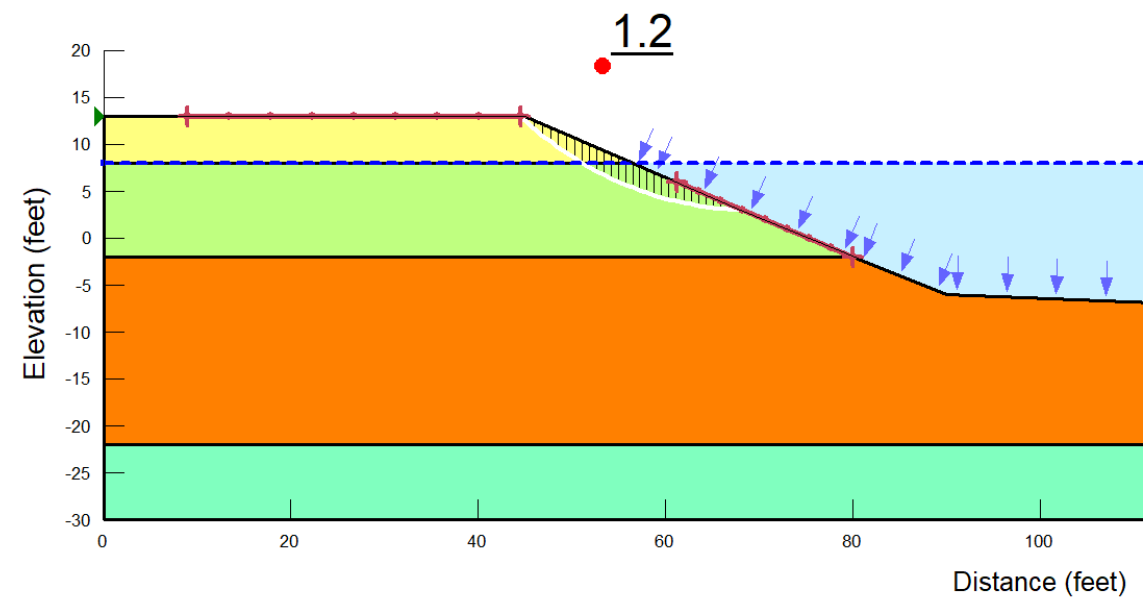


Not to Scale

Slope Stability Analysis Results
Slope Northeast of Bulkhead

Port of Ilwaco Bulkhead Replacement
Ilwaco, Washington

Figure 9

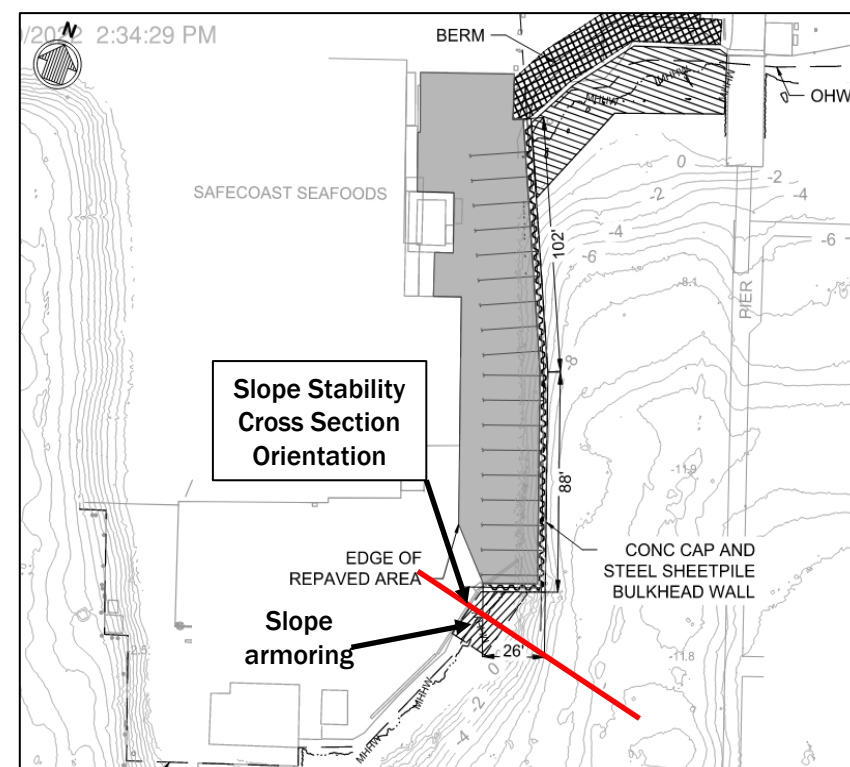


Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Berm	120	0	38
	Fill	120	0	30
	Lower Alluvium	110	800	0
	Lower Fill	120	0	28
	Rip Rap	105	0	48
	Upper Alluvium	105	250	0

Soil Properties Used in Slope Stability Analyses

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.



Not to Scale

Slope Stability Analysis Results
Slope South of Bulkhead

Port of Ilwaco Bulkhead Replacement
Ilwaco, Washington



Figure 10

APPENDIX A

Subsurface Explorations and Laboratory Testing

APPENDIX A

SUBSURFACE EXPLORATIONS AND LABORATORY TESTING

Subsurface Explorations

Soil and groundwater conditions at the site were explored by completing two borings on March 14, 2022 (B-2A) and May 19, 2022. Locations of the explorations are shown on Figure 2, Site Plan. Locations of the explorations were determined in the field using an electronic tablet with global positioning system (GPS) software. The locations and elevations of the explorations should be considered approximate.

During our site explorations on March 14, 2022 and our time on site during March 15, 2022, we used a vacuum truck to attempt an additional 6 boring locations on the wharf. Each boring met refusal, at depths varying from 3 to 4.3 feet, due to undocumented and abandoned utility lines, or large cobbles. Based on the presence of cobbles, the project team decided that continuing to attempt hollow-stem auger drilling within the wharf footprint was not effective. We therefore returned to the site on May 19, 2022 with a sonic drill rig capable of easily advancing through cobbles.

Boring B-1D was performed using a Terrasonic CC150 sonic track drill rig provided and operated by Holt Drilling, Inc. under subcontract to GeoEngineers. Boring B-2A was performed using a Diedrich D70 Turbo Track drill rig provided and operated by Holocene Drilling, Inc. under subcontract to GeoEngineers. Borings were advanced using hollow-stem auger and Sonic drilling methods to nominal depths of approximately 70 (B-2) and 65 (B-1) feet below surrounding grade. Standard Penetration Tests (SPT) were completed using a 1.475-inch inner-diameter split-barrel sampler driven into the soil using a 140-pound hammer free-falling a distance of 30 inches. The number of blows required to drive the sampler the last 12 inches or other indicated distance is recorded on the logs as the blow count. SPTs were advanced at 5-foot intervals. Continuous sonic sampling was also conducted between SPT Samples for B-1).

During the exploration program our field representative obtained soil samples, classified the soils, maintained a detailed log of each exploration, and observed groundwater conditions. Soils were classified visually in general accordance with ASTM International (ASTM) D 2488. Figure A-1 includes a Key to Exploration Logs. Summary logs of the explorations are included as Figures A-2 through A-3, Logs of Borings. The densities noted on the boring exploration logs are based on the blow counts produced in the SPT and our experience and judgment.

Borings were backfilled by the driller in accordance with Washington State Department of Ecology requirements.

Laboratory Test Results

Soil samples obtained from the explorations were retained in sealed plastic bags and transported to the GeoEngineers' laboratory. Representative soil samples were selected for laboratory tests to evaluate pertinent geotechnical engineering characteristics of the soils and refine our field classification, as necessary. The following paragraphs provide a description of the tests performed.

Atterberg Limits Testing

Atterberg Limits were performed on selected samples in general accordance with ASTM Test Method D4318. This test method determines the liquid limit, plastic limit, and plasticity index of soil particles passing the U.S. No. 40 sieve. Results for plastic soils are presented in Figure A-4, Atterberg Limits Test Results. The liquid limit and plasticity index are also presented on the exploration logs at the respective sample depths.

Moisture Content (MC)

The moisture content of selected samples was determined in general accordance with ASTM Test Method D 2216. Test results are presented on the exploration logs at the respective sample depths.

Percent Fines (%F)

Selected samples were “washed” through the U.S. No. 200 sieve to estimate the relative percentages of coarse- and fine-grained particles in the soil. The percent passing value represents the percentage by weight of the sample finer than the U.S. No. 200 sieve (fines). Tests were conducted in general accordance with ASTM D 1140. Test results are presented on the exploration logs at the respective sample depths.

Particle Size Gradation - Sieve Analysis (SA)

Sieve analyses were performed on selected samples in general accordance with ASTM Test Method D 6913. This test method covers the quantitative determination of the distribution of particle sizes in soils. Typically, the distribution of particle sizes larger than 75 micrometers (μm) is determined by sieving. The results of the tests were used to verify field soil classifications. Figures A-23 and A-24 present the results of our sieve analyses.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
		CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

Sampler Symbol Descriptions

	2.4-inch I.D. split barrel / Dames & Moore (D&M)
	Standard Penetration Test (SPT)
	Shelby tube
	Piston
	Direct-Push
	Bulk or grab
	Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS		TYPICAL DESCRIPTIONS
GRAPH	LETTER	
	AC	Asphalt Concrete
	CC	Cement Concrete
	CR	Crushed Rock/Quarry Spalls
	SOD	Sod/Forest Duff
	TS	Topsoil

Groundwater Contact



Measured groundwater level in exploration, well, or piezometer



Measured free product in well or piezometer

Graphic Log Contact



Distinct contact between soil strata



Approximate contact between soil strata

Material Description Contact



Contact between geologic units



Contact between soil of the same geologic unit

Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PL	Point lead test
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
UU	Unconsolidated undrained triaxial compression
VS	Vane shear










Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

Key to Exploration Logs



Figure A-1

Elevation (feet)	Depth (feet)	FIELD DATA				Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Interval	Recovered (in)	Blows/foot	Collected Sample Sample Name Testing						
33		18	3	7		ML	Gray silt (medium stiff, moist) (weathered siltstone)	63 59		Sample observed to crumble into semi-intact pieces of siltstone	
30		18	5								
35		18	7	9							
40		18	26	10		ML	Gray silt (hard, moist) (siltstone)			Siltstone pieces appeared more intact and distinct increase in density/consistency noted	
45		17	84	11							
50		17	86	12							
55		6	50/6"	13							

Log of Boring B-1D (continued)



Project: Port of Ilwaco Marina Structure Replacement
Project Location: Ilwaco, Washington
Project Number: 21551-003-00

Figure A-2
Sheet 2 of 2

Drilled	Start 3/14/2022	End 3/14/2022	Total Depth (ft)	70.5	Logged By Checked By	LSP BEL	Driller	Holocene Drilling, Inc.	Drilling Method	Mud Rotary			
Surface Elevation (ft) Vertical Datum			11 NAVD88		Hammer Data			Autohammer 140 (lbs) / 30 (in) Drop		Drilling Equipment		Track-mounted Diedrich D70 Turbo	
Easting (X) Northing (Y)			745847 374488		System Datum			See "Remarks" section for groundwater observed					
Notes:													

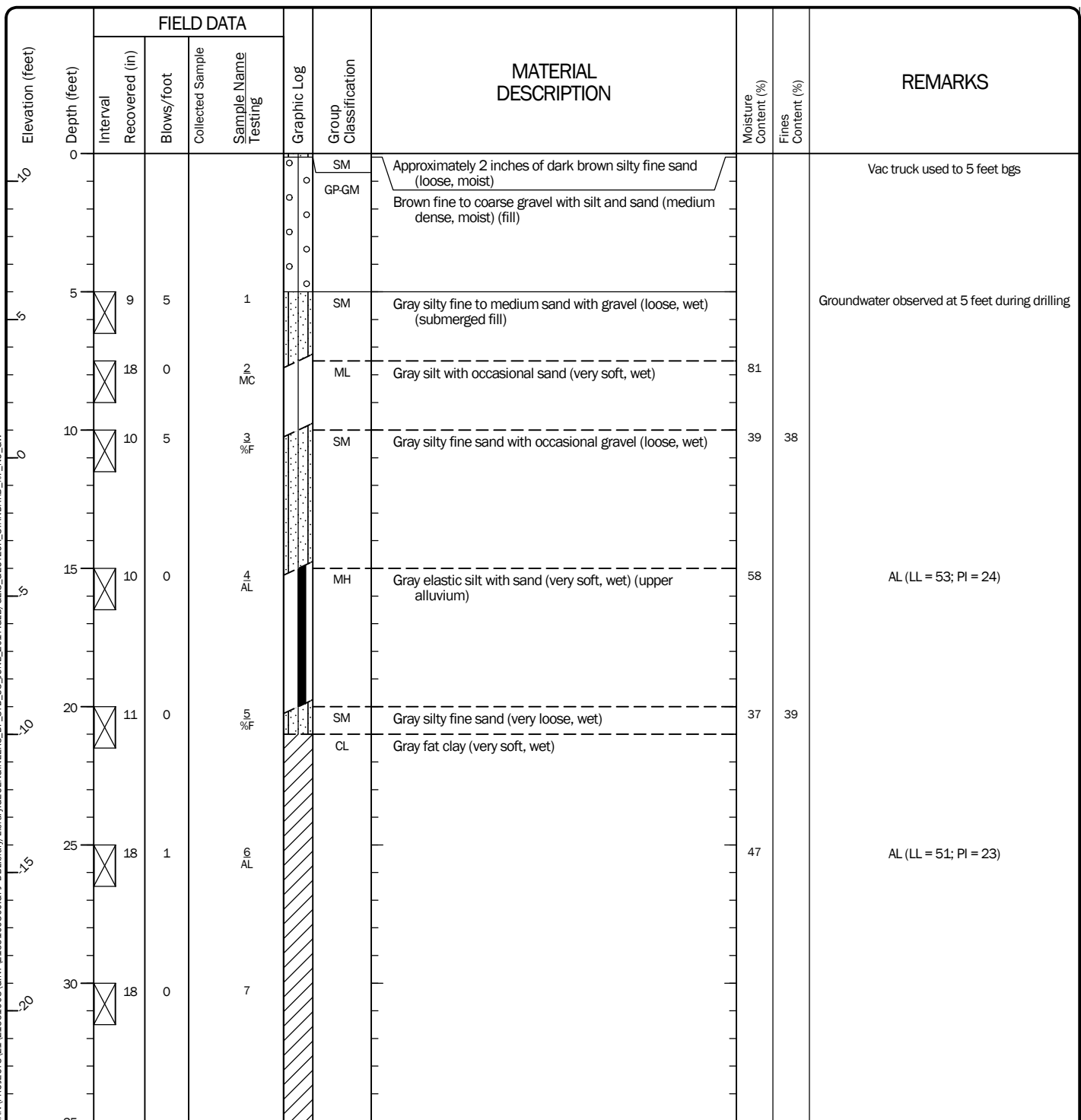
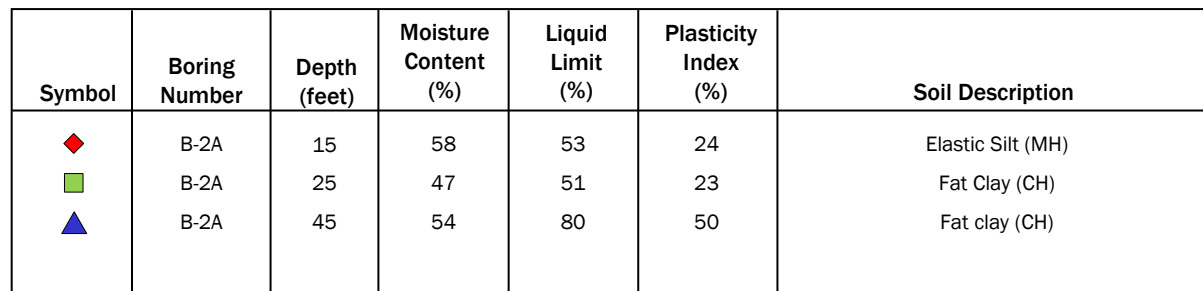


Figure A-3
Sheet 1 of 2



Note: This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc. Test results are applicable only to the specific sample on which they were performed and should not be interpreted as representative of any other samples obtained at other times, depths or locations, or generated by separate operations or processes. The liquid limit and plasticity index were obtained in general accordance with ASTM D 4318. GeoEngineers 17425 NE Union Hill Road Ste 250, Redmond, WA 98052

APPENDIX B

Report Limitations and Guidelines for Use

APPENDIX B

REPORT LIMITATIONS AND GUIDELINES FOR USE¹

This appendix provides information to help you manage your risks with respect to the use of this report.

Read These Provisions Closely

It is important to recognize that the geoscience practices (geotechnical engineering, geology, and environmental science) rely on professional judgment and opinion to a greater extent than other engineering and natural science disciplines, where more precise and/or readily observable data may exist. To help clients better understand how this difference pertains to our services, GeoEngineers includes the following explanatory “limitations” provisions in its reports. Please confer with GeoEngineers if you need to know more how these “Report Limitations and Guidelines for Use” apply to your project or site.

Geotechnical Services are Performed for Specific Purposes, Persons and Projects

This report has been prepared for Moffatt & Nichol and for the Project specifically identified in the report. The information contained herein is not applicable to other sites or projects.

GeoEngineers structures its services to meet the specific needs of its clients. No party other than the party to whom this report is addressed may rely on the product of our services unless we agree to such reliance in advance and in writing. Within the limitations of the agreed scope of services for the Project, and its schedule and budget, our services have been executed in accordance with our Agreement with Moffatt & Nichol dated January 25, 2022 and generally accepted geotechnical practices in this area at the time this report was prepared. We do not authorize, and will not be responsible for, the use of this report for any purposes or projects other than those identified in the report.

A Geotechnical Engineering or Geologic Report is based on a Unique Set of Project-Specific Factors

This report has been prepared for the Port of Ilwaco, Marina Structures Replacement and Dredging, Engineering, and Permitting located in Ilwaco, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, it is important not to rely on this report if it was:

- Not prepared for you,
- Not prepared for your project,
- Not prepared for the specific site explored, or
- Completed before important project changes were made.

¹ Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

For example, changes that can affect the applicability of this report include those that affect:

- The function of the proposed structure;
- Elevation, configuration, location, orientation, or weight of the proposed structure;
- Composition of the design team; or
- Project ownership.

If changes occur after the date of this report, GeoEngineers cannot be responsible for any consequences of such changes in relation to this report unless we have been given the opportunity to review our interpretations and recommendations. Based on that review, we can provide written modifications or confirmation, as appropriate.

Environmental Concerns are Not Covered

Unless environmental services were specifically included in our scope of services, this report does not provide any environmental findings, conclusions, or recommendations, including but not limited to, the likelihood of encountering underground storage tanks or regulated contaminants.

Information Provided by Others

GeoEngineers has relied upon certain data or information provided or compiled by others in the performance of our services. Although we use sources that we reasonably believe to be trustworthy, GeoEngineers cannot warrant or guarantee the accuracy or completeness of information provided or compiled by others.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by man-made events such as construction on or adjacent to the site, new information or technology that becomes available subsequent to the report date, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. If more than a few months have passed since issuance of our report or work product, or if any of the described events may have occurred, please contact GeoEngineers before applying this report for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Geotechnical and Geologic Findings are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies the specific subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied its professional judgment to render an informed opinion about subsurface conditions at other locations. Actual subsurface conditions may differ, sometimes significantly, from the opinions presented in this report. Our report, conclusions and interpretations are not a warranty of the actual subsurface conditions.

Geotechnical Engineering Report Recommendations are Not Final

We have developed the following recommendations based on data gathered from subsurface investigation(s). These investigations sample just a small percentage of a site to create a snapshot of the subsurface conditions elsewhere on the site. Such sampling on its own cannot provide a complete and accurate view of subsurface conditions for the entire site. Therefore, the recommendations included in this report are preliminary and should not be considered final. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for the recommendations in this report if we do not perform construction observation.

We recommend that you allow sufficient monitoring, testing and consultation during construction by GeoEngineers to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes if the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective means of managing the risks associated with unanticipated conditions. If another party performs field observation and confirms our expectations, the other party must take full responsibility for both the observations and recommendations. Please note, however, that another party would lack our project-specific knowledge and resources.

A Geotechnical Engineering or Geologic Report Could Be Subject to Misinterpretation

Misinterpretation of this report by members of the design team or by contractors can result in costly problems. GeoEngineers can help reduce the risks of misinterpretation by conferring with appropriate members of the design team after submitting the report, reviewing pertinent elements of the design team's plans and specifications, participating in pre-bid and preconstruction conferences, and providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. The logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Photographic or electronic reproduction is acceptable, but separating logs from the report can create a risk of misinterpretation.

Give Contractors a Complete Report and Guidance

To help reduce the risk of problems associated with unanticipated subsurface conditions, GeoEngineers recommends giving contractors the complete geotechnical engineering or geologic report, including these "Report Limitations and Guidelines for Use." When providing the report, you should preface it with a clearly written letter of transmittal that:

- Advises contractors that the report was not prepared for purposes of bid development and that its accuracy is limited; and
- Encourages contractors to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer.

Contractors are Responsible for Site Safety on Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and adjacent properties.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants, and no conclusions or inferences should be drawn regarding Biological Pollutants as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria and viruses, and/or any of their byproducts.

A Client that desires these specialized services is advised to obtain them from a consultant who offers services in this specialized field.

PORT OF ILWACO
Marine Structures Replacement
Ilwaco, WA

Appendix D

Condition Assessment Report

November 4, 2020

Port of Ilwaco
165 Howerton Avenue
Ilwaco, WA 98624

Attn: Mr. Guy Glenn, Port Manager

**Subject: Port of Ilwaco Marina Repairs Condition Assessment Letter Report - DRAFT
M&N Project No. 11172**

Mr. Glenn,

Moffatt & Nichol (M&N) conducted an above-water inspection and condition assessment of the Port of Ilwaco Marina on October 15, 2020. This letter report includes: a summary of M&N's scope of work, description of the facilities, inspection methodology, observed conditions, and recommendations.

1. Scope of Work

Moffatt & Nichol (M&N) was retained by the Port of Ilwaco (the Port) to provide a condition assessment of the Travelift Pier, Jessie's Wharf East Bulkhead, and the West Access Pier at the Port of Ilwaco in Ilwaco, Washington. The scope of work included above-water inspection of facilities, perimeter mapping, and preliminary bathymetric measurements. The observations noted in the field were analysed to ascertain a condition assessment rating for the structures and determine repair or replacement recommendations.

2. Facility Description

The Port of Ilwaco is located in Ilwaco, WA on the north bank of Baker Bay, immediately east of the mouth of the Columbia River. The Port area generally consists of a marina used for year-round moorage of recreational and commercial fishing vessels, upland commercial buildings and a boatyard. The boatyard is located at the northwest end of the marina and includes the Travelift Pier. The Travelift Pier was constructed in the late 1970's and primarily consists of concrete structural components and is used to haul-out large vessels. The Travelift equipment currently in use at the facility has a 50-ton capacity. Several commercial buildings, including the Jessie's Ilwaco Fish Co. building, are located along the length of the marina's northern shoreline. The buildings associated with Jessie's are located east of the boatyard and Travelift Pier. The Jessie's Ilwaco Fish Co. buildings are located on an earth-filled and timber pile supported wharf structure and includes a timber bulkhead along the eastern limits of the wharf. The timber pile supported wharf structure along the west side of the Jessie property is not included as part of this condition assessment.

The marina is accessed from the shoreline by four timber access piers. The West Access Pier is one of the main entry points for the marina for both pedestrians and utilities. The general arrangement of the Port and the facilities inspected is shown in Figure 1.



Figure 1: Port of Ilwaco General Arrangement

3. Inspection Methodology

The above-water inspection methodology was based on the ASCE Manuals and Reports on Engineering Practice Number 130, "Waterfront Facilities Inspection and Assessment", 2015 Edition (ASCE 130). ASCE 130 describes the types of inspections and specific structure considerations depending on objectives, frequency of inspection and the level of damage.

Three basic levels of inspection are used for inspecting waterfront facilities. The type and extent of damage/deterioration that can be detected depends on the level of inspection performed. The following general descriptions for Levels I through III comply with ASCE 130. This inspection included a Level I inspection of timber piling. Level II inspections were not necessary as marine growth was not required to be removed for visual or tactile inspection. Level III inspections are typically not performed unless the findings of a Level I or Level II inspection indicate that the components being inspected may have additional damage or deterioration not readily quantifiable from a tactile inspection. A Level III inspection was performed above-water on select timber elements suspected of having internal decay and that were not readily identifiable as being in major or severe condition.

Level I - Visual and tactile inspection of components without the removal of marine growth. This level of inspection generally serves as a confirmation of as-built conditions and detects obvious damage or deterioration to the structure.

Level II - Partial marine growth removal of a statistically representative sample – for piling, this is typically 10 percent of the visually inspected piles, or roughly 1 in every 10 piles. The procedure requires that removal occur at three distinct bands for a distance of 1 foot at each band. The bands are located near the mudline, at mid-depth, and near the waterline. This level of inspection is intended to detect and identify damage and deterioration that may be hidden by surface biofouling.

Level III - Non-destructive testing (NDT) or partially destructive testing (PDT) of a statistically representative sample. These procedures are conducted to detect any hidden internal damage or deterioration. For the purpose of this inspection, suspect above water components were drilled (PDT) to determine the presence and extent of internal rot. The drilled hole was then filled with a treated dowel to prevent water and insect entry.

The field inspection consisted of observing the structural elements of the Travelift pier and the east bulkhead of Jessie's wharf. The inspection also included observing the shoreline, slope protection, and gathering preliminary bathymetric and perimeter mapping data for use in conceptual design development. Photographs of typical components and conditions as well as deteriorated components and conditions were taken.

The above-water visual and tactile inspection of accessible above-water components was conducted on October 15, 2020. The above-water inspection included an inspection of the following:

Travelift - The above-water, above-deck, and under-deck inspection of the Travelift pier included inspection of the piles, pile caps, concrete deck, handrails, abutment, and the adjacent shoreline. Concrete surfaces of the Travelift Pier were sounded with a hammer in areas of damage and suspected deterioration.

Jessie's Wharf East Bulkhead - The above-water and above-deck inspection of the east bulkhead included an inspection of the timber piles, timber lagging, timber walers, and accessible portions of the steel-cable tiebacks. A hammer was used to sound the timber components. Suspect components were drilled to determine the presence and extent of internal rot. The drilled hole was then filled with a treated dowel to prevent water and insect entry.

West Access Pier - The above-water, above-deck, and under-deck inspection of the access pier included the above water portions of the piles, pile caps, stringers, cross-bracing, decking, and handrails. A hammer was used to sound the timber components. Suspect components were drilled to determine the presence and extent of internal rot. The drilled hole was then filled with a treated dowel to prevent water and insect entry.

November 4, 2020

The water level at the time of the inspection, as observed at the Cape Disappointment, WA Tide Station (NOAA Station ID: 9440581) was approximately +3.0-feet in the morning, rising to +7.9-feet mid-day, and then dropping to +2.4-feet in the afternoon. The water levels noted are relative to the mean low lower water vertical datum.

4. Observations

4.1. TraveLift Pier

The TraveLift Pier consists of prestressed-concrete piles, a steel H-pile, reinforced concrete runway beams, a reinforced-concrete abutment, and steel handrails along the outer perimeter of the runway beams. A timber catwalk is located at approximately mid-length of the runway beams and consists of timber stringers, and decking. Timber-pile dolphins are located at the southern end of each runway. The adjacent shoreline consists of various sized rock armouring. The general arrangement of the TraveLift Pier is shown in Photograph 1.



Photograph 1: TraveLift Pier

4.1.1. Piles

The Travelift Pier is supported by 27 prestressed-concrete piles and one steel H-pile. The concrete piles measure 12-inches square, and the H-pile is assumed to be a HP12.

No damage or deterioration is reported for 15 of the 27 concrete piles (56%). These piles visually appear sound with no cracking, delaminations, or spalling. Photograph 2 shows a typical concrete pile.

Minor to moderate damage, including cracks up to 1/16th inch wide, is present on 12 of the 27 concrete pile (44%). Photograph 3 shows a concrete pile with typical cracking approximately 10-inches below the runway beam soffit.

Four of the 27 concrete piles (15%) have corner spalls on the upper corners. The spalls have all been previously repaired and are believed to be from the original construction. Photograph 4 shows a typical observed corner spall with repair mortar.

The steel H-Pile exhibits moderate corrosion over the entire surface area above water. The corrosion does not appear to have resulted in measurable section loss. Photograph 6 shows the steel H-Pile.



Photograph 2: Typical Concrete Piles



Photograph 3: Moderate Cracking on Pile 2:A



Photograph 4: Corner Spall Repair on Pile 1:A



Photograph 5: Corner Spall Repair on Pile 2:A



Photograph 6: Steel H-Pile at Bent 5:A

4.1.2. Runway Beams

The runway beams span across the top of the piles functioning as a both a pile cap and a travel path for each side of the lift during operation. The beams measure 20-inches deep and 42-inches wide consisting of reinforced concrete. The upper inside corner of the beams has a steel angle iron wheel guide/kick plate. The beams also support steel handrails, a timber catwalk spanning between the beams and a timber walkway cantilevered off the outside of the beams near the southern ends. A topside view of the runway beams is shown in Photograph 7.



Photograph 7: Runway Beams from Atop Bent 1:A

Minor vertical hairline cracks measuring one-inch to nine-inches long are present along the full length of the beams. These hairline cracks are along the connection interface between the beam and the wheel guide/kick plate. Photograph 8 and Photograph 9 show typical examples of the hairline cracks.

One major crack is present on the southwest corner of the east runway beam. The crack is at a handrail post connection which appears to have been impacted during operation but does not affect the capacity of the structure.



Photograph 8: Typical Cracking Beneath Wheel Guide/Kick Plate



Photograph 9: Typical Cracking and Rust Staining

4.1.3. Abutment

A reinforced concrete abutment is located immediately north of the runway beams at the landside connection. A typical section of the abutment from the available as-built drawings is shown in Figure 2 below. In general, no damage or deterioration was observed on the concrete elements of the abutment, however, the concrete abutment shows signs of localized settlement. The top of the concrete abutment is approximately two-inches lower than the top of the adjacent runway beam surface. Wood wedges with a steel covering have been placed at the transition to compensate for the height difference.

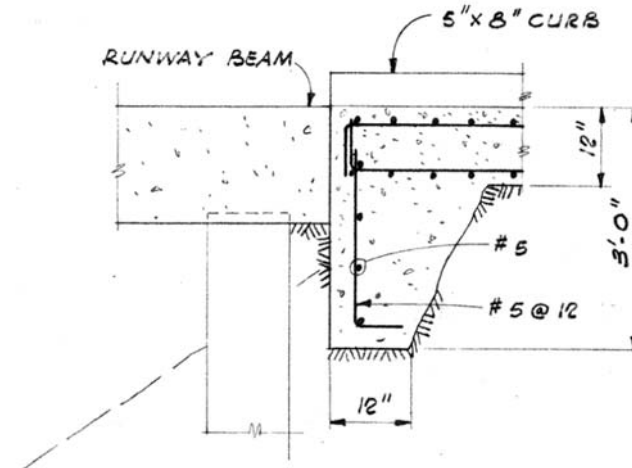


Figure 2: TravelLift Pier Abutment

4.1.4. Handrails

Galvanized steel handrails are located along the outer perimeter of the runway beams. The handrails consist of steel posts at six-foot spacing with top rails, mid rails, and toe plates. The handrail posts are attached to the runway beams with base plates and anchor bolts. Minor corrosion is present on isolated portions of the handrail. Photograph 10 shows the typical condition of the handrails.



Photograph 10: Typical Handrail with Minor Corrosion

4.1.5. Catwalk

A timber catwalk, oriented perpendicular to the runway beams, is located at approximately mid-length of the runways. The catwalk consists of pressure treated timber stringers and timber decking. The stringers are connected to the runway beams with steel brackets and anchor bolts. The minor checking and weathering of the timber elements is present. Photograph 11 shows the typical condition of the catwalk.



Photograph 11: Timber Catwalk

4.1.6. Dolphins

Two timber dolphins, each consisting of three creosote-treated batter piles, are located at the southern end of each runway. Minor damage, including checking and splitting is present. The east timber dolphin is shown Photograph 12.



Photograph 12: Typical Timber Pile Dolphin

4.1.7. Shoreline and Slope Protection

The shoreline immediately adjacent to the TraveLift Pier consists of mix-sized riprap and sparse vegetation. Evidence of erosion of the slope is present, most notable beneath the concrete vault located between the runway beam. Loss of material is estimated to be approximately one-foot thick, over an area of 1,000 square feet. The inconsistency of riprap size along the shoreline suggests that material has moved or been displaced since the original construction. This is further evident with the difference in elevation between the abutment and the runway beams, discussed previously. Photograph 13 and Photograph 14 show the typical condition of the shoreline. Photograph 15 shows the erosion below the concrete vault.



Photograph 13: Shoreline West of TraveLift Pier



Photograph 14: Shoreline East of Travelift Pier



Photograph 15: Erosion Evident Below Concrete Vault

4.1.8. Preliminary Bathymetry

Water depth measurements were taken along the length of the two runway structures using a handheld digital depth sounder at each of the pile locations. Measurements were corrected for tides and summarized in Table 1.

Table 1: TraveLift Preliminary Bathymetry

West Runway		East Runway	
Location (Pile Bent:Pile Row)	Mudline Elevation (ft, MLLW)	Location (Pile Bent:Pile Row)	Mudline Elevation (ft, MLLW)
2:A	+4.0	2:G	+5.0
3:A	-0.6	3:G	-0.6
4:A	-3.3	4:G	-2.2
5:A	-3.8	5:G	-4.1
6:A	-5.3	6:G	-4.1
7:A (West Dolphin)	-5.1	7:G (East Dolphin)	-4.1

4.2. Jessie's Wharf East Bulkhead

The East Bulkhead consists of creosote treated timber piles, lagging and walers. Wire strand tiebacks connected to the timber waler are presumed to connect to buried deadman in the upland area. Three steel pipe piles are located along the face of the bulkhead and are assumed to be used for mooring of vessels. The adjacent northern shoreline consists of a vegetated slope and a timber pile bulkhead retaining structure. The shoreline south of the East Bulkhead consists of various sized rocks and concrete debris. Timber pile stubs are located south of the southern shoreline. The general arrangement of the East Bulkhead is shown in Photograph 16.



Photograph 16: Jessie's Wharf East Bulkhead

4.2.1. Piles

Minor damage, including checking and splitting less than ½-inch wide is present on all of the East Bulkhead timber piling. Moderate to major rot is present in the upper 12-inches of 26 of the 118 timber piling (22-percent). Severe damage and deterioration, including section loss greater than 50-percent and missing or broken piling is present on 18 of the 118 timber piling (15-percent). Photograph 17 shows several of the piles with severe damage.



Photograph 17: East Bulkhead Piles

Minor damage, including checking and splitting less than ½-inch wide is present on all of the North Bulkhead timber piling that were visible at the time of inspection. The northern bulkhead is shown in Photograph 18.



Photograph 18: North Bulkhead Piles (Water Level Approx. +6.3-feet MLLW)

4.2.2. Lagging, Walers, and Tiebacks

4.2.2.1. East Bulkhead

Minor damage, including checking and splitting is present throughout the lagging and waler members. Additionally, moderate to severe deterioration of the lagging, including section loss, and breakage is present. The deterioration has led to gaps between adjacent lagging members, measuring up to several inches wide and allows for loss of backfill material. This loss of material has led to subsidence of the upland area. The East Bulkhead lagging, walers, and tieback strands are shown in Photograph 19 through Photograph 21.



Photograph 19: East Bulkhead Lagging



Photograph 20: East Bulkhead Waler



Photograph 21: East Bulkhead Tieback Strands

4.2.2.2. North Bulkhead

The North Bulkhead lagging consists of timber piles laid horizontally behind the vertical bulkhead piles. The lagging measures approximately 14-inches in diameter. Minor damage, including checking and splitting is present. The north bulkhead lagging is shown in Photograph 22.



Photograph 22: North Bulkhead Lagging

4.2.3. Shoreline and Slope Protection

The shoreline immediately south of the East Bulkhead consists of mix-sized riprap, broken concrete debris and sparse vegetation. No evidence of advanced erosion or sloughing is present, however, the inconsistency of riprap size suggests that some material may have moved or been displaced since the original construction of the shoreline. Photograph 23 shows the typical condition of the south shoreline.



Photograph 23: East Bulkhead South Shoreline

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The shoreline northeast of the East Bulkhead and adjacent to the North Bulkhead consists of a vegetated slope and timber debris. No evidence of advanced erosion or sloughing is present. Photograph 24 show the typical condition of the north shoreline.



Photograph 24: North Bulkhead Shoreline, Looking Northwest

4.2.4. Preliminary Bathymetry

Water depth measurements were taken along the length of the structure using a handheld digital depth sounder at approximate 10-foot intervals along three transects, with Station 0+00 being the northern corner of the bulkhead. Transects were located along the face of the bulkhead, 15-foot offset, and 30-foot offset from the bulkhead face. The measurements were corrected for tides and mudline elevations along the transects summarized in Table 2.

Table 2: East Bulkhead Preliminary Bathymetry

Station	Mudline Elevation (ft, MLLW)		
	Transect 1 (Face of Bulkhead)	Transect 2 (15ft Offset)	Transect 3 (30ft Offset)
0+00	7.0	4.5	2.0
0+10	4.1	2.6	0.8
0+20	1.9	0.3	-0.2
0+30	0.4	-1.7	-3.4
0+40	-0.7	-4.2	-5.2
0+50	-1.0	-4.9	-7.2
0+60	-9.2	-6.1	-8.3
0+70	-1.4	-5.5	-8.7
0+80	-1.9	-7.5	-8.7
0+90	-2.8	-7.5	-8.6
1+00	-2.9	-9.1	-9.0
1+10	-4.0	-9.0	-10.2
1+20	-3.6	-9.6	-10.2
1+30	-6.4	-9.4	-9.7
1+40	-3.8	-9.6	-9.8
1+50	-3.7	-9.0	-10.4
1+60	-2.8	-8.8	-10.4
1+70 (End of Timber Wall)	0.9	-4.9	-10.3

4.2.5. Upland Area

The upland area of the East Bulkhead consists of a paved driving surface used for accessing portions of the Jessie's Fish Co. building. The pavement is generally free of damage or significant deterioration, however, the pavement appears to have localized areas of subsidence adjacent to the bulkhead. Photograph 25 shows the typical condition of the upland area.



Photograph 25: East Bulkhead Upland

4.3. West Access Pier

The West Access Pier consists of treated timber components including piles, pile caps, stringers, cross bracing, and decking. A concrete abutment connects the pier to the upland area. Water and electrical utilities which service the marina are supported along the pier and transition onto an aluminium gangway. The adjacent shoreline consists of a vegetated slope. Photograph 26 shows an elevation view of the West Access Pier.



Photograph 26: West Access Pier, Looking Northeast (Water Level Approx. +6.3-feet MLLW)

4.3.1. Piles

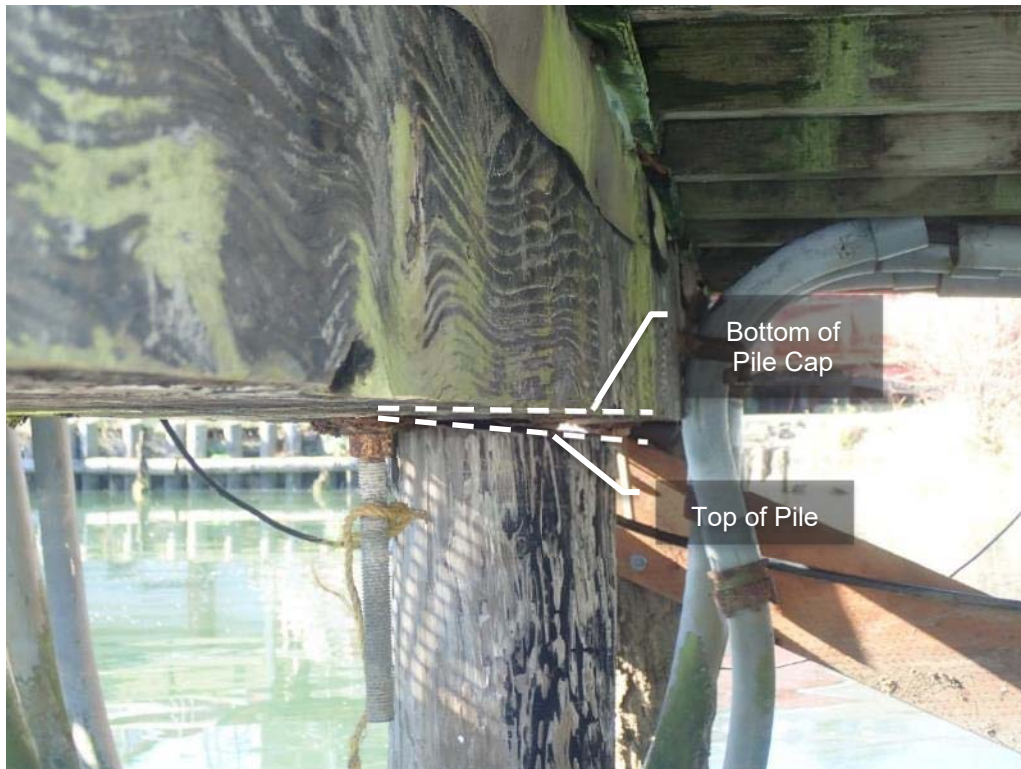
The West Access Pier is supported by nine creosote treated timber piles. The timber pile diameter is nominally 14-inches.

Major damage including diameter loss greater than 15-percent as a result of delamination of the outer shell and piles partially supporting the pile cap was observed on eight of the nine timber piles (89-percent). Photograph 27 shows diameter loss of Pile 3:A. Photograph 28 shows Pile 4:B partially supporting the pile cap.

Severe damage was observed on one of the nine timber piles (11-percent). Photograph 29 shows Pile 4:C with severe cross-section area loss.



Photograph 27: West Access Pier Typical Timber Pile with Shell Delamination



Photograph 28: West Access Pier Timber Pile 4:B, Partially Non-Bearing



Photograph 29: West Access Pier Timber Pile 4:C with Severe Section Loss

4.3.2. Pile Caps

The West Access Pier pile caps are creosote treated 12x12 timber members. Typically, there is no damage or deterioration of the pile caps. Photograph 30 shows a typical pile cap.



Photograph 30: West Access Pier Timber Pile Cap

4.3.3. Abutment

A reinforced concrete abutment provides a transition to the landside area of the West Access Pier. In general, no damage or deterioration was observed on the concrete elements of the abutment, and no signs of localized settlement or erosion are present. Photograph 31 shows the typical condition of the abutment.



Photograph 31: West Access Pier Abutment

4.3.4. Stringers

The stringers are pressure treated 4x12 timber members at 16-inch spacing. The stringers are double span, and lapped at the pile caps with toenail connections to the pile cap. The pile caps exhibit no damage or deterioration. Photograph 32 shows the typical condition of the stringers at Bent 3.



Photograph 32: West Access Pier Timber Stringers

4.3.5. Cross Bracing

The timber cross bracing for the West Access Pier is pressure treated 2x12 members positioned longitudinally along Row A and Row C and transversely along Bent 3 and Bent 4. The bracing exhibits no damage or deterioration. Photograph 33 shows the typical condition of the cross bracing.



Photograph 33: West Access Pier Timber Cross Bracing

4.3.6. Decking

The timber decking for the West Access Pier is comprised of 3x12 timbers oriented 90-degrees to the stringers. The decking typically has no damage or deterioration. Photograph 34 shows the typical condition of the decking.



Photograph 34: West Access Pier Timber Decking

4.3.7. Handrail

Timber handrails are located along the outer perimeter of the West Access Pier and consist of timber posts, top rails, and mid rails. The handrail posts are attached to the stringers with lag bolts. No damage or deterioration is present. Photograph 35 shows the typical condition of the handrails.



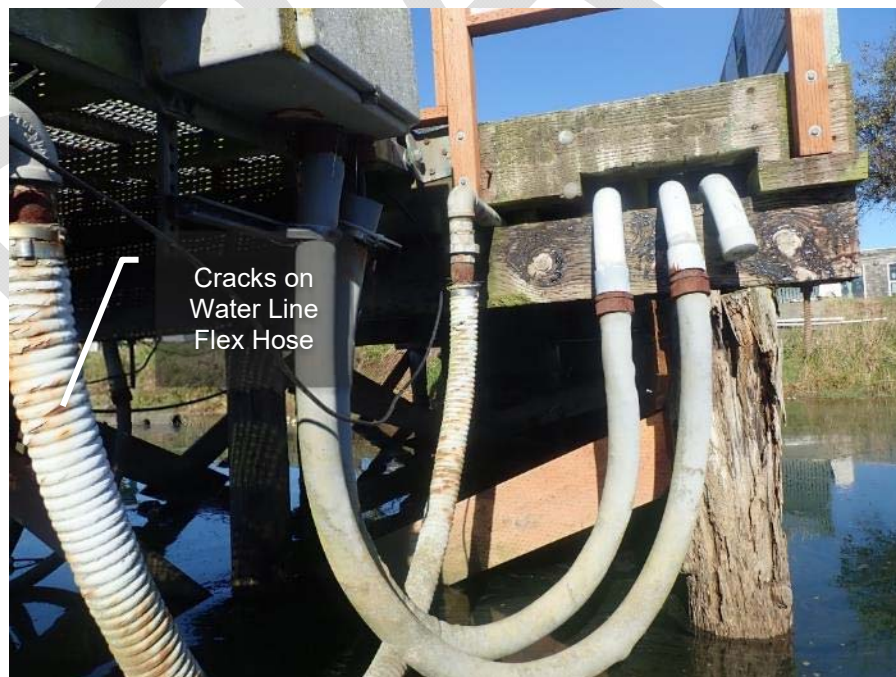
Photograph 35: Typical Handrail

4.3.8. Utilities

Utility conduit and piping for electrical and water systems are hung from the West Access Pier and transition onto an aluminium gangway. The electrical flex connection on the east side of the gangway has separated from the junction box and the water line flex hose is cracked near the southeast corner of the pier. Photograph 36 and Photograph 37 show the typical condition of the utilities.



Photograph 36: West Access Pier Electrical Utilities



Photograph 37: West Access Pier Water Flex Hose

4.3.9. Shoreline and Slope Protection

The shoreline east and west of the West Access Pier consists of vegetated slopes and small timber debris. No evidence of advanced erosion or sloughing is present. Photograph 38 and Photograph 39 show the typical condition of the shoreline.



Photograph 38: West Access Pier East Shoreline, Looking East



Photograph 39: West Access Pier West Shoreline, Looking East

4.3.10. Preliminary Bathymetry

Water depth measurements were taken along the length of the structure using a handheld digital depth sounder at each of the pile locations. Measurements were corrected for tides and summarized in Table 3.

Table 3: West Access Pier Preliminary Bathymetry

West		East	
Location (Pile Bent:Pile Row)	Mudline Elevation (ft, MLLW)	Location (Pile Bent:Pile Row)	Mudline Elevation (ft, MLLW)
2:A	5.3	2:C	5.9
3:A	3.3	3:C	3.3
4:A	1.2	4:C	-1.1

5. Recommendations & Closing

An overall Condition Assessment Rating (CAR) is assigned to the three facilities. The CARs are based on the findings of the visual observations. The condition assessment scale includes the following six categories: Good, Satisfactory, Fair, Poor, Serious, and Critical. The six CARs and descriptions are provided as an attachment to this report.

5.1. Travelift Pier

The Travelift Pier is rated as “Fair”. All primary structural elements are sound; but minor to moderate defects and deterioration are observed. Localized areas of moderate deterioration are present but do not significantly reduce the structural capacity. The localized deterioration is affecting the concrete apron structure and does not affect the structural capacity of the Travelift itself. The following repairs are recommended:

- Install shoreline protection along the shoreline
- Restore fill supporting the concrete vault

5.2. Jessie’s Wharf East Bulkhead

The East Bulkhead is rated as “Serious”. Advanced deterioration and breakage have affected the load-bearing capacity of the bulkhead. Additionally, the bulkhead experiences overtopping during extreme storm and tidal events. Due to the extent and nature of the deterioration, as well as overtopping of the bulkhead, it is assumed that repairing the structure in-kind is cost prohibitive, therefore, alternatives for replacement of the bulkhead should be evaluated.

5.3. West Access Pier

The West Access Pier is rated as “Serious”. Advanced deterioration of the timber piling has affected the load bearing capacity of the pier. The following repairs are recommended:

- Install structural pile jackets on all piles (nine total)
- Restore Piles 4:B and Pile 3:C to full bearing, and install steel straps to secure to pile cap
- Repair broken electrical fittings
- Replace cracked water flex hose

Thank you for the opportunity to work with you on this project. If you have any questions or need any further information, please do not hesitate to contact me.

Sincerely,



Aaron Patterson, PE
Inspection Team Leader



Attachments:

- Attachment A - Component Rating System
- Attachment B - Condition Assessment Ratings

Attachment A - Component Damage Rating System

Individual components were categorized into six damage ratings based on the observations and the component damage rating descriptions per ASCE 130¹. Each component rating is defined in Table A-1.

Table A-1: Component condition rating descriptions

DAMAGE RATING	DESCRIPTION
Not Inspected (NI)	Component was inaccessible or not included in the scope.
No Damage (ND)	Component had a sound material surface.
Minor (MN)	<p><i>Timber:</i> Checks, splits, and gouges less than 0.5 inches wide.</p> <p><i>Steel:</i> Less than 50% of perimeter or circumference affected by corrosion at any elevation or cross-section; loss of thickness up to 15% of nominal thickness at any location.</p> <p><i>Reinforced Concrete:</i> Mechanical abrasion or impact dents; general cracks up to 1/16-inch wide; occasional corrosion stain or small pop-out corrosion spall.</p> <p><i>Prestressed Concrete:</i> Minor mechanical or impact spalls up to 1/2-inch deep.</p>
Moderate (MD)	<p><i>Timber:</i> Checks and splits greater than 0.5 inches wide; diameter loss up to 15%; cross-section area loss up to 25%; corroded hardware; marine borer infestation.</p> <p><i>Steel:</i> Greater than 50% of surface at any elevation/cross-section affected by corrosion; 15% to 30% loss of nominal thickness at any location.</p> <p><i>Reinforced Concrete:</i> Structural cracks up to 1/16-inch wide; corrosion cracks up to 1/4-inch wide; chemical deterioration; random cracks up to 1/16-inch wide; soft concrete and rounding corners up to 1-inch deep; frequent corrosion stain or medium pop-out corrosion spall.</p> <p><i>Prestressed Concrete:</i> Structural cracks up to 1/32-inch in width; Chemical deterioration: random cracks up to 1/32-inch in width.</p>
Major (MJ)	<p><i>Timber:</i> Checks and splits through full depth of cross-section; diameter loss 15% to 30%; cross-section loss 25% to 50%; heavily corroded hardware; displacement, misalignments at connections.</p> <p><i>Steel:</i> Partial loss of flange edges or visible reduction of wall thickness; 30% to 50% loss of nominal thickness, any location.</p> <p><i>Reinforced Concrete:</i> Structural cracks 1/16-inch to 1/4-inch wide; partial breakage (spalls); corrosion cracks greater than 1/4-inch wide; multiple cracking and disintegration of surface due to chemical deterioration.</p> <p><i>Prestressed Concrete:</i> Structural cracks 1/32-inch to 1/8-inch in width; Any corrosion cracks generated by strands or cables; Chemical deterioration: cracks wider than 1/8-inch; "Softening" of concrete up to 1-inch deep.</p>
Severe (SV)	<i>Timber:</i> Diameter loss greater than 30%; cross-section area loss greater than 50%; loss of connections and/or fully non-bearing; partial or complete breakage.

¹ Damage Rating Descriptions from ASCE Manuals and Reports on Engineering Practice Number 130, "Waterfront Facilities Inspection and Assessment" (ASCE 130), Table 2-4, Table 2-5, Table 2-6, and Table 2-7.

DAMAGE RATING	DESCRIPTION
	<i>Steel:</i> Structural bends or buckling, breakage and displacement at supports, loose or lost connections; greater than 50% loss of nominal thickness, any location.
	<i>Reinforced Concrete:</i> Structural cracks greater than 1/4-inch wide; breakage; loss of bearing and displacement at connections; reinforcing steel w/cover loss and greater than 30% diameter loss for any main bar; exposed steel due to chemical deterioration; cross section loss greater than 30% of any component for any reason.
	<i>Prestressed Concrete:</i> Structural cracks wider than 1/8-inch and at least partial breakage or loss of bearing; Corrosion spalls over any prestressing steel; Partial spalling and loss of cross section due to chemical deterioration.

Attachment B – Condition Assessment Ratings

Overall Condition Assessment Ratings (CAR), as defined by ASCE 130², are assigned to each structure and primary component. The CARs are based on the findings of the visual and tactile observations. The condition assessment scale includes the six categories described in Table B-1.

Table B-1: Condition Assessment Rating Descriptions

CAR	DESCRIPTION
"Good"	No visible damage or only minor damage noted. Structural elements may show very minor deterioration, but no overstressing observed. <i>No repairs are required.</i>
"Satisfactory"	Limited minor to moderate defects or deterioration observed but no overstressing observed. <i>No repairs are required.</i>
"Fair"	All primary structural elements are sound but minor to moderate defects or deterioration observed. Localized areas of moderate to advanced deterioration may be present but do not significantly reduce the loadbearing capacity of the structure. <i>Repairs are recommended, but the priority of the recommended repairs is low.</i>
"Poor"	Advanced deterioration or overstressing observed on widespread portions of the structure but does not significantly reduce the load-bearing capacity of the structure. <i>Repairs may need to be carried out with moderate urgency.</i>
"Serious"	Advanced deterioration, overstressing, or breakage may have significantly affected the load-bearing capacity of primary structural components. Local failures are possible and loading restrictions may be necessary. <i>Repairs may need to be carried out on a high-priority basis with urgency.</i>
"Critical"	Very advanced deterioration, overstressing, or breakage has resulted in localized failure(s) of primary structural components. More widespread failures are possible or likely to occur, and load restrictions should be implemented as necessary. <i>Repairs may need to be carried out on a very high-priority basis with strong urgency.</i>

² CAR Descriptions from ASCE Manuals and Reports on Engineering Practice Number 130, "Waterfront Facilities Inspection and Assessment" (ASCE 130), Table 2-14