Critical Areas Report
and Habitat Management Plan
for
Port of Kalama
Marina Renovation
Kalama, Washington

Prepared for:
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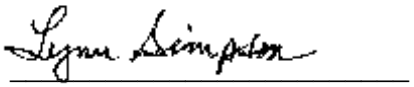
August 18, 2016

SIGNATURE

The information and data in this report were compiled and prepared under the supervision and direction of the undersigned.



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CRITICAL AREAS REPORT

On behalf of the Port of Kalama, Ecological Land Services, Inc. (ELS) has completed this critical areas report addressing fish and wildlife habitat conservation areas as a component of the critical areas report permitting process to renovate the existing marina on Port of Kalama property. A habitat management plan (HMP) is also required, and it is included in this document.

KMC 15.02.130(F) requires that an HMP be prepared by a qualified professional. Ms. Simpson meets the requirements of a qualified professional by education and experience. She has a B.A. in Geography/Environmental Studies and a B.S. in Chemistry, and she has worked for ELS for over 13 years as an Environmental Scientist. She has been certified by the Washington Department of Transportation as a senior writer of biological assessments for Endangered Species Act (ESA) consultation. Ms. Simpson has written numerous NEPA and SEPA documents, as well as mitigation plans for projects with wetland and stream impacts.

ELS biologists conducted a site visit with Port and agency personnel on January 20, 2016 to observe existing site conditions. Also present were Melody White with the U.S. Army Corps of Engineers (Corps), Shandra O'Haleck with the National Fisheries Management Service (NMFS) and Steve West with Washington Department of Fish and Wildlife (WDFW).

KMC 15.02.130(F) also requires that this plan be sent with the SEPA checklist to WDFW and to "other appropriate state and federal agencies for comment". This plan will be sent to WDFW, although they do not require it to issue a hydraulic project approval. The Corps is the federal agency issuing a permit, and it is required to consult with NMFS and U.S. Fish and Wildlife Service under the ESA. ESA consultation does not include state-listed species that are not federally listed, proposed, or candidates for listing. Therefore, this plan will not be submitted to federal agencies, because state priority habitats and some state-listed species are not within their jurisdiction.

PROJECT DESCRIPTION

Project Location

The project is located at 110 West Marine Drive in Kalama, Washington, Cowlitz County and is in Section 7 of Township 6N North, Range 1 West of the Willamette Meridian (see Sheets 1 and 2). The project is also within the 170800030306 6th field Hydraulic Unit Code and Water Resources Inventory Area 27 (Kalama/Lewis watersheds). Project figures are attached.

Project Description

The marina was constructed in the 1970s and requires normal repair and maintenance. The Port's marina renovation project consists of elements that are confined largely to repair and maintenance of the Port's marine structures, proposed new construction, and expanding existing structures. This project will replace the marginal float, transient moorage float, boat ramp float, fuel dock, and access floats; repairs will be made to the existing floating moorage houses; and a new visitors' dock along the east edge of the marina basin will be constructed. Work associated with each of these features is described in detail below.

Replace the marginal float, transient moorage float, boat ramp float, fuel dock, and access floats. Details are as follows:

- Replace existing modular concrete floats with new aluminum frame floats with grated deck surface. These include the marginal floats, transient moorage floats, boat ramp floats and fuel dock access floats.
- Replace fuel dock float with a new monolithic concrete float unit.
- Install upgraded utilities along the marginal float and provide improved electrical, lighting, potable water, and fire suppression systems to the marginal and transient floats.
- Upgrade electrical service to 30 ampere and 50 ampere power pedestals and dock lighting.
- Install new potable water service and pedestals with freeze protection.
- Install new fire suppression system consisting of dry fire line with upland fire department connections and standpipes along the floats for fire department use.
- Reinstall sewer pump-out equipment on widened section of marginal float.
- Re-establish fuel dispenser and service lines to new fuel float.
- Re-use existing steel-pipe anchor piles.
- Remove creosote timber piles and replace with new steel piles. Some of the steel pipe piles will be reused in-place, while others will need to be extracted and reinstalled at new locations.
- Replace existing steel gangway on the marginal float located at the south end of marina with a new ADA compliant, aluminum thru-truss gangway with grated deck and new upland concrete abutment.
- Replace concrete abutments for boat ramp float and fuel dock access float in-kind.
- Replace existing fuel dock access gangway with new aluminum thru-truss gangway with grated deck.

Repair the existing floating moorage houses. Details are as follows:

- Repair existing float structures, including replacing damaged or deteriorated walers and thru-rods, repair or replace pile hoops, repair damaged concrete surfaces, and other miscellaneous repairs.
- Repair timber roof structure framing as needed.
- Upgrade electrical service to 30 ampere and 50 ampere power pedestals and dock lighting.
- Install new potable water service and pedestals with freeze protection.
- Install new fire suppression system consisting of dry fire line with upland fire department connections and standpipes along the floats for fire department use.

Add a new visitors' dock along the east edge of the marina basin. Details are as follows:

- Install new aluminum-frame floats with grated deck surface for a continuous length of side-tie moorage for short-term visitors' vessels.
- Install new steel pipe piles to anchor the floats horizontally, while allowing vertical movement of the floats through all water levels.
- Install new ADA-compliant aluminum thru-truss gangway with fully grated deck and new upland concrete abutment.
- Install new 30 and 50 ampere electrical service power pedestals and dock lighting.

- Install new potable water service and pedestals with freeze protection.
- Install new fire suppression system consisting of dry fire line with upland fire department connections and standpipes along the floats for fire department use.

The following table summarizes existing structures to be removed and replaced.

Table 1. Existing Structures to be Removed or Replaced

	Area below or over OHW (sf)	**Deck Surface Type**	**Piles below OHW** (timber creosoted)
Marginal and Transient Floats	7,400	Solid	8 timber, 6 steel
Gangway	100	Solid	---
Boat Ramp Float	960	Solid	4 steel
Fuel Access Floats	1,090	Solid	6 steel
Fuel Dock Gangway	150	Solid	---
Fuel Dock Float	400	Solid	1 timber, 3 steel
Total	**10,100**		**9 timber, 19 steel**

*Overwater area only – does not include areas overlapping with landing float.

The following table summarizes the proposed structures.

Table 2. Proposed Structures.

	Area Below OHW[1] (sf)	**Solid Deck Surfaces** (sf)	**Grated Deck Surfaces**[2] (sf)	**Total Piles to be Driven below OHW**[3]
Aluminum Floats (marginal floats, transient moorage floats, boat ramp floats, fuel-dock access floats, and visitors' dock floats)	13,900	0	13,900	31
Concrete Floats (fuel dock)	500	500	0	3
Aluminum Gangways	1,050*	0	1,050*	0
Concrete Abutments	0	180	0	2
Totals	**15,450**	**680**	**14,950**	**36**

All new piles will be 12.75 inches in diameter.
1 = Overwater area only – does not include areas overlapping with landing float or land.
2 = 50 percent of the deck will be grated. Grating allows at least 50% light penetration.

Construction Sequencing
Work is proposed to begin in late 2017. Repairing the existing slips and constructing the visitors' dock will begin as funding becomes available; it is anticipated to be completed by 2018. Pile driving will be performed using the vibratory method. Underwater noise from vibratory pile driving has not been proven to cause injury to aquatic organisms, and the noise will be mostly contained within the marina. Therefore, all proposed work could take place any time of the year after permits are received.

Pile Driving and Removal
Nine creosote-treated timber piles that are below OHW will be replaced with nine hollow steel piles, and five steel piles will be re-used. A total of 36 piles will be installed below OHW for this project. There will be a net increase of 26 piles proposed for this project (23.1 square feet of additional benthic area coverage).

A barge-mounted crane will be used to remove and install steel piles with a vibratory hammer. The barge-mounted crane will also be used to install the prefabricated floats and gangways. A storage barge and small tender boat will likely be used to support the crane barge during construction.

The total time estimated to remove and install piles for dock replacement is four weeks, and the visitors' dock will take one week. It will take approximately 30 minutes to install each pile.

Other Activities
Other activities associated with this project include material staging, material storage, and disposal areas, as well as the presence of work vessels used in construction and delivery. Materials will be stored onsite either on the work barge or in adjacent upland parking area. There will also be roof repairs to covered structures, utility upgrades, and lighting will be installed at the new visitors' dock.

Impact Avoidance and Minimization Measures
The project has been designed to avoid and minimize impacts to habitats and species that may potentially occur in the vicinity of the project area. Several design features are proposed in order to avoid and minimize adverse impacts to the aquatic environment as listed below:

1. Gangways will be constructed of grated material to allow for light penetration into the water.
2. New floats will feature partially grated ADA-compliant grated decking to allow for light penetration to the water.
3. New floats will be located at elevations sufficient to eliminate float and vessel grounding after dredging is completed.
4. The new fuel dock will have a monolithic concrete deck surface, and pumps will be equipped with spill-detection monitors with an automatic cut-off switch to help protect the water from inadvertent fuel spills.

In addition to the measures described above, in order to further avoid and minimize adverse impacts to the aquatic environment, typical construction BMPs for working over, in, and near water will be applied, including the following measures:

Construction Avoidance and Minimization Measures:

1. New floats will be primarily be manufactured offsite, delivered, splashed, floated, and assembled final in place.
2. All manmade construction debris will be collected and not allowed to enter waters of the state/US.
3. Methods for containing debris during overwater demolition work may include use of tarps or shrouds. Other methods may be identified by the City, Engineer, or contractor.
4. Land-based equipment will not be operated on the substrate below the waterline.
5. Project construction will be completed in compliance with Washington State Water Quality Standards WAC 173-201A.
6. Contractor will use vegetable-oil based hydraulic fluid for equipment working over or in the water.
7. Contractor will check equipment for leaks and other problems that could result in discharge of petroleum-based products, hydraulic fluid, or other material to the waterway.
8. Contractors conducting in-water and overwater work, including demolition, will be familiar with BMP implementation and permit conditions typical of working in the aquatic environment.
9. The contractor will have a spill containment kit, including oil-absorbent materials, onsite to be used in the event of a spill or if any oil product is observed in the water.
10. Piles will be removed using vibratory extraction to greatest extent possible. Piles which cannot be extracted will be cut below the mudline.
11. Piles will be removed slowly so as to minimize sediment disturbance and turbidity in the water column.
12. Where possible, extraction equipment will be kept out of the water to avoid "pinching" the pile below the waterline to minimize creosote release during extraction.
13. New pile will be installed using a vibratory hammer only. Proofing with an impact hammer will not be necessary.

EXISTING CONDITIONS

The project site is on the Columbia River in the central portion of the Port of Kalama. East of the project site are a port access road, railroad tracks, Interstate 5, and the City of Kalama. The port office and a park are south of the site, and a log yard and mill are to the north. A parking area for boat trailers and the former port office are between the marina and the river. The banks of the marina vary from as steep as 2:1 (above elevation +5 feet) to as shallow as 5:1 from elevation +5 feet to bottom of basin. The banks consist of small riprap and little vegetation.

The marina banks slope at about a 1:1 slope and are riprapped; there is only sparse weedy herbaceous vegetation. The marina substrate primarily consists of fine sediments and is maintained at approximately -10 feet CRD. Ordinary high water (OHW), according to the Corps is 12.0 feet CRD, and mean lower low water (MLLW) is -2.0 feet CRD. The 100-year flood elevation is 19.7 feet CRD. The project area is located outside of the influence of saltwater from the ocean, but it is influenced by tides. The average tidal fluctuation is about 5 feet (USGS 1990).

Sediment Quality
Polychlorinated biphenyls (PCBs) were detected in two core samples collected at elevation -6.5 to -12.5 feet CRD in 2007 and elevation -5 to -9 feet CRD in 2013 from the southern portion of the Port of Kalama Marina. The concentration of PCBs detected in the samples was above the acceptable level to remain at the sediment interface with the water.

The Port plans to dredge the marina during the October through December 2016 in-water work window to the authorized dredge depth of -10 + 2 feet CRD and will be disposed at an appropriate upland facility. Additional samples will be collected after the dredging event, which is expected to remove the sediments containing PCBs. A clean sand cover will be placed on the area if sample results are above acceptable levels.

Water Quality
The 2012 303(d) list shows three water-quality impairments within the Columbia River near the action area (WDOE 2016). Just downstream of the action area in the Columbia River, there is an area listed as Category 5 (waters needing a total maximum daily load [TMDL]) for high water temperature. This area is also shown as a Category 4A (has an existing TMDL) for total dissolved gas and dioxin. Existing water quality will have no effect on the project, and the project will have no effect on these water-quality parameters. The website reported no sediment-quality impairments in the vicinity.

CRITICAL AREAS

This report has been prepared according to requirements in the *Kalama Municipal Code* (*KMC*) *Critical Areas Protection Chapter 15.02 (KMC 2016).* Critical areas described in this chapter include geological hazards, critical aquifer recharge areas, wetlands, frequently flooded areas, and fish and wildlife habitat conservation areas.

Features of the project that are in upland areas include the west and east slopes of the marina where concrete gangway abutments will be installed. The only other upland areas associated with this project are staging/stockpile areas in the existing parking areas.

There are no geological hazards on or near the site such as slides, erosion, or mining hazards. The site, however, is located on alluvial soils where it is susceptible to liquefaction during earthquakes. Liquefaction is not considered a geological hazard, but is considered a "geological concern" by the KMC, which does not require further study.

There are no wetlands on or near the project. Upland project areas are currently above the 100-year floodplain, so they are not in a frequently flooded area.

Critical aquifer recharge areas are determined by a very high susceptibility to contamination of the underlying aquifer due to high soil permeability and a high water table. Concrete gangway abutments and staging/stockpile areas are the only upland areas of this project, and they are generally impervious. Therefore, the site and surrounding area are not in a critical aquifer recharge area.

The critical area addressed in this report is areas of fish and wildlife habitat conservation (*KMC 15.02.130*). Areas that will be addressed in this report are associated with the Columbia River. There are no other conservation areas on or near the site. The Columbia River is a shoreline of statewide significance (Type S) and has a recommended riparian buffer of 250 feet (*KMC 15.02.140*). However, upland areas of the project consist of impervious surfaces and currently provide no habitat function for the river or wildlife. Because the project does not propose to change or improve the riparian habitat, it will not be discussed further in this report.

Critical fish and wildlife habitat conservation areas include nine classifications. Five of the following classifications will not be addressed because they do not occur within Kalama and they do not apply to the project vicinity: species of local importance (wildlife requiring protection such as western pond turtle, blacktail deer, bobcat, raccoon, and bear), kelp and eelgrass beds and herring and smelt spawning areas - (Columbia River smelt [eulachon] spawning areas will be addressed in other classifications), naturally occurring ponds under 20 acres, state natural-area preserves, and unintentionally created ponds.

Four critical fish and wildlife habitat conservation areas that will be addressed in this report are classifications associated with the Columbia River: areas where listed species have a primary association, commercial and recreational shellfish areas (crawfish fishery), smelt spawning areas, waters of the state, and waterbodies planted with gamefish by a governmental entity. Because this project affects a Classification 1 critical fish and wildlife habitat conservation area (areas where listed species have a primary association), a habitat management plan is required and is later in this document.

Statement of Accuracy and Assumptions

This project was designed by an engineer with extensive experience in designing similar structures. An assessment was made regarding the presence of listed species, project impacts on habitat and species, and whether the project meets management recommendations are based on numerous Endangered Species Act consultations by NMFS and from cited WDFW documents. Using judgement based on our professional experience, the methods and conclusions in this document are accurate and are based on best-available science.

Site Development Alternatives

The marina was constructed in the 1970s, and there is a current need for marina repairs and maintenance. There is also a need to provide additional short-term moorage. The proposed project will meet these two needs by making maintaining the marina infrastructure, as well as providing marina users with infrastructure that matches the estimated level of use.

The no-action alternative is that the marina facilities would continue to deteriorate and become unsafe, would not meet current ADA compliance standards, and there would be an unmet need for short-term moorage that would be provided by the visitors' dock. There is only one alternative that meets the need for marina repair and maintenance. The visitors' dock design has been assessed so that short-term moorage needs will be met without providing more dock area than is necessary to meet the demand. Therefore, the proposed project is the only alternative that meets the needs of marina users without causing excessive environmental impact.

Stormwater Management Plan
The site does not require a stormwater management plan, because there is no proposed change to stormwater quality or quantity.

POTENTIAL HABITAT IMPACTS

Direct Effects
Direct effects are those effects that take place at or near the time of construction. The following direct effects to the environment may occur:

Terrestrial

- None. There is no native terrestrial habitat in or near the marina that will be disturbed as part of this project. In-air noise is estimated to be at or below background noise.
-

Aquatic

- Intermittent, underwater noise and turbidity from removing 10 piles is estimated to remain within the marina for about 8 hours.
- Intermittent, underwater noise above the fish behavioral level due to vibratory pile driving 23 piles is estimated to extend as far as 1,120 feet from each pile (31.2 acres) for a period lasting about 5 weeks. Sheet 1 shows this area as the "action area".

Indirect Effects
Indirect effects are defined as those negative effects that are caused by the project, but occur after project completion. The following table compares the overwater areas below OHW before and after project completion.

Table 3. Overwater Coverage Comparison (below OHW)

	Existing (sf)		**Proposed** (sf)		**Net Difference** (sf)	
	Solid	Grated	Solid	Grated	Solid	Grated
Replacement Floats	8,525	0	500	10,400	-8,025	+ 10,400
Replacement Gangways	210	0	0	415*	-210	+415
Visitors' Dock Floats	0	0	0	3,680	0	+3,680
Visitors' Dock Gangway	0	0	0	230*	0	+230
Subtotal	*8,735*	*0*	*500*	*14,725*	***-8,235***	*+14,725*
Totals	8,735 sf		15,225 sf		**+6,490 sf**	

*Overwater area only – does not include area overlapping with landing float or land.

The project results in 6,450 square feet of new on-water and overwater structures, and most surfaces will be either fully or partially grated. The overall project offers significant ecological improvements. It increases light penetration by reducing solid floats and gangways, and will have a total of 8,235 square feet of grated surface where solid surfaces previously existed (existing 8,735 square feet minus the proposed 500 square feet of the fuel dock). Most of the

new overwater coverage results from the new visitors' float and gangway, which are necessary to accommodate heavy short-term/transient moorage needs. Nine creosote-treated timber piles will be replaced with nine new steel-pipe piles. The project improves recreational access along the shoreline of the state with ADA access and the additional visitors' float.

Terrestrial

- None. There is no native terrestrial habitat in or near the marina that will be disturbed as part of this project.

Aquatic

- Shading effects from an additional 3,680 square feet of grated floats within the marina (the fully grated gangway is over the water, so the shading is not anticipated to be significant).
- Benthic, epibenthic, and water-column impacts from an additional 26 piling below OHW totaling 23.1 square feet.

Effects from Interdependent Actions

Interdependent actions would not occur if the project was not constructed. Most materials will be brought in by boat, and any staging will occur in the marina or nearby areas that are already developed. No traffic detours will be necessary during construction. Therefore, there will be no effects from interdependent actions.

Effects from Interrelated Actions

Interrelated actions are part of the project and could possibly occur even if the project was not constructed. They are also actions that do not require permits when not related to a larger project (work above OHW, boat operation, etc.). The following interrelated actions will occur with this project:

- Shading effects in the marina from additional moored vessels temporarily using the visitors' floats.
- Additional overwater lighting from additional light poles and docked vessels. Currently, there is lighting in the marina and from the surrounding roadway.

Beneficial Effects

Beneficial effects from the project will result from the following project elements:

- Removing nine creosote-treated piles from the marina.
- Replacing 8,025 square feet of solid float decks with grated decks.
- Replacing 210 square feet of overwater solid-deck gangways with fully grated gangways.
- The new fuel dock will have a monolithic concrete deck surface, and pumps will be equipped with spill detection monitors to help protect the water from inadvertent fuel spills.

These beneficial effects will compensate for the additional 6,490 square feet of proposed floats and gangways, as well as an additional 26 piling (23.1 square feet). Comparing these additional areas (6,490 sf + 23.1 sf = 6,513.1) to the area of replaced solid floats, gangways, and creosote piling (8,025 + 210 + 9 = 8,244 sf), the ratio is 1.2 to 1. Based on this analysis and preliminary

feedback from National Marine Fisheries Services (NMFS), Washington Department of Fish and Wildlife (WDFW), and the City of Kalama, this project is self-mitigating.

DEVELOPMENT PERFORMANCE STANDARDS

The KMC *15.02.130(D)* requires development to conform to the following requirements (*italics*) when impacts to critical fish and wildlife habitat cannot be avoided. Requirements are followed by a discussion of how they are met for this project (in regular font).

a) Locate buildings and structures in a manner that preserves the habitat or minimizes adverse impacts.

This project was designed to avoid, minimize, and mitigate impacts to the river by fully grating gangways, adding grating to existing dock areas, removing creosote-treated piles. The new fuel dock will have a monolithic concrete deck surface, and pumps will be equipped with spill-detection monitors with an automatic cut-off switch to help protect the water from inadvertent fuel spills. Construction avoidance and minimization measures are discussed in a previous section of this document.

b) Consolidate habitat and vegetated open space in contiguous blocks, and where possible, locate habitat contiguous to other habitat, open space, or landscaped areas to contribute to ta continuous system of corridor that provides connections to adjacent habitat areas..

This project site and vicinity has little terrestrial habitat value, so it is not possible to provide habitat connections to adjacent areas.

c) Use native species in any landscaping of disturbed or undeveloped areas an in any enhancement of habitat or buffers.

d) Emphasize diversity in selection of plant materials and structure of landscaping.

No landscaping or buffer enhancement is proposed.

e) Remove and/or control any noxious or undesirable species of plants as identified by the Cowlitz County Weed Control Board.

Port policy for maintaining its property is to control undesirable plants as they occur.

f) Demonstrate how existing trees will be preserved, preferably in groves.

There are no existing trees.

g) Preserve and introduce native plant species, which serve as food, shelter from climatic extremes and predators, and structure and cover for reproduction and rearing of young for critical wildlife.

There are no existing trees to preserve and no plans to introduce new plants. This area has no existing native plants and there are no corridors to suitable habitat, so this standard does not apply to this project.

h) Preserve the natural hydraulic and ecological functions of drainage systems.

There are no natural drainage systems in the marina; however the Columbia River is in the vicinity. As discussed in the *Potential Habitat Impacts* section above, there will be insignificant impacts to ecological functions of the Columbia River.

i) Preserve critical fish and wildlife habitat areas through maintenance of stable channels, adequate low flows, (and) management of stormwater runoff, erosion, and sedimentation.
The project will not affect the river's channel stability or flows and will not increase streambank erosion or sedimentation. There are no proposed changes to stormwater quality or quantity.

j) Manage access to critical fish and wildlife habitat areas to protect species, which are sensitive to human disturbance.
Terrestrial habitat in the project area provides little function for terrestrial species, and there will be no change in human use of the terrestrial habitat. The purpose of the marina is to provide human access to the water, and this project will create an insignificant increase of human disturbance to the aquatic habitat. Therefore, access management is not required.

k) Maintain or enhance water quality through control of runoff and use of best management practices.
This project was designed to avoid and minimize potential water-quality impacts from the fuel dock by installing a leak-detection and automatic shut-off switch. There will be no change in stormwater conveyance as a result of this project.

HABITAT PROTECTION FOR FISH AND WILDLIFE CONSERVATION CLASSIFICATIONS

Habitat protection for Classification 3 (crawfish fishery) requires coordination with WDFW. The area habitat biologist stated in an email that there is currently no crawfish fishery managed by WDFW (West pers. comm. 2016).

Habitat protection for Classification 1, 3, 4, 6, and 7 can be found in the habitat management plan below. Classifications 2, 5, 8, and 9 do not apply to this project.

HABITAT MANAGEMENT PLAN

Appendix D of the KMC (Habitat Management Report Requirements) states that all information required by Appendix A of the KMC (Critical Area Permits) be submitted, which was discussed in the first section of this document. The following section of this report is the habitat management plan.

PRIORITY SPECIES AND HABITATS NEAR THE PROJECT SITE

The following table shows state priority habitats and federally listed or state-listed species that have a primary association with habitat within 1,300 feet of the project. The list was compiled using the most recent state and federal species lists (WDFW 2012 and 2016, NMFS 2016a and 2016b, USFWS 2016) and determining if the species have habitat near the site that is suitable for their use.

Table 2. State Priority Habitats and Federal and State Endangered, Threatened, and Sensitive Species that have Primary Association with Habitat on or Adjacent to the Project Area.

Species or State Priority Habitat	State Status	Federal Status
Fish		
Chinook Salmon *(Onchorhynchus tshawytscha*)		
Lower Columbia River Chinook ESU	Candidate	Threatened
Upper Willamette River Chinook ESU	Candidate	Threatened
Upper Columbia River Spring-run Chinook ESU	Candidate	Endangered
Snake River Spring-run Chinook ESU	Candidate	Threatened
Snake River Fall-run Chinook ESU	Candidate	Threatened
Chum Salmon (*Onchorhynchus keta*)		
Columbia River Chum Salmon ESU	Candidate	Threatened
Coho Salmon (*Onchorhynchus kisutch*)		
Lower Columbia River Coho Salmon ESU	Candidate	Threatened
Sockeye Salmon (*Onchorhynchus nerka*)		
Snake River Sockeye DPS	Candidate	Endangered
Steelhead (*Onchorhynchus mykiss*)		
Lower Columbia River Steelhead DPS	Threatened	Threatened
Upper Willamette River Steelhead DPS	Threatened	Threatened
Middle Columbia River Steelhead DPS	Threatened	Threatened
Upper Columbia River Steelhead DPS	Threatened	Threatened
Snake River Basin Steelhead DPS	Threatened	Endangered
North American Green Sturgeon Southern DPS *(Acipenser medirostris)*	None	Threatened
Eulachon (Columbia River Smelt) Southern DPS *(Thaleichthys pacificus)*	Candidate	Threatened
Bull Trout – Columbia River DPS *(Salvelinus confluentus)*	Candidate	Threatened
Birds		
Bald Eagle (*Haliaeetus leucocephalus*)	Sensitive	Species of Concern
Priority Habitats		
Instream	Priority Habitat	Not applicable
Riparian	Priority Habitat	Not applicable

Each fish population listed above is present in the Columbia River and could occur within or near the marina. Bald eagles use the Columbia River for foraging. State priority habitats in the vicinity include instream and riparian habitats.

PROJECT EFFECTS TO CRITICAL WILDLIFE HABITAT

Effects to federally listed species are addressed in detail in the biological evaluation written for this project (ELS 2016) as required by the U.S. Army Corps of Engineers for their Endangered Species Act consultation. The effects to fish habitat are discussed above in the section titled *Potential Habitat Impacts*.

State-listed species not addressed above include bald eagles, which may use the area for foraging. However, they are discouraged from foraging this area by the lack of perches and the

level of human activity. The project will not change these circumstances, so there will be no effects to bald eagle foraging habitat.

MANAGEMENT RECOMMENDATIONS

Effects to species are generally avoided or minimized if the project meets management recommendations that are discussed below.

Salmon and Steelhead

Federal

The Lower Columbia Salmon Recovery and Fish and Wildlife Subbasin Plan (LCFRB 2010) is being used as a recovery plan for salmon and steelhead by the National Marine Fisheries Service. This plan gives the following key recovery priorities in the lower Cowlitz subbasin to attain recovery of listed salmon and steelhead:

1. Manage regulated stream flows through the hydropower system.
2. Restore floodplain function, riparian function, and stream habitat diversity.
3. Protect intact forest in headwater basins.
4. Manage growth and development to protect watershed processes and habitat conditions.
5. Address immediate risks with short-term habitat fixes.
6. Manage forest lands to protect and restore watershed processes.
7. Restore passage at culverts and other artificial barriers.
8. Align hatchery priorities consistent with conservation objectives.
9. Manage fishery impacts so they do not impede progress toward recovery.
10. Reduce out-of-subbasin impacts so that the benefits of in-basin actions can be realized.

This project is limited in scope. Items 1 through 10 do not apply to this project.

State

WDFW does not have specific documents that have a short list of management recommendations for salmon; however, they do provide them for rainbow trout/steelhead (Rodrick and Milner 1991). Steelhead and salmon have similar life histories and habitat needs, so they are expected to be similar, if not identical. The following are management recommendations for steelhead:

- Buffer zones of at least the width of the height of the tallest tree should be maintained along stream banks, which provide rainbow trout and steelhead habitat, and any other stream which directly or indirectly influences rainbow trout and steelhead habitat.
- Road construction and maintenance activities should be avoided adjacent to streams which provide rainbow trout and steelhead habitat.
- Instream structures, such as bridges, piers, boat ramps, or culverts must not impede the natural movements of rainbow trout and steelhead.
- Waters inhabited by steelhead parr should not be treated with metal-based herbicides during the period March 1 through June 15.

Buffer zone management recommendation does not apply to this project because the existing conditions of the riparian buffer provide little to no habitat functions. This project avoids road construction and maintenance, and the dock will not impede natural movements of aquatic life. In addition, project does not propose herbicide treatment. For these reasons, the project meets state steelhead management recommendations.

North American Green Sturgeon
The federal recovery plan for this species has not yet been written, so there are no federal management recommendations. WDFW does not list management recommendations for this species.

Bull Trout
Federal management recommendations are not explicit for the project area but state that for the Olympic Management Unit on the Washington peninsula, recovery of bull trout includes protecting, restoring, and maintaining suitable habitat conditions and water quality with actions such as removing fish-passage barriers, maintaining and improving water quality, and improving habitat conditions in and along mainstem rivers (USFWS 2004). The project will not permanently degrade suitable habitat for bull trout, which are rare in the Columbia River. Water quality will not be negatively affected by the project, and it may have an overall beneficial effect by reducing the potential for spilling petroleum products by incorporating spill-detection monitors with an automatic cut-off switch to help protect the water from inadvertent fuel spills.

WDFW (Rodrick and Milner 1991) advises the following management recommendations for streams that contain bull trout and steelhead: 1) maintain buffer zones along stream banks of at least the width of the height of the tallest tree or 50 feet, whichever is wider, 2) avoid road construction and maintenance activities, and 3) avoid in-stream structures, such as bridges, trestles, boat ramps, or culverts, that impede the natural movements of fish. Current site conditions do not provide riparian habitat functions, and the project does not include road construction or maintenance. Habitat impacts from floating structures will be mitigated by replacing existing, solid float decking with grated decking, grating all gangways, and removing creosote-treated piles. For these reasons, state management recommendations will be met.

Eulachon
The federal recovery plan for this species has not yet been written, so there are no federal management recommendations. WDFW does not list management recommendations for this species.

Bald Eagle
The WDFW downloadable document updated on May 2011 (Larsen *et al* 2004) refers the viewer to the USFWS website, because the bald eagle listing in Washington was downlisted to sensitive, so it does not require a bald eagle management plan. However, the USFWS website does not have management recommendations, only guidelines to whether a permit is required under the Bald Eagle and Golden Eagle Protection Act for certain work within certain distances from nests and roosts.

Instream Habitat
WDFW does not have specific documents that have a short list of management recommendations for instream habitat. Aquatic Habitat Guidelines are a series of documents with guidelines to facilitate the consistent application of good science and practice for resources and habitat management, project design, construction, and operation in, near, or affecting aquatic systems. This project meets guidelines in these documents.

Riparian Habitat

The WDFW management recommendation for riparian habitat (Knutson and Naef 1997) is to "protect riparian habitat areas". Standard recommended RHA widths for areas with typed and non-typed streams. If the 100-year floodplain exceeds these widths, the RHA width should extend to the outer edge of the 100-year floodplain.

- Type 1 and 2 streams; or Shorelines of the State, Shorelines of Statewide Significance: 250 feet.
- Type 3 streams; or other perennial or fish bearing streams 5 to 20 feet wide: 200 feet.
- Type 3 streams; or other perennial or fish bearing streams less than 5 feet wide: 150 feet.
- Type 4 and 5 streams; or intermittent streams and washes with low mass wasting potential: 150 feet.
- Type 4 and 5 streams; or intermittent streams and washes with high mass wasting potential: 225 feet.

The following are important additions to the recommended RHA widths:

- Larger RHA widths may be required where priority species occur; consult Appendix D for these widths.
- Add 100 ft to the RHA's outer edge on the windward side of riparian areas with high blowdown potential.
- Extend RHA widths at least to the outer edge of unstable slopes along Type 4 and 5 waters in soils of high mass-wasting potential.

This project has little to no impact on the riparian habitat, which provides very few functions at this site. Therefore, the project meets the intent of the riparian management recommendations.

CONCLUSION

The proposed project will avoid and minimize impacts to species listed by the state and federal agencies and to state priority habitats. As stated above, this project will implement avoidance and minimization measures to preserve existing habitat. These measures include replacing existing solid-deck floats with grated floats and installing a fuel dock with spill-detection monitors and an automatic cut-off switch to help protect the water from inadvertent fuel spills. Additional best management practices will be implemented during construction.

Beneficial effects of this project will compensate for the additional 6,490 square feet of proposed floats and gangways, as well as an additional 26 piling (23.1 square feet). Comparing these additional areas (6,490 sf + 23.1 sf = 6,513.1) to the area of replaced solid floats, gangways, and creosote piling (8,025 + 210 + 9 = 8,244 sf), the ratio is 1.2 to 1. Based on this analysis and preliminary feedback from National Marine Fisheries Services (NMFS), Washington Department of Fish and Wildlife (WDFW), and the City of Kalama, this project is self-mitigating. For these reasons, the project will not have an overall negative impact on critical fish and wildlife habitat.

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Personal Communications:

West, Steve. Area Habitat Biologist for the Washington Department of Fish and Wildlife. Email dated June 7, 2016.

FIGURES

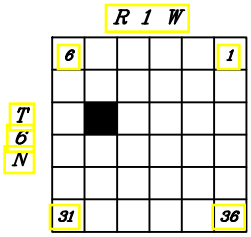
46.0077° Latitude
-122.8479° Longitude

LOCATION MAP

WATER LEVEL INFORMATION	
MHHW	+4.0'
OHW	+3.5'
MHW	+3.5'
MLW	+0.3'
MLLW	+0.0'

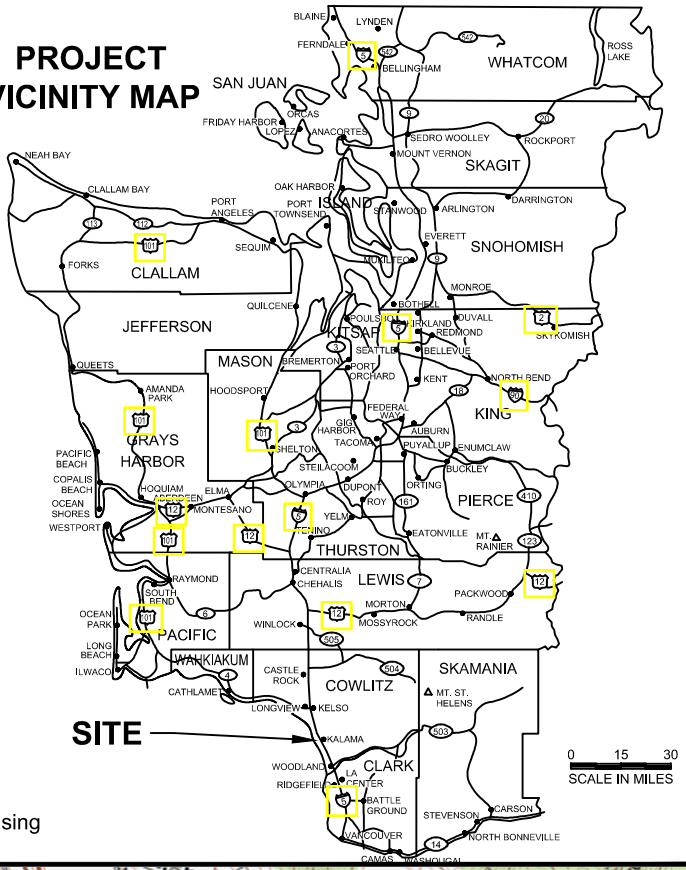
LAT: 46° 00' 26.90"N

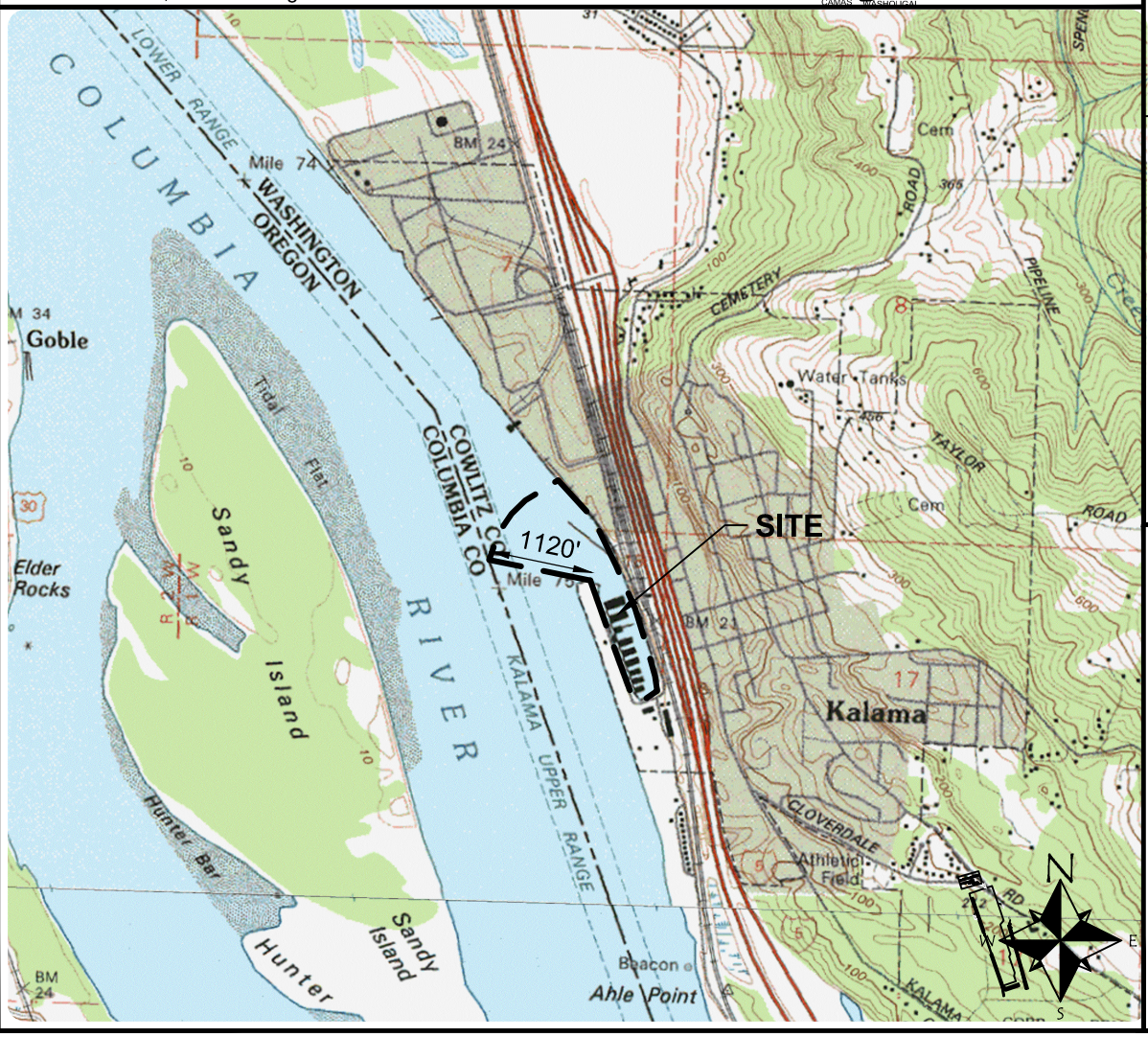
LONG: 122° 50' 52.58"W



NOTE:
USGS topographic quadrangle map reproduced using MAPTECH Inc., Terrain Navigator Pro software.

PROJECT VICINITY MAP





PROPOSED: Overwater Area Increase
IN Comlumbia River
NEAR:
COUNTY: Cowlitz **STATE:** WA
SHEET 1 **OF** 17
DATE: 8/23/16

Vicinity Map & Action Area
APPLICANT: PND Engineers
PROJECT NAME: Port of Kalama Marina Renovation
REFERENCE #:
SITE LOCATION ADDRESS:
110 West Marine Drive
Kalama, WA 98625

PURPOSE:
Marina Restoration

DATUM: NGVD29
ADJACENT PROPERTY OWNERS:

SCALE IN FEET
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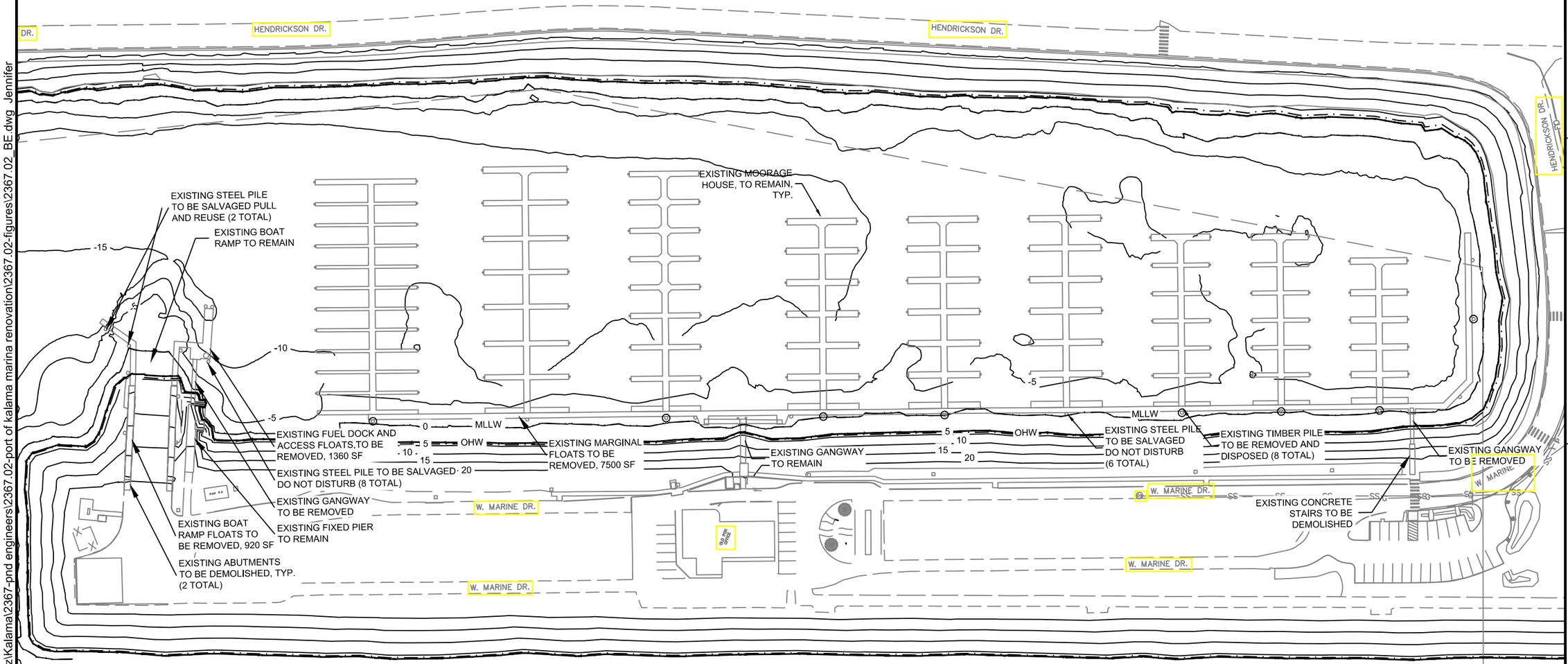
1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
Ecological Land Services



LEGEND

◎	TIMBER PILE
○	STEEL PILE

NOTE(S):

1. Base map from PND Engineers, Inc.

Existing Conditions & Demolition Plan

APPLICANT: PND Engineers
PROJECT NAME: Port of Kalama Marina Renovation
REFERENCE #:
SITE LOCATION ADDRESS: 110 West Marine Drive Kalama, WA 98625

PURPOSE: Marina Restoration

DATUM: NAVD 29-47
ADJACENT PROPERTY OWNERS:

PROPOSED: Overwater Area Increase

IN Columbia River
NEAR:
COUNTY: Cowlitz **STATE:** WA
SHEET 2 **OF** 17
DATE: 8/23/16

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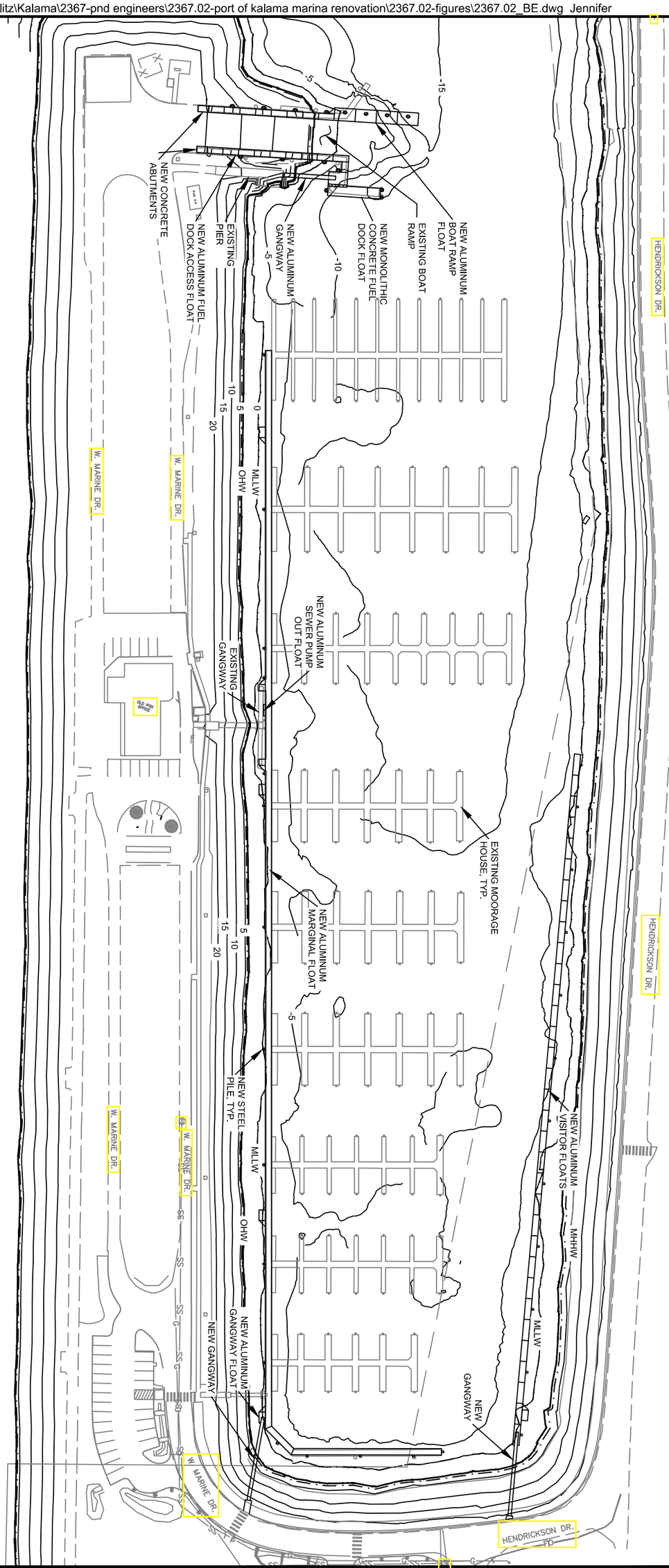
Longview, WA 98632
Phone: (360) 578-1371

SCALE IN FEET
0
100
200

Ecological Land Services

NOTE(S):

1. Base map from PND Engineers, Inc.



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SCALE IN FEET

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Longview, WA 98632
Phone: (360) 578-1371

PURPOSE: Marina Restoration

DATUM: NAVD 29-47

ADJACENT PROPERTY OWNERS:

Overall Site Plan

APPLICANT: PND Engineers

PROJECT NAME: Port of Kalama Marina Renovation

REFERENCE #:

SITE LOCATION ADDRESS: 110 West Marine Drive, Kalama, WA 98625

PROPOSED: Overwater Area Increase

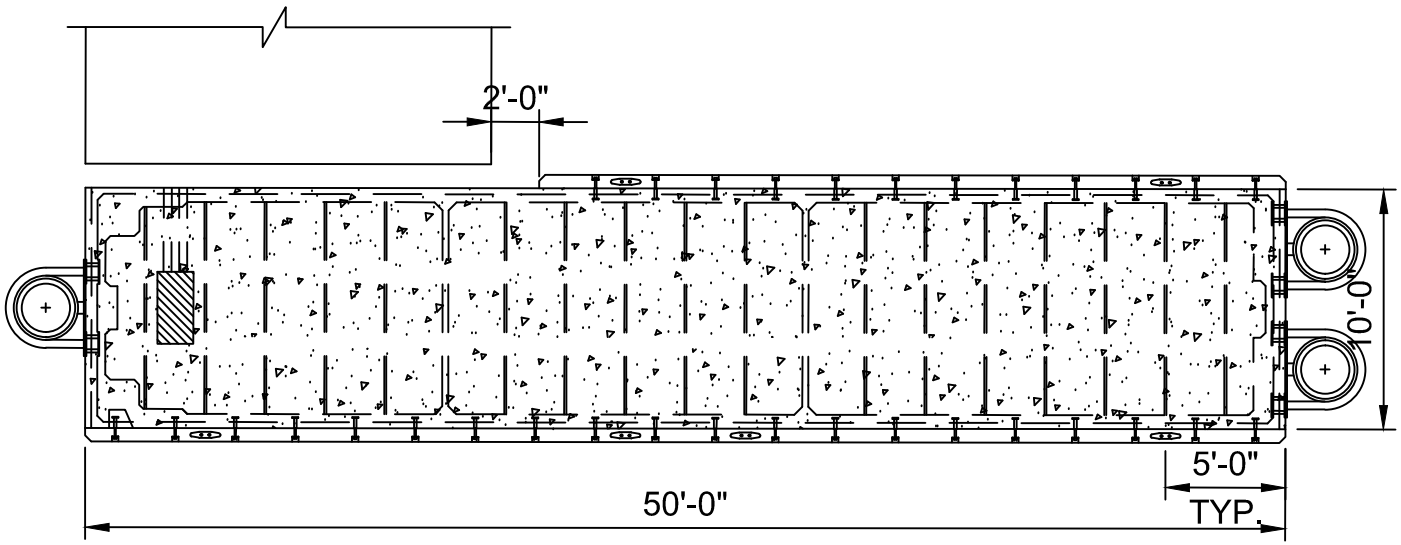
IN Comlumbia River

NEAR:

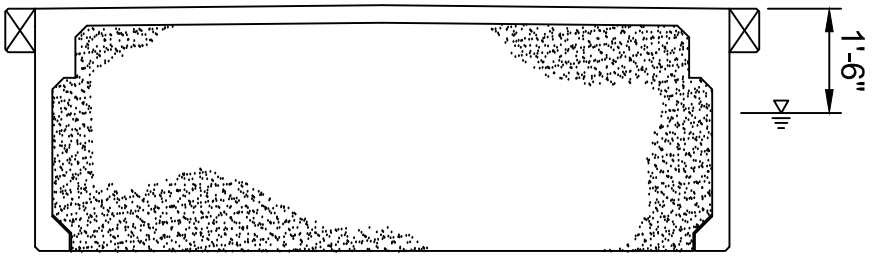
COUNTY: Cowlitz **STATE:** WA

SHEET 3 **OF** 17

DATE: 8/23/16



FLOAT PLAN



FLOAT SECTION

NOT TO SCALE

Ecological Land Services
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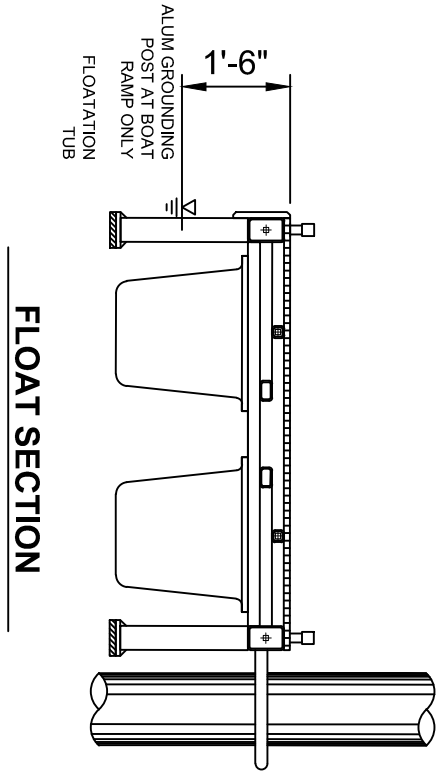
Longview, WA 98632
Phone: (360) 578-1371

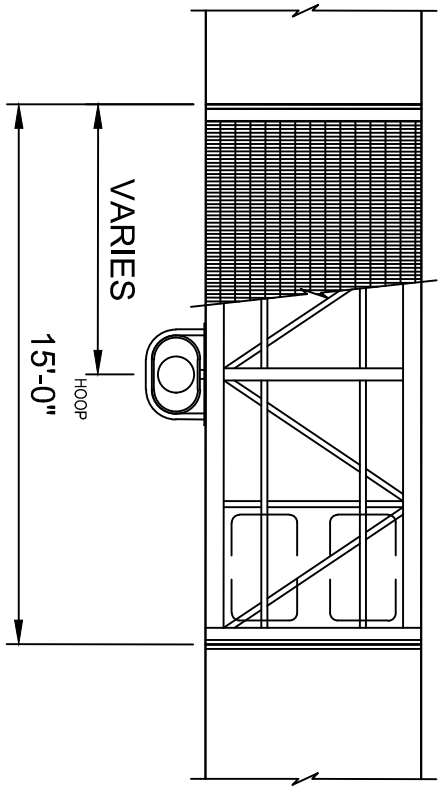
PURPOSE: Marina Restoration	Proposed Monolithic Concrete Float Detail	**PROPOSED:** Overwater Area Increase
	APPLICANT: PND Engineers	
	PROJECT NAME: Port of Kalama Marina Renovation	**IN** Comlumbia River
DATUM: N/A	**REFERENCE #:**	**NEAR:**
ADJACENT PROPERTY OWNERS:	**SITE LOCATION ADDRESS:** 110 West Marine Drive Kalama, WA 98625	**COUNTY:** Cowlitz **STATE:** WA
		SHEET 4 **OF** 17
		DATE: 8/23/16

NOTE(S):

1. Base map from PND Engineers, Inc.

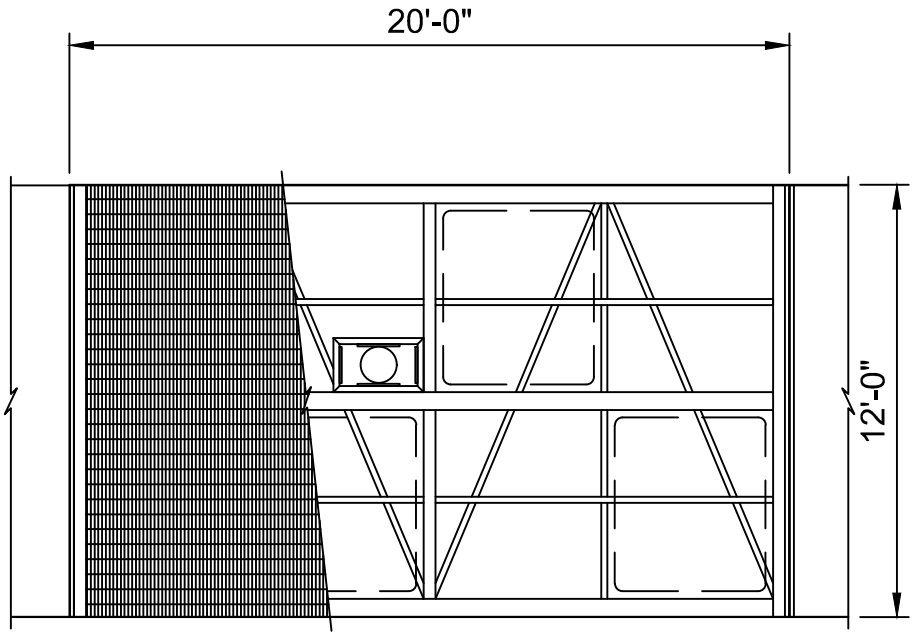


FLOAT SECTION

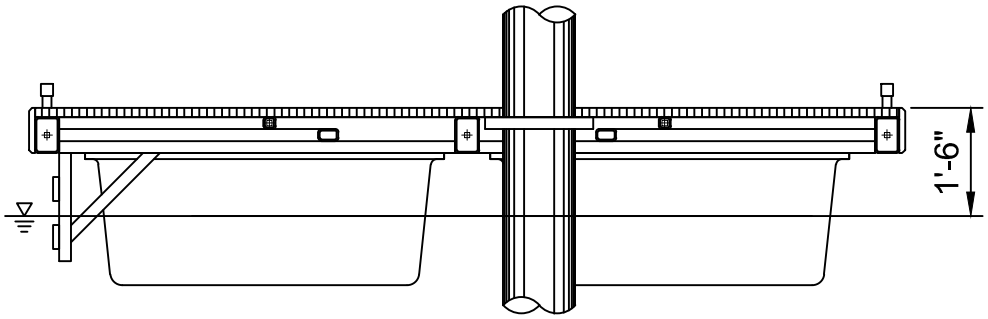


FLOAT PLAN

NOT TO SCALE Ecological Land Services 1157 3rd Ave., Suite 220A Longview, WA 98632 Phone: (360) 578-1371	**PURPOSE:** Marina Restoration **DATUM:** N/A **ADJACENT PROPERTY OWNERS:**	Aluminum Float With External Pile Hoop **APPLICANT:** PND Engineers **PROJECT NAME:** Port of Kalama Marina Renovation **REFERENCE #:** **SITE LOCATION ADDRESS:** 110 West Marine Drive Kalama, WA 98625	**PROPOSED:** Overwater Area Increase **IN** Comlumbia River **NEAR:** **COUNTY:** Cowlitz **STATE:** WA **SHEET** 5 **OF** 17 **DATE:** 8/23/16



FLOAT PLAN



FLOAT SECTION

NOTE(S):

1. Base map from PND Engineers, Inc.

NOT TO SCALE	**PURPOSE:** Marina Restoration **DATUM:** N/A **ADJACENT PROPERTY OWNERS:**	Aluminum Float With Internal Pile Hoop **APPLICANT:** PND Engineers **PROJECT NAME:** Port of Kalama Marina Renovation **REFERENCE #:** **SITE LOCATION ADDRESS:** 110 West Marine Drive Kalama, WA 98625	**PROPOSED:** Overwater Area Increase **IN** Comlumbia River **NEAR:** **COUNTY:** Cowlitz **STATE:** WA **SHEET** 6 **OF** 17 **DATE:** 8/23/16

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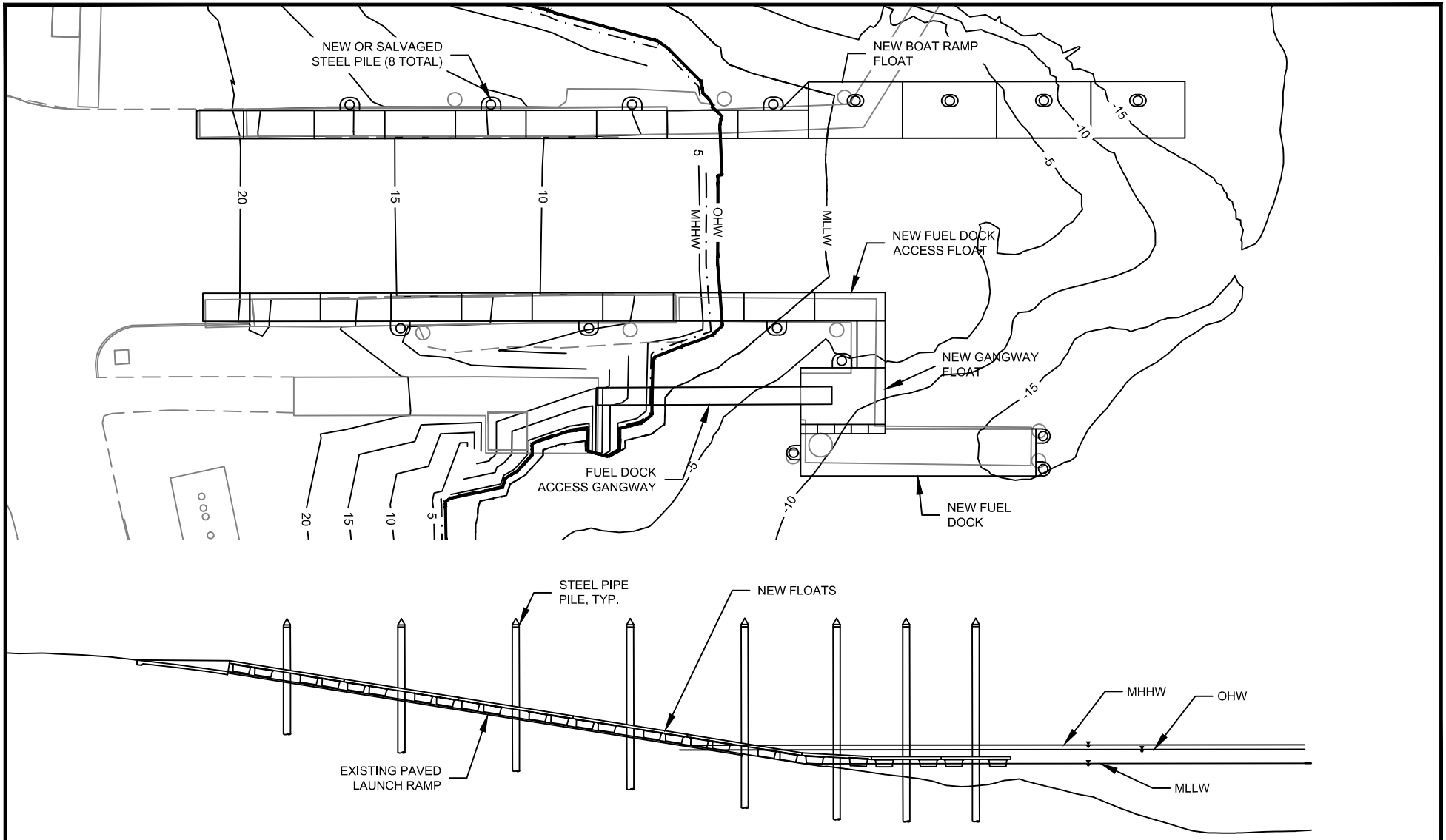

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Ecological Land Services
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Longview, WA 98632
Phone: (360) 578-1371

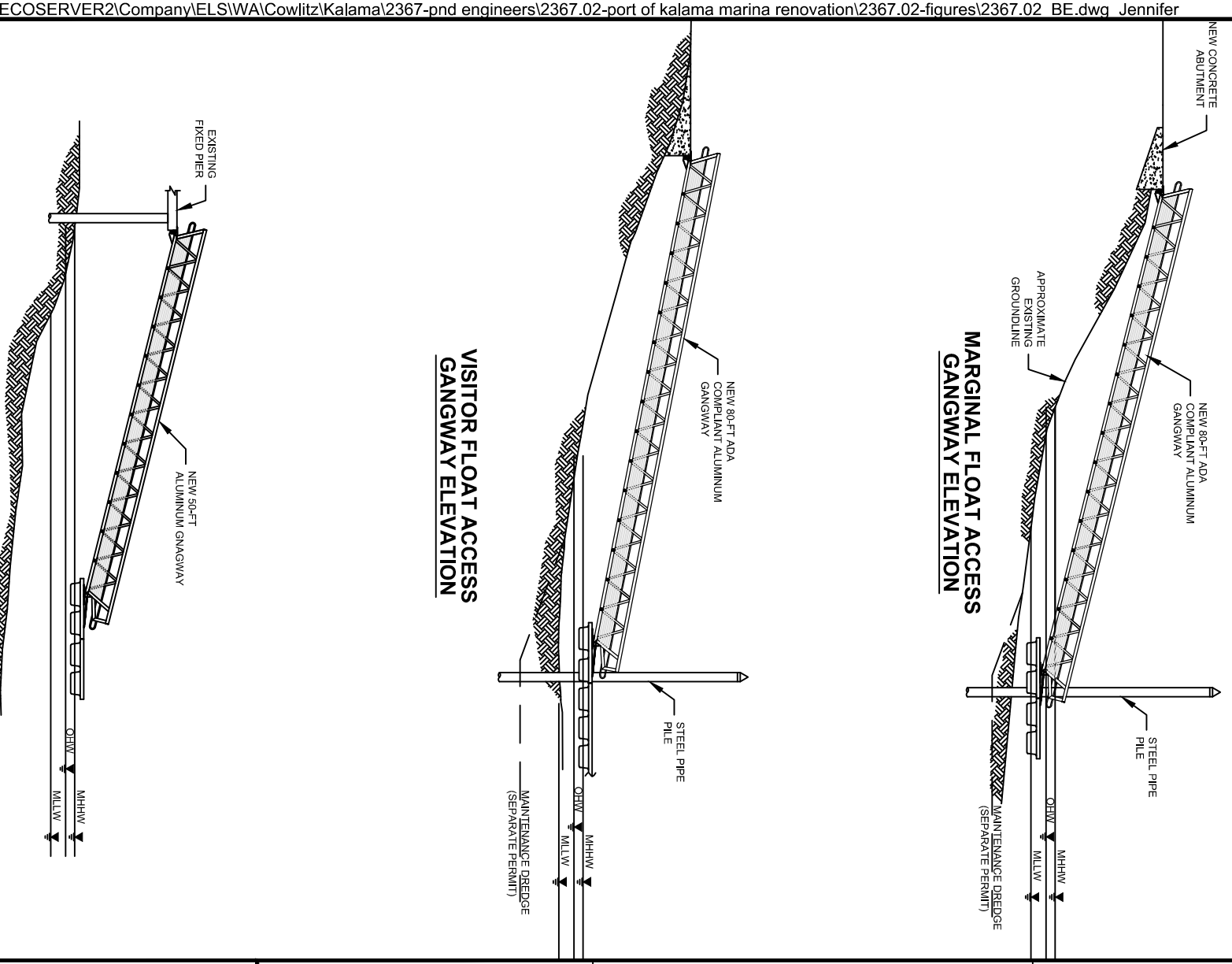
PURPOSE:
Marina Restoration

DATUM: NAVD 29-47
ADJACENT PROPERTY OWNERS:

Boat Ramp Float Plan & Elevation
APPLICANT: PND Engineers
PROJECT NAME: Port of Kalama Marina Renovation
REFERENCE #:
SITE LOCATION ADDRESS:
110 West Marine Drive
Kalama, WA 98625

PROPOSED: Overwater Area Increase

IN Comlumbia River
NEAR:
COUNTY: Cowlitz **STATE:** WA
SHEET 7 **OF** 17
DATE: 8/23/16



NOTE(S):

1. Base map from PND Engineers, Inc.

NOT TO SCALE

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Phone: (360) 578-1371

PURPOSE:
Marina Restoration

DATUM: N/A
ADJACENT PROPERTY OWNERS:

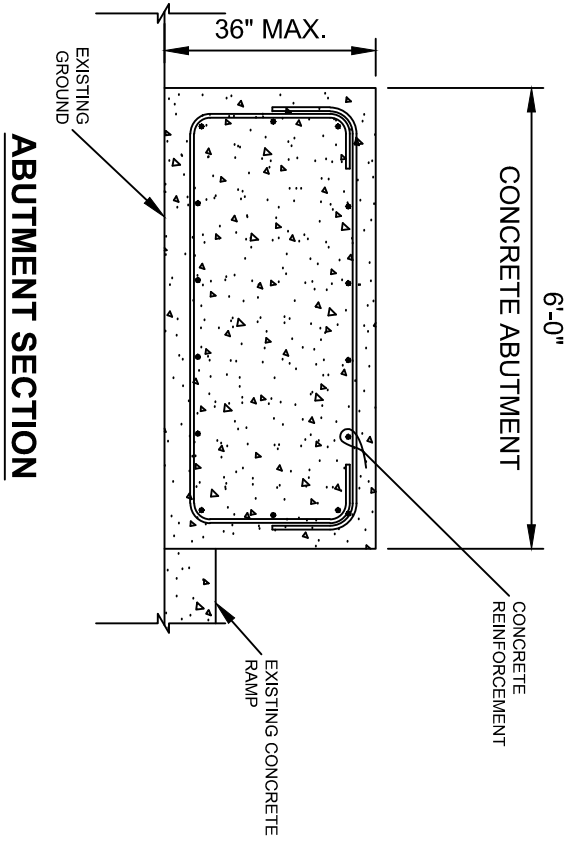
Proposed Gangway Elevations
APPLICANT: PND Engineers
PROJECT NAME: Port of Kalama Marina Renovation
REFERENCE #:
SITE LOCATION ADDRESS:
110 West Marine Drive
Kalama, WA 98625

PROPOSED: Overwater Area Increase

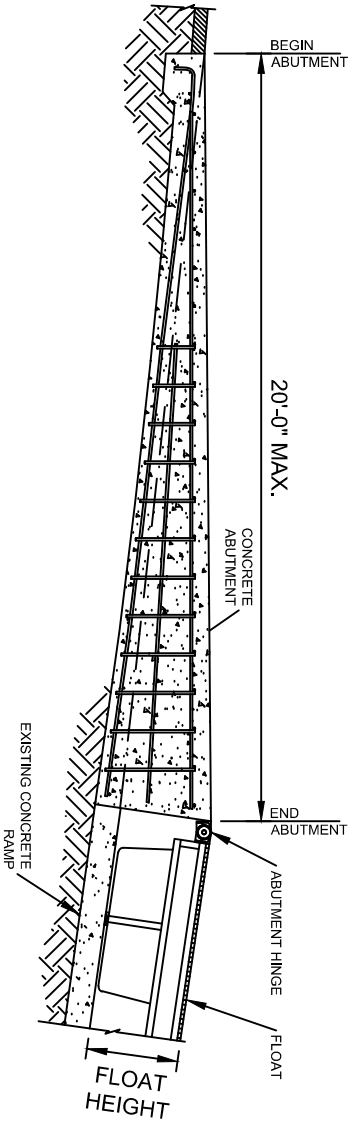
IN Comlumbia River
NEAR:
COUNTY: Cowlitz **STATE:** WA
SHEET 8 **OF** 17
DATE: 8/23/16

NOTE(S):

1. Base map from PND Engineers, Inc.

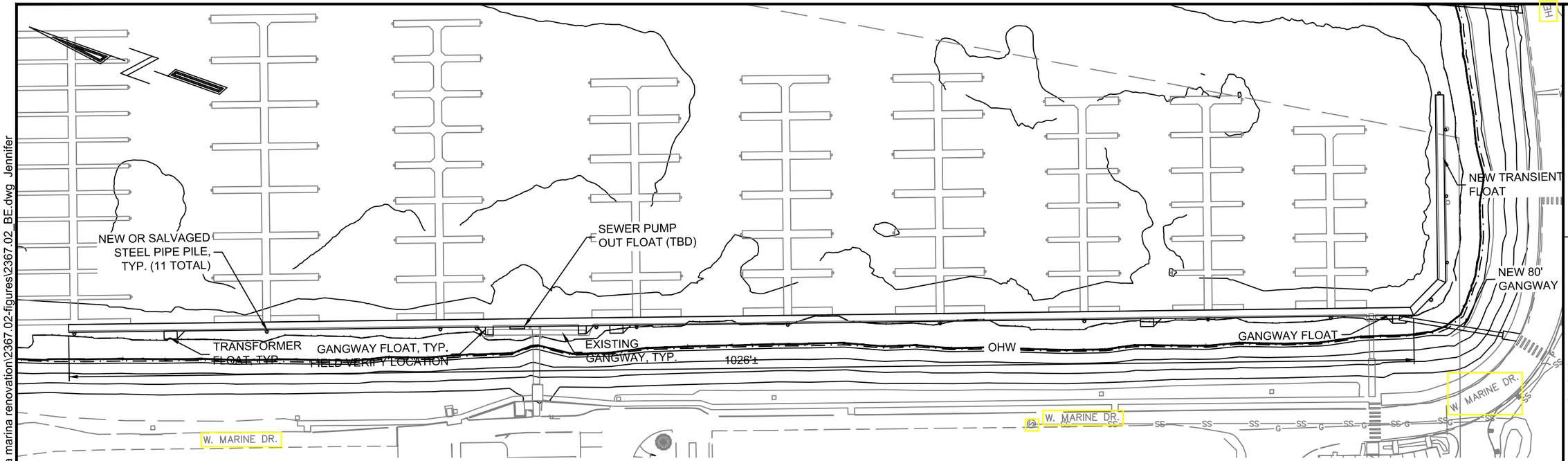


ABUTMENT SECTION



ABUTMENT PROFILE

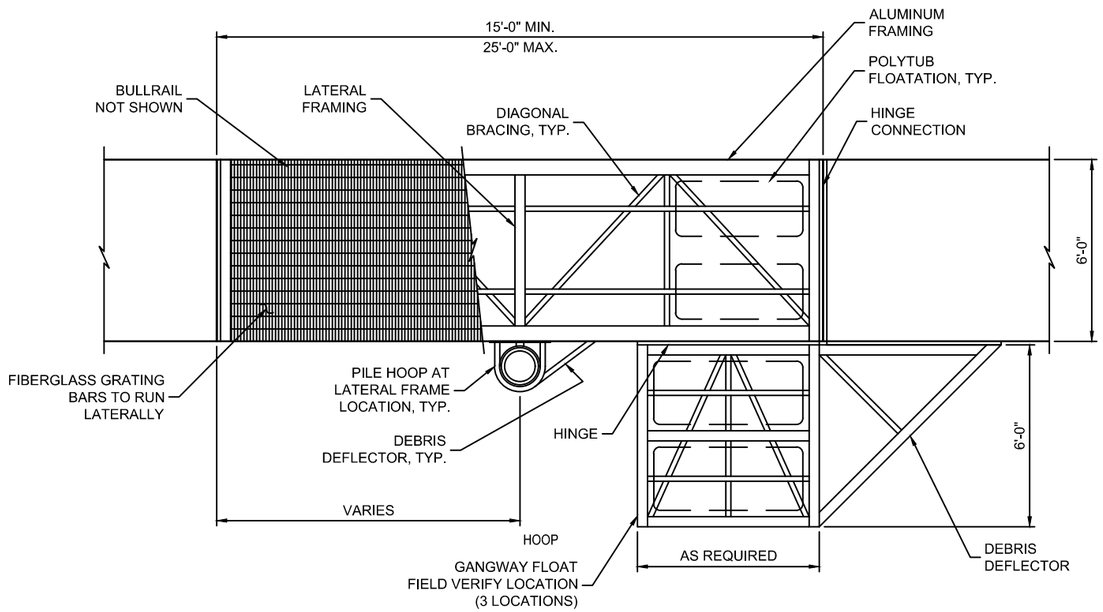
Ecological Land Services 1157 3rd Ave., Suite 220A Longview, WA 98632 Phone: (360) 578-1371 NOT TO SCALE	**PURPOSE:** Marina Restoration **DATUM:** N/A **ADJACENT PROPERTY OWNERS:**	Typical Float Abutment Profile & Section **APPLICANT:** PND Engineers **PROJECT NAME:** Port of Kalama Marina Renovation **REFERENCE #:** **SITE LOCATION ADDRESS:** 110 West Marine Drive Kalama, WA 98625	**PROPOSED:** Overwater Area Increase **IN** Comlumbia River **NEAR:** **COUNTY:** Cowlitz **STATE:** WA **SHEET** 9 **OF** 17 **DATE:** 8/23/16



PLAN - 1"=80'

NOTE(S):

1. Base Plan from PND Engineers, INC.



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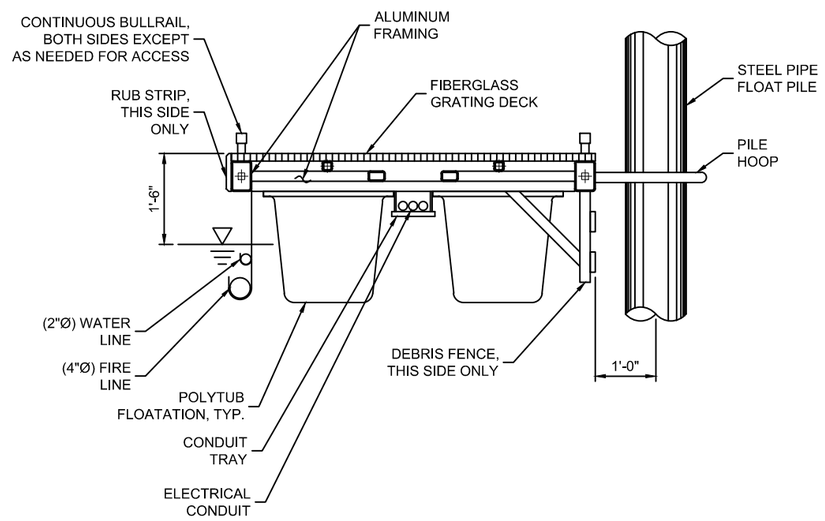


FLOAT SECTION - 1"=30'

PROPOSED: Overwater Area Increase

IN Columbia River
NEAR:
COUNTY: Cowlitz **STATE:** WA
SHEET 10 **OF** 17
DATE: 8/23/16

Marginal Float

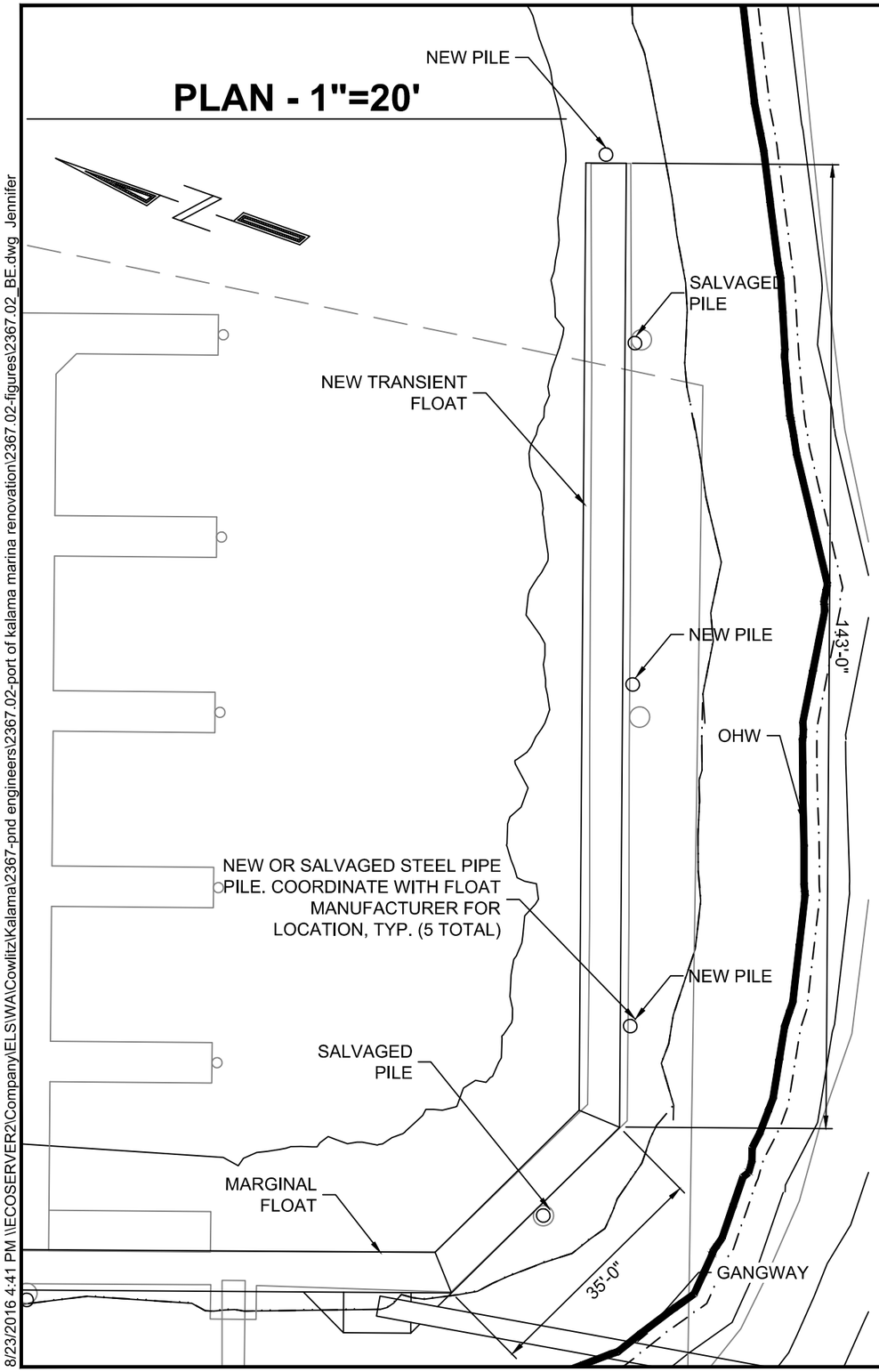
APPLICANT: PND Engineers
PROJECT NAME: Port of Kalama Marina Renovation
REFERENCE #:
SITE LOCATION ADDRESS:
110 West Marine Drive
Kalama, WA 98625

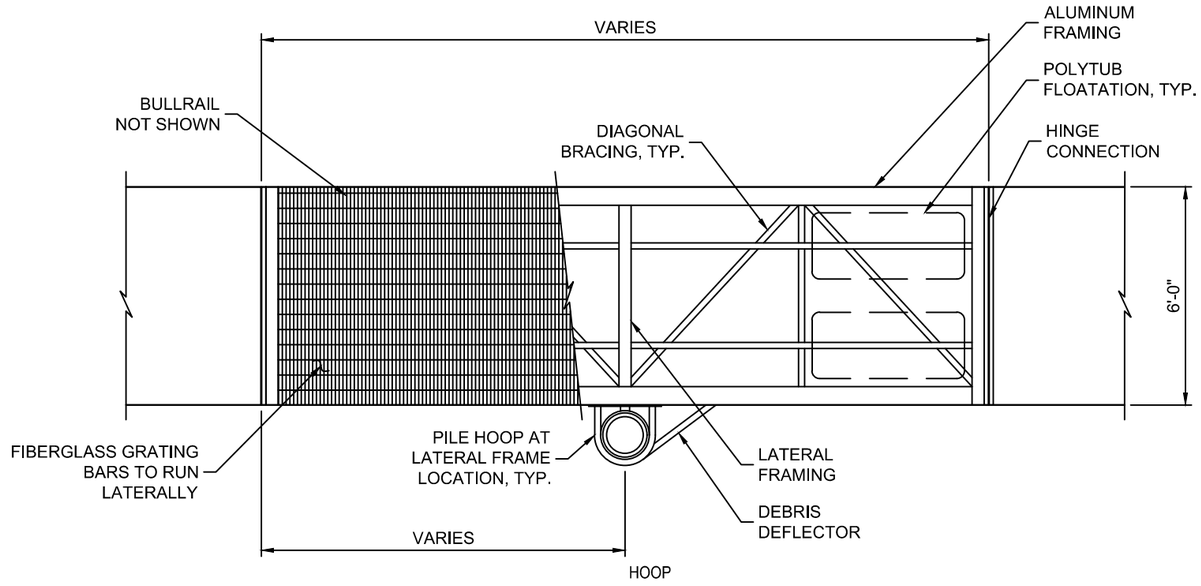
PURPOSE:
Marina Restoration

DATUM: NAVD 29-47
ADJACENT PROPERTY OWNERS:

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371

Ecological Land Services

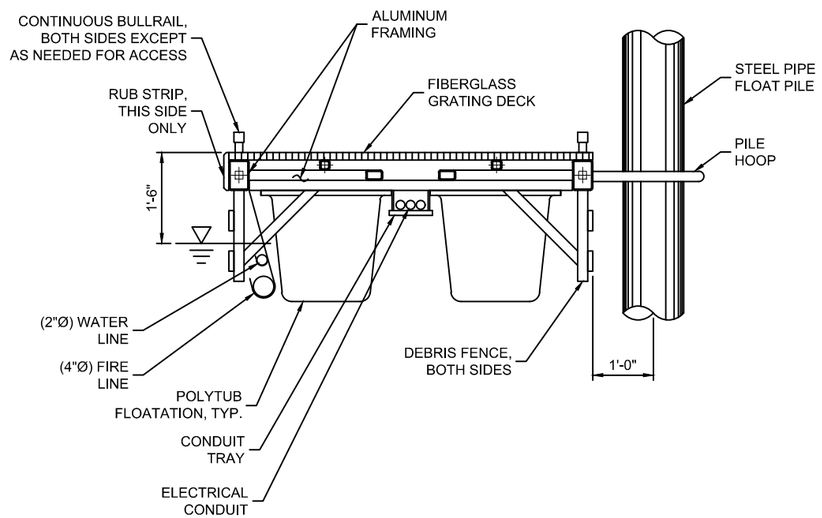




FLOAT PLAN - 1"=50'

NOTE(S):

1. Base Plan from PND Engineers, INC.



FLOAT SECTION - 1"=30'

PROPOSED: Overwater Area Increase

IN Columbia River
NEAR:
COUNTY: Cowlitz **STATE:** WA
SHEET 11 **OF** 17
DATE: 8/23/16

Transient Moorage

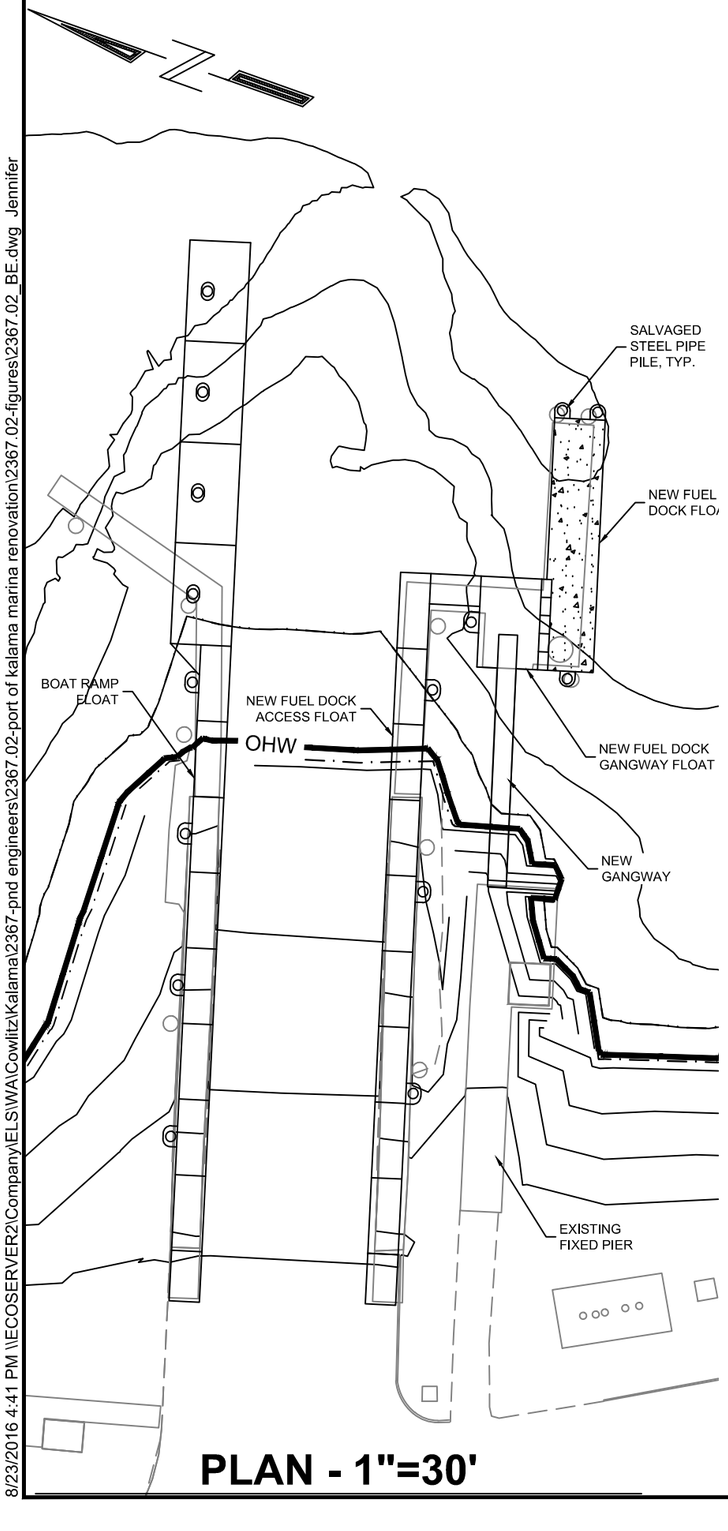
APPLICANT: PND Engineers
PROJECT NAME: Port of Kalama Marina Renovation
REFERENCE #:
SITE LOCATION ADDRESS: 110 West Marine Drive Kalama, WA 98625

PURPOSE: Marina Restoration

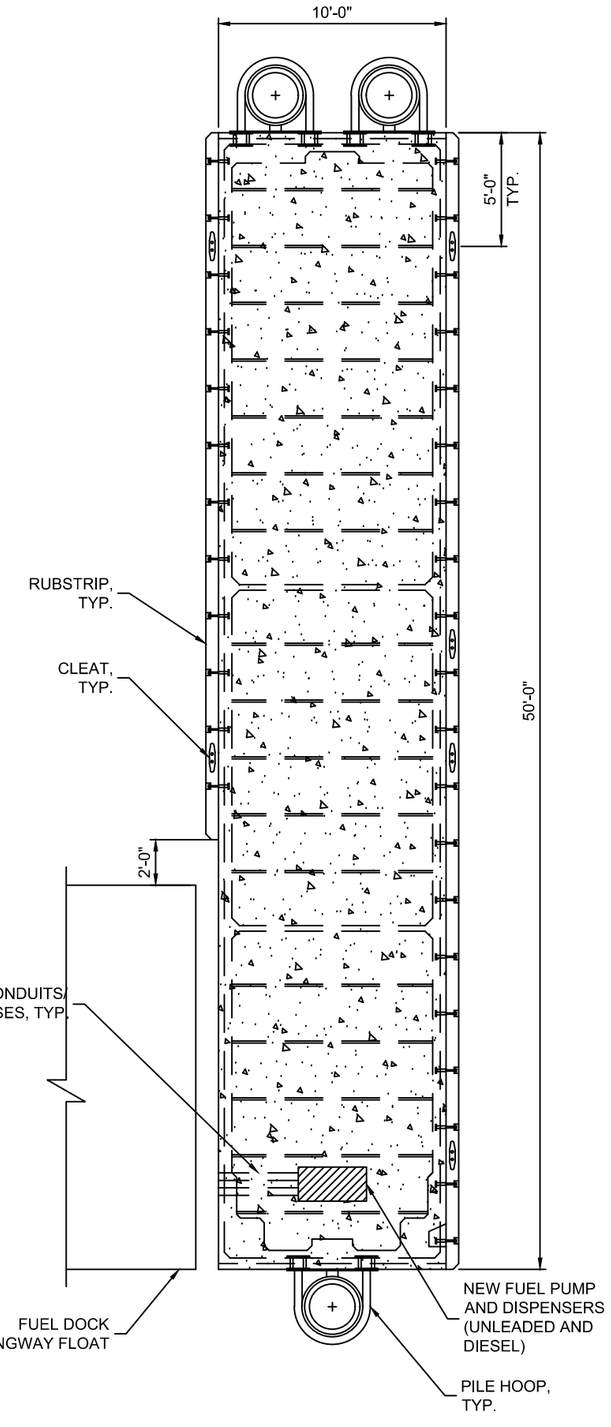
DATUM: NAVD 29-47
ADJACENT PROPERTY OWNERS:

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371

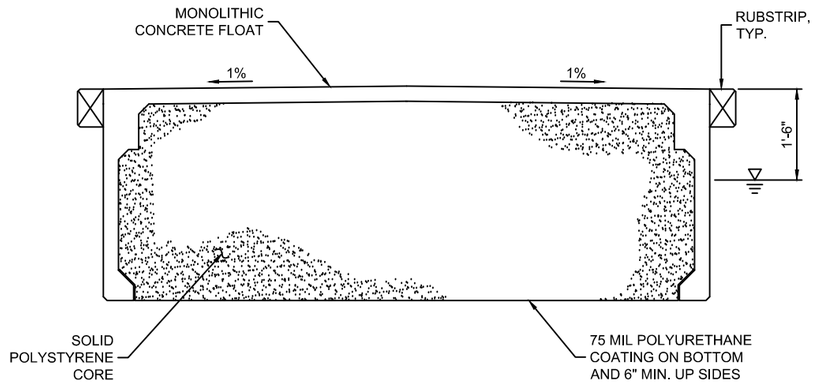
Ecological Land Services



PLAN - 1"=30'



FLOAT PLAN - 1"=80'



FLOAT SECTION - 1"=30'

NOTE(S):

1. Base Plan from PND Engineers, INC.

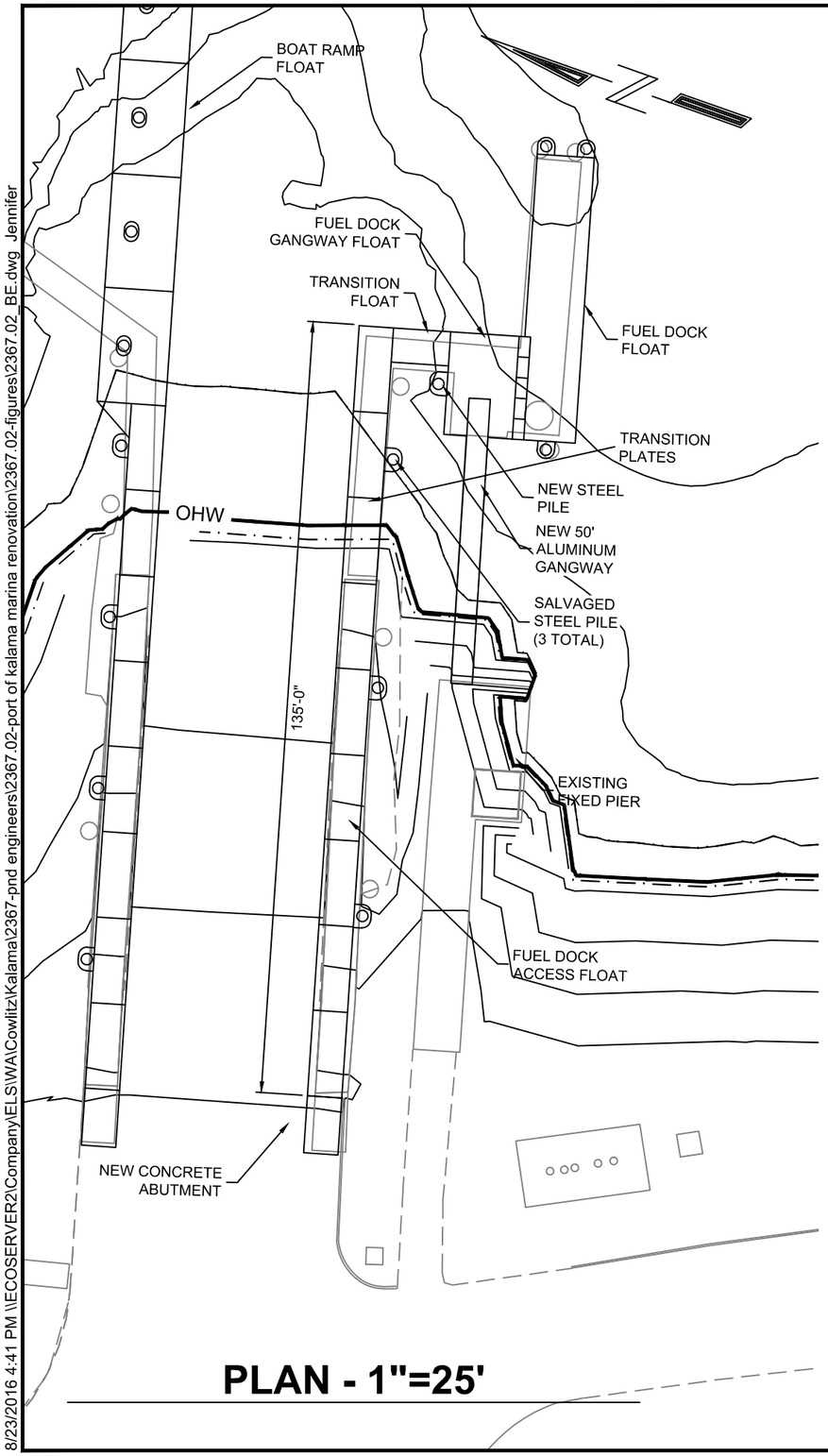
PROPOSED: Overwater Area Increase
IN Columbia River
NEAR:
COUNTY: Cowlitz **STATE:** WA
SHEET 12 **OF** 17
DATE: 8/23/16

Fuel Dock Float
APPLICANT: PND Engineers
PROJECT NAME: Port of Kalama Marina Renovation
REFERENCE #:
SITE LOCATION ADDRESS: 110 West Marine Drive, Kalama, WA 98625

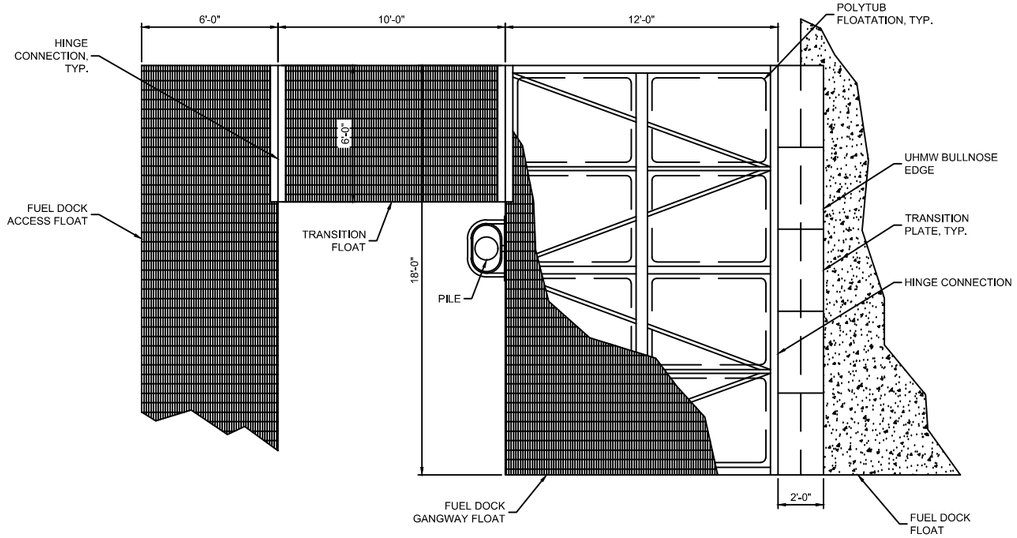
PURPOSE: Marina Restoration
DATUM: NAVD 29-47
ADJACENT PROPERTY OWNERS:

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371

Ecological Land Services



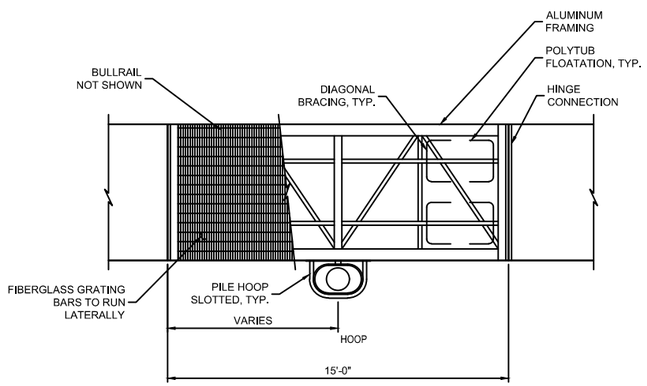
PLAN - 1"=25'



PLAN - 1"=80'

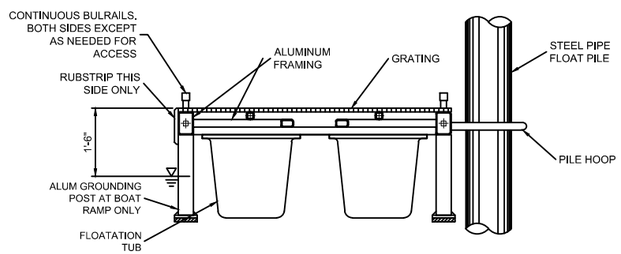
NOTE(S):

1. Base Plan from PND Engineers, INC.



FUEL DOCK ACCESS FLOAT PLAN - 1"=80'

TRANSITION FLOAT SIMILAR



FUEL DOCK ACCESS FLOAT SECTION - 1"=40'

TRANSITION FLOAT SIMILAR

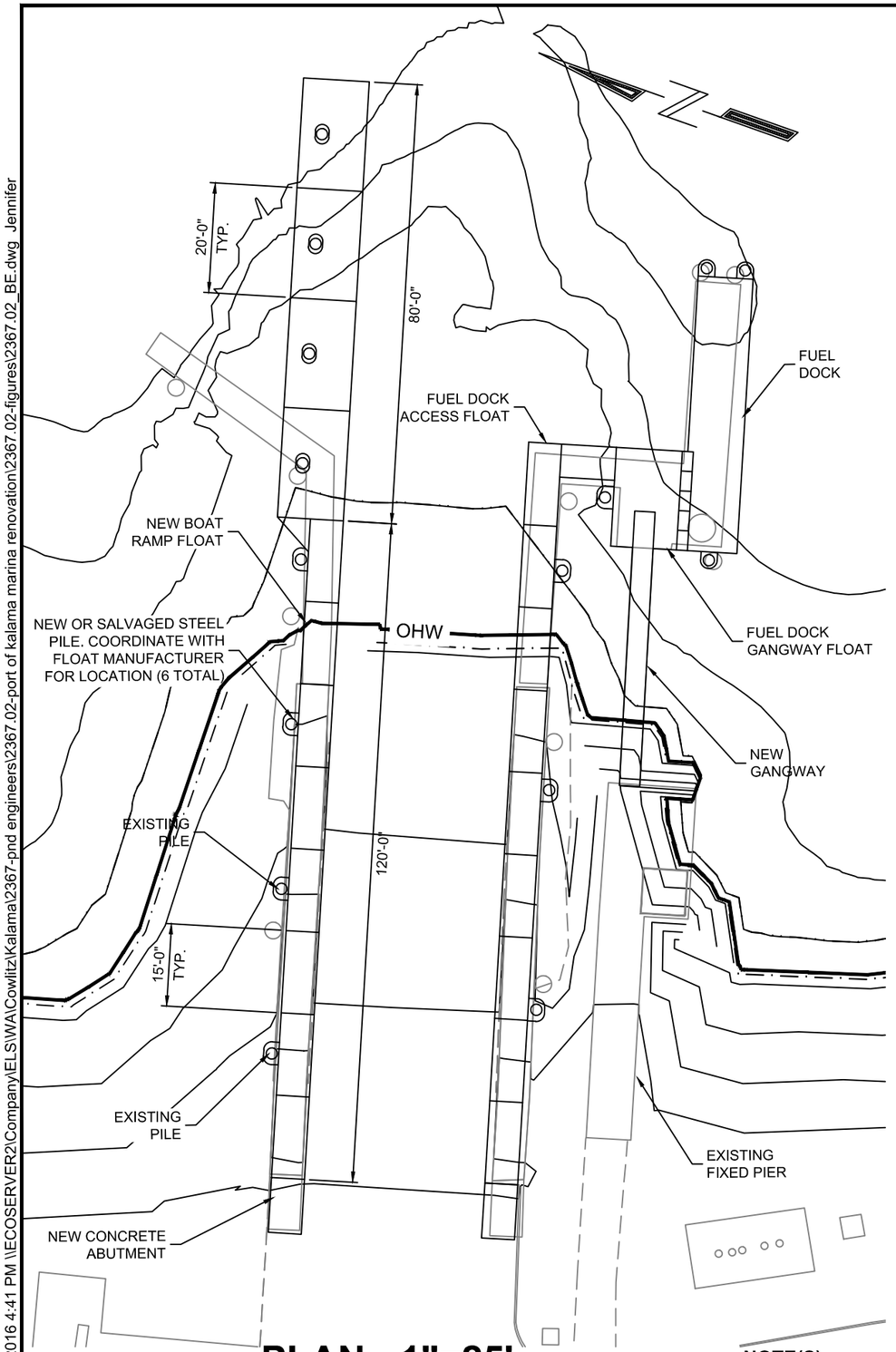
PROPOSED: Overwater Area Increase
IN Columbia River
NEAR:
COUNTY: Cowlitz **STATE:** WA
SHEET 13 **OF** 17
DATE: 8/23/16

Fuel Dock Access Float and Gangway Float
APPLICANT: PND Engineers
PROJECT NAME: Port of Kalama Marina Renovation
REFERENCE #:
SITE LOCATION ADDRESS: 110 West Marine Drive Kalama, WA 98625

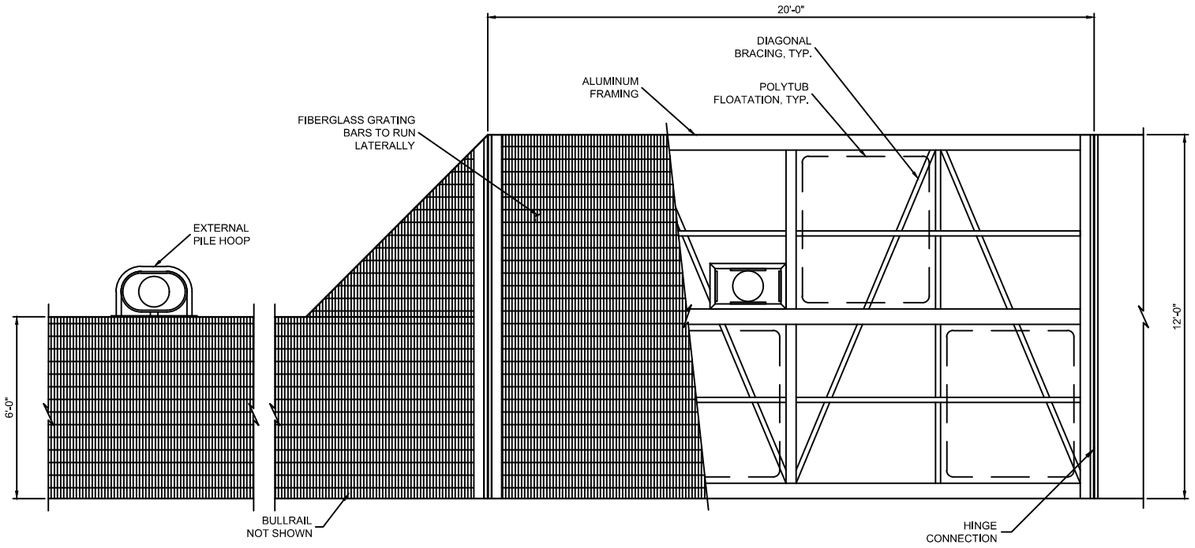
PURPOSE: Marina Restoration
DATUM: NAVD 29-47
ADJACENT PROPERTY OWNERS:

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371

Ecological Land Services

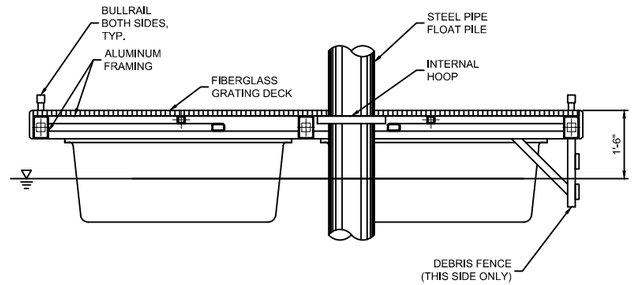


PLAN - 1"=25'

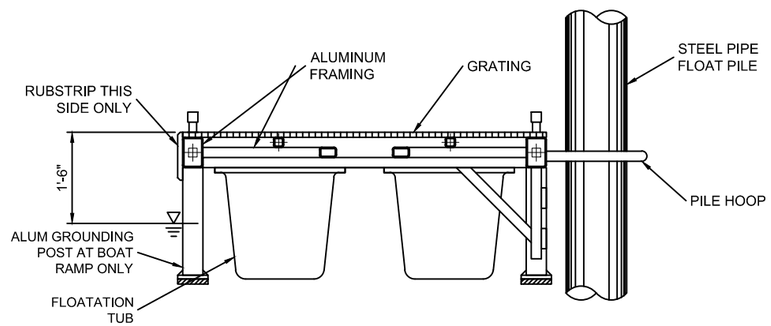


FLOAT PLAN - 1"=60'

END FLOAT SHOWN



6 FOOT WIDE FLOAT SECTION - 1"=40'



12 FOOT WIDE FLOAT SECTION - 1"=30'

NOTE(S):

1. Base Plan from PND Engineers, INC.

PROPOSED: Overwater Area Increase

IN Comlumbia River
NEAR:
COUNTY: Cowlitz **STATE:** WA
SHEET 14 **OF** 17
DATE: 8/23/16

Boat Ramp Float

APPLICANT: PND Engineers
PROJECT NAME: Port of Kalama Marina Renovation
REFERENCE #:
SITE LOCATION ADDRESS: 110 West Marine Drive Kalama, WA 98625

PURPOSE: Marina Restoration
DATUM: NAVD 29-47
ADJACENT PROPERTY OWNERS:

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Longview, WA 98632
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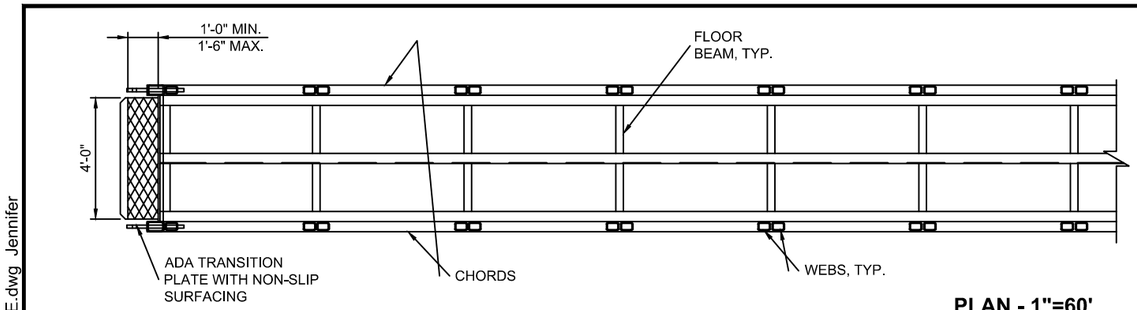
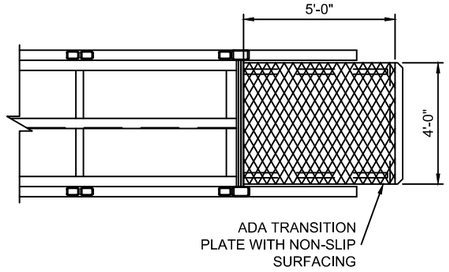
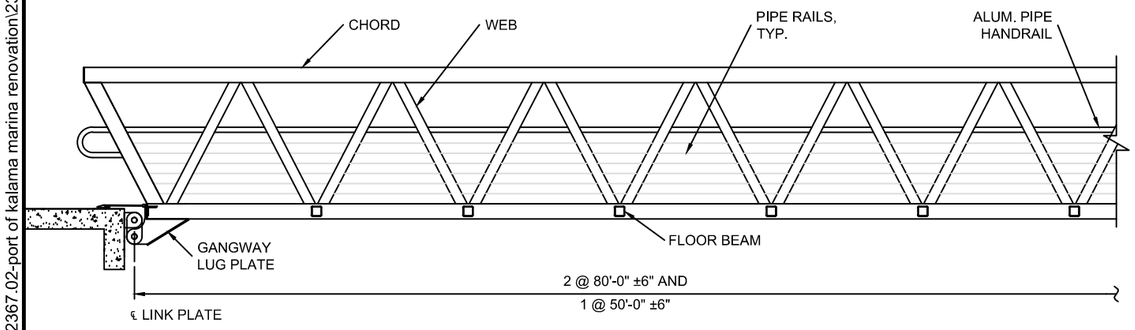
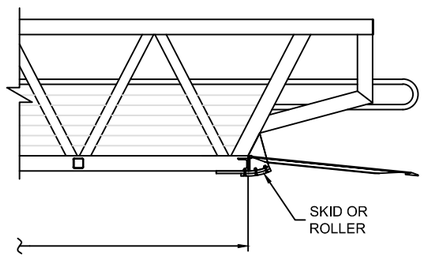


PLAN - 1"=60'
(AT FLOOR FRAMING)

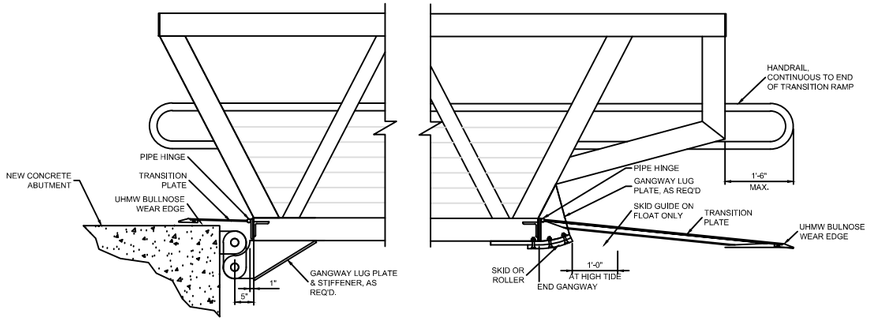






ELEVATION
ALUMINUM GANGWAY - 1"=60'

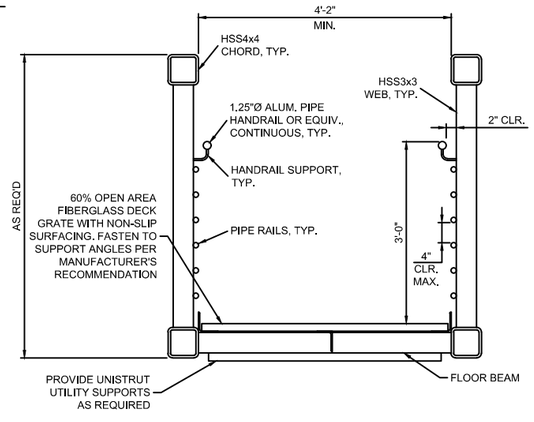
BOARDWALK END



BOARDWALK END - 1"=40'

FLOAT END - 1"=40'

FLOAT END



TYPICAL SECTION - 1"=30'

NOTE:
Base Plan from PND Engineers, INC.
WELD ALL JOINTS WITH MINIMUM 5/16" FILLET
WELD ALL AROUND OR EQUIVALENT BEVEL WELD.

GANGWAY PERFORMANCE CRITERIA
Gangway is design build by vendor to meet performance criteria requirements. Submit shop drawings and calculations for approval.

SUPPLIED DETAILS
Details shown are for reference only. Gangway manufacturer may submit different details for attaching gangway at hanger end, bearing end (skid shoe or roller), transition plates, etc. Submit alternative details with calculations for approval.

APPLICABLE CODES
All local codes plus the Applicable Codes and Standards.

DESIGN CRITERIA
Dead Loads - 80' Gangway (8,000 lb max. self weight)
50' Gangway (5,000 lb max. self weight)
Live Load - Uniform 100 psf
Wind Load - 85 mph

MATERIALS AND CONSTRUCTION

All material and construction shall conform to the following:

STRUCTURAL STEEL
ASTM A36 galvanized

ALUMINUM
Aluminum for gangway shall conform to 6061-T6 unless otherwise noted. Aluminum pipe for rails shall be 6063-T6. Modification to the gangway as detailed shall conform to the latest revisions of the Aluminum Design Manual and all applicable standards as set forth by the Aluminum Association. Edges shall be cut true, smooth and free of burrs. Flame cutting is not permitted. Holes for bolts shall be drilled or punched. Corner edges shall be ground smooth. Weld spatter and flash marks shall be removed and ground smooth. Mill stamps and markings shall be removed from all exposed surfaces. No finish is required on aluminum surfaces.

ALUMINUM WELDING
Per AWS D1.2. All welders shall be qualified per AWS for the type of welding anticipated.

BOLTS
All bolts shall be ASTM A325, hot-dip galvanized unless otherwise noted. Washers shall be used under both head and nut of all bolts.

GALVANIZING
All steel and hardware shall be hot-dipped galvanized per ASTM A123 or A153 after fabrication unless otherwise noted.

DISSIMILAR ISOLATION
Isolation washers & bushings shall be used between dissimilar metals.

DECK
Deck grating shall be light transmitting fiberglass deck grating. Attach to floor supports using Manufacturer supplied hold-downs and connectors per Manufacturer's recommendations.

NON-SLIP SURFACING
All walking surfaces shall have a non-slip surface meeting ADA requirements. Submit sample for approval.

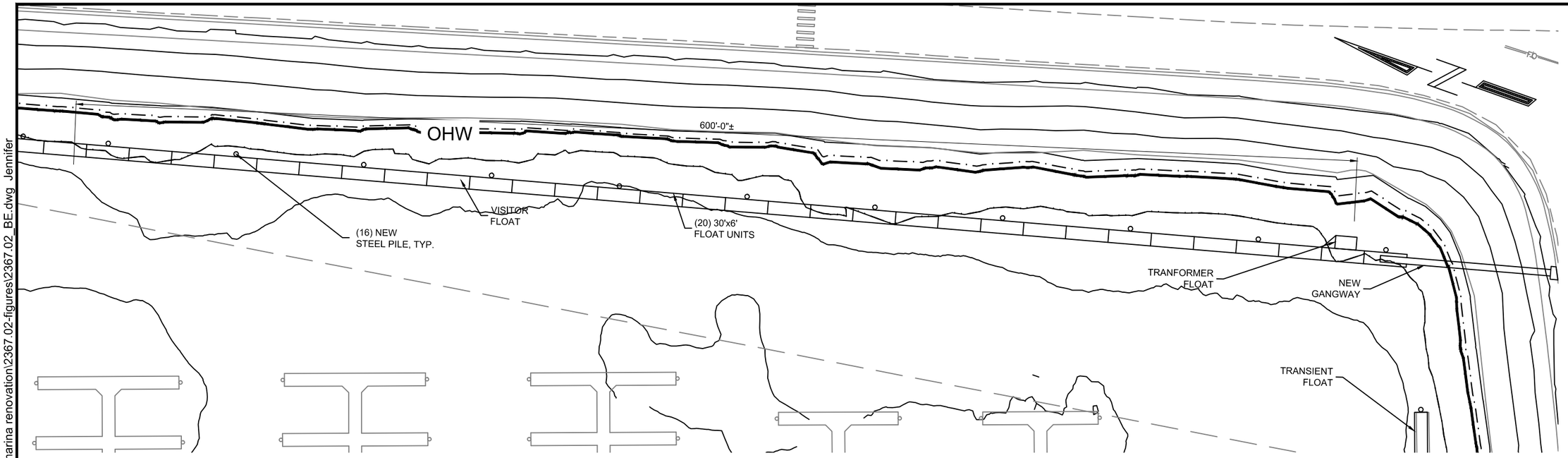
PROPOSED: Overwater Area Increase
IN Columbia River
NEAR:
COUNTY: Cowlitz **STATE:** WA
SHEET 15 **OF** 17
DATE: 8/23/16

New Aluminum Gangways
APPLICANT: PND Engineers
PROJECT NAME: Port of Kalama Marina Renovation
REFERENCE #:
SITE LOCATION ADDRESS:
110 West Marine Drive
Kalama, WA 98625

PURPOSE: Marina Restoration
DATUM: N/A
ADJACENT PROPERTY OWNERS:

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371

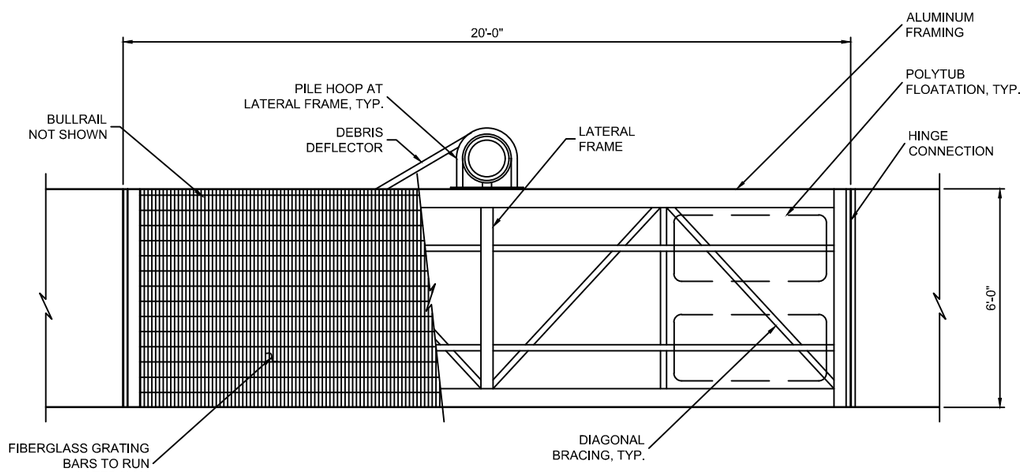
Ecological Land Services



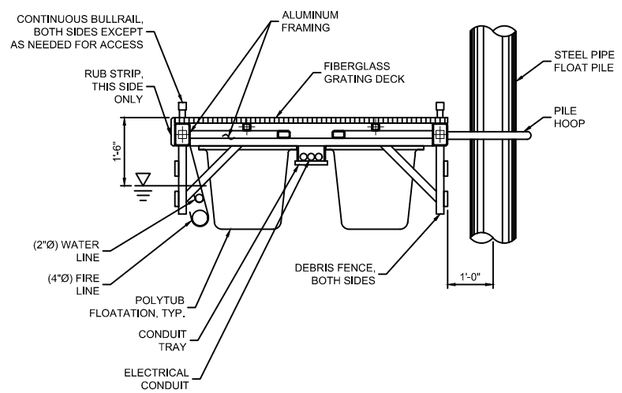
PLAN - 1"=50'

NOTE(S):

1. Base Plan from PND Engineers, INC.



FLOAT PLAN - 1"=50'



FLOAT SECTION - 1"=40'

PROPOSED: Overwater Area Increase

IN Columbia River
NEAR:
COUNTY: Cowlitz **STATE:** WA
SHEET 16 **OF** 17
DATE: 8/23/16

Visitor Float

APPLICANT: PND Engineers
PROJECT NAME: Port of Kalama Marina Renovation
REFERENCE #:
SITE LOCATION ADDRESS: 110 West Marine Drive Kalama, WA 98625

PURPOSE: Marina Restoration

DATUM: NAVD 29-47
ADJACENT PROPERTY OWNERS:

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371

Ecological Land Services

PILE SCHEDULE

LOCATION	PILE ID	DIA (IN)	T (IN)	TOP EL	TIP EL
MARGINAL FLOATS	MF 1	12.75	0.50	+30'	TBD
	MF 2	12.75	0.50	+30'	TBD
	MF 3	12.75	0.50	+30'	TBD
	MF 4	12.75	0.50	+30'	TBD
	MF 5	12.75	0.50	+30'	TBD
	MF 6	12.75	0.50	+30'	TBD
	MF 7	12.75	0.50	+30'	TBD
	MF 8	12.75	0.50	+30'	TBD
	MF 9	12.75	0.50	+30'	TBD
	MF 10	12.75	0.50	+30'	TBD
	MF 11	12.75	0.50	+30'	TBD
TRANSIENT FLOATS	TF 1	12.75	0.50	+30'	TBD
	TF 2	12.75	0.50	+30'	TBD
	TF 3	12.75	0.50	+30'	TBD
	TF 4	12.75	0.50	+30'	TBD
	TF 5	12.75	0.50	+30'	TBD
BOAT RAMP FLOATS	BR 1	12.75	0.50	+30'	TBD
	BR 2	12.75	0.50	+30'	TBD
	BR 3	12.75	0.50	+30'	TBD
	BR 4	12.75	0.50	+30'	TBD
	BR 5	12.75	0.50	+30'	TBD
	BR 6	12.75	0.50	+30'	TBD
	BR 7	12.75	0.50	+30'	TBD
	BR 8	12.75	0.50	+30'	TBD
FUEL DOCK FLOAT	FD 1	12.75	0.50	+30'	TBD
	FD 2	12.75	0.50	+30'	TBD
	FD 3	12.75	0.50	+30'	TBD
ACCESS FLOAT	FDA 1	12.75	0.50	+30'	TBD
	FDA 2	12.75	0.50	+30'	TBD
	FDA 3	12.75	0.50	+30'	TBD
	FDA 4	12.75	0.50	+30'	TBD
VISITOR FLOATS	VF 1	12.75	0.50	+30'	TBD
	VF 2	12.75	0.50	+30'	TBD
	VF 3	12.75	0.50	+30'	TBD
	VF 4	12.75	0.50	+30'	TBD
	VF 5	12.75	0.50	+30'	TBD
	VF 6	12.75	0.50	+30'	TBD
	VF 7	12.75	0.50	+30'	TBD
	VF 8	12.75	0.50	+30'	TBD
	VF 9	12.75	0.50	+30'	TBD
	VF 10	12.75	0.50	+30'	TBD
	VF 11	12.75	0.50	+30'	TBD
	VF 12	12.75	0.50	+30'	TBD

TO BE DEVELOPED

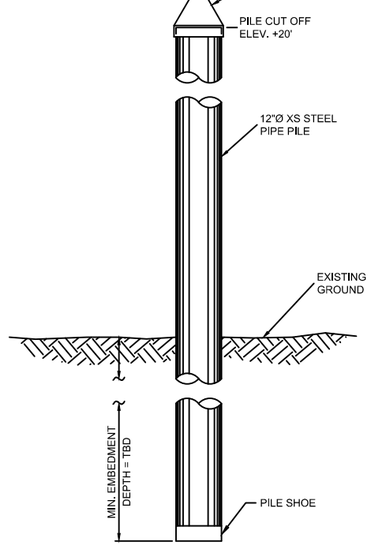
SECTION

TO BE DEVELOPED

PILE SPLICE

TO BE DEVELOPED

PROFILE



PILE SECTION - 1"=60'

NOTE(S):

1. Base Plan from PND Engineers, INC.

Pile Schedule and Details

APPLICANT: PND Engineers
PROJECT NAME: Port of Kalama Marina Renovation
REFERENCE #:
SITE LOCATION ADDRESS: 110 West Marine Drive Kalama, WA 98625

PURPOSE: Marina Restoration

DATUM: NAVD 29-47
ADJACENT PROPERTY OWNERS:

PROPOSED: Overwater Area Increase
IN Columbia River
NEAR:
COUNTY: Cowlitz **STATE:** WA
SHEET 17 **OF** 17
DATE: 8/23/16

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Ecological Land Services