



US Army Corps  
of Engineers ®  
Seattle District

**BIOLOGICAL EVALUATION  
FOR INFORMAL ESA CONSULTATION**  
For: \_\_\_\_\_ (Corps Reference Number)  
Version: May 2012



**\*\* This form is for projects that have insignificant or discountable impacts on listed species. It contains all the information required for a biological evaluation, but in abbreviated form and with minimal instructions on how to fill it out. For more detailed instructions, a format for development of a biological assessment or biological evaluation can be found on the Seattle District Corps website ([www.nws.usace.army.mil](http://www.nws.usace.army.mil) – click on regulatory and then on endangered species, BA Template). You may also contact the Corps at 206-764-3495 for further information.**

**Drawings and Photographs - Drawings and photographs must be submitted.** Photographs must be submitted showing local area, shoreline conditions, existing overwater structures, and location of the proposed project. Drawings must include a vicinity map; plan, profile, and cross-section drawings of the proposed structures; and over- and in-water structures on adjacent properties. (For assistance with the preparation of the drawings, please refer to our *Drawing Checklist* located on our website at [www.nws.usace.army.mil](http://www.nws.usace.army.mil) Select Regulatory – Regulatory/Permits – Forms.) Submit the information to: U.S. Army Corps of Engineers, Regulatory Branch, P.O. Box 3755, Seattle, Washington 98124-3755.

**Date: October 2022**

<b>SECTION A - General Information</b>			
<b>1. Applicant name:</b> Paul West, City of Mercer Island Public Works			
Mailing address: 9611 SE 36th Street, Mercer Island, WA 98040			
Work phone: (206) 275-7833	Home phone:	Email: paul.west@mercergov.org	Fax:
<b>2. Joint-use applicant name (if applicable):</b>			
Mailing address:			
Work phone:	Home phone:	Email:	Fax:
<b>3. Authorized agent name:</b> Josh Jensen, Anchor QEA			
Mailing address: 1201 3rd Avenue, Suite 2600, Seattle, WA 98101			
Work phone: (206) 903-3374	Home phone:	Email: jjensen@anchorqea.com	Fax:
<b>4. Location where proposed work will occur</b>			
Address (street address, city, county): Luther Burbank Park: 2040 84th Avenue SE, Mercer Island, WA 98040			
Location of joint-use property (street address, city, county):			
Waterbody: Lake Washington			
¼ Section: SW	Section: 6	Township: 24N	Range: 5E
Latitude: 47.591034 N lat.		Longitude: -122.224481 W. long.	

**5. Description of Work:**

**Include project drawings and site photographs.**

*Describe the proposed project in detail. Please describe any mitigation that is being proposed for impacts from your project. Attach a mitigation plan as an appendix, if appropriate.*

The City of Mercer Island (City) is proposing the Luther Burbank Park Waterfront Improvements Project (Project) to repair, maintain, and enhance the waterfront program at Luther Burbank Park in the City of Mercer Island, Washington (Figure BE-1).

Appendix 1 provides detailed Project drawings that are referenced throughout this report.

An overview of the Project components is provided in Appendix 1, Figure 3. The Project includes repairing and replacing portions of the existing dock structures, including repairs to the north dock structure, and replacing and reconfiguring the central and south dock structures to accommodate waterfront programming and current and projected watercraft uses. Other waterside improvements include installing a grated overwater public access platform in the nearshore to improve access to the water along the existing plaza area.

The Project also includes upgrades to the waterfront plaza and Boiler Building. These include Boiler Building repairs (i.e., new roof, seismic retrofits, and new lighting); Boiler Building restroom annex renovation to improve the restroom facilities and construct a new rooftop viewing deck; concession stand repairs; and waterfront plaza renovations and access upgrades.

The Project will improve access to the waterfront by creating new Americans with Disabilities Act (ADA)-accessible routes from the plaza to the viewing deck on the existing Boiler Building annex restroom rooftop, and to the expanded north beach area that will be improved with fish habitat gravel and riparian plantings. The ADA route will connect to the adjacent future south shoreline trail that will be constructed as part of a separate project. The ADA route will also connect to the existing trail that continues north of the Project area. All proposed waterfront improvements including the dock structures and gangways will also meet ADA requirements.

The waterfront plaza renovations and access upgrades will incorporate low impact development (LID) features that will provide stormwater buffering and biofiltration functions similar to a vegetated shoreline. An irrigation intake system will also be installed at the south end of the plaza.

Project details and construction methods are described in the following subsections.

## Upland and Shoreline Improvements

The proposed upland and shoreline improvements include the following (Appendix 1, Figures 3 through 6):

- **Boiler Building Repairs:** installing a new roof, seismic retrofits, and new lighting on the existing building
- **Boiler Building Restroom Annex Renovation (Rooftop Viewing Deck):** renovating the existing restrooms, constructing a new rooftop viewing deck, and installing new lighting on the existing building
- **Concession Stand Repairs:** installing improvements and a new electrical panel within the concession area of the existing building
- **Waterfront Plaza Renovations and Access Upgrades:**
  - Installing 1,970 sf of planting and irrigation
  - Installing 1,800 sf of plaza paving improvements
  - Installing three benches and one picnic table
  - Installing 65 lf of a new structural ADA-accessible ramp to the viewing deck
  - Expanding the north beach access with a new 120-lf ADA-accessible pathway connection and beach expansion
  - Installing a 6-foot concrete seatwall at north beach pathway
  - Installing 61 lf of split rail fencing
  - Installing a new 140-lf on-grade pathway connection between the structural ramp, south shoreline trail, and upland plaza
  - Installing granite steps at the new on-grade pathway
- **Shoreline and Beach Enhancements:** expanding the north beach by placing fish habitat gravel landward of the upland edge of the existing beach, relocating boulders and large woody debris (LWD) along the shoreline, enhancing riparian vegetation
- **Waterfront Drainage LID:** installing new site drainage improvements including 2,500 sf of pervious paver drainage design at the plaza, installing a silva cell biofiltration array with a new stormwater outfall to the lake, and complying with all associated storm drainage reporting and compliance requirements
- **Irrigation Intake System Installation:** replacing and installing a new irrigation intake, pump system, and supply lines

### *Boiler Building Repairs*

Exterior repairs to the Boiler Building will include installing seismic retrofits, a new roof, and replacing and installing wall-mounted light fixtures to enhance public safety.

### *Boiler Building Restroom Annex Renovation (Viewing Deck)*

The Boiler Building restroom annex rooftop will be renovated to facilitate a new rooftop viewing deck. The viewing deck will be constructed with Bison wood-paneled deck-surfacing material on pedestals with a 1/2-inch maximum gap for ADA accessibility on top of the existing concrete roof. The existing rooftop elevation is 29 feet, and the

rooftop itself is 40 feet by 21 feet in length and width. The new rooftop will be elevated to approximately 30 feet in height to match the future second level of the Boiler Building and will match the existing extent of the rooftop area. Amenities, such as a new guardrail, light fixtures, new signage displays, and site furnishings, will be installed.

#### *Concession Stand Repairs*

The concession stand is located between the Boiler Building and restrooms and is approximately 160 sf in area. An existing casework area on the east side of the wall will be removed and replaced with a new 6-inch concrete wall with concrete counter above. A new sink will be installed in the southwest corner of the concession area and a new electrical panel will be installed in the northwest corner.

#### *Waterfront Plaza Renovations and Access Upgrades*

Table 1 describes each Project element and the impervious surface removed, replaced, or installed for each feature. The Project will reduce overall impervious surface area by approximately 5% and will replace approximately 50% of existing impervious surfaces.

Plaza renovations for the Project include removing 5,205 sf of concrete pavers, brick pavers, concrete paving, and a small area of asphalt paving in front of the Boiler Building restroom annex under the breezeway (Appendix 1, Figure 4). Approximately 2,595 sf of existing impervious surface will be replaced, including 2,015 sf of new concrete paving in the western portion of the plaza by the Boiler Building and 580 sf of gravel driveway paving (Appendix 1, Figure 5). Approximately 2,410 sf of pervious pavers will be installed in the eastern part of the plaza (not included in impervious surface calculations). Two benches are proposed along the outside of Boiler Building in the plaza, and one picnic table is proposed at southern end of the plaza.



**Table 1**  
**Impervious Surfaces Summary**

Project Element	Impervious Surface Removed (sf)	Impervious Surface Replaced (sf)	New Impervious Surface Installed (sf)
<b>Waterfront Plaza</b>			
Concrete pavers, brick pavers, and concrete paving at waterfront plaza	4,425	2,015	n/a
Asphalt paving at Boiler Building restroom annex breezeway	320	n/a	n/a
<b>Driveway and ADA Trail/Ramp</b>			
Gravel driveway paving	580	580	n/a
Gravel on-grade pathway south of plaza	170	n/a	700
Structural concrete ADA-accessible ramp to the new viewing deck	n/a	n/a	260
Rock terrace at on-grade pathway	n/a	n/a	375
Granite steps at on-grade pathway	n/a	n/a	60
<b>North Beach Access</b>			
Gravel pathway at north beach	30	n/a	400
Concrete pathway segment	n/a	n/a	150
Rock revetment at north beach	n/a	n/a	300
Concrete cap for sheetpile wall	n/a	n/a	11
Rock terrace at north beach	n/a	n/a	60
Concrete seatwall	n/a	n/a	11
<b>Total</b>	<b>5,205</b>	<b>2,595</b>	<b>2,327</b>

The Project includes several shoreline trail access improvements (on-grade pathway and ramp, north beach pathway). The new on-grade pathway south of the plaza will be an accessible, crushed rock surfaced pedestrian trail (Appendix 1, Figure 5). Approximately 42 cubic yards of terraced rock wall (375 sf) will be placed to accommodate ADA-accessible slopes along this pathway. A stormwater outfall will be relocated during this construction.

A new structural ADA-accessible ramp is designed to provide access to the new viewing deck and will be located behind the Boiler Building restroom annex on the northwest side of the rooftop. Several footings will be installed to support the viewing deck access ramp, ranging from 3.5 to 5.5 feet deep and requiring excavation of approximately 20 cubic yards of soil total. The ramp will connect to the new on-grade crushed gravel pathway that will lead down to the plaza, dock, and future south shoreline trail. The on-grade pathway will also lead uphill to a new granite step feature that connects to an existing uphill trail network. Construction of the upland trail will be completed with standard heavy equipment including small excavators, small bulldozer, dump truck, and similar equipment.

The north beach access will be expanded with a new ADA-compliant pathway connection (Appendix 1, Figure 5). A gravel pathway will connect to a concrete trail segment leading to a seawall. A sheetpile wall with concrete cap will be installed at the east end of the trail. The trail will be supported by a rock terrace on the landward side and a rock revetment adjacent to the beach (see sections in Appendix 1, Figure 6).

#### *Shoreline and Beach Enhancements*

In addition to improving public access and safety, the design includes shoreline and beach enhancements (Appendix 1, Figure 5). The Project will expand the north beach by placing fish habitat gravel landward of the upland edge of the existing beach, relocate boulders and LWD along the shoreline, and enhance riparian vegetation. The beach expansion includes placing 45 cubic yards of habitat gravel and cobble underlayment (605 square feet) and relocating intermittent boulders and LWD along the existing beach and riparian buffer area. The expanded beach and riparian area will maintain nearshore habitat functions. The planting plan to replace removed riparian vegetation and trees is described later in this section.

Habitat gravel will consist of naturally rounded material that complies with Washington Department of Fish and Wildlife (WDFW) grain size criteria for Lake Washington. Gravel depth is a maximum of 2- to 3-foot thickness on the landward side, tapering on the waterward toe of placement (see sections in Appendix 1, Figure 6). The material will be placed from the upland or by barge using a conveyor (e.g., telebelt or similar) to place the material precisely and evenly. All materials will be sourced from an approved off-site distributor.

#### *Waterfront LID*

Approximately 2,410 sf of concrete and brick pavers at the plaza will be replaced with pervious pavers along the eastern edge of the plaza. The pervious pavers will abut the new concrete paving on the western portion of the plaza and will end at the waterfront edge. A silva cell system will be installed under the south end of the plaza to provide biofiltration of stormwater. A new outfall from this system will be installed in the bulkhead south of the pedestrian plaza. A vegetated conveyance swale will be installed along the resurfaced gravel maintenance driveway.

#### *Irrigation Intake System Installation*

The irrigation intake system includes installing a new water pump station south of the Boiler Building and a new freshwater intake screen in Lake Washington east of the pump station (Appendix 1, Figure 5). They will connect to upland irrigation systems within the park. Upland work will include installing the pump station, trenching approximately 50 feet east from the pump station under the plaza to the intake screen, and installing pipe bedding material and the piping in the trench.

A coring saw, or similar, will be used to core a hole through the existing retaining wall to insert the intake and filter backwash pipes through the wall and into the lake. A small

portion of the lake, in and around the area where the pipe penetration will be constructed through the bulkhead wall, will be temporarily dewatered to allow for drilling through the bulkhead and installation of the screen in the dry. Once the penetration is sealed and grout has cured, the screen will be installed on the end of the pipe and the temporary cofferdam used to dewater that portion of the lake will be removed and the lake will be allowed to submerge the fish screen.

The intake screen will be a self-cleaning suction screen designed to screen fish from entering the intake facilities in compliance with current fish screening guidelines from WDFW and the National Marine Fisheries Service. The irrigation intake system will draw water from Lake Washington at a maximum rate of 0.089 cubic foot per second (40 gallons per minute), as allowed by the approved water right change (Water Right Claim 158498AH).

### **In-Water and Overwater Activities**

The in-water and overwater Project elements are described in this section and shown in Appendix 1, Figures 3, 4, and 7 through 12.

#### *North Dock Repairs*

The Project proposes to retain and repair the northernmost segment of the dock (approximately 188 feet long and 8 feet wide; Appendix 1, Figures 7 and 8). Approximately 235 sf of the existing concrete dock connecting to the waterfront plaza will be removed and replaced with fiberglass-reinforced plastic (FRP) grating. Approximately 120 sf of an existing wood finger dock will be removed (Appendix 1, Figure 4).

Some timber piles supporting the north dock have decayed and need repair. The Project includes removing and replacing the top portion of up to five decayed timber piles with ACZA-treated timber. The damaged portions of the pile will be cut away, and a new timber section will be attached to the remaining pile with steel straps (Appendix 1, Figure 9).

As part of the north dock repairs, 38 creosote-treated timber piles will be wrapped with fiberglass jackets (Appendix 1, Figure 8). The area around the bottom of each pile will be excavated a minimum of 2 feet deep to allow the jacket to be extended below the mudline. A marine epoxy grout will be injected between the pile and the jacket. The jackets will isolate the creosote-treated piles from the water to prevent further leaching of creosote into the water column, reducing a source of water pollution into the lake.

#### *Central Dock Reconfiguration*

The central dock is a fixed concrete structure (Appendix 1, Figure 2). The existing dock will be entirely removed (Appendix 1, Figure 4) and replaced in a new configuration. The reconfigured central dock will include a wave attenuator/mooring float attached to the

existing fixed concrete dock by an ADA-compliant grated gangway (Appendix 1, Figure 7a). The wave attenuator/mooring float will be 10 feet wide with 2 feet of freeboard. To provide adequate wave attenuation, the float material will be concrete, with light penetration options where possible. The bulk of the structure is located as far off shore as practical in approximately 36 to 38 feet of water to reduce the effect of shading on the lake bottom. The float will attach to 16 new steel piles (24-inch diameter; Appendix 1, Figures 10 and 11). Attached to the inside of the wave attenuator/mooring float will be two new grated finger floats, each 25 feet long with 1.5 feet of freeboard (Appendix 1, Figure 7). Elevation and section views of the central dock are provided in Figures 10 and 11.

The intended use of the wave attenuator/mooring float is for small (up to 26-foot) powerboat moorage. The width is designed to attenuate passing vessel wakes and protect moored boats. The wave attenuation function is critical because the area is frequented by wake surfing boats, a recent boating trend that uses back-weighted boats designed to produce large wakes for surfing without the use of the tow rope that is typically required for waterskiing and wake boarding. In the last decade, wake surfing has become popular in Lake Washington. The large waves this generates cause floating docks to pitch excessively. The waves affect the docks intermittently, unpredictably, and without warning. These conditions create unstable surfaces on floating docks, posing a risk to dock users and prohibiting ADA-compliant access. The wave attenuation provided by this mooring float addresses this problem. This project will also install regulatory buoys offshore of the float to inform boaters of wake regulations in proximity to the shoreline.

### *South Dock Reconfiguration*

The south dock is a fixed concrete structure that will be removed (Appendix 1, Figure 4) and replaced in a new configuration. The new south dock is intended for nonmotorized watercraft—kayaks, canoes, rowboats, and small sailboats—to accommodate public use and boating programs such as rentals, classes, and camps. The design includes the reuse of an existing 10-foot by 50-foot grated float and construction of a new 8-foot-wide by 50-foot-long, 9-inch-freeboard general-purpose float (Appendix 1, Figures 7 and 12). The proposed floating structures will connect to the existing fixed dock by an ADA-compliant grated gangway. The floats will attach to five new steel piles (16-inch diameter).

The new general-purpose float will be constructed with a low freeboard to make the use of kayaks and stand-up paddleboards easier and with grated surfacing to meet light transmittance requirements. Two grated finger floats (each 15 feet long by 3 feet wide) will extend from the general-purpose float to provide areas for kayak launching, including one ADA-accessible kayak launch point.

### *Overwater Access Platform*

The Project includes a new grated overwater platform as part of the goal to improve access to the waterfront (Appendix 1, Figure 3). Portions of the “Handsome Bollards” chain will be removed to allow the public past the art feature and onto the platform where they can access the lake at water level. The platform will only provide access to the ordinary high water level and will not descend to the beach substrate. The platform will attach to the existing concrete bulkhead at the plaza as an overwater feature and will be of FRP grating material. The platform is being permitted separately with the U.S. Army Corps of Engineers but will be incorporated with the Project for other permit agencies.

### *Buoys*

To reduce the risks created by passing vessels, the City will replace one buoy and add two new buoys in the lake. Two will be “no wake” buoys located east and southeast of the docks, and one will be a “nonmotorized vessel” buoy located near the south dock (Appendix 1, Figure 7).

### *Summary of Pile and Overwater Cover Quantities*

Table 2 summarizes the in-water piles and overwater cover to be removed, repaired, and installed.

Up to sixty-seven 12- to 14-inch creosote-treated timber piles and two 16-inch concrete encapsulated piles in total will be removed during dock demolition and repair. A total of 23 new steel piles (16- and 24-inch diameter) will be installed for the reconfigured docks, and six new pin piles (6-inch diameter) will be installed for the overwater platform. The Project will result in a net reduction of 40 piles in Lake Washington, and removal or fiberglass encapsulation of creosote-treated timber piles.

Piles will be installed using a water-based pile driver and a vibratory and/or impact hammer. It is anticipated that impact pile driving will be limited to proofing or if obstructions are encountered during vibratory pile driving. During all impact driving, sound-attenuation devices such as wooden cushion blocks or similar devices will be employed to minimize sound-related impacts.

The Project will result in a net reduction of approximately 5 sf of overwater cover (4,665 sf removed and 4,660 sf added). Much of the new overwater cover to be installed for the Project will consist of grated material that will allow light penetration.

**Table 2  
In-Water and Overwater Work Summary**

Project Portion	Element	Features Removed	Features Replaced	Net Change
North Dock Repairs <sup>1</sup>	In-water piles	One 12- to 14-inch creosote-treated timber pile <sup>1</sup>	Not applicable	Net decrease of 1 in-water pile
	Overwater cover	Approximately 355 sf of overwater cover (235 sf of existing concrete dock; 120 sf of one wood finger dock)	235 sf FRP grating	Net decrease of 120 sf overwater cover
Central Dock Reconfiguration	In-water piles	Approximately twenty-six 12-to 14-inch creosote-treated timber piles)	Approximately 17 piles (sixteen 24-inch steel piles; one 16-inch steel pile)	Net decrease of 9 in-water piles
	Overwater cover	Approximately 1,500 sf fixed concrete dock	Approximately 3,160 sf of new overwater cover (2,610 sf of wave attenuator float, 175 sf of two grated finger floats, 375 sf of grated gangway)	Net increase of 1,660 sf overwater cover
South Dock Reconfiguration	In-water piles	Approximately 42 piles (forty 12- to 14-inch creosote-treated timber piles; two 16-inch concrete encapsulated piles)	Approximately six 16-inch steel piles	Net decrease of 36 in-water piles
	Overwater cover	Approximately 2,810 sf existing cover (1,930 sf of fixed concrete dock; 40 sf of aluminum ramp; seven 120-sf wood finger docks)	Approximately 713 sf of new overwater cover (380 sf of general-purpose float, 90 sf of 2 grated finger floats, 225 sf of grated gangway, 18 sf of concrete gangway abutment)	Net decrease of 2,097 sf overwater cover
Overwater Access Platform	In-water piles	Not applicable	Approximately 6 pin piles (6-inch steel piles)	Net increase of 6 in-water piles
	Overwater cover	Not applicable	Approximately 552 sf of grated overwater cover	Net increase of 552 sf overwater cover
<b>Total</b>	<b>In-water piles</b>	<b>Approximately 69 piles removed</b>	<b>Approximately 29 piles installed</b>	<b>Net decrease of 40 in-water piles</b>
	<b>Overwater cover</b>	<b>Approximately 4,665 sf of existing cover removed</b>	<b>Approximately 4,660 sf of new overwater cover installed<sup>2</sup></b>	<b>Net decrease of approximately 5 sf of overwater cover</b>

Note:

1. Table does not include repair and fiberglass encapsulation of existing north dock piles. Up to five 14-inch decayed creosote-treated timber pile tops will be removed and replaced with ACZA treated timber piles and wrapped with fiberglass jacket.
2. Approximately 2,000 sf of new overwater cover will consist of FRP grating.
3. An existing floating wood dock will be removed from the south dock during demolition, temporarily stored on site, and replaced for reuse as part of the reconfigured south dock. This floating wood dock is not included in the overwater cover calculations shown here.

### *Planting Plan*

To construct the new access pathways, plaza paving, and expanded north beach, up to 10 trees located along the shoreline and in the uplands will be removed and replaced with 20 new trees (Table 3; Appendix 1, Figures 13 and 14). Approximately 4,300 sf of riparian and upland vegetation will be removed during construction, and 2,020 sf of native shrub and groundcover vegetation will be installed, including shoreline riparian, upland, and stormwater swale vegetation. Loss of vegetation is due to areas expanded for public access opportunities. The Project will install diverse native planting palette, including variety of groundcover, shrubs, and both deciduous and coniferous trees.

All planting areas will be irrigated and maintained per the park maintenance plan to establish and support species growth. Table 3 summarizes the proposed tree and vegetation removal and replacement activities. All plant installations will occur above the ordinary high water mark.

**Table 3**  
**Areas of Vegetation Disturbance and Restoration**

<b>Project Component</b>	<b>Location</b>	<b>Quantity or Area</b>
Vegetation removal	North beach	1,800 sf (riparian)
	South on-grade pathway	2,500 sf (upland)
	<b>Total</b>	<b>4,300 sf removed</b>
Shrub and groundcover planting	North beach	730 sf (riparian)
	South on-grade pathway	1,290 (upland)
	<b>Total</b>	<b>2,020 installed</b>
Tree removal	North beach	4 trees (deciduous)
	South on-grade pathway and ramp	3 trees (deciduous)
	Plaza	3 trees (deciduous)
	<b>Total</b>	<b>10 trees removed</b>
Tree installation	North beach	11 trees
	South on-grade pathway	8 trees
	Plaza	1 tree
	<b>Total</b>	<b>20 trees installed</b>

**For projects that include pile driving**

*If steel or concrete piles are being installed with an impact hammer pile driver, marbled murrelets may be adversely impacted. For installation of any type of pile with a vibratory pile driver, marine mammals may be adversely impacted. A monitoring plan may be required to ensure protection of these species.*

<b>Please fill out the following: (obtain information from contractor)</b>	
5.1 Number of piles being replaced:	<u>Approx. 69 piles will be removed (67 creosote-treated timber and 2 creosote-treated timber encapsulated in concrete)</u>  <u>29 new steel piles installed</u>
5.2 Replacement pile type: (e.g.: ACZA-treated wood, steel, coating used on steel piles)	<u>Replacement piles will be steel</u>
5.3 Replacement pile size: (e.g. 12-inch)	<u>Replacement piles will be 24-inch (16 piles), 16-inch (7 piles), and 6-inch (6 piles)</u>
5.4 Installation method: (e.g.: vibratory, impact hammer)	<u>Vibratory hammer with impact hammer proofing.</u>  <b>Note:</b> Vibratory or impact installation of wood, concrete, plastic, or other non-metal piles of any size is allowed. Impact installation of steel piles in marine waters is not covered under the programmatic and, in freshwater, is only covered programmatic for steel piles up to 10 inches.
5.5 Anticipated dates, number of minutes and number of days vibratory pile driving	<u>Up to 360 minutes per day (2 to 3 piles per day, 60 to 120 minutes per pile)</u>  <u>Up to 15 days (29 piles, 2 to 3 piles per day)</u>  Anticipated dates: <u>During the approved regulatory work window for Lake Washington (typically between July 16 and March 15) or an approved extension</u>
5.6 For vibratory installation, will proofing be required? If so, how many pile strikes per pile?	Yes <input checked="" type="checkbox"/> Number of pile strikes per pile: <u>30</u> No <input type="checkbox"/>
5.7 For impact hammer installation, estimate the number of pile strikes required per pile:	<u>30 strikes per pile (proofing only)</u>
5.8 For impact hammer installation or proofing, estimated number of pile strikes per day:	Strikes per day: <u>Up to 90 strikes per day (up to 3 piles per day, 30 strikes per pile)</u>  Number of days <u>Up to 15 days (29 piles, 2 to 3 piles per day)</u>  Anticipated dates: <u>During the approved regulatory work window for Lake Washington (typically between July 16 and March 15) or an approved extension</u>
5.9 For impact hammer pile driving or proofing, sound attenuation measures:	<u>Wood cushion block</u>



<b>Please fill out the following: (obtain information from contractor)</b>	
5.10 Anticipated dates, number of minutes and number of days of impact hammer pile driving or proofing:	<p><u>During the approved regulatory work window for Lake Washington (typically between July 16 and March 15) or an approved extension</u></p> <p><u>Up to 60 minutes of impact proofing per pile x 29 piles = 1,740 total minutes</u></p> <p><u>Up to 3 piles per day = 180 minutes impact proofing per day max.</u></p> <p><u>Up to 15 days of pile installation</u></p>
5.11 Describe substrate into which piling will be driven:	<u>The piles will primarily be installed into very dense glacially consolidated soils.</u>

## **6. Construction Techniques:**

*Describe methods and timing of construction to be employed in building the project and any associated features. Identify actions that could affect listed / proposed species or designated / proposed critical habitat and describe in sufficient detail to allow an assessment of potential impacts. Consider actions such as vegetation removal, temporary or permanent elevations in noise level, channel modifications, hydrological or hydraulic alterations, access roads, power lines etc. Also discuss construction techniques associated with any interdependent or interrelated projects.*

*Address the following:*

A. Construction sequencing and timing of each stage (duration and dates):

The Project is anticipated to be constructed in two phases and will occur over 14 months beginning in or around July 2023, or once all permits and approvals are issued. In-water work will occur during the approved regulatory work window for Lake Washington, which is typically between July 16 and March 15 (or an approved extension). Overwater or upland activities may occur outside of the in-water work window. The following construction phase and sequences are proposed:

### **Phase 1: July 2023-January 2024**

- Boiler Building Repairs
- Boiler Building Restroom Annex Renovation
- Concession Stand Repairs

### **Phase 2: June 2024-November 2024**

- North Dock Repairs
- Central Dock Reconfiguration
- South Dock Reconfiguration
- Overwater Access Platform
- Waterfront Plaza Renovation and Access Upgrades
- North Beach Enhancements
- Waterfront LID
- Irrigation Intake System

B. Site preparation:

Prior to earth-disturbing activities, site preparation will include installing best management practices (BMPs) to manage stormwater runoff and prevent erosion from upland areas as described in Section 11. Approximately 4,350 square feet of existing concrete and asphalt paving and concrete and brick pavers will be removed (Table 2). Approximately 4,300 square feet of vegetation will also be removed to prepare the site for construction (Table 3).

C. Equipment to be used:

Upland work will be completed using excavators, backhoes, dump trucks, and other typical heavy construction equipment. Cobbles and habitat gravel will be placed on the north beach from the upland or by barge using a conveyor (e.g., telebelt or similar) to place the material precisely and evenly.

Piles will be installed by a water-based excavator mounted vibratory pile driver and proofed with an impact hammer. During all impact driving, sound-attenuation devices such as a wooden cushion blocks or similar devices will be employed to minimize sound-related impacts. BMPs and noise-attenuation measures will be implemented to minimize impacts to fish and wildlife species as described in Section 11. Existing piles to be removed will be extracted according to the BMP standards provided by the Washington Department of Natural Resources (DNR 2017).

Construction equipment needed to install the new irrigation intake system includes an excavator, backhoe, and coring saw, as detailed in the Biological Evaluation for the Luther Burbank Park Irrigation Intake and Swim Area Maintenance Project (Anchor QEA 2020).

D. Construction materials to be used:

Construction materials to be used for overwater and in-water work include steel piles, light-penetrating fiberglass-reinforced plastic (FRP) grating, untreated timber pile caps, fiberglass and grout for encapsulation of timber piles, and concrete for gangway abutments. Beach enhancement materials will include WDFW-approved habitat gravel and cobbles, LWD, and boulders. Materials used for upland improvements will include concrete, pervious pavers, gravel, split-rail fencing, riprap for rock terrace, and granite steps, as well as interior and exterior building materials (e.g., lighting).

E. Work corridor:

The work corridor includes both upland and in-water construction areas on the Lake Washington shoreline and to a pile depth below the lake OHWM, reaching competent soils.

F. Staging areas and equipment wash outs:

Equipment and materials will be staged in existing cleared upland areas of the park. A barge may be used to stage equipment and materials needed for in-water work. No equipment washouts will be needed.

G. Stockpiling areas:

Stockpiling areas will be the same as those discussed previously for staging (Section F).

H. Running of equipment during construction:

Equipment will run periodically during the 14-month construction period. In-water equipment will run only during the approved regulatory work window for Lake Washington, which is typically between July 16 to March 15 (or an approved extension).

I. Soil stabilization needs / techniques:

Stormwater and erosion control BMPs will be installed to prevent erosion in disturbed upland areas as described in Section 11.

J. Clean-up and re-vegetation:

Upland areas where soils are disturbed will be revegetated as soon as possible. Approximately 20 new trees will be installed in upland and shoreline areas to replace the trees removed for the Project (Table 3). The riparian area along the north beach will be revegetated with native and native-adapted species.

K. Storm water controls / management:

During construction, stormwater control BMPs will be implemented as described in Section 11. The completed Project will include LID measures and stormwater improvements in compliance with stormwater management requirements.

L. Source location of any fill used:

All fill used in upland areas and the cobble/beach habitat gravel to be placed landward of OHWM will be composed of clean materials obtained from a reputable local source.

M. Location of any spoil disposal:

No dredging or spoils disposal is proposed.

## 7. Action Area

*Please describe the action area. The action area means all areas to be affected directly (e.g., earth moving, vegetation removal, construction noise, placement of fill, release of environmental contaminants) and indirectly by the proposed action. (Example: as a direct effect, the action area for pile driving would include the area out to where the noise from the pile driving falls below the level of harm or disturbance for listed species. For vibratory hammer pile driving impacts to killer whales, this level is 120 dB. Action area will include any area where the underwater noise level may exceed 120 dB).*

The action area encompasses the location where construction will occur, as well as all areas that may experience direct effects or delayed consequences, and interrelated and interdependent actions. The geographic extent of the action area was defined by the farthest geographic reach of Project actions that may lead to potential impacts on listed species or critical habitat. These include construction-related in-water noise, in-air noise, and turbidity. Visible in-water turbidity will not be allowed to extend beyond 300 feet of pile driving locations, in accordance with state water quality standards (Washington Administrative Code 173-201A), which is well within the portion of the action area where in-water noise impacts would occur.

Existing piles will be removed with a vibratory hammer. Piles will be installed to the extent possible using a vibratory hammer; an impact hammer may be required to proof new piles and has been included as part of this assessment. The action area is defined for the purposes of this Project as the area within the radius required for in-air construction equipment noise and underwater pile driving noise to attenuate to background noise levels (Figure BE-2).

### In-Air Noise

The in-air portion of the action area is the distance at which in-air noise attenuates to background sound levels. It was calculated using reference sound levels for the three loudest pieces of equipment that may be used. For this Project, they include an impact pile driver installing 24-inch-diameter steel piles (108 dB), a vibratory pile driver (105 dB), and a concrete drill (93 dB) (WSDOT 2020). The combined sound level for all three of these pieces of equipment is 110 dB.

Ambient noise levels in the area are estimated at 67 A-weighted decibels (dBA) due to their reasonable comparison to that of playgrounds and parks (Awbrey and Bowles 1990). Given the urban setting of the Project area, slightly higher ambient noise levels of approximately 70 dBA were assumed for this analysis.

Traffic on Interstate 90 (I-90) is a major noise source in the Project vicinity. The average annual daily traffic (AADT) for segments of I-90 near Luther Burbank Park was approximately 102,000 vehicles in 2020 (WSDOT 2022). This is equivalent to

approximately 10,200 vehicles per hour. Assuming travel speeds of 60 miles per hour on I-90, this traffic volume results in noise levels of approximately 84 dBA equivalent continuous sound level ( $L_{eq}$ ) at a distance of 50 feet.

The extent to which in-air construction noise will travel away from the Project site depends on whether the vicinity is “hard” (consists of surfaces such as water and pavement that do not absorb noise) or “soft” (with vegetation, topography, or other features that absorb noise). Background noise levels including traffic affect how far construction noise will travel before attenuating to background levels.

Lake Washington acts as a “hard” surface. Using equations from WSDOT (2020), in-air construction noise from the Project will attenuate to background levels at a distance of approximately 4,922 feet (0.9 mile) over Lake Washington (Figure BE-2). The vegetation and topography located west of the construction site on Mercer Island would be considered a “soft” surface. Construction noise is calculated to attenuate to background levels within approximately 1,959 feet (0.4 mile) of the Project site along the eastern side of Mercer Island (Figure BE-2).

Traffic noise from I-90 is calculated to attenuate to background levels within approximately 425 feet of I-90. Because this distance falls within the distance at which construction noise attenuates to background, the extent of construction noise is used for this evaluation.

### **In-Water Noise**

In-water noise has the potential to affect listed salmonids and marbled murrelet that could be present in the action area. The potential area where sound generated from the Project could propagate above ambient levels was calculated using tools available from the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Fish and Wildlife Service (USFWS).

Lake Washington is actively used by boats, and human noise sources include ship traffic and fishing-boat depth sounders. Natural noise sources include waves, wind, rainfall, currents, and biological sound sources (e.g., fish; Carr et al. 2006). Background noise levels are compared to the NOAA threshold levels to determine thresholds of harassment and injury for aquatic species.

No reference underwater sound levels suitable for National Marine Fisheries Service (NMFS) consultation are available for the vicinity of the Project. A 120 dB background sound level for Seattle (in the 1 to 20 kHz broadband range appropriate to fish and marbled murrelet) was used for this analysis (WSDOT 2020). WSDOT also states that this is the ambient underwater noise level for deep freshwater lakes.

The practical spreading loss model was used to estimate the extent of underwater sound from the Project (WSDOT 2020). Piles will be removed from and installed in Lake Washington, in water ranging from approximately 14 to 45 feet deep. The following pile types will be removed or driven as part of the Project:

- Timber piles (12- to 14-inch) will be removed with a vibratory hammer
- Concrete encapsulated piles (16-inch) will be removed with a vibratory hammer
- Steel piles (6-, 16-, and 24-inch) will be installed with a vibratory hammer and proofed with an impact hammer

Installation of 24-inch steel piles is expected to cause the greatest underwater sound of these activities; therefore, sound estimates for driving 24-inch steel piles are used in these calculations. Because no site-specific data are available for estimating the source sounds of 24-inch piles, analyses were conducted using source sound estimates from similar projects. Table 4 summarizes the highest in-water sound levels expected from the Project and the distance at which they attenuate to the background sound level.

**Table 4**  
**Underwater Sound Levels for 24-inch Steel Piles Proposed for the Project**

Pile Size/Type and Proposed Activity	Peak Level	Single Strike SEL	RMS Level	Attenuation to Background
24-inch steel piles, impact installation <sup>a</sup>	204 dB at 10 meters	174 dB at 10 meters	189 dB at 10 meters	23 miles
24-inch steel piles, vibratory installation <sup>b</sup>	181 dB at 10 meters	153 dB at 10 meters	153 dB at 10 meters	7 miles

Notes:

The impact installation values are unattenuated and therefore conservative.

- Noise levels for SR 520 Bridge project, 24-inch steel piles driven in 28 feet of water with impact hammer (WSDOT 2020).
- Noise levels for Prichard Lake Pumping Station (Sacramento), 24-inch steel piles driven in 9 feet of water with vibratory hammer (CalTrans 2020).

Based on the practical spreading loss model and attenuation distances, underwater sound from impact pile driving 24-inch steel pipe piles will require 23 miles to attenuate to the 120 dB RMS background value, and vibratory installation sound will require 7 miles to attenuate to background. However, the actual area of increased underwater sound will be constrained by the shorelines of Lake Washington and will extend approximately 4 miles northwest from the pile driving area at the farthest extent (Figure BE-2).

## 8. Species Information:

*Identify each listed or proposed species, including terrestrial species, as well as designated or proposed critical habitat in the action area. Please include information on which listed species use are expected to be found in the action area and the potential for them to be there during project activities..*

*To determine what listed or proposed species may occur in the action area, contact NOAA Fisheries at the address listed below and obtain a county list of federally listed/ designated and proposed species and critical habitat from the:*

U.S Fish and Wildlife Service at: [http://westernwashington.fws.gov/se/SE\\_List/endangered\\_Species.asp](http://westernwashington.fws.gov/se/SE_List/endangered_Species.asp)

National Marine Fisheries Service at:

510 Desmond Dr., SE # 103

Lacey, WA 98503

(360) 753-9530

<http://www.nwr.noaa.gov>

The following species are listed as of August 11, 2011:

### USFWS SPECIES

#### BIRDS

Marbled murrelet  
Northern spotted owl  
Short-tailed albatross  
Western snowy plover

#### MAMMALS

Canada lynx  
Columbia white-tailed deer  
Gray wolf (western WA)  
Gray wolf (eastern WA)  
Grizzly bear  
Woodland caribou  
Pygmy rabbit (Columbia Basin DPS)

#### INSECTS

Oregon silverspot butterfly

#### PLANTS

Bradshaw's desert parsley  
Marsh sandwort  
Showy stickseed  
Wenatchee Mtns. Checker-mallow  
Golden paintbrush  
Kincaid's lupine  
Nelson's checker-mallow  
Water howellia  
Spalding's catchfly  
Ute ladies'-tresses

#### FISH

Bull trout, Columbia River  
Bull trout, coastal-Puget Sound  
Dolly varden, coastal-Puget Sound

### NMFS SPECIES

#### FISH

Chum, Columbia River  
Chum, Hood Canal summer  
Chinook, lower Columbia River  
Chinook, upper Columbia River spring  
Chinook, Puget Sound  
Chinook, Snake River fall  
Chinook, Snake River spring-summer  
Chinook, upper Willamette River  
Coho, lower Columbia River  
Sockeye, Ozette Lake  
Sockeye, Snake River  
Steelhead, upper Columbia River  
Steelhead, middle Columbia River  
Steelhead, lower Columbia River  
Steelhead, Snake River  
Steelhead, upper Willamette River  
Steelhead, Puget Sound  
Sturgeon, Green (southern DPS)  
Eulachon, Pacific (southern DPS)  
Bocaccio (Georgia Basin DPS)  
Rockfish, canary (Georgia Basin DPS)  
Rockfish, yelloweye (Georgia Basin DPS)

#### MARINE MAMMALS

Humpback whale  
Blue whale  
Fin whale  
Sei whale  
Sperm whale  
Southern resident killer whale  
Steller sea lion

#### REPTILES-AMPHIBIANS

Leatherback sea turtle  
Loggerhead sea turtle  
Green sea turtle  
Olive Ridley sea turtle

Table 5 presents a summary of threatened and endangered species potentially occurring in the action area based on species lists provided by NMFS (2022) and USFWS (2022). The NMFS species list encompasses the entire north Puget Sound region, while USFWS provides site-specific species lists. The table also identifies whether critical habitat has been designated by the NMFS or USFWS for those species within the Project vicinity. The Project will occur during the approved in-water work window for the site when the species listed in Table 5 are unlikely to be present.

**Table 5  
Species and Critical Habitat with Federal ESA Status Likely to Occur in the Action Area**

Common Name (Scientific Name)	Jurisdiction	ESA Status	Critical Habitat
Chinook salmon ( <i>Oncorhynchus tshawytscha</i> ) Puget Sound ESU	NMFS	Threatened	Designated
Steelhead ( <i>O. mykiss</i> ) Puget Sound DPS	NMFS	Threatened	None designated within the action area.
Bull trout ( <i>Salvelinus confluentus</i> ) Coastal-Puget Sound DPS	USFWS	Threatened	Designated
Marbled murrelet ( <i>Brachyramphus marmoratus</i> )	USFWS	Threatened	None designated within the action area.

USFWS (2022) identifies the following additional listed and candidate species as potentially occurring in the action area; however, these species are not addressed in this Biological Evaluation due to lack of suitable habitat within and adjacent to the action area, for reasons listed below:

- **Streaked horned lark** (*Eremophila alpestris strigata*): The streaked horned lark was listed as threatened in 2015 under the ESA. Streaked horned larks require open prairie or coastal habitat with no trees and few shrubs. There are no known breeding populations of streaked horned larks in King County and the action area lacks suitable habitat (Stinson 2016).
- **Yellow-billed cuckoo** (*Coccyzus americanus*): Yellow-billed cuckoos are now functionally extirpated in the state, with 16 of 20 sightings from 1974 and 2016 occurring in eastern Washington (Wiles and Kalasz 2017). The action area lacks large patches of riparian habitat suitable for the species.
- **Monarch butterfly** (*Danaus plexippus*): Adult monarch butterflies feed on nectar from a wide variety of flowers. Reproduction is dependent on the presence of milkweed, the sole food source for larvae (Federal Register Vol. 85, No. 243). The number of monarchs in Washington is relatively low and they are most likely to occur in eastern Washington. Monarchs migrating south through Washington often concentrate along the Columbia and Snake Rivers (WDFW 2022a).

NMFS (2022) identifies the additional species of bocaccio (*Sebastes paucispinis*; Puget Sound/Georgia Basin DPS); yellow rockfish (*Sebastes ruberrimus*; Puget Sound/Georgia Basin DPS); green sturgeon (*Acipenser medirostris*; Southern DPS); and killer whale (*Orcinus orca*; Southern Resident DPS) as potentially occurring in the north Puget Sound region. However, the action area is not used by these species because Lake Washington does not provide marine or estuarine habitat.



## 9. Existing Environmental Conditions:

*Describe existing environmental conditions for the following:*

### A. Shoreline riparian vegetation and habitat features

Lake Washington is a large, freshwater lake that occupies approximately 34 square miles between the metropolitan cities of Seattle and Bellevue. The water levels in Lake Washington are seasonally managed by the U.S. Army Corps of Engineers to accommodate water usage, navigation, fish passage, and salinity control. The park's shoreline is characterized by various conditions including a developed concrete shoreline and undeveloped vegetated areas. Within the Project area, the shoreline condition, categorized by the south, central, and north areas, includes the following (Appendix 1, Figure 2):

- The south Project area shoreline is located south of the waterfront plaza. This area consists of small areas of lawn, shrubby riparian vegetation along the lake shore, a gravel driveway, and trees/shrubs and invasive vegetation farther upslope. Improvements to the south shoreline trail (outside the Project area) are being permitted as part of a separate project.
- The central Project area shoreline, adjacent to the waterfront plaza, has a vertical bulkhead slope. The lake bottom substrate contains sand and silt with small rocks and remnant concrete and timber debris from past uses. The central shoreline is mostly developed, and vegetation is limited to dense non-native aquatic vegetation, Eurasian milfoil (*Myriophyllum spicatum*), found near the park's shoreline.
- The north Project area shoreline consists of a small gravel beach with fringing trees and shrubs, with a trail, grass lawn areas, and trees located farther upslope.

Lake Washington provides habitat for a variety of aquatic species. Fish species occurrence and migration documented in Lake Washington, according to the Washington Department of Fish and Wildlife (WDFW) SalmonScape and Priority Habitats and Species websites (WDFW 2022a, 2022b), includes bull trout (*Salvelinus confluentus*), Chinook salmon (*Oncorhynchus tshawytscha*), Puget Sound steelhead (*O. mykiss*), sockeye salmon (*O. nerka*), and coho salmon (*O. kisutch*). The WDFW Priority Habitats and Species data (WDFW 2022b) do not identify any documented occurrences of terrestrial priority species or priority habitats in the Project area of the park.

### B. Aquatic substrate and vegetation (include information on the amount and type of eelgrass or macroalgae present at the site)

The aquatic substrate is primarily silt and sand due to the lake environment. No eelgrass is present because the Project area is not within a marine environment. Eurasian milfoil (*Myriophyllum spicatum*) occurs in Lake Washington at the Project site.

### C. Surrounding land/water uses

Existing structures in the Project area include the dock and Boiler Building (Appendix 1, Figure 2). The Boiler Building is located within the waterfront plaza west of the dock and is currently used for park storage and restrooms. The shoreline is defined by a vertical concrete bulkhead spanning approximately 200 linear feet (lf). The bulkhead delineates the plaza area, which includes concrete paving and pavers. To the north of the dock along the plaza's shoreline bulkheads is an art installation called "Handsome Bollards" that includes a series of bollards approximately 6 feet apart with bronze hands that hold a metal chain. Current access to the plaza is limited to the gravel maintenance driveway at the south end of the Project area and an asphalt pathway at the north end.

Existing stormwater features include a stormwater conveyance swale that abuts the western edge of the gravel maintenance driveway and drains to an existing catch basin. The catch basin drains to the lake through a 6-inch PVC storm drain to an outfall south of the plaza. Two additional catch basins located north of the plaza, between the asphalt pathway and Boiler Building, drain to the lake through a 6-inch PVC storm drain and outfall in the north end of the plaza. The northern outfall runs underneath the plaza and through the existing bulkhead to the lake.

Two decommissioned underground storage tanks (USTs) associated with previous boiler plant operations are located in the Project area. These are registered with the Washington State Department of Ecology. Petroleum hydrocarbons, polycyclic aromatic hydrocarbons, and metals (barium, chromium and lead) associated with the tanks have been detected in site soils (GeoEngineers 2022) at concentrations below Model Toxics Control Act Method A cleanup levels. The City has engaged a geotechnical consultant to develop a soil management plan should any contaminated soils be encountered during construction. Any contaminated materials removed from the site will be properly disposed of at an approved upland landfill.

The existing dock (Appendix 1, Figure 2) is a fixed 5,500-square-foot (sf) dock structure with wood and concrete decking, supported by 107 creosote-treated timber piles (14- to 16-inch-diameter). The deck is solid concrete with no grating and currently impedes light transmission to the aquatic environment. The existing dock structure includes three main segments, each measuring 8 feet wide. Eight narrow (22- by 4-foot) timber fixed dock fingers provide moorage opportunities for small powerboats along the existing dock. A 500-sf float and gangway (ramp) flank the existing dock structure. The float is intended to be reused in the new design.

In 2014, the City conducted an assessment of shoreline and overwater structures, including an underwater structural assessment of the dock, and noted degraded conditions (OAC 2014). Shoreline structures observed within the Project area include the concrete bulkhead, brick and concrete pavers at the plaza, and the gravel maintenance road. The concrete bulkhead was found to be in good condition; however,

the brick pavers and the maintenance road appeared to present hazards. The brick pavers were found to be a potential tripping hazard with uneven surfaces, and the maintenance road showed signs of erosion from runoff on the road and adjacent areas. Overwater structures observed within the Project area include the concrete dock, finger docks, and the timber piles. The concrete dock and creosote-treated timber piles were found to be in good condition. Structural issues were noted in relation to the timber cap beams and mooring piles on the south end of the dock. The cap beams and mooring piles showed signs of decay and were recommended for repair.

As discussed previously, the Project area is developed with public recreation facilities. Outside of the Project area, approximately 20 acres of the park is undeveloped open space that supports a variety of wildlife, including 135 species of birds, 50 species of waterfowl, raccoons, beavers, muskrats, tree frogs, and rabbits (City of Mercer Island 2022). Habitat for many of the terrestrial species is provided by wetlands that occupy the north and south ends of the park, outside of the Project area. The park also contains areas with maintained lawns surrounded by stands of trees.

#### D. Level of development

The park itself has generally low levels of development. The areas surrounding the park are generally more urbanized and zoned for single family properties.

#### E. Water quality

The Washington State Department of Ecology water quality atlas (Ecology 2022) indicates several pollutants on the 303d list in Lake Washington, meaning that the pollutants exceed water quality standards and there is no cleanup plan. The south end of Lake Washington near the Cedar River confluence contains dioxin, PCBs, DDE, dieldrin, chlordane, and bacteria. South of the SR 520 bridge, pollutants include bacteria, dioxin, DDD, DDE, mercury, PCBs, chlordane, and dieldrin. There are no mapped 303d pollutants adjacent to the Mercer Island shoreline or the Project site (Ecology 2022).

#### F. Describe use of the action area by listed salmonid fish species.

Listed salmonids known to occur in Lake Washington include Chinook salmon, winter steelhead, and bull trout, as discussed below (WDFW 2022b, 2022c).

##### **Chinook Salmon**

Chinook salmon spawn in several streams draining to Lake Washington. Those nearest the Project site include May Creek and the Cedar River, both located south of and outside the action area.

Chinook Salmon mostly use Lake Washington as a migratory corridor from their natal stream to the marine environment or as an extended rearing location before

outmigrating to the marine environment (Tabor et al. 2006). Most of the wild juvenile Chinook salmon enter Lake Washington from the Cedar River from January through June. Portions of the existing Lake Washington shoreline have degraded habitat that is poorly suited for protection from predators and migration of Chinook salmon.

Small juvenile Chinook salmon concentrate in shallow water, approximately 0.4 meter (1.3 feet) in depth, and prefer low-gradient shorelines with small substrates such as sand and gravel (Tabor and Piaskowski 2002). As juvenile Chinook salmon grow larger, they move into water 2 to 3 meters (6.6 to 10 feet) deep by mid-June. Juvenile Chinook salmon also prefer a diverse shoreline with open areas, woody debris, and overhanging vegetation as refuge from predators during the day (Tabor and Piaskowski 2002). Other studies have shown that most (more than 80%) juvenile Chinook salmon are found at sites with overhanging vegetation and small woody debris, as compared to sites without vegetation and small wood (Tabor et al. 2004).

### **Steelhead**

Two populations of Puget Sound steelhead inhabit the Lake Washington basin. The Cedar River population is of natural origin, while the north Lake Washington population is introduced. Both populations of winter-run steelhead have recently undergone steep declines in abundance.

Winter-run and ocean-maturing steelhead return as adults to Puget Sound tributaries from December to April (PSBRT 2005). Spawning occurs from January to mid-June, with peak spawning occurring from mid-April through May. The majority of steelhead juveniles reside in freshwater for 2 years prior to immigrating to marine habitats, with limited numbers migrating as 1- or 3-year-old smolts. Smoltification and seaward migration occur principally from April to mid-May (PSBRT 2005). The inshore migration pattern of steelhead in Puget Sound is not well understood; it is generally thought that steelhead smolts move quickly offshore (PSBRT 2005).

Winter steelhead spawn in the Cedar River, south of the action area. Little information is currently known about juvenile steelhead use of Lake Washington. WDFW researchers have captured steelhead migrants in the Cedar River from mid-April through the end of May (Volkhardt et al. 2006), but if or how they use the nearshore area of the lake has not been determined.

## **Bull Trout**

Lake Washington provides potential rearing, foraging, and migration habitat for bull trout. Adult and subadult bull trout have been observed infrequently in the lower Cedar River, Lake Washington, and at the Ballard Locks. The WDFW Priority Habitats and Species mapping indicates Dolly Varden/bull trout rearing in Lake Washington (WDFW 2022b). However, no bull trout spawning activity or juvenile rearing has been observed and no distinct spawning populations are known to exist in the Lake Washington basin outside of the upper Cedar River above Lake Chester Morse. This upper Cedar River population is mainly adfluvial, moving between Lake Chester Morse, the Cedar River, and the Rex River throughout the year. Surface water temperatures in Lake Washington and the Ship Canal are too warm for bull trout during late spring through early fall, and these high temperatures likely limit residence time for bull trout that may enter the lake through the locks. Observations of bull trout in the locks suggest that migration is occurring from other watersheds. (SPU 2015, King County 2000).

- G. Is the project located within designated / proposed bull trout or Pacific salmon critical habitat? If so, please address the proposed projects' potential direct and indirect effect to primary constituent elements (Critical habitat templates can be found on the Corps website at: <http://www.nws.usace.army.mil/Missions/CivilWorks/Regulatory/PermitGuidebook/EndangeredSpecies.aspx>, select Forms, Tools and References; Forms and Templates; Critical Habitat Assessment Forms.

Lake Washington is designated as critical habitat for Chinook salmon (Federal Register Vol. 70, No. 170) and for bull trout foraging, migration, and overwintering (Federal Register Vol. 70, No. 185). Lake Washington is not designated as critical habitat for steelhead, although the Cedar River is (Federal Register Vol. 81 No. 36). Project effects on physical and biological features (PBFs) for these species are discussed below.

## **Chinook Salmon**

Table 6 lists the PBFs for Chinook salmon and steelhead, PBF presence in the action area, and how PBFs would be affected by the Project. The PBFs that are present in the action area include numbers 2 and 3. Construction of the Project would result in short-term impacts on these PBFs but would provide a long-term benefit after Project completion.

**Table 6**  
**Salmon and Steelhead PBFs and Project Effects**

PBF	Presence in Action Area	Project Effects
(1) Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation, and larval development.	Not present. No spawning occurs within the action area or in Lake Washington.	Not applicable.
(2) 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.	Chinook salmon rear in Lake Washington, although rearing habitat is degraded. Steelhead use of the lake for rearing is unknown.	Project construction would cause short-term turbidity and underwater noise that could disturb rearing fish. However, construction would occur during the in-water work window, when listed salmonids are least likely to be present. The Project would permanently remove several trees and riparian shrub vegetation along the lake shoreline above the OHWM. While all of the trees and some riparian vegetation would be replaced, this would cause a slight reduction in shade and food sources for fish. In the long term, the Project would improve rearing habitat by shifting part of the dock into deeper water; removing creosote-treated timber piles from the aquatic environment; and installing grated surfaces in the gangway and float decking to the extent practicable.
(3) 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.	Potentially present in action area in terms of salmon and steelhead movement between different parts of Lake Washington, and between the lake and spawning streams.	In-water construction equipment could temporarily modify nearshore fish migration corridors. However, construction would occur during the in-water work window, when salmonids are least likely to be present. The Project would improve migratory habitat by reducing the number of piles in the lake.
(4) 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.	Not present. Lake Washington does not provide estuarine habitat.	Not applicable.

PBF	Presence in Action Area	Project Effects
(5) 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.	Not present. Lake Washington does not provide nearshore marine habitat.	Not applicable.
(6) Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.	Not present. Lake Washington does not provide offshore marine habitat.	Not applicable.

### Bull Trout

Table 7 lists the PBFs for bull trout, PBF presence in the action area, and how PBFs would be affected by the Project. The PBFs that are present in the action area include numbers 2, 3, and 8. Construction of the Project would result in short-term impacts on these PBFs but would provide a long-term benefit after Project completion.

**Table 7**  
**Bull Trout PBFs and Project Effects**

PBF	Presence in Action Area	Project Effects
(1) Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.	Not present in Lake Washington or action area. The lake shorelines are highly modified, and connections to groundwater that would provide thermal refugia are likely minimal.	Not applicable.
(2) Migratory 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.	Potentially present in action area in terms of bull trout movement between different parts of Lake Washington, and between the lake and the Cedar River.	In-water construction equipment could temporarily modify nearshore fish migration corridors. However, construction would occur during the in-water work window, when bull trout are least likely to be present. The Project would improve migratory habitat by reducing the number of piles in the lake.
(3) An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.	Present in Lake Washington and possibly the action area. The lake supports numerous warmwater fish species and likely abundant macroinvertebrates that provide food for those fish. The lake is fresh water and does not support marine forage fish.	Project construction would cause short-term turbidity and underwater noise that could disturb fish prey species. However, construction would occur during the in-water work window, when listed salmonids are least likely to be present. The Project would permanently remove several trees and riparian shrub vegetation along the lake shoreline above the OHWM.

PBF	Presence in Action Area	Project Effects
		While all of the trees and some riparian vegetation would be replaced, this would cause a slight reduction in shade and food sources for prey species. In the long term, the Project would improve prey habitat by shifting part of the dock into deeper water; removing creosote-treated timber piles from the aquatic environment; and installing grated surfaces in the gangway and float decking to the extent practicable.
(4) Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes with features such as large wood, side channels, pools, undercut banks and substrates, to provide a variety of depths, gradients, velocities, and structure.	Not present in Lake Washington or action area. The lake shoreline is highly modified and simplified.	Not applicable.
(5) Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures at the upper end of this range. Specific temperatures within this range will vary depending on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shade, such as that provided by riparian habitat; and local groundwater influence	Not present in Lake Washington or action area. High lake water temperatures likely limit residence time of bull trout in the lake (SPU 2015).	Not applicable.
(6) Substrates 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 (e.g., less than 12 percent) of fine substrate less than 0.85 mm (0.03 in.) in diameter and minimal embeddedness of these fines in larger substrates are characteristic of these conditions.	Not present in Lake Washington or action area. The lake receives stormwater runoff from surrounding urbanized areas. Stormwater likely carries large volumes of sediments into the lake.	Not applicable.
(7) A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, they minimize departures from a natural hydrograph.	Not present in Lake Washington or action area. The lake's water levels are controlled by the U.S. Army Corps of Engineers.	Not applicable.



PBF	Presence in Action Area	Project Effects
(8) Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.	Potentially present in Lake Washington and action area. Some parts of the lake have poor water quality, but the area around Mercer Island does not contain mapped water quality impairments (Ecology 2022).	Construction would occur during the in-water work window, when bull trout are least likely to be present. Construction would result in short-term turbidity, but the Project would result in a long-term benefit to water quality by removing creosote-treated piles from the lake and improving stormwater management at the waterfront plaza.
(9) Few or no nonnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass; inbreeding (e.g., brook trout); or competitive (e.g., brown trout) species present.	Not present in Lake Washington or action area. The lake is used by numerous warmwater predatory species.	Not applicable.

H. Describe use of the action area by other listed fish species (*green sturgeon*, *eulachon*, *bocaccio*, *canary rockfish* and *yelloweye rockfish*).

The action area is not used by these species because it does not provide marine or estuarine habitat.

I. Is the project located within designated/proposed critical habitat for any of the species listed below? If so please address the proposed projects' potential direct and indirect effect to primary constituent elements. Please see the NOAA-Fisheries and US Fish and Wildlife websites ([www.nwr.noaa.gov](http://www.nwr.noaa.gov) and [www.fws.gov/pacific](http://www.fws.gov/pacific) respectively) for further information.

*Southern resident killer whale*      *Marbled murrelet*  
*Northern spotted owl*              *Western snowy plover*  
*Green sturgeon*                          *Eulachon*

The action area is not located within critical habitat for any of the listed species.

J. Describe use of action area by marbled murrelets. How far to the nearest marbled murrelet nest site or critical habitat? Some information is available on the Fish and Wildlife Service website: <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B08C>.

The nearest designated critical habitat for marbled murrelets is approximately 30 miles east of the action area. The action area lacks old-growth forest habitat required for murrelet nesting, and there are no known nest sites in the action area (WDFW 2022b). Marbled murrelets typically use nearshore marine waters for foraging. However, the species is known to use lakes for feeding and has been sighted on Lake Washington in the past (early 1900s; Carter and Sealy 1986). Studies in the upper Cedar River watershed found a few marbled murrelets present (Cooper et al. 2008). Therefore, the species is assumed to be potentially present at low numbers in the action area.

- K. Describe use of action area by the spotted. How far to the nearest spotted nest site or critical habitat? Some information is available on the Fish and Wildlife Service website:  
<http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B08B>.

The Project is in an area that does not include suitable nesting and foraging habitat for northern spotted owls (*Strix occidentalis caurina*). The WDFW PHS maps do not document northern spotted owls in the vicinity of the Project (WDFW 2022b). The nearest critical habitat for northern spotted owl is approximately 30 miles east of the Project area.

- L. **For marine areas only:** Describe use of action area by Southern Resident killer whales. How often have they been seen in the area and during what months of the year? For information on noise impacts on killer whales and other marine mammals, please see the National Marine Fisheries website: <http://www.nwr.noaa.gov/Marine-Mammals/MM-consults.cfm>.

The Project is not located within a marine area, and no Southern Resident killer whales are present.

- M. **For marine areas and Columbia River:** How far is the nearest steller sea lion haulout site from the action area? Describe their use of the action area. See the National Marine Fisheries website: <http://www.nwr.noaa.gov/Marine-Mammals/MM-consults.cfm> for information on the steller sea lion and location of their haulout sites.

The Project is not located within a marine area or the Columbia River, and no Steller sea lions are present.

- N. **For marine areas only: Forage Fish Habitat** – only complete this section if the project is in tidal waters.

Check box if Washington Department of Fish and Wildlife (WDFW) documented habitat is present. Go to the WDFW website for this information: <http://wdfw.wa.gov/fish/forage/forage.htm>, then search for each species under the link to Biology, then the link to Documented Spawning Grounds (if available, please attach a copy of the Hydraulic Project Approval from WDFW):

**Surf Smelt:**       **Pacific Herring:**       **Sand Lance:**

Check box if the proposed action will occur in potentially suitable forage fish spawning habitat:

**Surf Smelt:**       **Pacific Herring:**       **Sand Lance:**

If no boxes are checked, please explain why site is not suitable as forage fish spawning habitat.

Please describe the type of substrate and elevation and presence of aquatic vegetation at the project area. For example:

At +10 to +5 feet above MLLW, there is no aquatic vegetation, the substrate consists of large cobbles.

At +5 to +1 foot above MLLW, there is eelgrass and the substrate consists of fine sand.

The Project is not located within a marine area, and no forage fish are present.

## 10. Effects Analysis

*Describe the direct and indirect effects of the action on the proposed and listed species as well as designated and proposed critical habitat within the action area. Consider the impact to both individuals and the population. Discuss the short-term, construction-related, impacts as well as the long-term and permanent effects.*

### Direct Impacts

Direct impacts to listed species as a result of the Project could include the following:

- Construction noise (in-air and in-water)
- Short-term turbidity during in-water work
- Disturbance of benthic species
- Removal and replanting of riparian vegetation
- Dock reconfiguration, with reduction in overwater cover/shading, reduction in number of piles, and shifting of docks into deeper water
- Improvement in water quality due to removal/encapsulation of creosote-treated timber piles and installation of waterfront LID
- Construction and operation of new intake of lake water for irrigation
- Construction and operation of new stormwater management system elements and relocated stormwater outfall
- Erosion during upland ground disturbance

These potential impacts are described below. The Project has been designed to avoid and minimize impacts on listed species and aquatic habitats. In addition, the conservation measures described later in this document will be implemented to avoid and minimize impacts during construction.

#### *In-Air Noise*

Impact pile driving can interfere with or mask marbled murrelet in-air communications during foraging. However, limited impact pile driving (proofing) of 24-inch steel piles is not typically expected to cause these impacts. To provide a worst-case assessment for the Project, an area of 138 feet from the pile driving locations is shown in Figure BE-3 where there is the potential for masking of in-air sound communication of marbled murrelets if impact pile driving were to occur for any greater length of time based on guidance from USFWS (WSDOT 2020).

Given the very low number of marbled murrelet observations and lack of suitable nesting habitat in the Project vicinity, it is highly unlikely that individual murrelets would be present within 138 feet of pile driving activities. In addition, Project construction noise is expected to attenuate to background levels within 1 mile or less of the Project site and therefore would not affect potentially suitable nesting habitat in the upper Cedar River watershed or other undeveloped areas. It is possible that a murrelet could experience increased noise levels while flying through the action area to or from inland nesting sites, but effects on in-air behavior or communications are unlikely.

### *In-Water Noise*

Construction noise from pile driving could have a direct impact on fish or marbled murrelets, or may cause them to avoid the Project area. The effects of underwater noise related to pile driving are dependent on several factors, including the size, type, and depth of the animal; the depth, intensity, and duration of the pile driving sound; the depth of the water column; the substrate of the habitat; the standoff distance between the pile and the animal; and the sound propagation properties of the environment. The level of noise effects will be related to the received level and duration of the sound exposure, which are in turn influenced by the distance between the animal and the source. The farther away from the source, the less intense the exposure should be. The surrounding environment will attenuate or enhance the distance that underwater sound waves will travel depending on a variety of variables. Shallow environments are typically more structurally complex, which leads to rapid sound attenuation. Soft substrates such as sand will absorb or attenuate the sound more readily than hard substrates (e.g., rock) that may reflect the acoustic wave. Soft, porous substrates also require less time to drive the pile and require less forceful equipment, which decreases the underwater noise duration, intensity, and effect.

**Chinook salmon, steelhead, and bull trout.** Table 8 lists the distances at which pile driving noise is anticipated to attenuate to agency-accepted injury and disturbance thresholds for salmonids (Figure BE-4; WSDOT 2020). As stated earlier, driving of 24-inch steel piles was analyzed as the Project activity likely to result in the greatest level of underwater sound. The use of vibratory hammers minimizes the noise levels generated from pile installation and therefore the magnitude of the effects to listed salmonid species. However, impact driving will be necessary in order to proof the piles and reach appropriate supporting substrates. There is the potential for Chinook salmon, bull trout, and steelhead to be injured or to experience behavioral effects during pile driving. Behavioral effects are more likely given the larger extent of underwater noise during limited impact proofing of piles (2.5 miles). Injurious effects would be limited to areas within 50 meters (164 feet) of impact pile driving and could likely be avoided by fish during limited pile proofing.

**Table 8**  
**In-Water Noise Threshold Injury and Disturbance Distances for Salmon and Steelhead**

Pile Size/Type and Proposed Activity	Distance for Pile-Related Noise to Attenuate to Threshold			
	Fish Injury (all fish sizes): 206 dB peak	Fish Injury (fish ≥2 grams): 187 dB cSEL	Fish Injury (fish <2 grams): 183 dB cSEL	Behavioral Effects: 150 dB RMS
Install 24-inch steel piles (impact)	7 meters (23 feet)	27 meters (89 feet)	50 meters (164 feet)	3,981 meters (2.5 miles)
Install 24-inch steel piles (vibratory)	n/a <sup>1</sup>	n/a <sup>1</sup>	n/a <sup>1</sup>	16 meters (52 feet)

Note:

1. Injury thresholds do not apply for fish when assessing vibratory pile driving (CalTrans 2020).

**Marbled murrelet.** There are no published studies specific to the effects of impact pile driving underwater sound on marbled murrelets. Impact pile driving could result in auditory injury (hearing damage) or non-auditory injury (barotrauma), based on data from other species. Marbled murrelets have been observed to continue foraging within 300 meters of active pile driving operations despite elevated underwater sound. Masking of underwater sound communication is possible if impact pile driving occurs for extended periods (WSDOT 2020). However, impact driving for this Project is limited to proofing only.

Table 9 lists the distances at which pile driving noise is anticipated to attenuate to agency-accepted injury and disturbance thresholds for marbled murrelet (WSDOT 2020). As stated earlier, driving of 24-inch steel piles was analyzed as the Project activity likely to result in the greatest level of underwater sound. Behavioral and auditory impacts are possible if murrelets are diving within the areas shown in Figure BE-3, which are limited to within 10 feet of impact pile proofing. Behavioral effects are possible within 2.5 miles of impact proofing. However, impacts to marbled murrelets are unlikely because the species is not known to regularly forage in Lake Washington.

**Table 9**  
**In-Water Noise Threshold Injury and Disturbance Distances for Marbled Murrelet**

Pile Size/Type and Proposed Activity	Distance for Pile-Related Noise to Attenuate to Threshold		
	Auditory Injury: 202 dB SEL	Non-auditory Injury: 208 dB SEL	Behavioral Effects: 150 dB RMS
Install 24-inch steel piles (impact)	3 meters (10 feet)	1 meter (3 feet)	3,981 meters (2.5 miles)
Install 24-inch steel piles (vibratory)	n/a <sup>1</sup>	n/a <sup>1</sup>	16 meters (52 feet)

Note:

1. Injury thresholds do not apply for marbled murrelet when assessing vibratory pile driving (WSDOT 2020).

### *Turbidity*

Removing, installing, and encapsulating piles and excavating below the OWHM to install cobble underlayment at the north beach may cause a temporary and minor increase in turbidity. Turbidity occurs when suspended organic and inorganic particles in the water column scatter light wavelengths and reduce the light available to underwater environments. The extent of sediment suspension is a byproduct of several factors, including physical properties of the sediment, site conditions, and nature and extent of debris and obstructions. Sediment plume sizes typically decrease exponentially with movement away from the construction activities both vertically and horizontally, as well as with time due to movement of suspended material downstream (Nightingale and Simenstad 2001).

Suspended sediment and turbidity can affect fish (particularly salmon) via several mechanisms, including direct mortality, gill tissue damage, physiological stress, and

behavioral changes. The level of impact to individuals depends on the amount of time an individual is exposed to suspended sediments, the concentration of suspended sediment in the water column, the composition of the sediments (fine-grained versus coarse-grained, chemical associations, etc.), and the concentration of contaminants associated with the sediments. Impacts could result in lethal or sublethal physical or behavioral responses from aquatic organisms depending on the extent of turbidity.

Turbidity resulting from in-water work will not be allowed to exceed 300 feet from construction per state water quality standards (WAC 173-201A). Fish would be able to move away from the construction area to avoid turbidity. In-water work will be restricted to the approved in-water work period (July 16 to March 15) to minimize impacts on salmonid species. BMPs will be implemented during construction to limit turbidity (Section 11).

#### *Disturbance of Benthic Species*

Removing, installing, and encapsulating piles and excavating below the OWHM to install cobble underlayment at the north beach will cause a temporary disturbance of benthic species on the lake bottom, leading to a temporary and minor loss of foraging opportunities for bull trout, steelhead, and Chinook salmon in the vicinity of the Project. The recolonization of the area with benthic species is expected to occur quickly.

#### *Removal and Replanting of Riparian Vegetation*

The Project includes removing several trees and riparian vegetation to install the new rock terrace supporting the ADA-accessible trail near the north beach. While this represents a relatively small amount of vegetation removal relative to vegetation throughout the Park, and some of the vegetation to be removed consists of non-native invasive species, it is a loss of potential shade and sources of invertebrate prey for fish species. The Project includes replanting riparian vegetation (see Appendix 1, Figures 13 and 14). Western red cedars will be installed near the north beach, providing additional shading for the lake. There will be a minor temporal loss of riparian vegetation functions while the new plantings grow to maturity.

#### *Dock Reconfiguration*

The completed Project will provide a minor benefit to aquatic habitat in Lake Washington. A net reduction of 40 piles and 5 sf of overwater cover would occur. Creosote-treated piles will be replaced with steel piles, or encapsulated in fiberglass, improving water quality. Existing concrete decking will be replaced with grating, allowing better light penetration. The center and south docks will be shifted waterward to open up the nearshore habitat for use by salmonids.

#### *Water Quality Improvements*

The Project will benefit water quality in Lake Washington by removing or encapsulating creosote-treated timber piles and installing new LID features (pervious pavers and silva cell at the plaza, vegetated stormwater swale near the south trail).

### *Lake Water Irrigation Intake*

The Project includes installing a new intake for irrigation water from Lake Washington. The intake will be screened to prevent fish entrainment. The volume of water to be used is minor relative to the size of the lake (a maximum rate of 0.089 cubic foot per second [40 gallons per minute] as allowed by the approved Water Right Claim 158498AH). The immediate area around where the pipe penetration will be constructed through the bulkhead wall will be temporarily dewatered to allow for drilling through the bulkhead and installation of the screen in the dry. A hole will be drilled through the existing concrete bulkhead for the intake pipe. Noise, turbidity, and disturbance effects on aquatic species will be minimal due the short construction timeframe for the intake, small area affected, and existing degraded quality of habitat near the bulkhead.

### *Stormwater Management System and Outfall*

Installation of 2,410 sf of pervious pavers to replace concrete and brick pavers at the plaza, addition of a silva cell biofiltration system under the south end of the plaza, and construction of a new vegetated swale along the gravel driveway could result in soil erosion, which would be minimized as discussed below. Relocation of the stormwater outfall in the bulkhead south of the plaza would require temporary dewatering of a small area of the lake nearshore to allow construction in the dry. Effects on aquatic species will be short-term and minimal due the small area affected and the degraded quality of habitat near the bulkhead. These improvements will slightly improve water quality in Lake Washington by more effectively removing sediment and other pollutants from stormwater and attenuating peak stormwater runoff compared to existing conditions.

The existing site sheetflows directly into the waterway over concrete, gravel, and vegetated areas. No treatment, infiltration potential or flow control is provided in the existing developed areas. The project will reduce the peak runoff by providing infiltration potential and by reducing impervious surfaces. Approximately 2,410 square feet of impervious pavement will be converted to pervious pavers, with only a total of 1,600 square feet of new and replaced gravel pedestrian paths and access road proposed. The net reduction in impervious surfaces will decrease the peak stormwater runoff flow rate. The pervious pavers and silva cell will remove sediment and other pollutants that would have been conveyed to Lake Washington in the existing conditions. Overall the project will result in no pollution-generating surfaces.

The existing concrete bulkhead will be cored for the placement of the new outfall from the silva cell and the cored hole will be grouted to the outfall. The existing 4-inch diameter ductile iron outfall will be abandoned with a grout plug.

### *Erosion from Upland Areas*

The upland components of the Project will require vegetation removal, grading, and installation of surfacing materials such as concrete, pavers, and gravel. These activities have the potential to result in erosion of soils, which could be washed into the lake if not properly controlled and result in turbidity and sedimentation of aquatic habitat. The BMPs listed in Section 11 will be followed to ensure that disturbed soils are properly managed during construction to avoid these impacts.

### **Delayed Consequences**

It is possible, but highly unlikely, that fuel or lubricants from construction equipment could enter the water. The measures described in Section 11 will be implemented to avoid spills and respond to any accidental releases of these materials to the water.

### **11. Conservation measures:**

*Conservation measures are measures that would reduce or eliminate adverse impacts of the proposed activity (examples: work done during the recommended work window (to avoid times when species are most likely to be in the area), silt curtain, erosion control best management practices, percent grating on a pier to reduce shading impacts).*

#### **Proposed work window:**

In-water work will occur during the in-water work window for Lake Washington which is anticipated to be July 16 to March 15 (or an approved extension).

#### **Other conservation measures:**

To avoid or minimize potential adverse impacts to the aquatic environment, the following additional BMPs will be employed during construction:

- Applicable permits for the Project will be obtained prior to construction. Work will be performed according to the requirements and conditions of these permits.
- The contractor will be responsible for the preparation and implementation of a spill plan to be used for the duration of construction, which will include spill prevention, control, and response BMPs. In addition, the spill plan will outline roles and responsibilities, notifications, inspections, and response protocols to be implemented in the event of an inadvertent spill during construction.
- The contractor will supply to the Project Engineers a Temporary Erosion and Sediment Control (TESC) Plan and/or a Construction Stormwater Pollution Prevention Plan (SWPPP) that will use BMPs to prevent erosion and sediment-laden runoff from leaving the site. These plans will be implemented prior to the start of ground-disturbing activities. All areas disturbed by Project construction will be stabilized as soon as possible to prevent erosion and re-vegetated as soon as practicable post-construction and prior to the removal of TESC/SWPPP measures.



- Excess or waste materials will not be disposed of or abandoned waterward of the OHWM or allowed to enter waters of the state.
- No petroleum products, chemicals, or other toxic or deleterious materials will be allowed to enter surface waters.
- Barges will not be allowed to ground out during construction.
- A temporary floating debris boom will be installed around the work area. The contractor will be required to retrieve any floating debris generated during construction using a skiff and a net. Debris will be disposed of at an appropriate upland facility.
- Demolition and construction materials will not be stored where wave action or upland runoff can cause materials to enter surface waters.
- No uncured concrete or grout will be in contact with surface waters.
- Piles will be removed as practicable, using best efforts, equipment preferences, and BMPs identified in Washington Department of Natural Resources *Puget Sound Initiative Derelict Creosote Piling Removal: Best Management Practices for Pile Removal and Disposal* (WDNR 2017).
- All creosote-treated materials will be disposed of in a landfill or recycling facility approved to accept these types of materials.
- Vibratory pile driving will be used to the maximum extent practicable, with limited impact pile driving to reach required pile depths and for pile proofing. During all impact driving, sound-attenuation devices such as a wooden cushion blocks or similar devices will be employed to minimize sound-related impacts, as determined through federal Endangered Species Act consultation.
- New light fixtures on overwater structures will be directed away from the water to the extent practicable to minimize impacts on aquatic species.
- Geotechnical engineering recommendations will be incorporated into the Project.
- Any contaminated soils encountered in the vicinity of the two decommissioned underground storage tanks will be identified and handled according to a soil management plan developed by a qualified engineer.
- Any additional measures required by the agencies during Endangered Species Act consultation will be incorporated into the Project to avoid impacts on federally listed species.

## 12. Determination of Effect:

*Provide a summary of impacts concluding with statement(s) of effect, by species. Even projects that are intended to benefit the species might have short-term adverse impacts and those must be addressed. Only the following determinations are valid for listed species or designated critical habitat:*

**No effect.** Literally no effect. No probability of any effect. The action is determined to have ‘no effect’ if there are no proposed or listed salmon and no proposed or designated critical habitat in the action area or downstream from it. This effects determination is the responsibility of the action agency to make and does not require NMFS review.

**May Affect, Not Likely to Adversely Affect (NLAA)** – Insignificant, discountable, or beneficial effects. The effect level is determined to be ‘may affect, not likely to adversely affect’ if the proposed action does not have the potential to hinder attainment of relevant properly functioning indicators and has a negligible (extremely low) probability of taking proposed or listed salmon or resulting in the destruction or adverse modification of their habitat. An insignificant effect relates to the size of the impact and should never reach the scale where take occurs. A ‘discountable effect’ is defined as being so extremely unlikely to occur that a reasonable person cannot detect, measure, or evaluate it. This level of effect requires informal consultation, which consists of NMFS and/or USFWS concurrence with the action agency’s determination.

**May Affect, Likely to Adversely Affect (LAA)** This form is not appropriate for use with a project that is LAA listed species. Please see the Biological Assessment (BA) template on the Corps website:

[http://www.nws.usace.army.mil/PublicMenu/Menu.cfm?sitename=REG&pagename=mainpage\\_ESA](http://www.nws.usace.army.mil/PublicMenu/Menu.cfm?sitename=REG&pagename=mainpage_ESA)

Potential impacts to listed species include limited physical and behavioral impacts from turbidity, disturbance of benthic food resources, removal of riparian vegetation, and in-air and in-water noise as a result of construction activities. Based on the guidance and definitions provided above and the previously discussed Project effects, the effect determinations for species present in Lake Washington is that the Project **may affect and is likely to adversely affect Puget Sound Chinook salmon, Puget Sound bull trout, and Puget Sound steelhead.** Justification for these determinations is as follows:

- Noise levels from impact pile driving may exceed both behavioral and auditory injury thresholds for fish during the in-water work period. Behavioral effects would extend to approximately 2.5 miles from the pile driving locations during impact proofing. Injurious effects would be limited to approximately 164 feet around the pile driving locations and would be easier for fish to avoid. Vibratory pile driving will be used to the maximum extent possible to minimize underwater noise impacts, with impact pile driving limited to proofing. Work will occur during the approved in-water work period, or an approved extension, when salmonids are least likely to be present.
- Temporary turbidity and suspended sediments could temporarily disrupt fish in the Project area. Turbidity will be minimized during construction through implementation of BMPs. It is likely that turbid sediments will disseminate to background levels within 300 feet of the in-water activity, in compliance with Washington State water quality standards.
- Disturbance of substrate and benthic and epibenthic prey will occur during in-water work. This effect will be short term and temporary due to expected rapid recovery of the benthic community following this work, and no long-term modifications of salmonid prey species habitats are expected.
- A limited amount of riparian vegetation will be removed near the north beach, resulting in a minor loss of shade and source of organic materials to the lake. Vegetation will be replanted, including coniferous trees.

- Portions of the existing docks will be moved into deeper water, benefiting juvenile salmonids that may use nearshore areas. The Project will reduce the number of piles in the lake and will incorporate grated surfacing to reduce shading, thereby reducing areas for species that prey on juvenile salmonids.
- The Project will improve water quality by removing or encapsulating creosote-treated timber piles from the lake and improving stormwater management at the site.
- Installation and operation of the irrigation intake will result in minor, temporary construction impacts when the immediate area is dewatered, and would not affect aquatic habitat in the long term because the intake will be screened.
- The BMPs described in Section 11 will avoid and minimize erosion from upland areas and the potential for accidental releases of fuels or other toxic materials during construction.
- Operations will be stopped temporarily if injured, sick, or dead listed species are located in the Project area. The contractor will follow appropriate notification protocol as described in all permits issued for this work.

Based on the guidance and definitions provided above and the previously discussed Project effects, the effect determination is that the Project **may affect but is not likely to adversely affect marbled murrelet** for the following reasons:

- Underwater noise levels from impact pile driving may exceed both behavioral and auditory injury thresholds for marbled murrelet during the in-water work period. Behavioral effects would extend to approximately 2.5 miles from the pile driving locations during impact proofing. Injurious effects would be limited to approximately 10 feet around the pile driving locations. Vibratory pile driving will be used to the maximum extent possible to minimize underwater noise impacts, with impact pile driving limited to proofing. Marbled murrelets have been rarely sighted in Lake Washington and are highly unlikely to occur immediately adjacent to impact pile driving locations. In addition, the Lake Washington shoreline includes populated urbanized areas associated with recreational boat traffic that are unfavorable to marbled murrelets.
- Marbled murrelets could encounter elevated in-air noise levels while moving to and from nesting habitat in the upper Cedar River watershed, but this area supports very few nests. The Project will not disturb suitable nesting habitat for marbled murrelets.
- Marbled murrelets may forage in lakes but are more commonly associated with marine habitat near nest sites. Very few marbled murrelets have been reported foraging in Lake Washington.

Based on the guidance and definitions provided above and the previously discussed Project effects, the effect determination for salmonid species likely to be present in Lake Washington is that the Project **may affect and is likely to adversely affect** designated critical habitat for Puget Sound Chinook salmon and Coastal-Puget Sound bull trout. Critical habitat for steelhead and marbled murrelet is not present within the action area. Justification for these determinations is as follows:

- Removal of riparian vegetation will result in a minor reduction in shading and organic material input to shallow nearshore areas. Vegetation will be replanted, including shade-providing coniferous trees, but will take time to become reestablished.

- BMPs will be employed, as described in Section 11, to minimize potential impacts to listed salmonids due to accidental releases of fuels, eroded soils, or other materials to the lake.
- Increased turbidity and disturbance of benthic prey species during in-water construction activities will be short-term and localized.
- The Project will result in no net increase in overwater cover and will incorporate light-penetrating materials to the maximum extent possible. Portions of the dock will be moved to deeper water, improving nearshore habitat for juvenile salmonids.
- Removing creosote-treated piles and installing upgraded stormwater management features will improve water quality.
- Installation and operation of the irrigation water intake has been permitted under an existing water right and will have only minor, temporary impacts during dewatering to install the intake. The intake will be screened to prevent fish entrainment.

### 13. EFH Analysis

*Essential Fish Habitat (EFH) is broadly defined by the Act (now called the Magnuson-Stevens Act or the Sustainable Fisheries Act) to include “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity”. This language is interpreted or described in the 1997 Interim Final Rule [62 Fed. Reg. 66551, Section 600.10 Definitions] -- Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include historic areas if appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species’ contribution to a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species’ full life cycle.*

*Additional guidance for EFH analyses can be found at the NOAA Fisheries web site under the Sustainable Fisheries Division.*

#### A. Description of the Proposed Action (may refer to BA project description)

The Project is described in Section A.5.

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

The objective of this assessment is to describe potential adverse effects to designated Essential Fish Habitat (EFH) for federally managed fish species within the action area. It also describes conservation measures proposed to avoid, minimize, or otherwise offset potential adverse effects to designated EFH resulting from the Project.

This document was also prepared as a resource document for concurrent EFH consultation with NMFS for compliance with the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and the 1996 Sustainable Fisheries Act (SFA). EFH is defined by the Magnuson-Stevens Act in 50 Code of Federal Regulations 600.905-930 as, “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” The action area includes designated EFH for Pacific salmon (PFMC 2021). The federally managed species with EFH in Puget Sound are Chinook, coho, and pink salmon. The objective of this assessment is to describe potential adverse effects to designated EFH for these

federally managed fisheries species within the action area. It also describes conservation measures proposed to avoid, minimize, or otherwise offset potential adverse effects to designated EFH resulting from the Project.

The action area includes habitats that have been designated as EFH for Pacific salmon EFH (NOAA 2022). This EFH includes the following:

- Pacific coast salmon EFH includes those waters and substrate necessary for salmon production needed to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem. In estuarine and marine areas, salmon EFH extends from the extreme high tide line in nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (200 nautical miles or 370.4 km) offshore. Managed salmon stocks include Chinook, coho, pink (odd-numbered years only), and any salmon species listed under the ESA that is measurably impacted by Council fisheries (PFMC 2021).

The objective of this assessment is to describe potential adverse effects to designated EFH for federally managed fisheries species within the action area. It also describes conservation measures proposed to avoid, minimize, or otherwise offset potential adverse effects to designated EFH resulting from the Project. EFH and life-history stages for species that may occur in the Project vicinity are listed in Table 10.

**Table 10  
Managed Species and Life-History Stages with Designated Essential Fish Habitat that May Occur in the Action Area**

Species	Adult	Spawning/ Mating	Juvenile	Larvae	Eggs/ Parturition
Chinook salmon	X		X		
Coho salmon	X		X		
Puget Sound pink salmon	X		X		

**C. Effects of the Proposed Action**

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

Potential adverse effects on EFH include temporary and localized minor turbidity effects and in-water noise during pile driving. Direct and indirect effects on EFH and the impact avoidance, minimization, and conservation measures that avoid and minimize impacts are identified in Table 11.

**Table 11**  
**Impact Mechanisms of Proposed Project on Essential Fish Habitat**

Affected EFH	Impact Mechanism	Impact Avoidance and Minimization and Conservation Measures
Pacific salmon EFH (water column)	Project activities would result in short-term and localized turbidity during pile removal, pile driving, and encapsulation of piles with fiberglass. These activities would also temporarily disturb benthic species that may serve as prey for salmonids. These activities are anticipated to have insignificant effects on EFH. Turbidity and benthic disturbance would be temporary and localized and are not expected to impact primary productivity and food resources for Pacific salmon.	The Project is timed to occur during the in-water work window for protection of listed fish species.
Pacific salmon EFH (water column)	There is a nominal chance that an unintentional release of fuel, lubricants, or hydraulic fluid from land-based construction equipment could enter waterbodies. Eroded soils from upland construction areas could enter the lake, causing sedimentation and turbidity. Salmonid species are mobile and would be expected to avoid areas where unsuitable conditions exist.	Construction contractors would be required to implement BMPs to prevent or respond to spills and avoid soil erosion and runoff.
Pacific salmon EFH (aquatic habitat)	Impact pile driving would result in short-term, localized increases in underwater noise levels. Effects on salmonid behavior could occur within 2.5 miles of pile driving locations. Injurious effects are unlikely due to the small area of noise that would exceed injury thresholds.	The Project is timed to occur during the in-water work window for protection of listed fish species.
Pacific salmon EFH (aquatic habitat)	The Project would result in a minor reduction in riparian vegetation and associated shading/organic input along the lake shore until new plantings become established. Removal/encapsulation of creosote-treated timber piles and installation of stormwater LID features would improve water quality. Moving portions of the dock to deeper water would improve nearshore habitat for juvenile salmonids. The irrigation intake will be screened to prevent fish entrainment.	Replacement riparian vegetation, including coniferous trees, will be planted near the north beach.

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)

There are no unique effects to an individual managed species as a result of the Project.

iii. Effects on Associated Species, Including Prey Species

No impacts on the health or availability of prey species are anticipated.

#### iv. Cumulative Effects

There are no future state, tribal, local, and private actions in the vicinity of the Project that are reasonably certain to occur within the Project footprint that would result in cumulative effects to EFH.

#### D. Proposed Conservation Measures

See proposed conservation measures in Section 11 of this BE.

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

The proposed Project is anticipated to have temporary and insignificant effects to EFH. Therefore, it is concluded that the Project **will not adversely affect** Pacific salmon EFH.

#### 14. References:

*Include any studies or papers that support statements made in this form (example: reference the source for the listed species that are covered).*

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## **15. Appendices:**

*As needed include mitigation, revegetation plans, monitoring plans, results of studies, water quality information, etc.*

## FIGURES



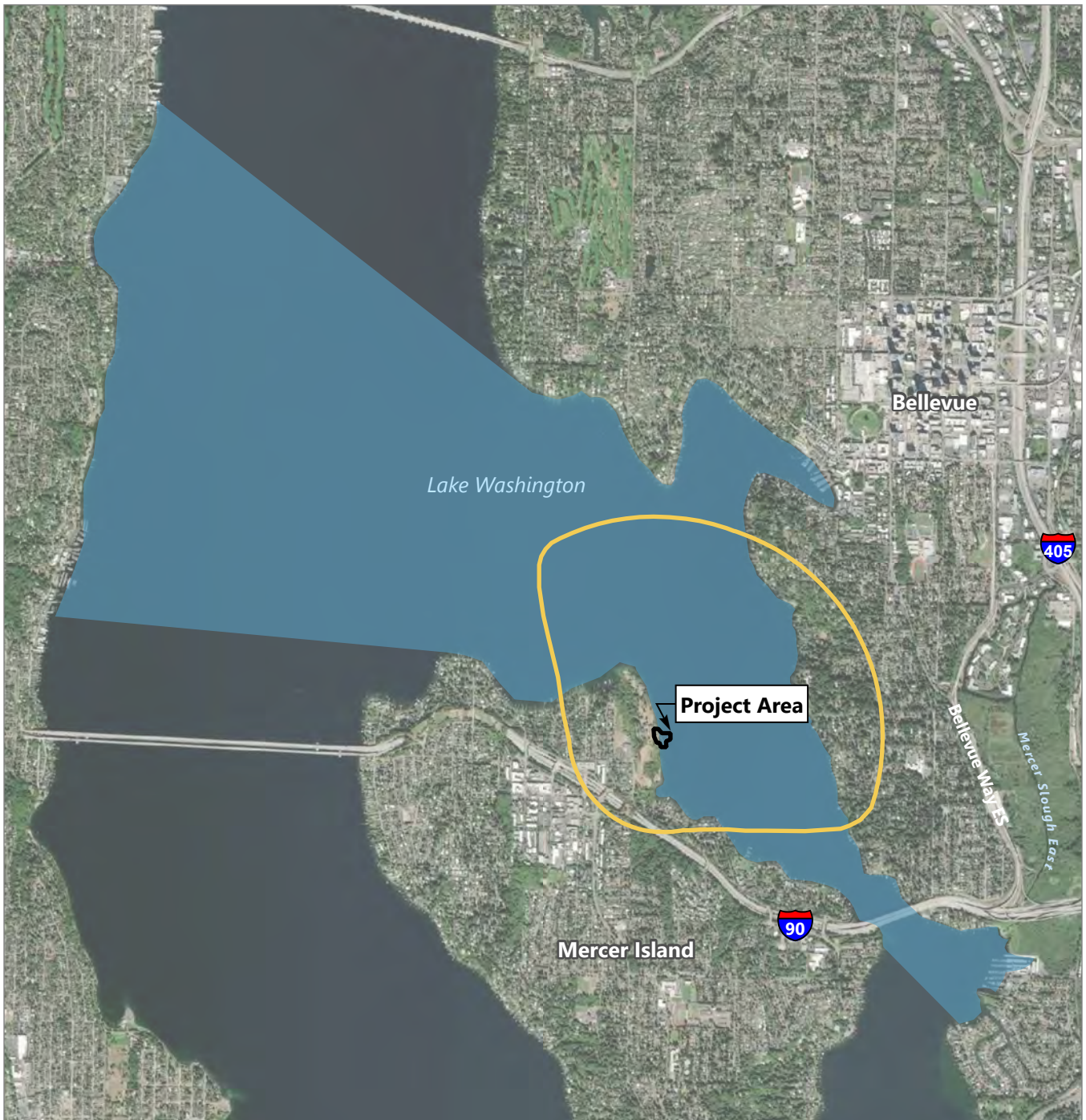
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**Figure BE-1  
Vicinity Map**

Biological Evaluation  
Luther Burbank Park Waterfront Improvements



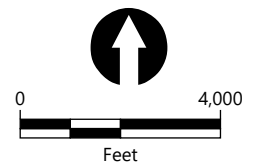


**LEGEND:**

-  Project Area
-  In-Water Noise Attenuation to Background (120 dBA): Constrained by Land Masses
-  In-Air Noise Attenuation to Background (70 dBA) – Hard Surface: 0.9 mile
-  In-Air Noise Attenuation to Background (70 dBA) – Soft Surface: 0.4 mile

**NOTE:**

1. Aerial imagery: ESRI Streaming Imagery



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**Figure BE-2  
Action Area**

Biological Evaluation  
Luther Burbank Waterfront Improvements

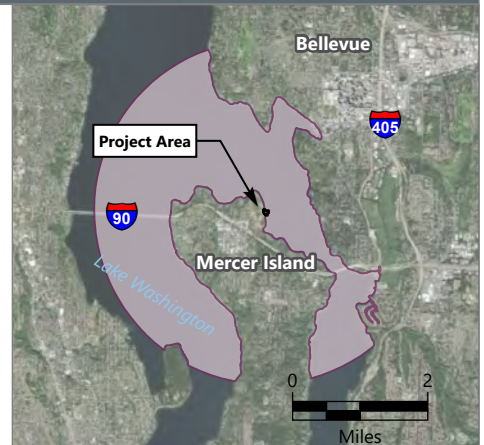


**LEGEND:**

- Project Area
- Distance for In-Air Masking – Impact Pile Driving: 138 feet
- In-Water Non-auditory Injury (208 dB SEL) – Impact Pile Driving: 3 feet
- In-Water Auditory Injury (202 dB SEL) – Impact Pile Driving: 10 feet
- In-Water Behavioral Effects (150 dB RMS) – Vibratory Pile Driving: 52 feet
- In-Water Behavioral Effects (150 dB RMS) – Impact Pile Driving: 2.5 miles

**NOTE:**

1. Aerial imagery: USA NAIP Streaming Imagery



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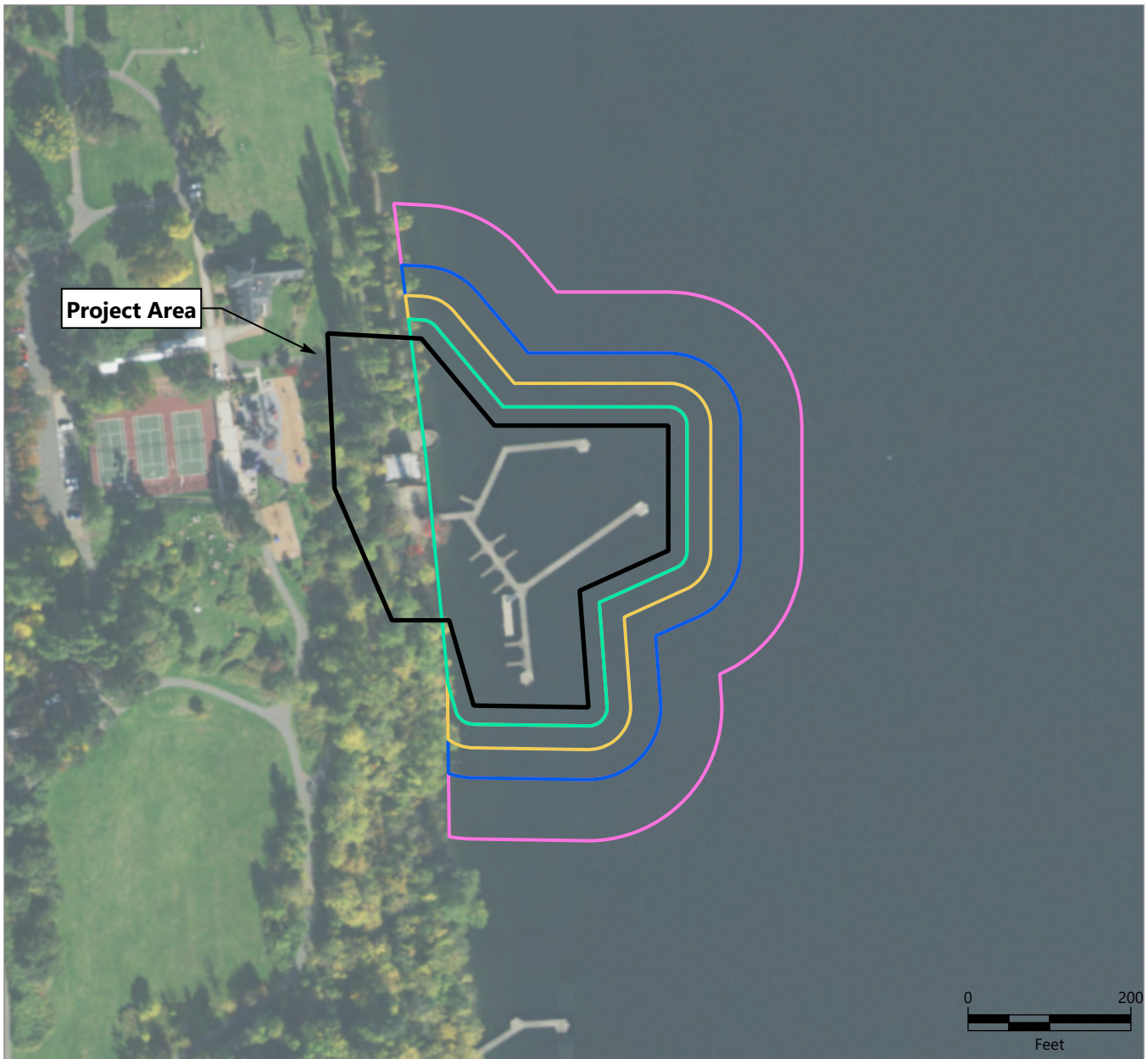
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**Figure BE-3**  
**In-Air and In-Water Noise Thresholds for Marbled Murrelet**

Biological Evaluation  
Luther Burbank Waterfront Improvements





**LEGEND:**

-  Project Area
-  Distance to Peak Injury Threshold all Fish (206 dB PEAK) – Impact Pile Driving: 23 feet
-  Distance to Injury Threshold for Fish >2 Grams (187 dB cSEL) – Impact Pile Driving: 89 feet
-  Distance to Injury Thresholds for Fish <2 Grams (183 dB cSEL) – Impact Pile Driving: 164 feet
-  Fish Behavioral Disturbance (150 dB RMS) – Vibratory Pile Driving: 52 feet
-  Fish Behavioral Disturbance (150 dB RMS) – Impact Pile Driving: 2.5 miles

**NOTE:**

1. Aerial imagery: USA NAIP Streaming Imagery



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**Figure BE-4**  
**In-Water Noise Thresholds for Chinook Salmon and Steelhead**

Biological Evaluation  
Luther Burbank Waterfront Improvements

**APPENDIX 1  
PROJECT DRAWINGS**



Sheet List Table	
Sheet Number	Sheet Title
1	Vicinity Map
2	Existing Conditions
3	Project Overview
4	Demolition and TESC Site Plan
5	Upland and Shoreline Project Plan
6	Upland and Shoreline Cross Sections
7	In-Water and Overwater Construction Plan
8	North Dock Pier Repair and Fiberglass Encapsulation Details
9	North Dock Pile Repair Details
10	Central Dock Reconfiguration - Elevation View
11	Central Dock Reconfiguration - Section View and Pile Schedule
12	South Dock Reconfiguration - Elevation View
13	Planting Plan
14	Plant Schedule



**REFERENCE #:**

**APPLICANT:** CITY OF MERCER ISLAND

**LOCATION:** 2040 84TH AVENUE SE,  
MERCER ISLAND, WA 98040

**ADJACENT PROPERTY OWNERS:**  
CITY OF MERCER ISLAND, PARCELS 0724059054, 0124049018,  
0124049002

**NAME:** LUTHER BURBANK WATERFRONT IMPROVEMENTS PROJECT

**PROPOSED:** REPAIR AND REPLACE DOCK STRUCTURES AND COMPLETE UPLAND IMPROVEMENTS

**PURPOSE:** IMPROVE PUBLIC ACCESS AND RECREATIONAL USES

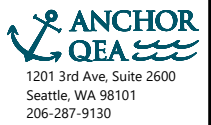
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**VERTICAL DATUM:** NAVD88

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**LONGITUDE:** -122.224481 W  
**S-T-R:** 6-25N-5E

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**NEAR/AT:** MERCER ISLAND  
**COUNTY:** KING  
**STATE:** WASHINGTON

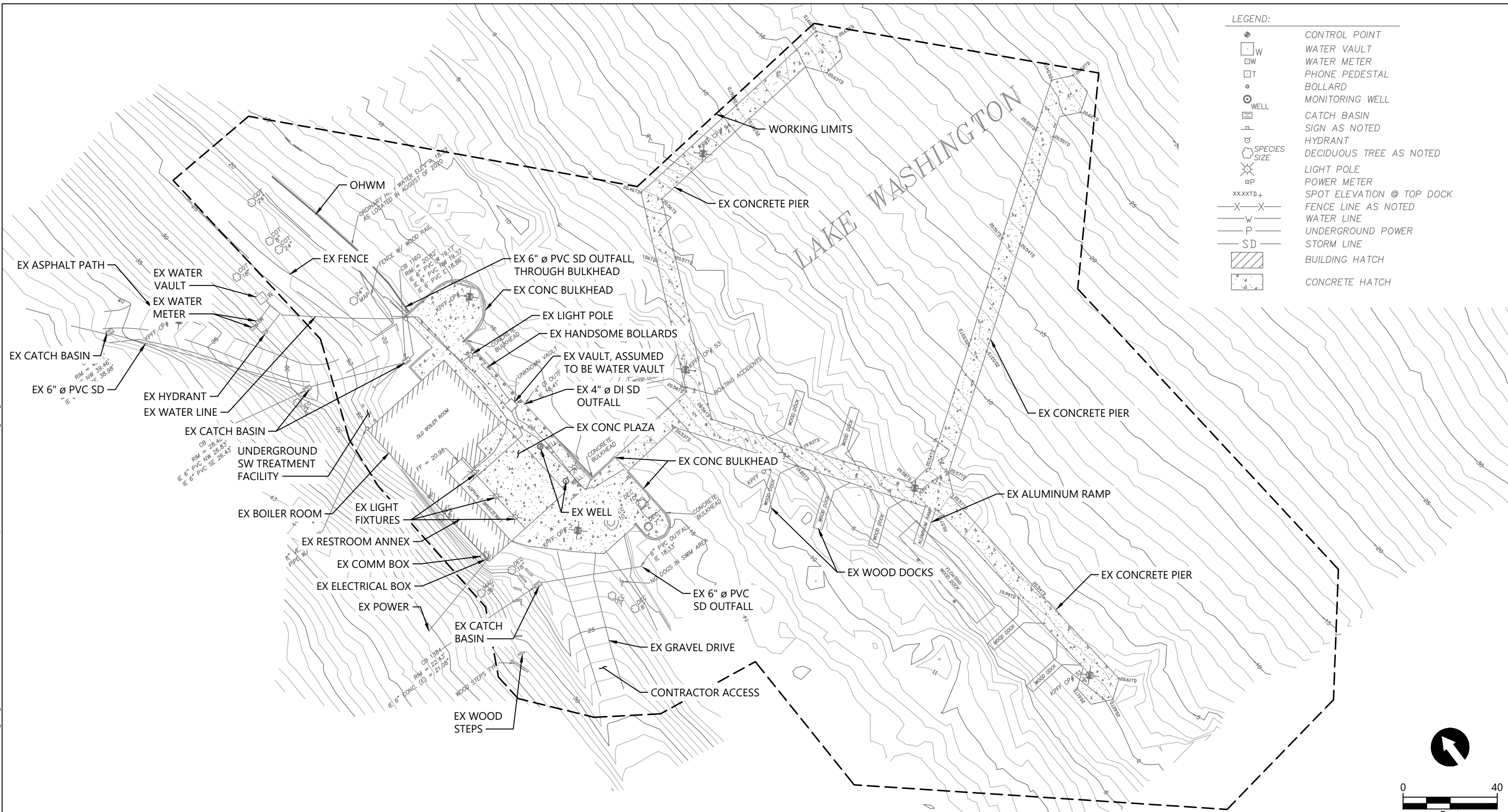
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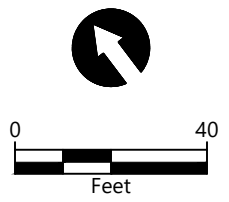


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**LEGEND:**

	CONTROL POINT
	WATER VAULT
	WATER METER
	PHONE PEDESTAL
	BOLLARD
	MONITORING WELL
	CATCH BASIN
	SIGN AS NOTED
	HYDRANT
	DECIDUOUS TREE AS NOTED
	LIGHT POLE
	POWER METER
	SPOT ELEVATION @ TOP DOCK
	FENCE LINE AS NOTED
	WATER LINE
	UNDERGROUND POWER
	STORM LINE
	BUILDING HATCH
	CONCRETE HATCH



**EXISTING CONDITIONS**

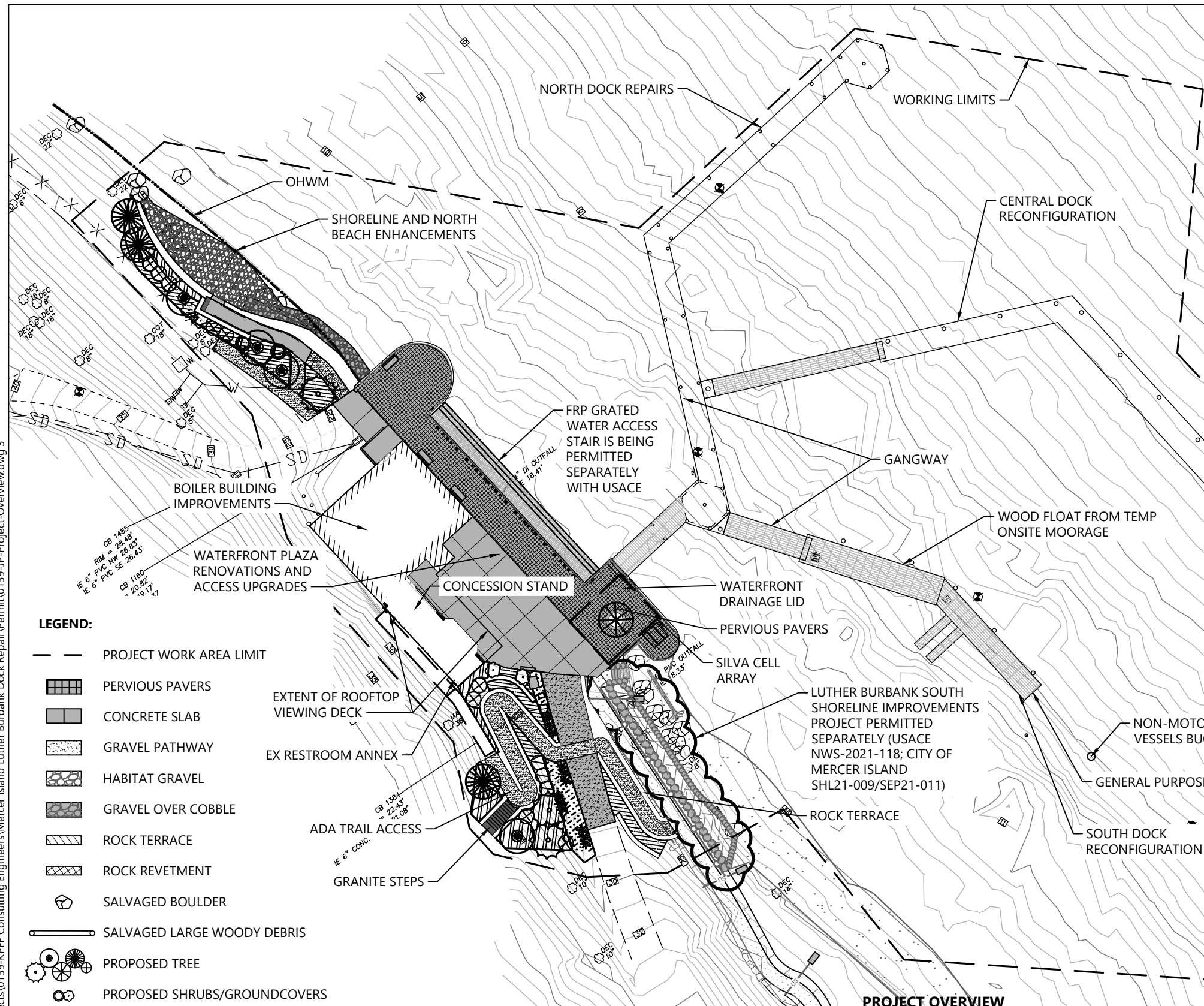
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SOURCE: SURVEY PROVIDED BY KPFF





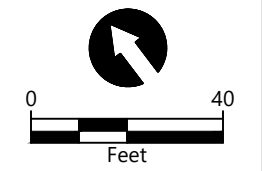
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IN-WATER AND OVERWATER WORK SUMMARY				
PROJECT PORTION	ELEMENT	FEATURES REMOVED	FEATURES REPLACED	NET CHANGE
NORTH DOCK REPAIRS	IN-WATER PILES	ONE 12- TO 14-INCH CREOSOTE- TREATED TIMBER PILES	NOT APPLICABLE	NET DECREASE OF 1 IN-WATER PILE
	OVERWATER COVER	APPROXIMATELY 355 SF OF OVERWATER COVER (235 SF OF EXISTING CONCRETE DOCK; 120 SF OF ONE WOOD FINGER DOCK)	235 SF FRP GRATING	NET DECREASE OF 120 SF OVERWATER COVER
CENTRAL DOCK RECONFIGURATION	IN-WATER PILES	APPROXIMATELY TWENTY-SIX 12- TO 14-INCH CREOSOTE-TREATED TIMBER PILES	APPROXIMATELY 17 PILES (SIXTEEN 24-INCH STEEL PILES; ONE 16-INCH STEEL PILE)	NET DECREASE OF 9 IN-WATER PILES
	OVERWATER COVER	APPROXIMATELY 1,500 SF FIXED CONCRETE DOCK	APPROXIMATELY 3,160 SF OF NEW OVERWATER COVER (2,610 SF OF WAVE ATTENUATOR FLOAT, 175 SF OF TWO GRATED FINGER FLOATS, 375 SF OF GRATED GANGWAY)	NET INCREASE OF 1,660 SF OF OVERWATER COVER
SOUTH DOCK RECONFIGURATION	IN-WATER PILES	APPROXIMATELY 42 PILES (FORTY 12- TO 14-INCH CREOSOTE-TREATED TIMBER PILES; TWO 16-INCH CONCRETE ENCAPSULATED PILES)	APPROXIMATELY SIX 16-INCH STEEL PILES	NET DECREASE OF 36 IN-WATER PILES
	OVERWATER COVER	APPROXIMATELY 2,810 SF EXISTING COVER (1,930 SF OF FIXED CONCRETE DOCK; 40 SF OF ALUMINUM RAMP; SEVEN 120-SF WOOD FINGER DOCKS)	APPROXIMATELY 713 SF OF NEW OVERWATER COVER (380 SF OF GENERAL-PURPOSE FLOAT, 90 SF OF 2 GRATED FINGER FLOATS, 225 SF OF GRATED GANGWAY, 18 SF OF CONCRETE GANGWAY ABUTMENT)	NET DECREASE OF 2,097 SF OF OVERWATER COVER
PUBLIC ACCESS STAIRS	IN-WATER PILES	NOT APPLICABLE	APPROXIMATELY 6 PIN PILES (6-INCH STEEL PILES)	NET INCREASE OF 6 IN-WATER PILES
	OVERWATER COVER	NOT APPLICABLE	APPROXIMATELY 552 SF OF GRATED OVERWATER COVER	NET INCREASE OF 552 SF OF OVERWATER COVER
TOTAL	IN-WATER PILES	APPROXIMATELY 69 PILES REMOVED	APPROXIMATELY 29 PILES INSTALLED	NET DECREASE OF 40 IN-WATER PILES
	OVERWATER COVER	APPROXIMATELY 4,665 SF OF EXISTING COVER REMOVED	APPROXIMATELY 4,660 SF OF NEW OVERWATER COVER INSTALLED	NET DECREASE OF APPROXIMATELY 5 SF OF OVERWATER COVER

NOTE: TABLE DOES NOT INCLUDE REPAIR AND FIBERGLASS ENCAPSULATION OF EXISTING NORTH DOCK PILES. UP TO FIVE (5) 14-INCH DECAYED CREOSOTE-TREATED TIMBER PILE TOPS WILL BE REMOVED AND REPLACED WITH ACZA TREATED TIMBER PILES AND WRAPPED WITH A FIBERGLASS JACKET

- LEGEND:**
- PROJECT WORK AREA LIMIT
  - PERVIOUS PAVERS
  - CONCRETE SLAB
  - GRAVEL PATHWAY
  - HABITAT GRAVEL
  - GRAVEL OVER COBBLE
  - ROCK TERRACE
  - ROCK REVETMENT
  - SALVAGED BOULDER
  - SALVAGED LARGE WOODY DEBRIS
  - PROPOSED TREE
  - PROPOSED SHRUBS/GROUNDCOVERS
  - RIPARIAN SHRUBS
  - NATIVE UPLAND PLANTING/GROUNDCOVER
  - STORMWATER CONVEYANCE PLANTING
  - PICNIC TABLE
  - BENCH



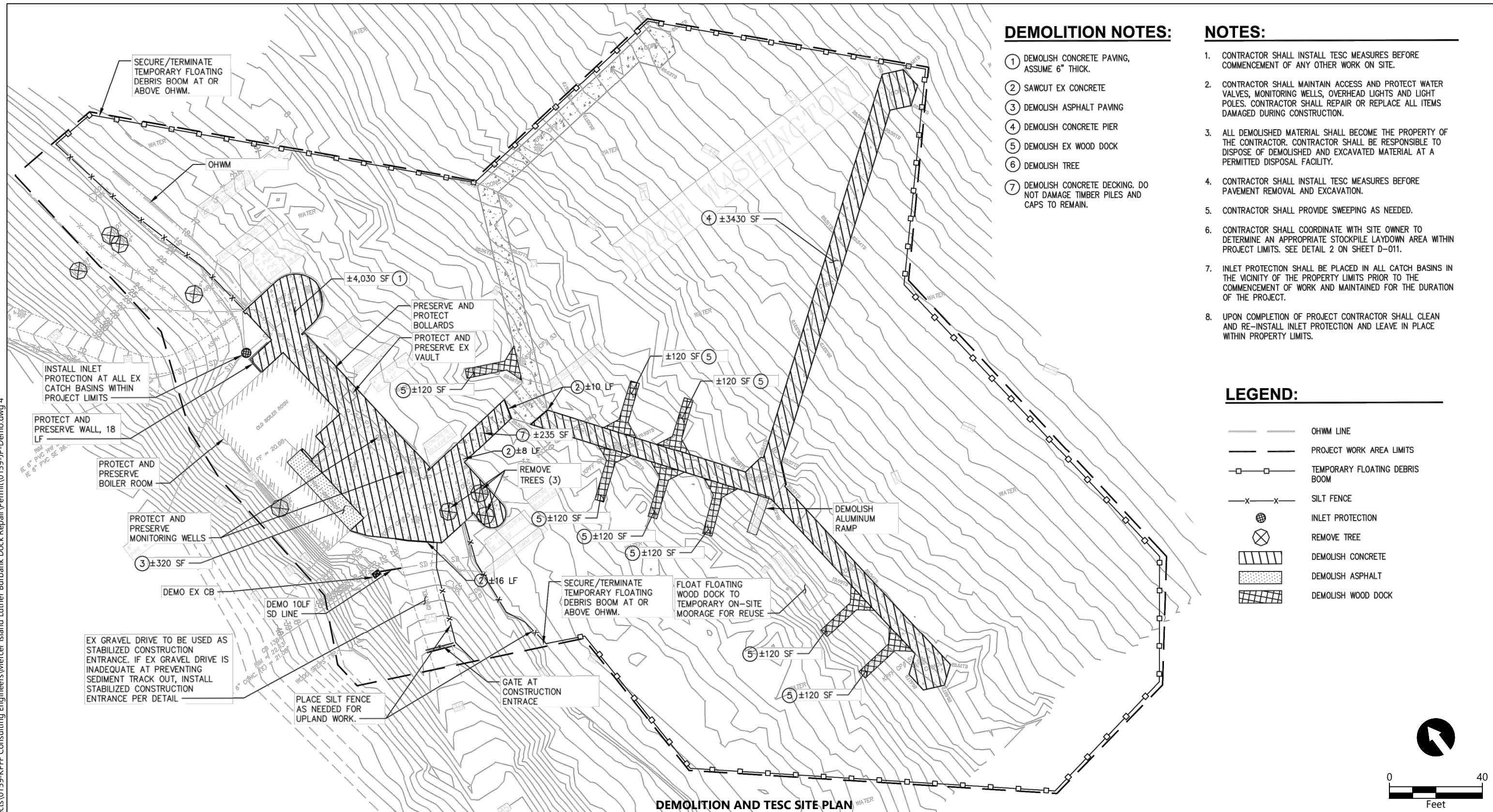
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**SOURCE:** SURVEY AND PIER PLAN CAD FILE PROVIDED BY KPFF.





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**DEMOLITION NOTES:**

- ① DEMOLISH CONCRETE PAVING, ASSUME 6" THICK.
- ② SAWCUT EX CONCRETE
- ③ DEMOLISH ASPHALT PAVING
- ④ DEMOLISH CONCRETE PIER
- ⑤ DEMOLISH EX WOOD DOCK
- ⑥ DEMOLISH TREE
- ⑦ DEMOLISH CONCRETE DECKING. DO NOT DAMAGE TIMBER PILES AND CAPS TO REMAIN.

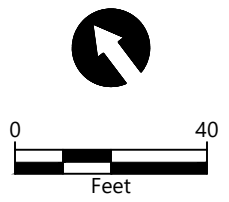
**NOTES:**

- 1. CONTRACTOR SHALL INSTALL TESC MEASURES BEFORE COMMENCEMENT OF ANY OTHER WORK ON SITE.
- 2. CONTRACTOR SHALL MAINTAIN ACCESS AND PROTECT WATER VALVES, MONITORING WELLS, OVERHEAD LIGHTS AND LIGHT POLES. CONTRACTOR SHALL REPAIR OR REPLACE ALL ITEMS DAMAGED DURING CONSTRUCTION.
- 3. ALL DEMOLISHED MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR. CONTRACTOR SHALL BE RESPONSIBLE TO DISPOSE OF DEMOLISHED AND EXCAVATED MATERIAL AT A PERMITTED DISPOSAL FACILITY.
- 4. CONTRACTOR SHALL INSTALL TESC MEASURES BEFORE PAVEMENT REMOVAL AND EXCAVATION.
- 5. CONTRACTOR SHALL PROVIDE SWEEPING AS NEEDED.
- 6. CONTRACTOR SHALL COORDINATE WITH SITE OWNER TO DETERMINE AN APPROPRIATE STOCKPILE LAYDOWN AREA WITHIN PROJECT LIMITS. SEE DETAIL 2 ON SHEET D-011.
- 7. INLET PROTECTION SHALL BE PLACED IN ALL CATCH BASINS IN THE VICINITY OF THE PROPERTY LIMITS PRIOR TO THE COMMENCEMENT OF WORK AND MAINTAINED FOR THE DURATION OF THE PROJECT.
- 8. UPON COMPLETION OF PROJECT CONTRACTOR SHALL CLEAN AND RE-INSTALL INLET PROTECTION AND LEAVE IN PLACE WITHIN PROPERTY LIMITS.

**LEGEND:**

- OHWM LINE
- PROJECT WORK AREA LIMITS
- TEMPORARY FLOATING DEBRIS BOOM
- x—x— SILT FENCE
- ⊗ INLET PROTECTION
- ⊗ REMOVE TREE
- ▨ DEMOLISH CONCRETE
- ▨ DEMOLISH ASPHALT
- ▨ DEMOLISH WOOD DOCK

DEMOLITION AND TESC SITE PLAN



**REFERENCE #:**  
**APPLICANT:** CITY OF MERCER ISLAND  
**LOCATION:** 2040 84TH AVENUE SE, MERCER ISLAND, WA 98040  
**ADJACENT PROPERTY OWNERS:**  
 1 - CITY OF MERCER ISLAND, PARCELS 0724059054, 0124049018, 0124049002

**NAME:** LUTHER BURBANK WATERFRONT IMPROVEMENTS PROJECT  
**PROPOSED:** REPAIR AND REPLACE DOCK STRUCTURES  
**PURPOSE:** IMPROVE PUBLIC ACCESS AND RECREATIONAL USES  
**HORIZONTAL DATUM:** WASHINGTON STATE PLANE, NORTH ZONE, NAD83  
**VERTICAL DATUM:** NAVD88

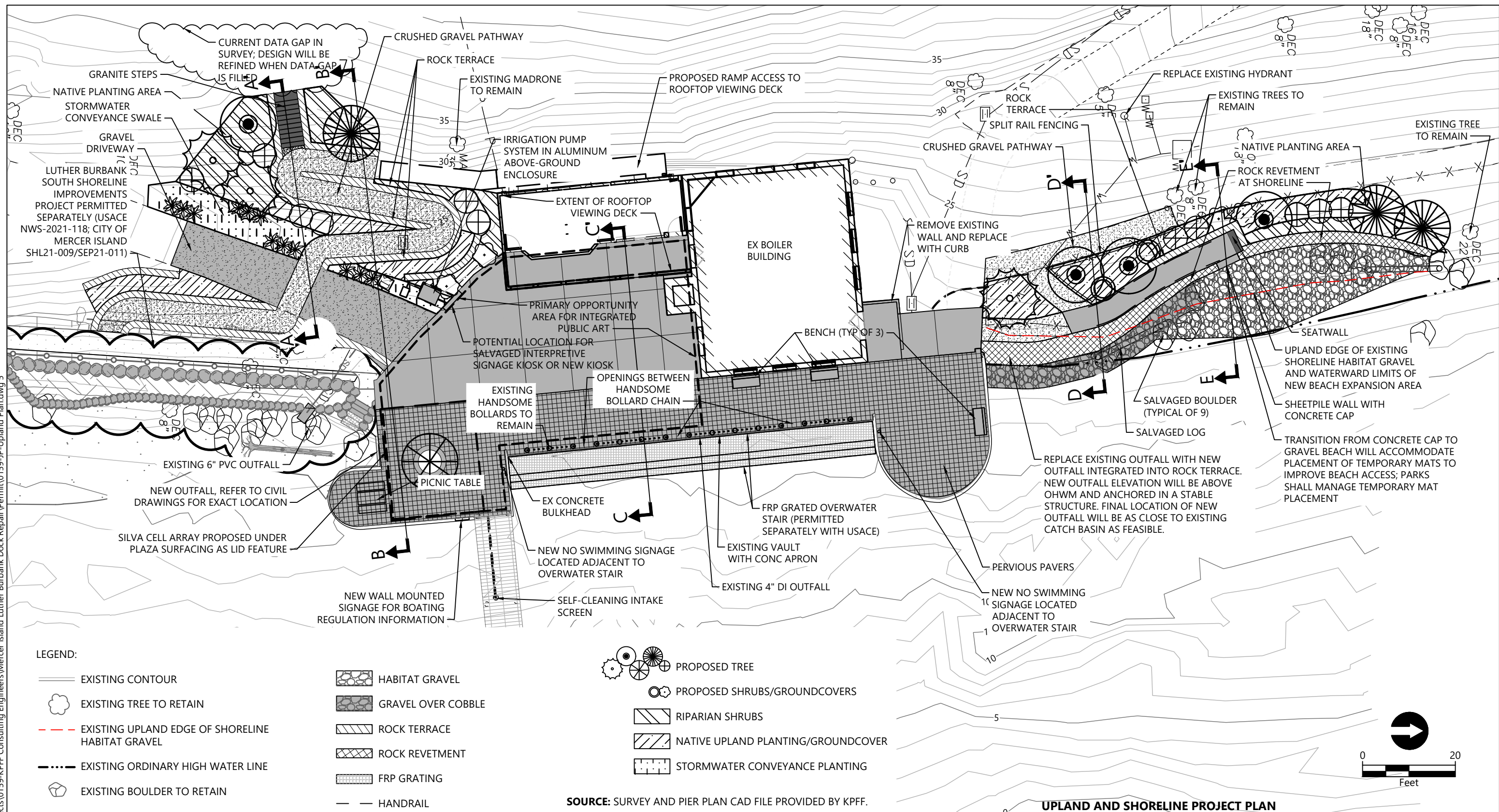
**LATITUDE:** 47.591034 N  
**LONGITUDE:** -122.224481 W  
**S-T-R:** 6-25N-5E  
**IN:** LAKE WASHINGTON  
**NEAR/AT:** MERCER ISLAND  
**COUNTY:** KING  
**STATE:** WASHINGTON  
**DATE:** OCTOBER 2022  
**FIGURE:** 4 of 14

SOURCE: DEMOLITION AND TESC SITE PLAN PROVIDED BY KPFF.





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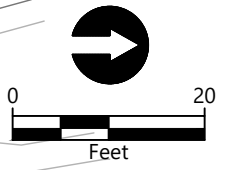


**LEGEND:**

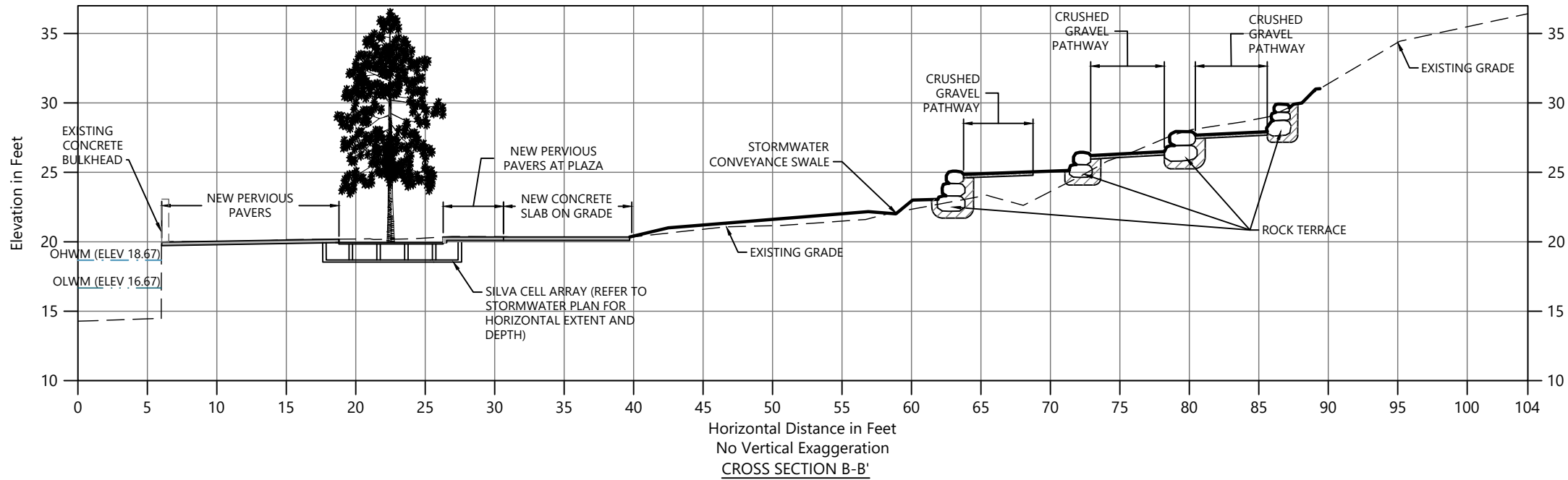
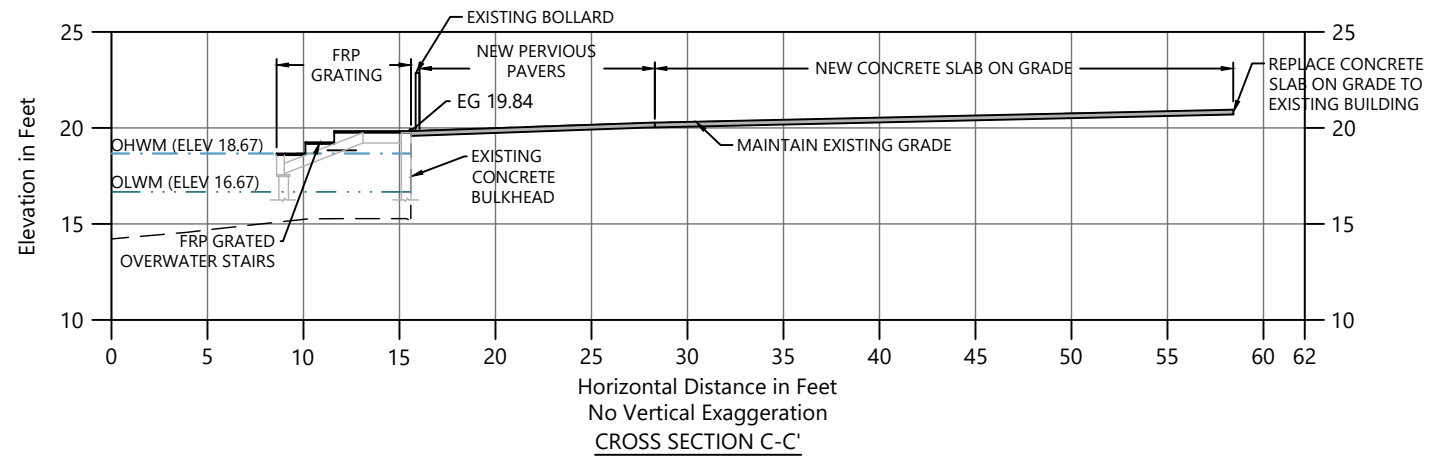
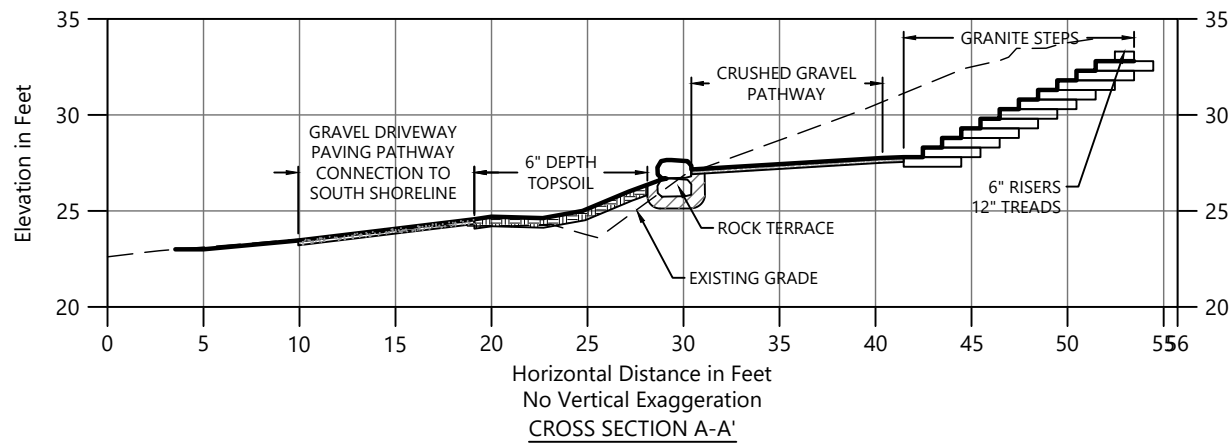
- EXISTING CONTOUR
- EXISTING TREE TO RETAIN
- EXISTING UPLAND EDGE OF SHORELINE HABITAT GRAVEL
- EXISTING ORDINARY HIGH WATER LINE
- EXISTING BOULDER TO RETAIN
- PROPOSED CONTOUR
- PERVIOUS PAVERS
- CONCRETE SLAB ON GRADE WITH SAWCUT JOINT SCORING
- CRUSHED GRAVEL PATHWAY
- GRAVEL DRIVEWAY PAVING
- EXISTING BOLLARD AND CHAIN TO REMAIN
- HABITAT GRAVEL
- GRAVEL OVER COBBLE
- ROCK TERRACE
- ROCK REVETMENT
- FRP GRATING
- HANDRAIL
- PICNIC TABLE
- BENCH
- SALVAGED LOG
- SALVAGED BOULDER
- PROPOSED TREE
- PROPOSED SHRUBS/GROUNDCOVERS
- RIPARIAN SHRUBS
- NATIVE UPLAND PLANTING/GROUNDCOVER
- STORMWATER CONVEYANCE PLANTING

**SOURCE:** SURVEY AND PIER PLAN CAD FILE PROVIDED BY KPFF.

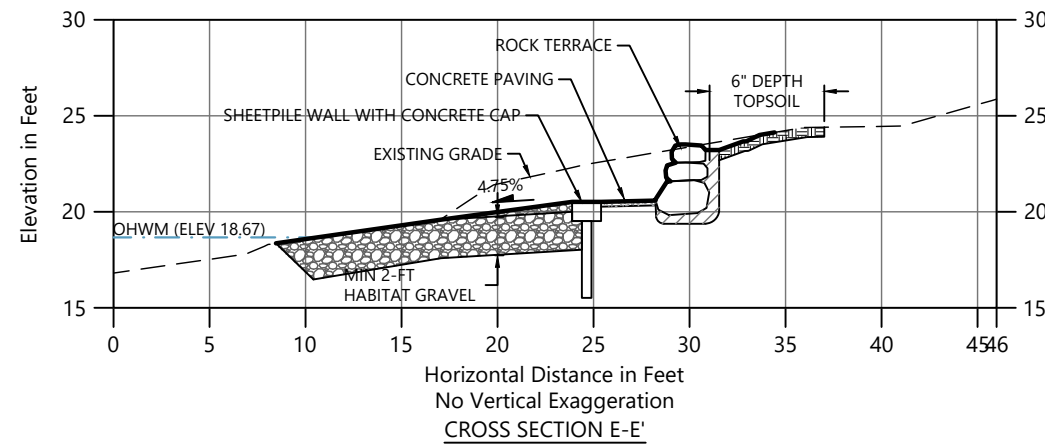
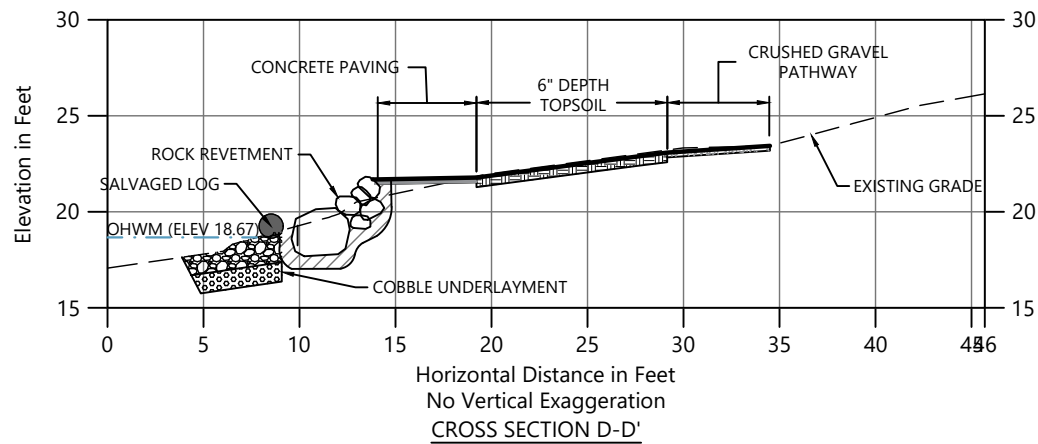
<b>UPLAND AND SHORELINE PROJECT PLAN</b>	
<p><b>REFERENCE #:</b></p> <p><b>APPLICANT:</b> CITY OF MERCER ISLAND</p> <p><b>LOCATION:</b> 2040 84TH AVENUE SE, MERCER ISLAND, WA 98040</p> <p><b>ADJACENT PROPERTY OWNERS:</b> 1 - CITY OF MERCER ISLAND, PARCELS 0724059054, 0124049018, 0124049002</p>	<p><b>NAME:</b> LUTHER BURBANK WATERFRONT IMPROVEMENTS PROJECT</p> <p><b>PROPOSED:</b> REPAIR AND REPLACE DOCK STRUCTURES</p> <p><b>PURPOSE:</b> IMPROVE PUBLIC ACCESS AND RECREATIONAL USES</p> <p><b>HORIZONTAL DATUM:</b> WASHINGTON STATE PLANE, NORTH ZONE, NAD83</p> <p><b>VERTICAL DATUM:</b> NAVD88</p>
<p><b>LATITUDE:</b> 47.591034 N</p> <p><b>LONGITUDE:</b> -122.224481 W</p> <p><b>S-T-R:</b> 6-25N-5E</p>	<p><b>IN:</b> LAKE WASHINGTON</p> <p><b>NEAR/AT:</b> MERCER ISLAND</p> <p><b>COUNTY:</b> KING</p> <p><b>STATE:</b> WASHINGTON</p>
<p><b>DATE:</b> OCTOBER 2022</p>	<p><b>FIGURE:</b> 5 of 14</p>



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- LEGEND:**
- - - EXISTING GRADE
  - PROPOSED GRADE
  - HABITAT GRAVEL
  - ROCK TERRACE
  - TOPSOIL
  - CRUSHED GRAVEL PATHWAY
  - QUARRY SPALL



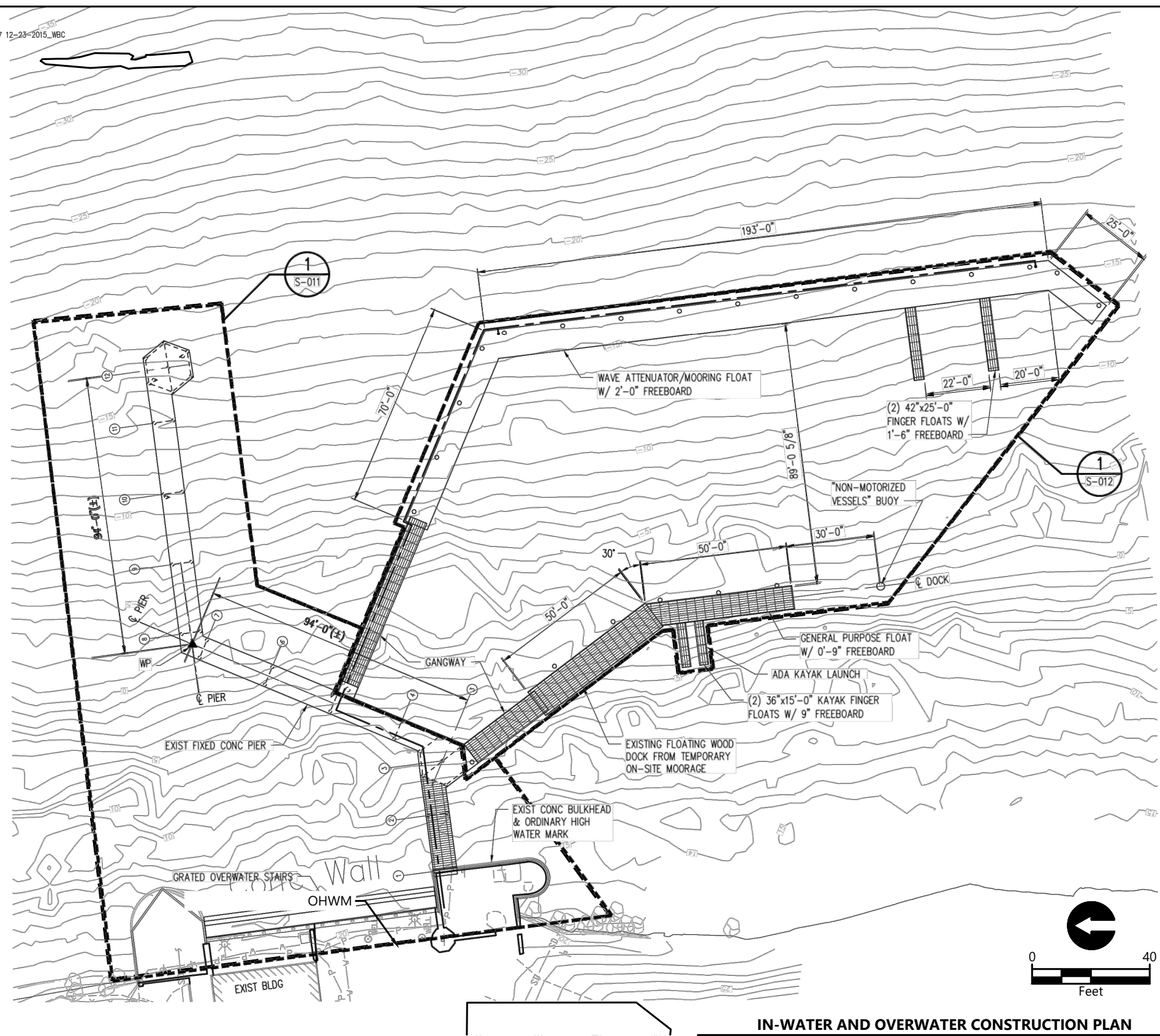
**UPLAND AND SHORELINE CROSS SECTIONS**

<p><b>REFERENCE #:</b></p> <p><b>APPLICANT:</b> CITY OF MERCER ISLAND</p> <p><b>LOCATION:</b> 2040 84TH AVENUE SE, MERCER ISLAND, WA 98040</p> <p><b>ADJACENT PROPERTY OWNERS:</b> 1 - CITY OF MERCER ISLAND, PARCELS 0724059054, 0124049018, 0124049002</p>	<p><b>NAME:</b> LUTHER BURBANK WATERFRONT IMPROVEMENTS PROJECT</p> <p><b>PROPOSED:</b> REPAIR AND REPLACE DOCK STRUCTURES</p> <p><b>PURPOSE:</b> IMPROVE PUBLIC ACCESS AND RECREATIONAL USES</p> <p><b>HORIZONTAL DATUM:</b> WASHINGTON STATE PLANE, NORTH ZONE, NAD83</p> <p><b>VERTICAL DATUM:</b> NAVD88</p>	<p><b>LATITUDE:</b> 47.591034 N</p> <p><b>LONGITUDE:</b> -122.224481 W</p> <p><b>S-T-R:</b> 6-25N-5E</p> <p><b>IN:</b> LAKE WASHINGTON</p> <p><b>NEAR/AT:</b> MERCER ISLAND</p> <p><b>COUNTY:</b> KING</p> <p><b>STATE:</b> WASHINGTON</p> <p><b>DATE:</b> OCTOBER 2022</p>
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SOURCE: SURVEY PROVIDED BY KPFF

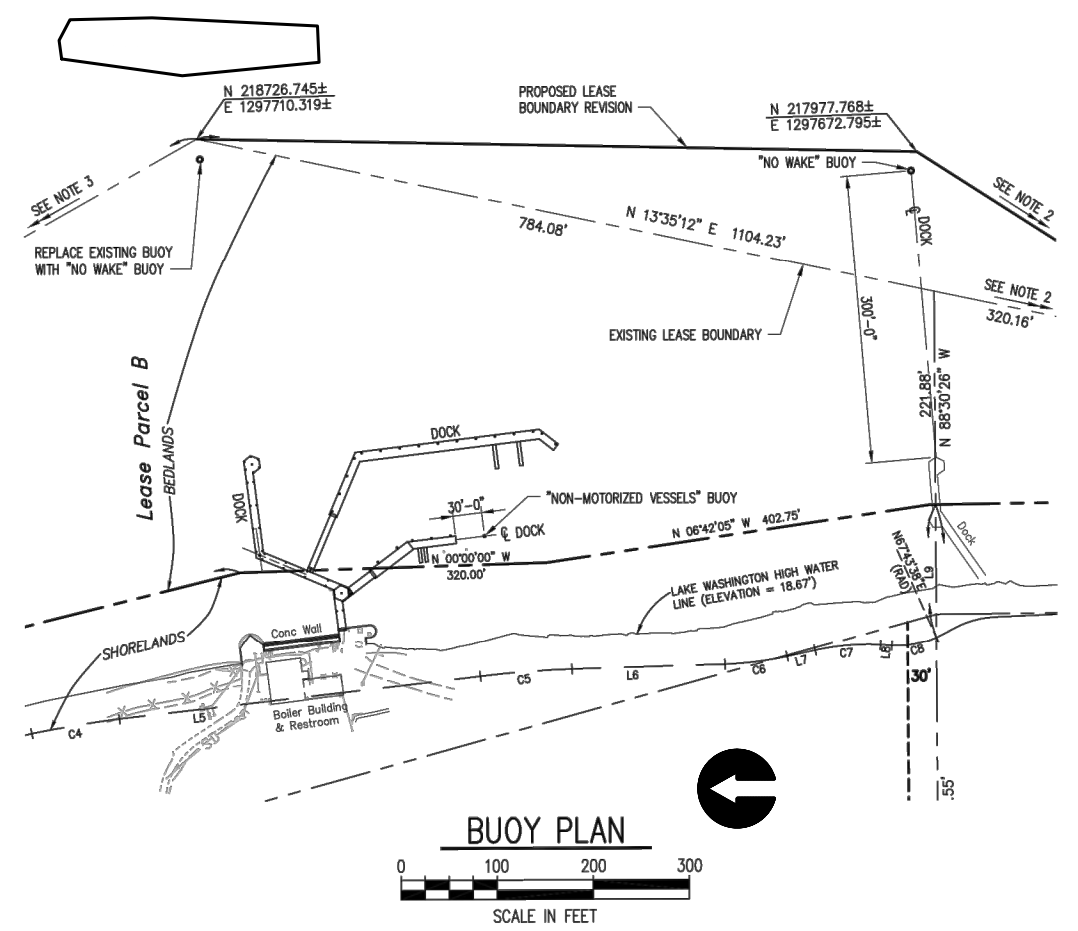






**NOTES:**

1. PROPOSED IMPROVEMENTS OVERWATER COVERAGE: ±4425 SF.
2. EXTENDS TO EXISTING BOUNDARY CORNER AT N 217653.411, E 1297450.919.
3. EXTENDS TO EXISTING BOUNDARY CORNER AT N 220320.192, E 1296873.931.



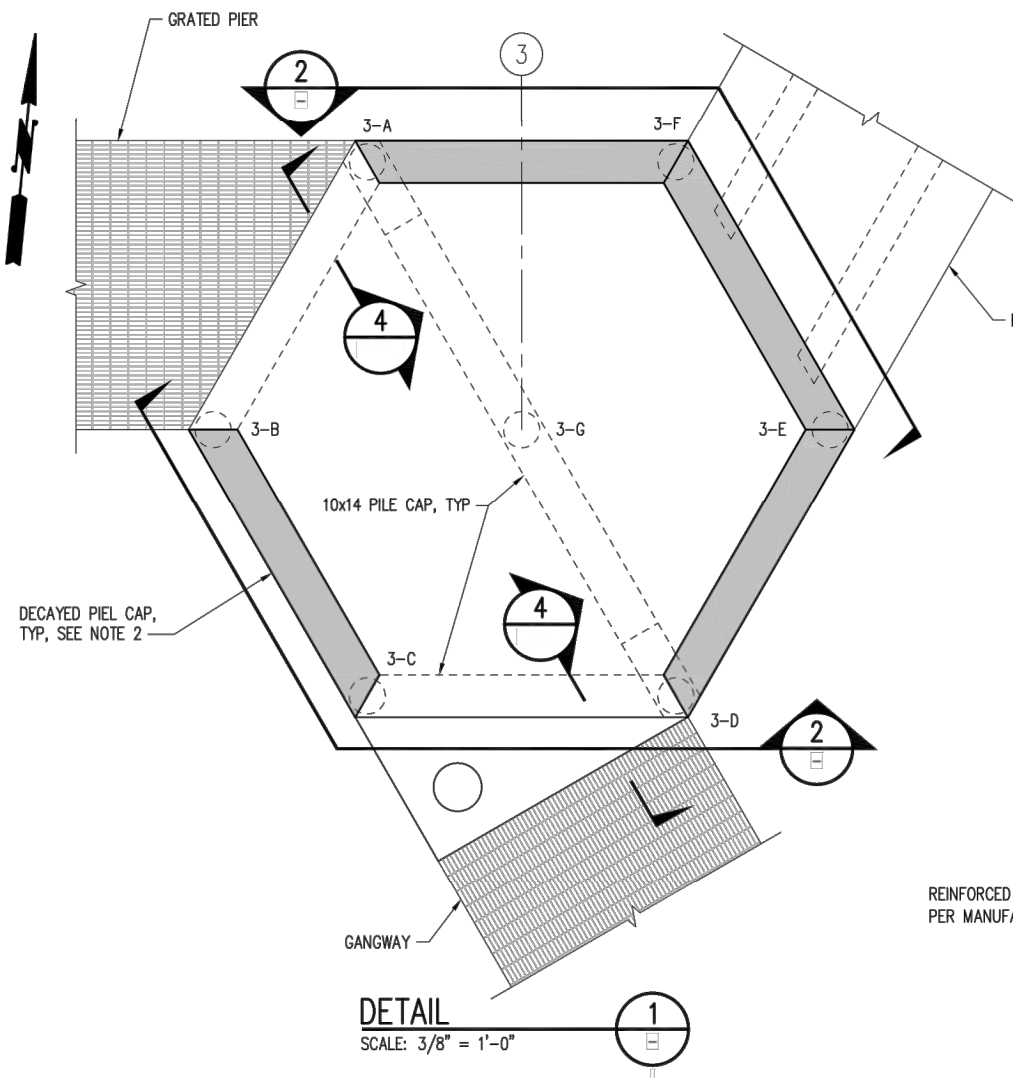
**IN-WATER AND OVERWATER CONSTRUCTION PLAN**

<p><b>REFERENCE #:</b></p> <p><b>APPLICANT:</b> CITY OF MERCER ISLAND</p> <p><b>LOCATION:</b> 2040 84TH AVENUE SE, MERCER ISLAND, WA 98040</p> <p><b>ADJACENT PROPERTY OWNERS:</b> 1 - CITY OF MERCER ISLAND, PARCELS 0724059054, 0124049018, 0124049002</p>	<p><b>NAME:</b> LUTHER BURBANK WATERFRONT IMPROVEMENTS PROJECT</p> <p><b>PROPOSED:</b> REPAIR AND REPLACE DOCK STRUCTURES</p> <p><b>PURPOSE:</b> IMPROVE PUBLIC ACCESS AND RECREATIONAL USES</p> <p><b>HORIZONTAL DATUM:</b> WASHINGTON STATE PLANE, NORTH ZONE, NAD83</p> <p><b>VERTICAL DATUM:</b> NAVD88</p>	<p><b>LATITUDE:</b> 47.591034 N <b>LONGITUDE:</b> -122.224481 W <b>S-T-R:</b> 6-25N-5E</p> <p><b>IN:</b> LAKE WASHINGTON <b>NEAR/AT:</b> MERCER ISLAND <b>COUNTY:</b> KING <b>STATE:</b> WASHINGTON</p> <p><b>DATE:</b> OCTOBER 2022</p>
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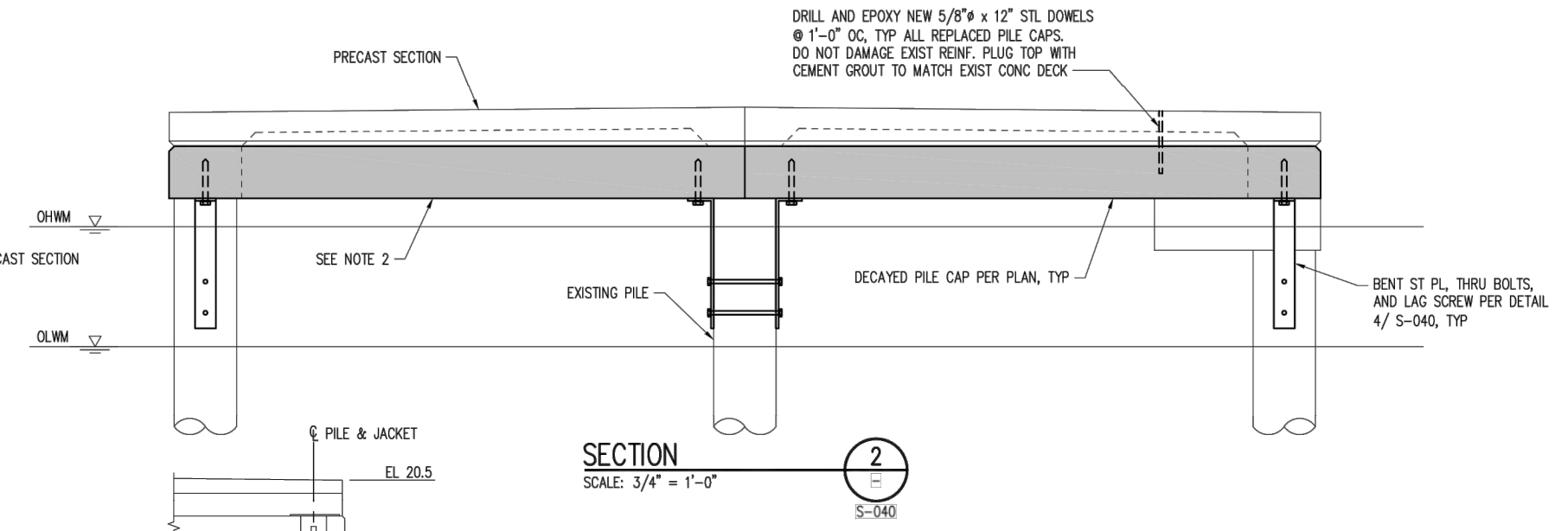
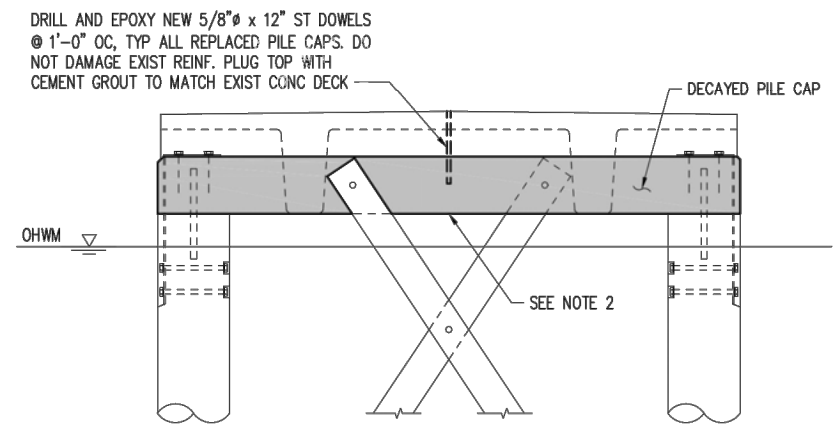
SOURCE: IN-WATER AND OVERWATER CONSTRUCTION PLAN PROVIDED BY KPFF.



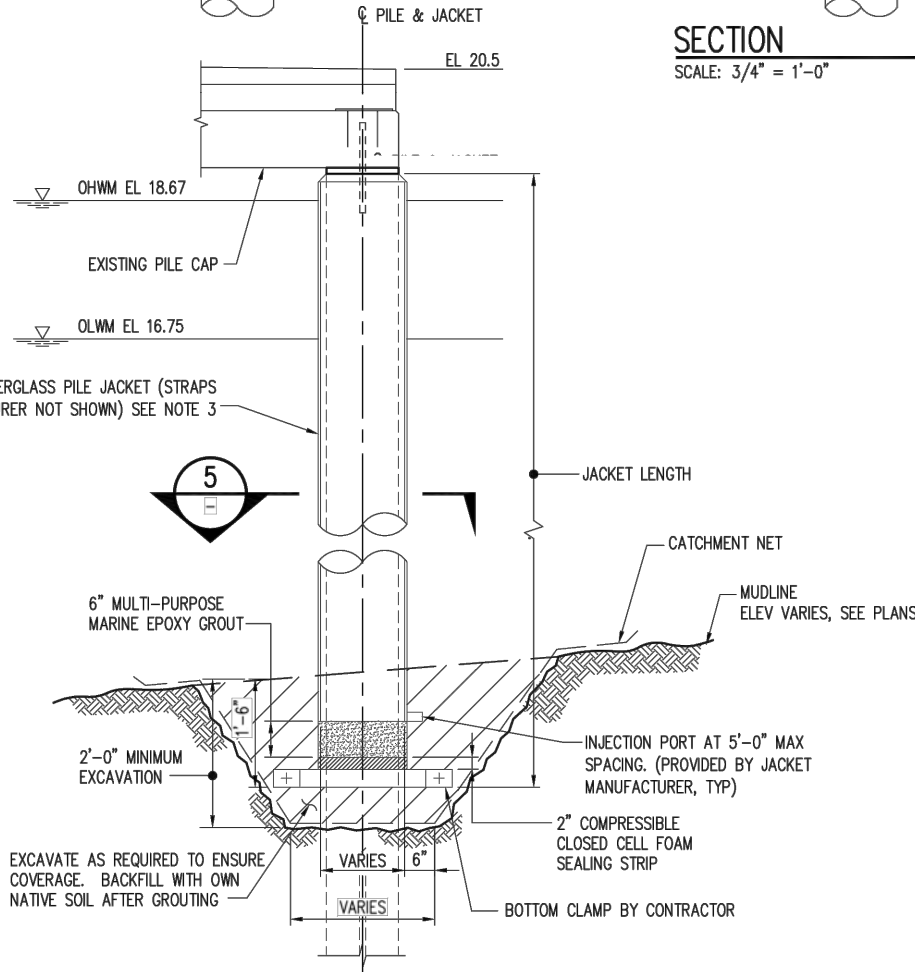
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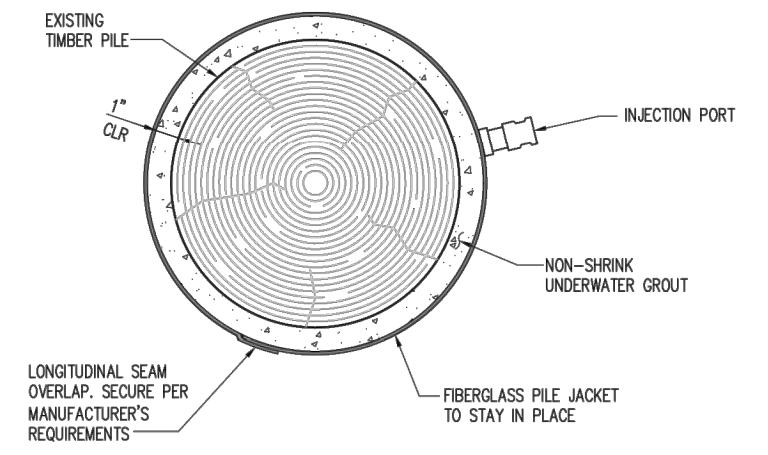
**DETAIL 1**  
SCALE: 3/8" = 1'-0"



**SECTION 2**  
SCALE: 3/4" = 1'-0"  
S-040



**SECTION 4**  
SCALE: 3/4" = 1'-0"



**SECTION 5**  
SCALE: 3" = 1'-0"

- NOTES:**
- SEE DRAWINGS S-030 THRU S-032 FOR EXISTING CONDITIONS.
  - EXTRACT DECAYED PILE CAPS FULL LENGTH WITHOUT DAMAGING EXISTING CONC DECK AND TIMBER PILES, AND REPLACE WITH TREATED 10x14 TIMBERS. REPLACE CONNECTING HARDWARE SHOWN IN EXISTING CONDITIONS UNO.
  - PLACE JACKETS AROUND ALL (38) PILES, INCLUDING PILES REPAIRED PER DETAIL 6/S-040.

**NORTH DOCK PIER REPAIR AND FIBERGLASS ENCAPSULATION DETAILS**

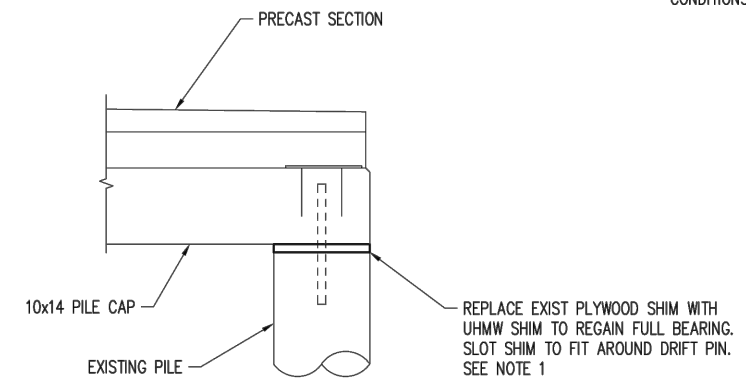
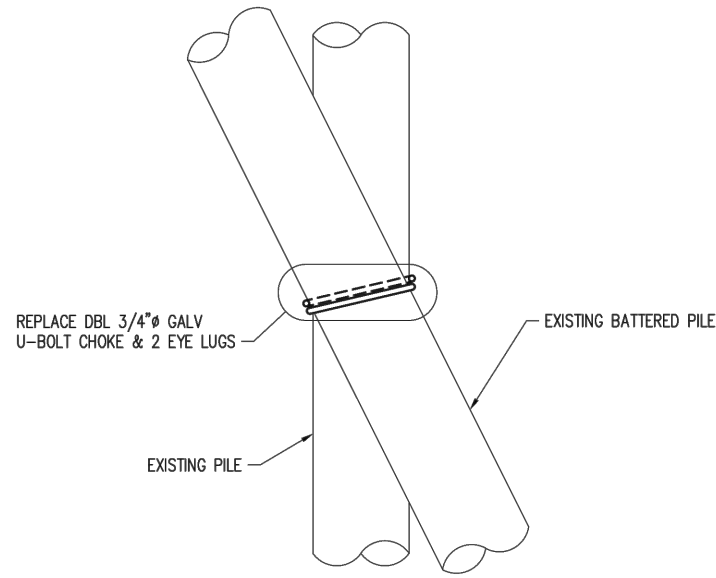
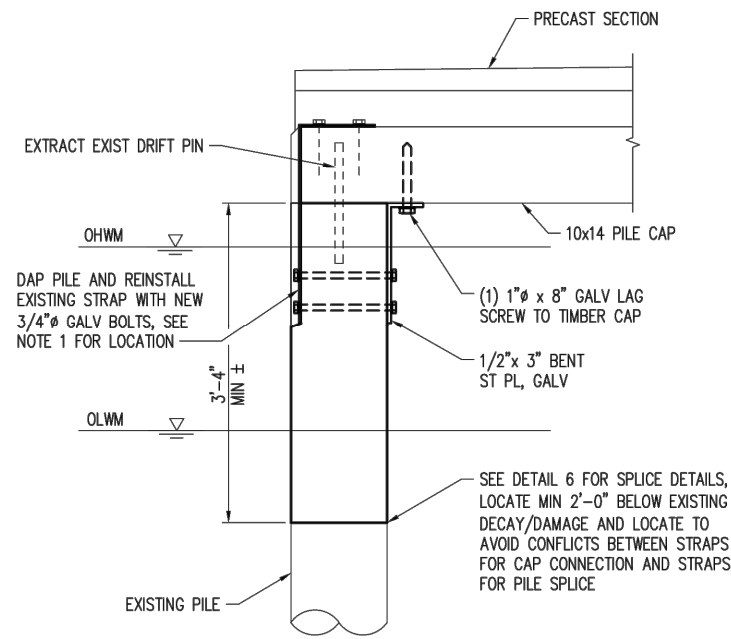
<p><b>REFERENCE #:</b></p> <p><b>APPLICANT:</b> CITY OF MERCER ISLAND</p> <p><b>LOCATION:</b> 2040 84TH AVENUE SE, MERCER ISLAND, WA 98040</p> <p><b>ADJACENT PROPERTY OWNERS:</b> 1 - CITY OF MERCER ISLAND, PARCELS 0724059054, 0124049018, 0124049002</p>	<p><b>NAME:</b> LUTHER BURBANK WATERFRONT IMPROVEMENTS PROJECT</p> <p><b>PROPOSED:</b> REPAIR AND REPLACE DOCK STRUCTURES</p> <p><b>PURPOSE:</b> IMPROVE PUBLIC ACCESS AND RECREATIONAL USES</p> <p><b>HORIZONTAL DATUM:</b> WASHINGTON STATE PLANE, NORTH ZONE, NAD83</p> <p><b>VERTICAL DATUM:</b> NAVD88</p>	<p><b>LATITUDE:</b> 47.591034 N <b>LONGITUDE:</b> -122.224481 W <b>S-T-R:</b> 6-25N-5E</p> <p><b>IN:</b> LAKE WASHINGTON <b>NEAR/AT:</b> MERCER ISLAND <b>COUNTY:</b> KING <b>STATE:</b> WASHINGTON</p> <p><b>DATE:</b> OCTOBER 2022</p>
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SOURCE: NORTH DOCK PIER REPAIR AND FIBERGLASS ENCAPSULATION DETAILS PROVIDED BY KPFF.

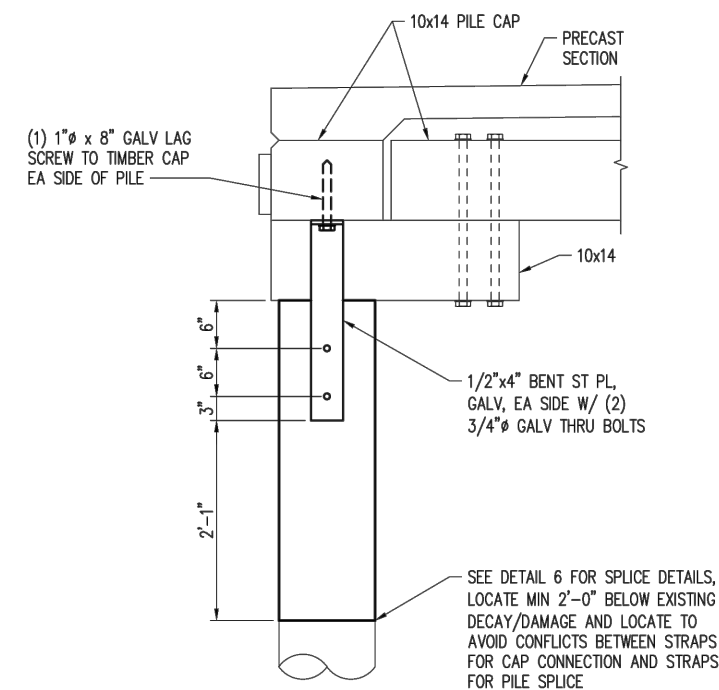


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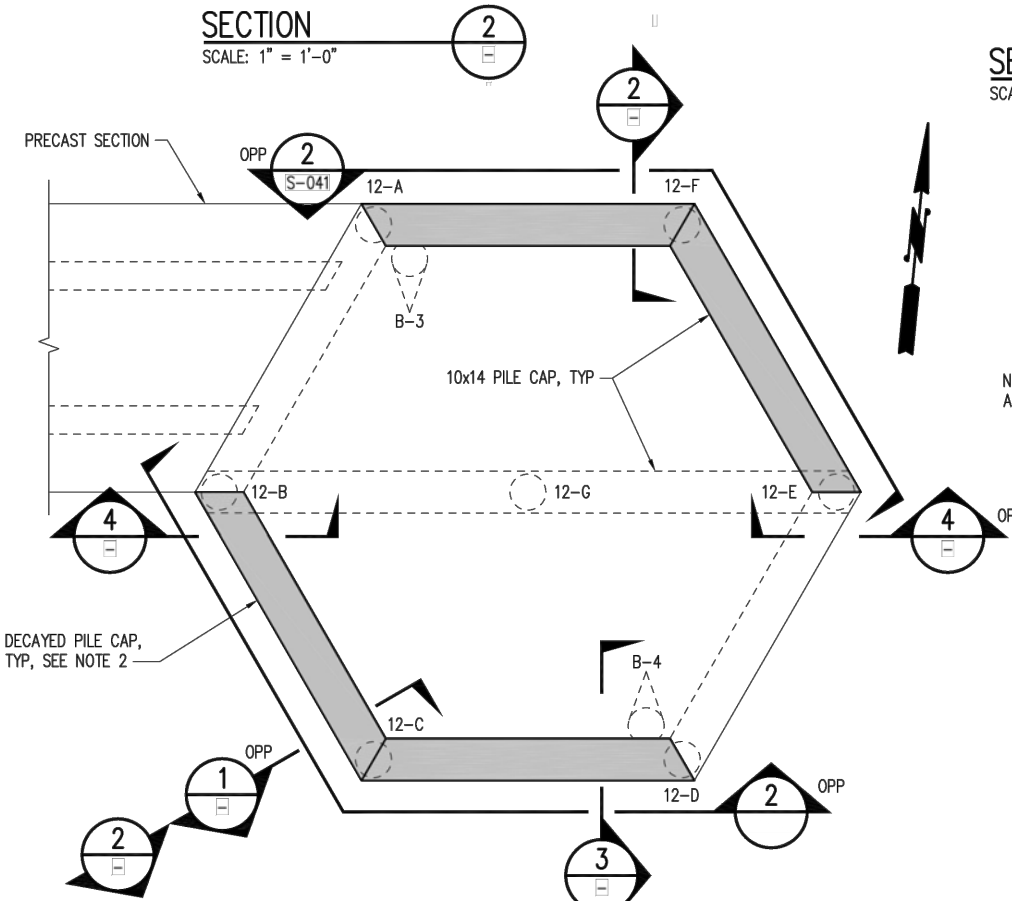
**NOTES:**

- SEE DRAWINGS S-030 THRU S-032 FOR EXISTING CONDITIONS.
- EXTRACT DECAYED PILE CAPS FULL LENGTH WITHOUT DAMAGING EXISTING CONC DECK AND TIMBER PILES, AND REPLACE WITH TREATED 10x14 TIMBERS. REPLACE CONNECTING HARDWARE SHOWN IN EXISTING CONDITIONS UNO.



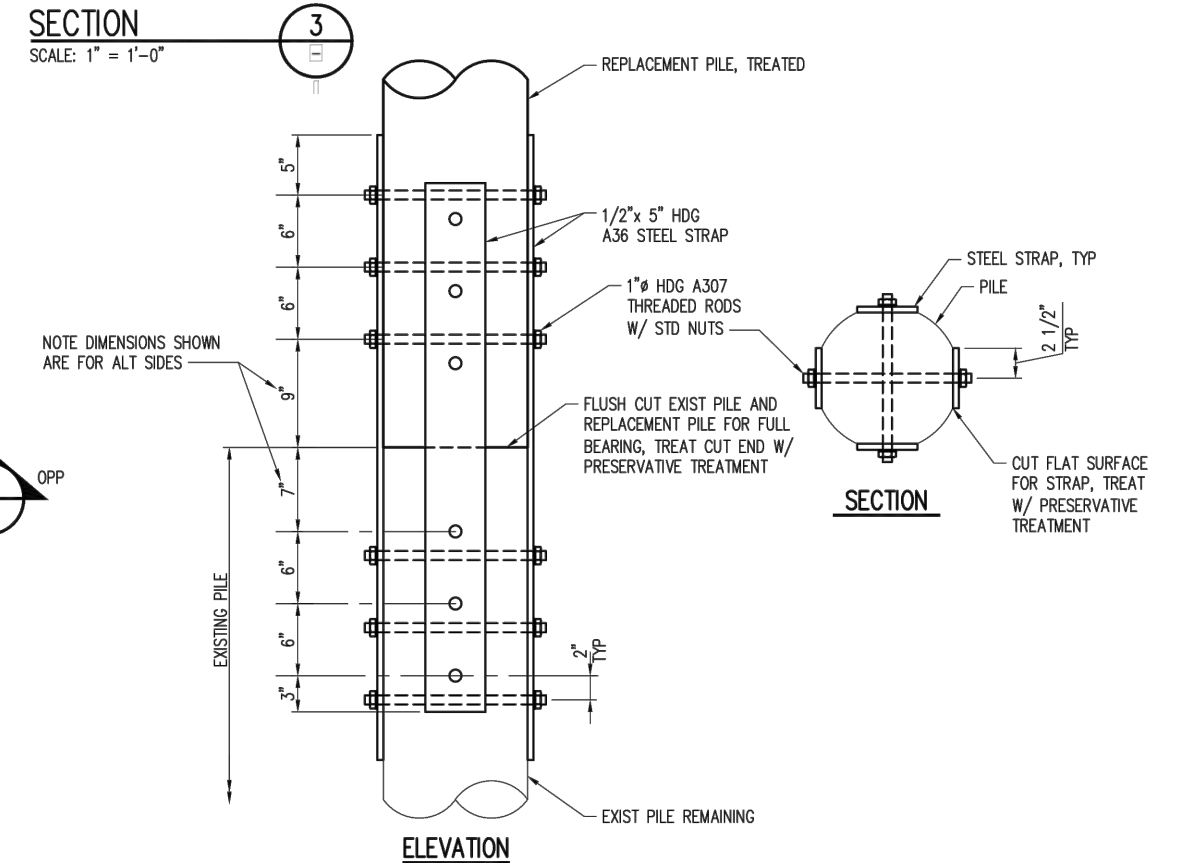
**SECTION**

SCALE: 1" = 1'-0"



**SECTION**

SCALE: 1" = 1'-0"



**NORTH DOCK PILE REPAIR DETAILS**

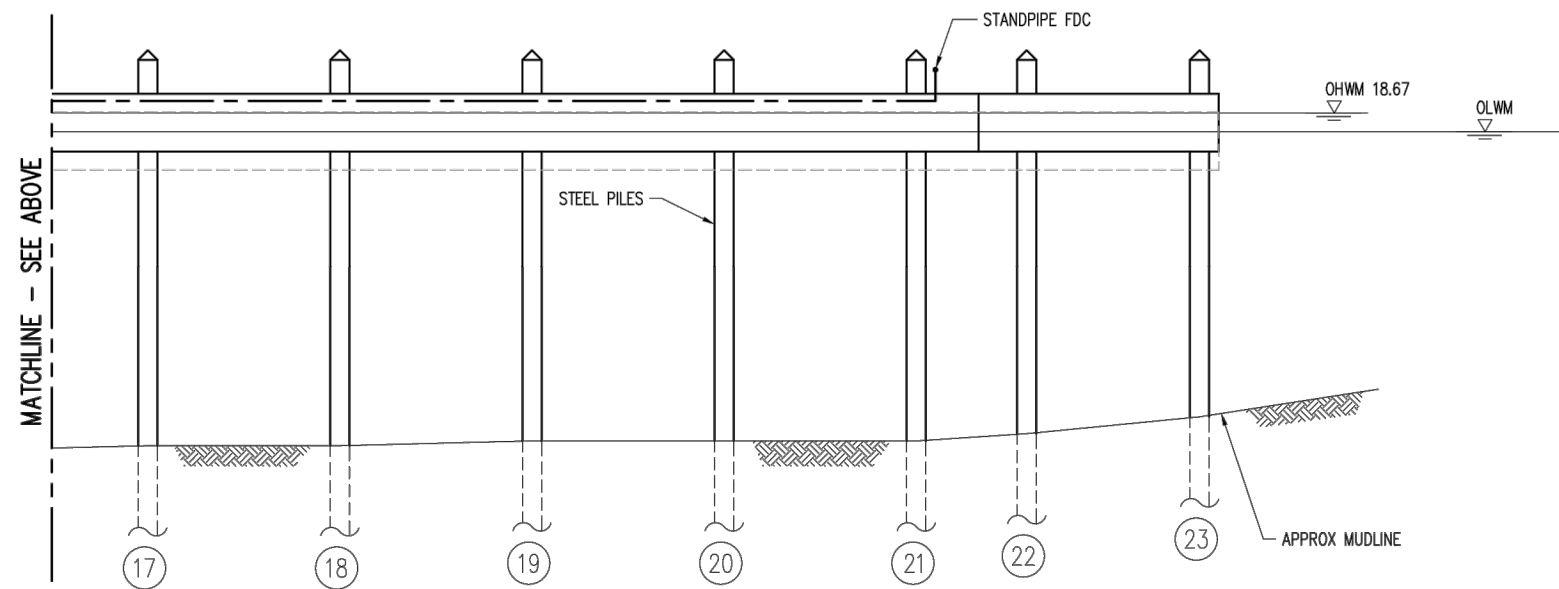
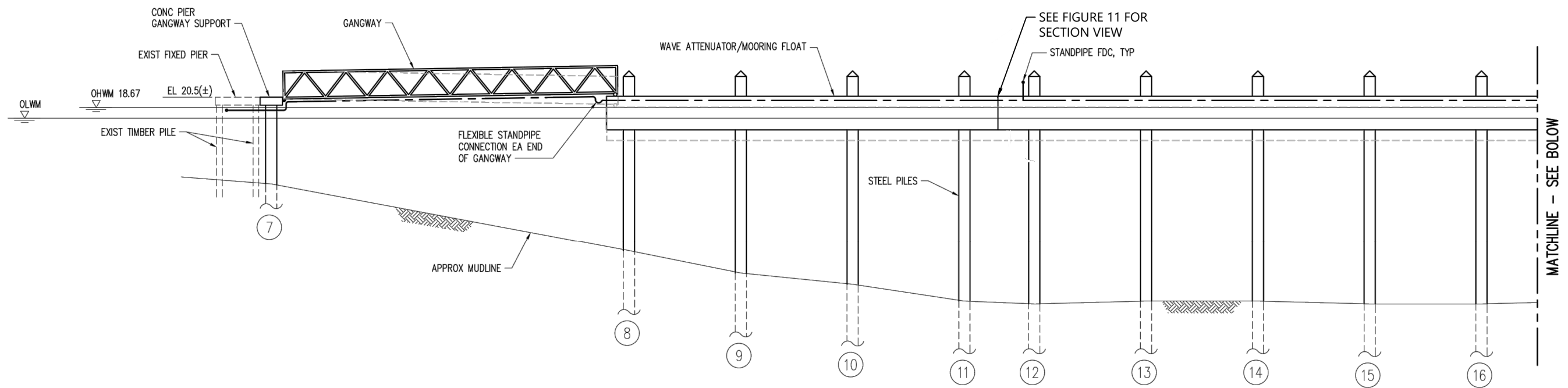
<p><b>REFERENCE #:</b></p> <p><b>APPLICANT:</b> CITY OF MERCER ISLAND</p> <p><b>LOCATION:</b> 2040 84TH AVENUE SE, MERCER ISLAND, WA 98040</p> <p><b>ADJACENT PROPERTY OWNERS:</b> 1 - CITY OF MERCER ISLAND, PARCELS 0724059054, 0124049018, 0124049002</p>	<p><b>NAME:</b> LUTHER BURBANK WATERFRONT IMPROVEMENTS PROJECT</p> <p><b>PROPOSED:</b> REPAIR AND REPLACE DOCK STRUCTURES</p> <p><b>PURPOSE:</b> IMPROVE PUBLIC ACCESS AND RECREATIONAL USES</p> <p><b>HORIZONTAL DATUM:</b> WASHINGTON STATE PLANE, NORTH ZONE, NAD83</p> <p><b>VERTICAL DATUM:</b> NAVD88</p>	<p><b>LATITUDE:</b> 47.591034 N <b>LONGITUDE:</b> -122.224481 W <b>S-T-R:</b> 6-25N-5E</p> <p><b>IN:</b> LAKE WASHINGTON <b>NEAR/AT:</b> MERCER ISLAND <b>COUNTY:</b> KING <b>STATE:</b> WASHINGTON</p> <p><b>DATE:</b> OCTOBER 2022</p>
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SOURCE: NORTH DOCK PILE REPAIR DETAILS PROVIDED BY KPFF.





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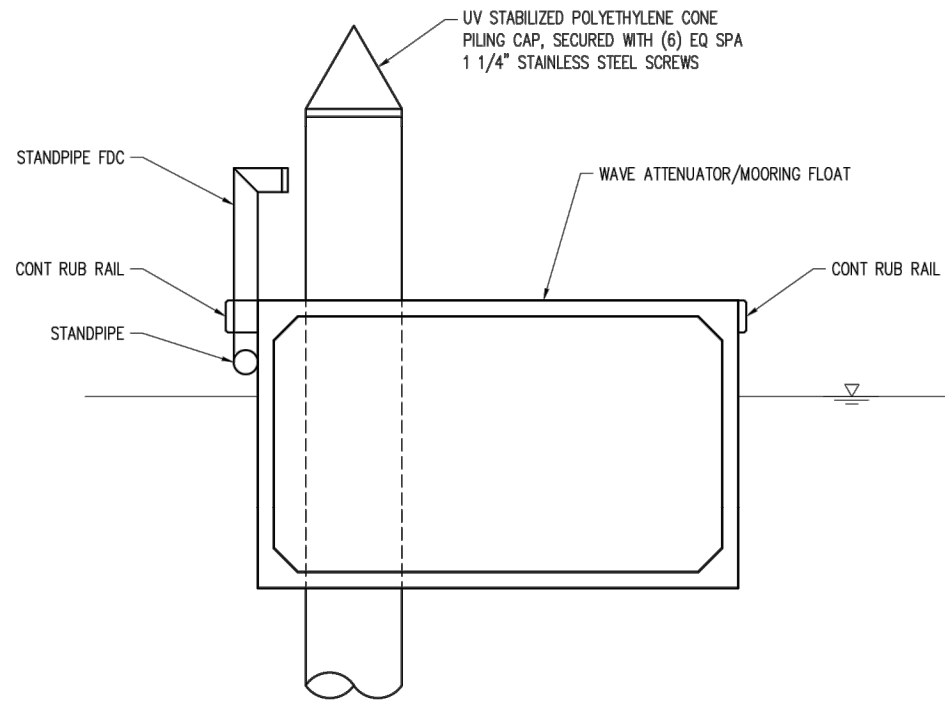
**CENTRAL DOCK RECONFIGURATION - ELEVATION VIEW**

<p><b>REFERENCE #:</b></p> <p><b>APPLICANT:</b> CITY OF MERCER ISLAND</p> <p><b>LOCATION:</b> 2040 84TH AVENUE SE, MERCER ISLAND, WA 98040</p> <p><b>ADJACENT PROPERTY OWNERS:</b> 1 - CITY OF MERCER ISLAND, PARCELS 0724059054, 0124049018, 0124049002</p>	<p><b>NAME:</b> LUTHER BURBANK WATERFRONT IMPROVEMENTS PROJECT</p> <p><b>PROPOSED:</b> REPAIR AND REPLACE DOCK STRUCTURES</p> <p><b>PURPOSE:</b> IMPROVE PUBLIC ACCESS AND RECREATIONAL USES</p> <p><b>HORIZONTAL DATUM:</b> WASHINGTON STATE PLANE, NORTH ZONE, NAD83</p> <p><b>VERTICAL DATUM:</b> NAVD88</p>	<p><b>LATITUDE:</b> 47.591034 N <b>LONGITUDE:</b> -122.224481 W <b>S-T-R:</b> 6-25N-5E</p> <p><b>IN:</b> LAKE WASHINGTON <b>NEAR/AT:</b> MERCER ISLAND <b>COUNTY:</b> KING <b>STATE:</b> WASHINGTON</p> <p><b>DATE:</b> OCTOBER 2022</p>
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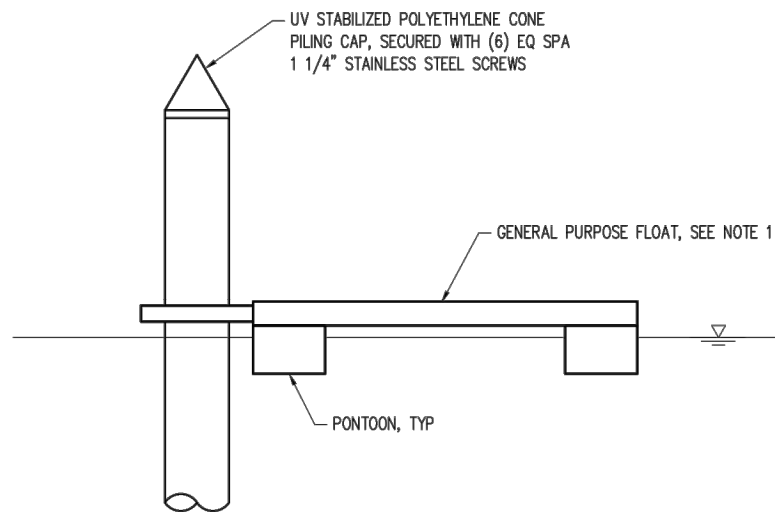


SOURCE: CENTRAL DOCK RECONFIGURATION - ELEVATION VIEW PROVIDED BY KPFF.

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**SECTION 1**  
SCALE: 1/2" = 1'-0"



**SECTION 1**  
SCALE: 1/2" = 1'-0"

NOTE: 40% MINIMUM LIGHT TRANSMISSION IS REQUIRED

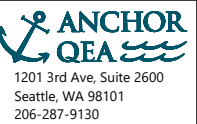
PILE SCHEDULE *						
Pile ID	Nominal Dia (in)	Wall t (in)	Cutoff Elev (ft)	Approx Mudline Elev (ft)	Embed (ft)	Tip Elev (ft)
1	16	0.625	20.00	9.00	20.00	-11.00
2	16	0.625	22.00	2.75	20.00	-17.25
3	16	0.625	22.00	-0.25	20.00	-20.25
4	16	0.625	22.00	-1.75	20.00	-21.75
5	16	0.625	22.00	-1.50	20.00	-21.50
6	16	0.625	22.00	-1.00	20.00	-21.00
7	16	0.625	20.00	5.50	20.00	-14.50
8	24	0.625	25.00	-7.50	28.00	-35.50
9	24	0.625	25.00	-10.75	28.00	-38.75
10	24	0.625	25.00	-13.00	28.00	-41.00
11	24	0.625	25.00	-16.00	28.00	-44.00
12	24	0.625	25.00	-16.50	28.00	-44.50
13	24	0.625	25.00	-16.25	28.00	-44.25
14	24	0.625	25.00	-16.25	28.00	-44.25
15	24	0.625	25.00	-16.25	28.00	-44.25
16	24	0.625	25.00	-16.25	28.00	-44.25
17	24	0.625	25.00	-16.00	28.00	-44.00
18	24	0.625	25.00	-15.75	28.00	-43.75
19	24	0.625	25.00	-15.50	28.00	-43.50
20	24	0.625	25.00	-15.50	28.00	-43.50
21	24	0.625	25.00	-15.50	28.00	-43.50
22	24	0.625	25.00	-14.75	28.00	-42.75
23	24	0.625	25.00	-12.75	28.00	-40.75

\*PILE SCHEDULE INCLUDES ALL PILES FOR THE PROJECT EXCEPT SIX 6-INCH-DIAMETER PIN PILES FOR NEW OVERWATER STAIR. SCHEDULE DOES NOT INCLUDE EXISTING PILES TO BE REPAIRED.

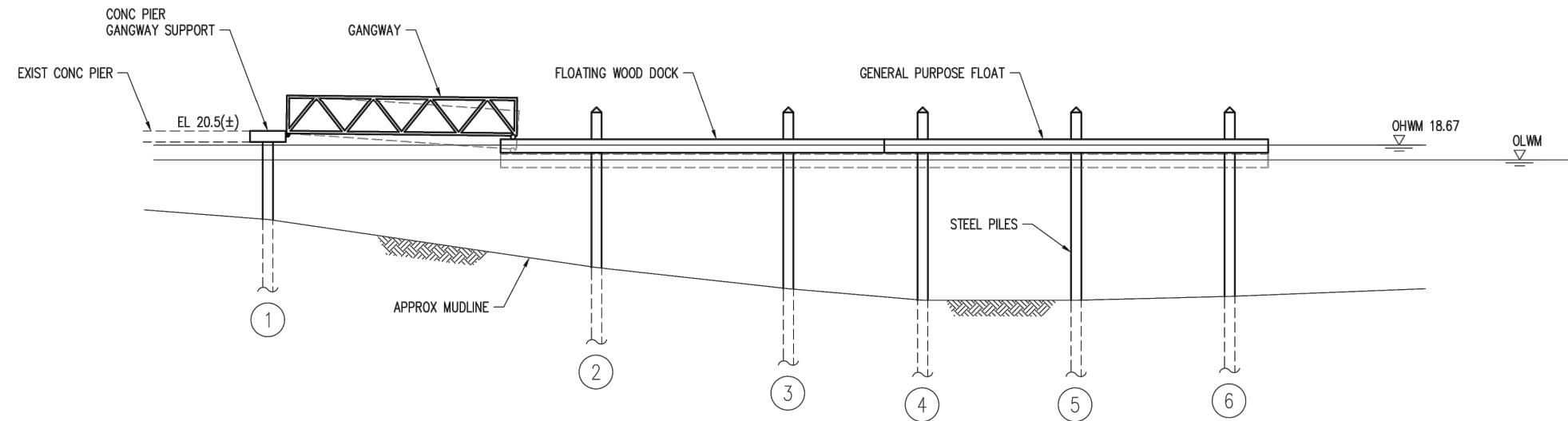
**CENTRAL DOCK RECONFIGURATION - SECTION VIEW AND PILE SCHEDULE**

<p><b>REFERENCE #:</b></p> <p><b>APPLICANT:</b> CITY OF MERCER ISLAND</p> <p><b>LOCATION:</b> 2040 84TH AVENUE SE, MERCER ISLAND, WA 98040</p> <p><b>ADJACENT PROPERTY OWNERS:</b> 1 - CITY OF MERCER ISLAND, PARCELS 0724059054, 0124049018, 0124049002</p>	<p><b>NAME:</b> LUTHER BURBANK WATERFRONT IMPROVEMENTS PROJECT</p> <p><b>PROPOSED:</b> REPAIR AND REPLACE DOCK STRUCTURES</p> <p><b>PURPOSE:</b> IMPROVE PUBLIC ACCESS AND RECREATIONAL USES</p> <p><b>HORIZONTAL DATUM:</b> WASHINGTON STATE PLANE, NORTH ZONE, NAD83</p> <p><b>VERTICAL DATUM:</b> NAVD88</p>	<p><b>LATITUDE:</b> 47.591034 N <b>LONGITUDE:</b> -122.224481 W <b>S-T-R:</b> 6-25N-5E</p> <p><b>IN:</b> LAKE WASHINGTON <b>NEAR/AT:</b> MERCER ISLAND <b>COUNTY:</b> KING <b>STATE:</b> WASHINGTON</p> <p><b>DATE:</b> OCTOBER 2022</p>
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SOURCE: CENTRAL DOCK RECONFIGURATION - SECTION VIEW AND PILE SCHEDULE PROVIDED BY KPFF.



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 Oct 19, 2022 1:51pm chewett



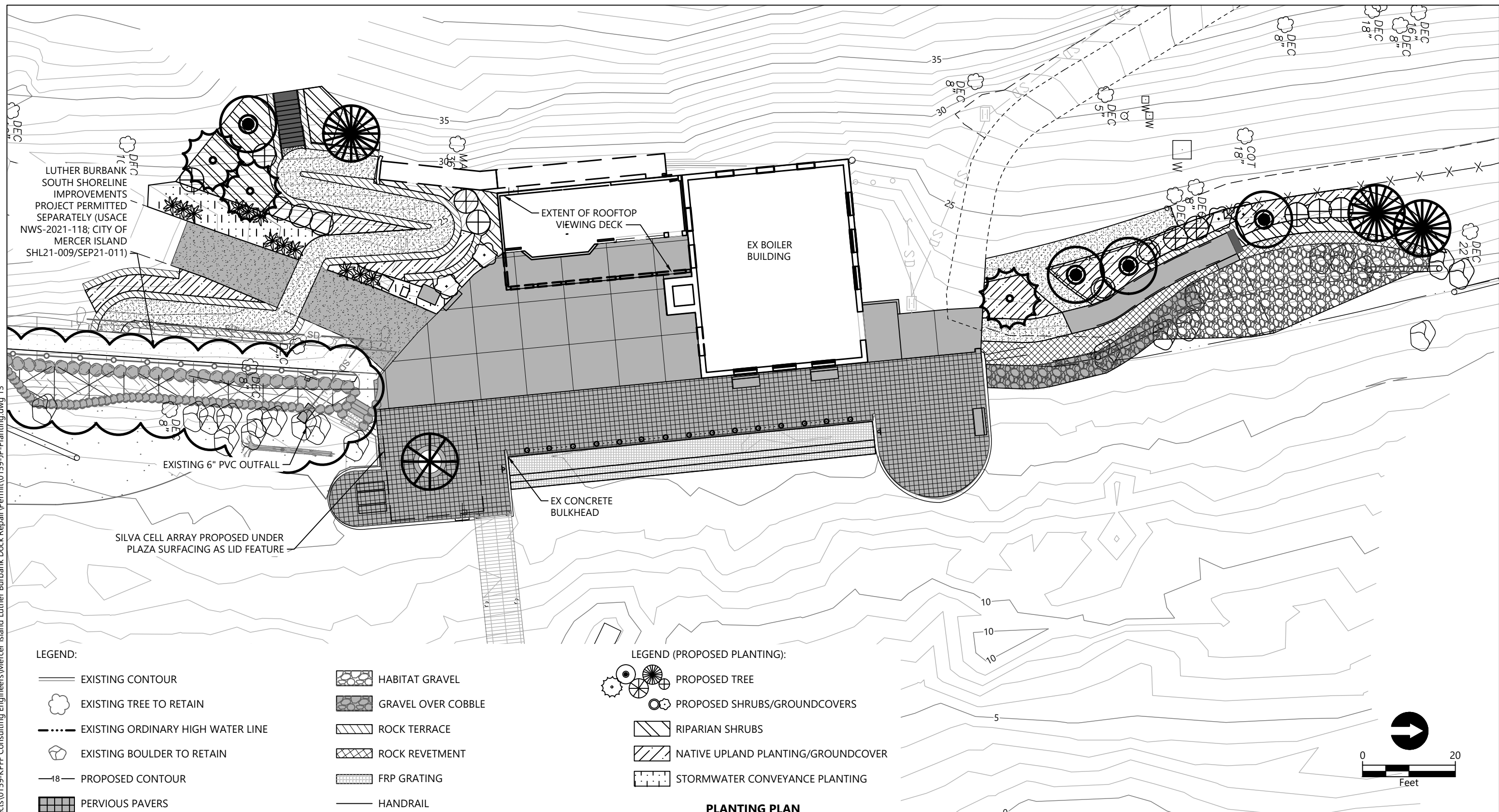
**SOUTH DOCK RECONFIGURATION - ELEVATION VIEW**

<p><b>REFERENCE #:</b></p> <p><b>APPLICANT:</b> CITY OF MERCER ISLAND</p> <p><b>LOCATION:</b> 2040 84TH AVENUE SE, MERCER ISLAND, WA 98040</p> <p><b>ADJACENT PROPERTY OWNERS:</b> 1 - CITY OF MERCER ISLAND, PARCELS 0724059054, 0124049018, 0124049002</p>	<p><b>NAME:</b> LUTHER BURBANK WATERFRONT IMPROVEMENTS PROJECT</p> <p><b>PROPOSED:</b> REPAIR AND REPLACE DOCK STRUCTURES</p> <p><b>PURPOSE:</b> IMPROVE PUBLIC ACCESS AND RECREATIONAL USES</p> <p><b>HORIZONTAL DATUM:</b> WASHINGTON STATE PLANE, NORTH ZONE, NAD83</p> <p><b>VERTICAL DATUM:</b> NAVD88</p>	<p><b>LATITUDE:</b> 47.591034 N  <b>LONGITUDE:</b> -122.224481 W  <b>S-T-R:</b> 6-25N-5E</p> <p><b>IN:</b> LAKE WASHINGTON  <b>NEAR/AT:</b> MERCER ISLAND  <b>COUNTY:</b> KING  <b>STATE:</b> WASHINGTON</p> <p><b>DATE:</b> OCTOBER 2022</p>
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SOURCE: SOUTH DOCK RECONFIGURATION - ELEVATION VIEW PROVIDED BY KPFF.

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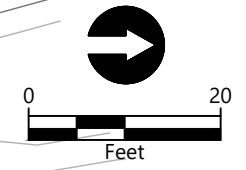


- LEGEND:**
- EXISTING CONTOUR
  - EXISTING TREE TO RETAIN
  - EXISTING ORDINARY HIGH WATER LINE
  - EXISTING BOULDER TO RETAIN
  - PROPOSED CONTOUR
  - PERVIOUS PAVERS
  - CONCRETE SLAB ON GRADE WITH SAWCUT JOINT SCORING
  - CRUSHED GRAVEL PATHWAY
  - GRAVEL DRIVEWAY PAVING
  - EXISTING BOLLARD AND CHAIN TO REMAIN
  - HABITAT GRAVEL
  - GRAVEL OVER COBBLE
  - ROCK TERRACE
  - ROCK REVETMENT
  - FRP GRATING
  - HANDRAIL
  - SPLIT RAIL FENCING
  - PICNIC TABLE
  - BENCH
  - SALVAGED LOG
  - SALVAGED BOULDER

- LEGEND (PROPOSED PLANTING):**
- PROPOSED TREE
  - PROPOSED SHRUBS/GROUNDCOVERS
  - RIPARIAN SHRUBS
  - NATIVE UPLAND PLANTING/GROUNDCOVER
  - STORMWATER CONVEYANCE PLANTING

**PLANTING PLAN**

<p><b>REFERENCE #:</b></p> <p><b>APPLICANT:</b> CITY OF MERCER ISLAND</p> <p><b>LOCATION:</b> 2040 84TH AVENUE SE, MERCER ISLAND, WA 98040</p> <p><b>ADJACENT PROPERTY OWNERS:</b> 1 - CITY OF MERCER ISLAND, PARCELS 0724059054, 0124049018, 0124049002</p>	<p><b>NAME:</b> LUTHER BURBANK WATERFRONT IMPROVEMENTS PROJECT</p> <p><b>PROPOSED:</b> REPAIR AND REPLACE DOCK STRUCTURES</p> <p><b>PURPOSE:</b> IMPROVE PUBLIC ACCESS AND RECREATIONAL USES</p> <p><b>HORIZONTAL DATUM:</b> WASHINGTON STATE PLANE, NORTH ZONE, NAD83</p> <p><b>VERTICAL DATUM:</b> NAVD88</p>	<p><b>LATITUDE:</b> 47.591034 N <b>LONGITUDE:</b> -122.224481 W <b>S-T-R:</b> 6-25N-5E</p> <p><b>IN:</b> LAKE WASHINGTON <b>NEAR/AT:</b> MERCER ISLAND <b>COUNTY:</b> KING <b>STATE:</b> WASHINGTON</p> <p><b>DATE:</b> OCTOBER 2022</p>
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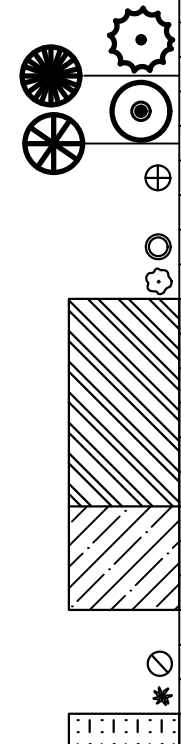


**SOURCE:** SURVEY AND PIER PLAN CAD FILE PROVIDED BY KPFF.






PLANT SCHEDULE			
COMMON NAME	SCIENTIFIC NAME	SIZE	SPACING
TREES			
GRAND FIR	ABIES GRANDIS	5-6' HT	AS SHOWN
WESTERN RED CEDAR	THUJA PLICATA	5-6' HT	AS SHOWN
BIG LEAF MAPLE	ACER MACROPHYLLUM	1.5" CAL	AS SHOWN
SWAMP OAK	QUERCUS PALUSTRIS	2" CAL	AS SHOWN
VINE MAPLE	ACER CIRCINATUM	5 GAL	AS SHOWN
HIGH SHRUBS			
INDIAN PLUM	OEMLERIA CERASIFORMIS	2 GAL	AS SHOWN
MOCK ORANGE	PHILADELPHUS LEWISII	2 GAL	AS SHOWN
SHRUBS - RIPARIAN			
SWORD FERN	POLYSTICHUM MUNITUM	1 GAL	3' O.C.
RED FLOWERING CURRANT	RIBES SANGUINEUM	1 GAL	3' O.C.
NOOTKA ROSE	ROSA NUTKANA	1 GAL	3' O.C.
THIMBLEBERRY	RUBUS PARVIFLORUS	1 GAL	3' O.C.
SNOWBERRY	SYMPHORICARPOS ALBUS	1 GAL	3' O.C.
GROUNDCOVERS			
SWORD FERN	POLYSTICHUM MUNITUM	1 GAL	3' O.C.
OREGON GRAPE	MAHONIA NERVOSA	1 GAL	3' O.C.
SHRUBS/GROUNDCOVERS - STORMWATER CONVEYANCE AREA			
RED OSIER DOGWOOD	CORNUS SERICEA	1 GAL	AS SHOWN
LADY FERN	ATHYRIUM FILIX-FEMINA	1 GAL	AS SHOWN
SEED MIX - STORMWATER CONVEYANCE AREA			



**PLANT SCHEDULE**

<p><b>REFERENCE #:</b></p> <p><b>APPLICANT:</b> CITY OF MERCER ISLAND</p> <p><b>LOCATION:</b> 2040 84TH AVENUE SE, MERCER ISLAND, WA 98040</p> <p><b>ADJACENT PROPERTY OWNERS:</b> 1 - CITY OF MERCER ISLAND, PARCELS 0724059054, 0124049018, 0124049002</p>	<p><b>NAME:</b> LUTHER BURBANK WATERFRONT IMPROVEMENTS PROJECT</p> <p><b>PROPOSED:</b> REPAIR AND REPLACE DOCK STRUCTURES</p> <p><b>PURPOSE:</b> IMPROVE PUBLIC ACCESS AND RECREATIONAL USES</p> <p><b>HORIZONTAL DATUM:</b> WASHINGTON STATE PLANE, NORTH ZONE, NAD83</p> <p><b>VERTICAL DATUM:</b> NAVD88</p>	<p><b>LATITUDE:</b> 47.591034 N</p> <p><b>LONGITUDE:</b> -122.224481 W</p> <p><b>S-T-R:</b> 6-25N-5E</p> <p><b>IN:</b> LAKE WASHINGTON</p> <p><b>NEAR/AT:</b> MERCER ISLAND</p> <p><b>COUNTY:</b> KING</p> <p><b>STATE:</b> WASHINGTON</p> <p><b>DATE:</b> OCTOBER 2022</p>	 <p>1201 3rd Ave, Suite 2600 Seattle, WA 98101 206-287-9130</p>
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