April 2023
Luther Burbank Park Waterfront Improvements

ANCHOR QEA

Project Description

Prepared for City of Mercer Island

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Prepared for
City of Mercer Island
Public Works Department
9611 SE 36th Street
Mercer Island, Washington 98040

Prepared by
Anchor QEA, LLC
1201 3rd Avenue, Suite 2600
Seattle, Washington 98101

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ABBREVIATIONS

ADA	Americans with Disabilities Act
BMP	best management practice
City	City of Mercer Island
FRP	fiberglass-reinforced plastic
lf	linear feet
LID	low-impact development
LWD	large woody debris
n/a	not applicable
Project	Luther Burbank Park Waterfront Improvements Project
sf	square feet
SWPPP	Stormwater Pollution Prevention Plan
TESC	Temporary Erosion and Sediment Control
UST	underground storage tank
WDFW	Washington Department of Fish and Wildlife

1 Introduction

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 1). 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 and universally 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 universally accessible route will connect to the adjacent future south shoreline trail that will be constructed as part of a separate project. The universally accessible 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 universally accessible 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.

Based on requirements provided by the Fire Department in an on-site meeting with KPFF Consulting Engineers in December 2022, the project will add a new ductile fire water line, fire hydrants, and a fire access apparatus access road (hammerhead). While installing that fire line, the project will excavate an existing gravel trail (1,235 square feet [sf]) and replace it with an in-kind gravel trail (1,235 sf). The project will also take advantage of some existing paved areas and expand it with permeable geogrid (2,384 sf) to create the hammerhead. Existing trees will be protected in place for the extent of the trenching, and the disturbed lawn and plant area will be renovated to match existing conditions.

The following sections provide more detail regarding the purpose and background of the Project, existing conditions, Project elements and construction methods, and best management practices (BMPs).

1.1 Purpose

Luther Burbank Park is a popular park used by the residents of Mercer Island and the greater Seattle-Bellevue metro area for many waterfront recreational activities. The dock structures in their current configuration (Figure 2) were constructed in 1974 to accommodate small boats in a different shoreline and recreational setting than exists today. The purpose of the Project is to modernize and optimize public access, recreational uses, and public safety, including reconfiguring the waterfront park to better accommodate small boats and nonmotorized watercraft and improve universal access to the docks, viewing deck, and beach, while avoiding and minimizing potential impacts to sensitive environments and resulting in no net loss of ecological function.

1.2 Location and Background

Luther Burbank Park is located on the shoreline of Lake Washington at 2040 84th Avenue SE, Mercer Island, Washington (Figure 1). The park is a 55-acre recreation area managed by the City. The park has a play area, trails, an off-leash dog area, picnic areas, tennis courts, a boat dock, a public fishing pier, a swimming beach, two smaller park buildings, a community pea-patch, and an outdoor amphitheater.

The Project area is located on the lake shoreline in the central area of the park. The Project area includes the Boiler Building, the Boiler Building restroom annex, the existing dock structure, the north beach area, and the waterfront plaza and bulkhead structure (Figure 2). The Project area is surrounded by the remainder of the park and park facilities. Adjacent properties outside the park include residential properties located to the west and southeast, and two roadways, North Mercer Way and Interstate 90, located southwest of the park. Lake Washington is located on the north and east sides of the park, and on the east side of the Project area.

King County constructed the dock facilities in 1974, with ownership subsequently transferred to the City. In 2006, the City issued a master plan showing the area as a small boating center with improved water access, including beach access and ADA-compliant access. In 2014, the City conducted an underwater structural assessment of the dock features and documented degraded conditions. The City initially considered renovating the existing structure, but at the advice of the Muckleshoot Tribe, developed a more holistic program to identify opportunities to redesign and improve the facilities and nearshore environment.

2 Existing Conditions

Existing structures in the Project area include the dock and Boiler Building (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.

The existing dock (Figure 2) is a fixed 5,500-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.

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 2022a) at concentrations below Model Toxics Control Act Method A cleanup levels. The City has developed an environmental construction contingency plan for soil management for Luther Burbank Park, with GeoEngineers as a geotechnical consultant. This identifies and provides direction on how to handle any contaminated soils encountered during construction. Any contaminated materials removed from the site will be properly disposed of at an approved upland landfill.

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.

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 (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 bordered by lombardy poplar 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. The potential occurrence of bald eagle, federally listed salmonids, and marbled murrelet is discussed in the Project Critical Areas Report and Biological Evaluation.

3 Project Elements and Construction Methods

The Project includes upland, shoreline, in-water, and overwater work along Lake Washington. Figure 3 provides an overview of the project components, and Figure 4 provides a demolition plan. Project details and construction methods are described in the following subsections.

3.1 Upland and Shoreline Improvements

The proposed upland and shoreline improvements include the following (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 1,770 sf of planting and irrigation
  - Installing 2,000 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 universally accessible pathway connection and mobi mats at the beach expansion to provide access to the ordinary high water mark
  - 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
  - Replacing an existing 252-lf gravel trail (1,235 sf) with an in-kind gravel trail (1,235 sf) at the new fire line installation
  - Installing a ductile iron fire water line and fire hydrants
  - Installing geogrid to expand an existing hardscape area to create an approved fire apparatus access turnaround for fire trucks
  - 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
- **Fire Department Required Updates:** adding a fire water line, fire hydrants, and a fire access apparatus access road and renovating an existing gravel trail

3.1.1 Boiler Building Repairs

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

3.1.2 Boiler Building Restroom Annex Renovation (Viewing Deck)

The Boiler Building restroom annex rooftop will be renovated to facilitate a new outdoor 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. Diagrams 1 and 2 provide conceptual sketches of the rooftop viewing deck overlaid on photographs of the existing structure.

Diagram 1
Conceptual Sketch of Viewing Deck (South End) and ADA-Accessible Ramp Location

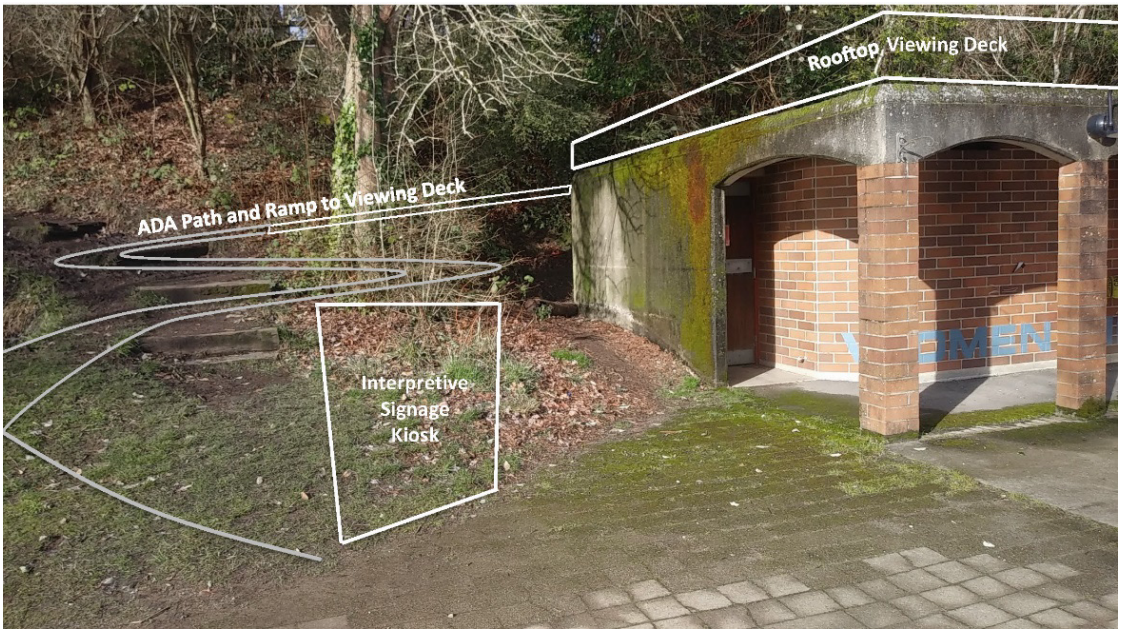


Diagram 2
Conceptual Sketch of Viewing Deck

3.1.3 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.

3.1.4 Waterfront Plaza Renovations and Access Upgrades

Table 1 describes each Project element and the impervious surface removed, replaced, or installed for each feature. Approximately 25% of the Project area is currently impervious surfaces (buildings, pavement, driveway, and docks). The Project will reduce overall impervious surface area by approximately 5%.

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 (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 (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. Diagrams 3 to 5 provide conceptual sketches of these improvements overlaid on photographs of existing conditions.

Table 1
Impervious Surfaces Summary

Project Element	Impervious Surface Removed (sf)	Impervious Surface Replaced (sf)	New Impervious Surface Installed (sf)
Waterfront Plaza			
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
Driveway and ADA Trail/Ramp			
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

Project Element	Impervious Surface Removed (sf)	Impervious Surface Replaced (sf)	New Impervious Surface Installed (sf)
Fire Department Updates			
Gravel trail renovation at fire line	1,235	1,235	n/a
Fire apparatus access hammerhead	n/a	n/a	86
North Beach Access			
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 sheet pile wall	n/a	n/a	11
Rock terrace at north beach	n/a	n/a	60
Concrete seatwall	n/a	n/a	11
Total	**6,440**	**3,830**	**2,413**

Diagram 3
Existing Plaza and East Side of Boiler Building with Approximate Locations of New Benches and Lighting (Looking North)

Diagram 4
Approximate Locations of New Paving at South End of Plaza (Looking North)

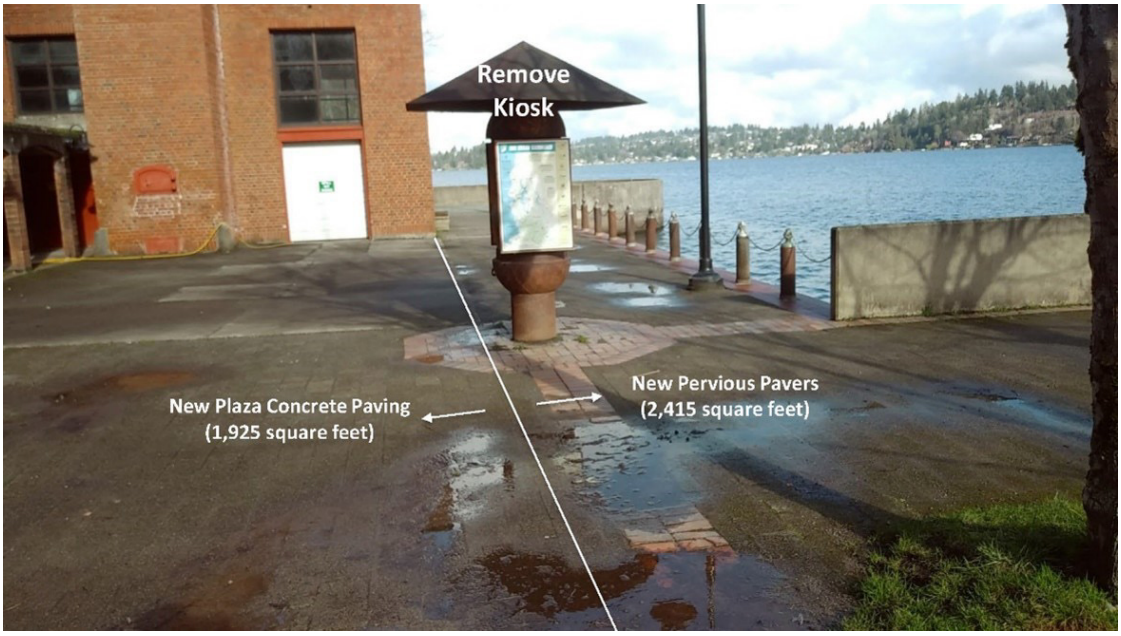


Diagram 5
Locations of New Pervious Pavers and Silva Cell at South End of Plaza (Looking South)

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 (Figure 5, Diagram 1). Approximately 42 cubic yards of terraced rock wall (375 sf) will be placed to accommodate ADA-accessible slopes along this public access trail. An existing stormwater outfall will be temporarily removed and reinstalled during this construction.

A new structural accessible walkway 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 (see Diagram 1). Piles will be driven to support the viewing deck access walkway. To eliminate the need to excavate for footings; 4" diameter steel piles, will be driven into the ground. A footing drain will also be installed below grade along the length of the back of the boiler building, this will be an 18" x 20" gravel filled trench, including a perforated or slotted pipe to collect and divert surface and shallow groundwater away from the building. The access walkway 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 universally accessible and ADA-compliant pathway connection (Figure 5). A gravel pathway will connect to a concrete trail segment leading to a seatwall. An up-to-6-foot-long sheet pile 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 Figure 6). The sheet pile wall and rock terrace and revetment features are proposed to provide shoreline stabilization support to the landward public access trail and to protect the habitat restoration area and beach from erosion.

3.1.5 Shoreline and Beach Enhancements

In addition to improving public access and safety, the design includes shoreline and beach enhancements (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 sf) 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 in Section 3.3.

Habitat gravel will consist of naturally rounded material that complies with 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 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.

Diagram 6 provides a photograph of the existing north beach with the approximate location of nearshore habitat enhancements labeled.

Diagram 6
Approximate Location of North Beach Improvements (Looking North)

3.1.6 Waterfront Low-Impact Development

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 (Diagram 4). A silva cell system will be installed under the south end of the plaza to provide biofiltration of stormwater (Diagram 5). 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.

3.1.7 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 (Figure 5). These features 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. Additional trenching will occur to install piping north of the plaza area to a Fire Department connection just northwest of the administrative building.

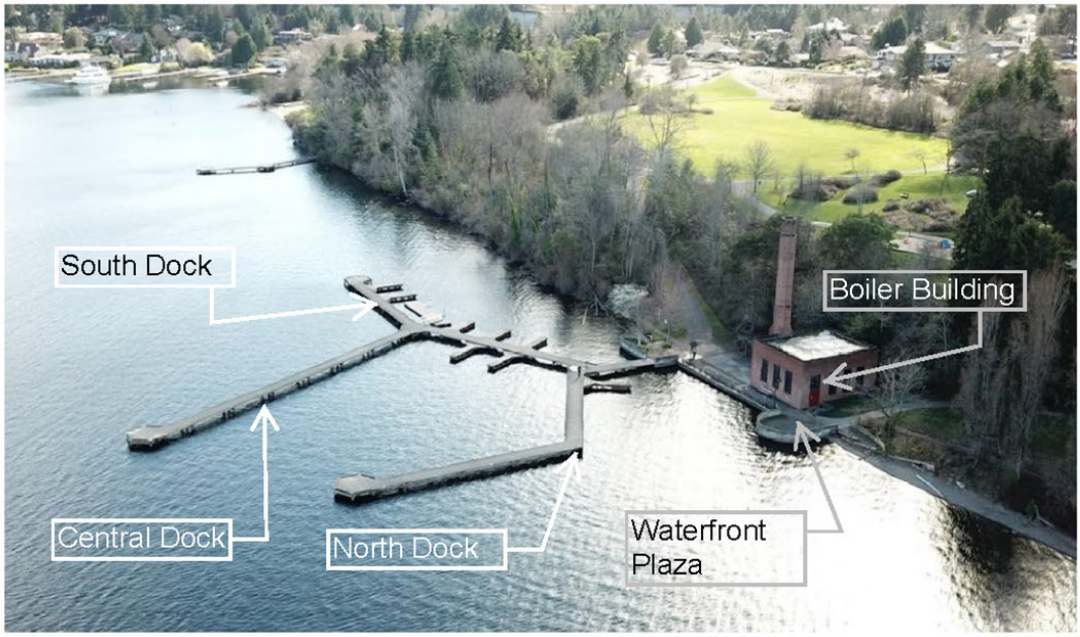
A coring saw, or similar, will be used to core a hole through the existing retaining wall to insert the intake and filter backwash pipes through the wall and into the lake. A small portion of the lake, in and around the area where the pipe penetration will be constructed through the bulkhead wall, will 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).

3.2 In-Water and Overwater Activities

The in-water and overwater Project elements are described in this section and shown in Figures 3, 4, and 7 through 12. Diagram 7 shows an aerial overview of the existing dock structures.

Diagram 7
Aerial View of Existing Dock Structures (Looking Southwest)



3.2.1 North Dock Repairs

The Project proposes to retain and repair the northernmost segment of the dock (approximately 188 feet long and 8 feet wide; 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 (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 (Figure 9).

As part of the north dock repairs, 38 creosote-treated timber piles will be wrapped with fiberglass jackets (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.

3.2.2 Central Dock Reconfiguration

The central dock is a fixed concrete structure (Figure 3). The existing dock will be entirely removed (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 (Figure 7). The wave attenuator/mooring float will be 10 feet wide with 2 feet of freeboard. To provide adequate wave attenuation and protect shoreline ecological functions from erosion, the float material will be concrete, with light penetration options where possible. The bulk of the structure is located as far offshore 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; 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 (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 (Section 3.2.5).

According to the Mercer Island Shoreline Master Program, breakwaters are prohibited, except for those structures installed to protect or restore ecological functions. These structures shall provide for mitigation according to the sequence defined in Washington Administrative Code 173-26-201(2)(e). The proposed wave attenuation float has been designed to reduce wave energy along both the south and north shorelines of the park. The float reduces wave energy from both storm waves present during winter months and large boat wakes present primarily during summer months. Wave modeling completed as part of the design process for the dock predicts that wave heights will be reduced between 0.5 and 1.0 foot along portions of the shoreline compared to adjacent shorelines (Blue Coast 2022). This reduction in wave height will subsequently reduce wave energy along the nearshore and along the shoreline areas of the park, thus reducing the erosion due to waves and boat wake in these areas. This will provide protection to the recently restored area that was supplemented by placement of habitat-grade gravel and LWD and the planting of native riparian plant species (permitted under City Permit Nos. SHL20-016 and SHL SHL21-009).

3.2.3 South Dock Reconfiguration

The south dock is a fixed concrete structure that will be removed (Figure 4) and replaced in a new configuration. As with the central dock, the south dock will have a grated surface that allows for at least 40% light transmittance over 100% of the dock.

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 (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 accommodate kayaks and stand-up paddleboards, 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.

3.2.4 Overwater Access Platform

The Project includes a new grated overwater platform as part of the goal to improve access to the waterfront (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.

3.2.5 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 (Figure 7).

3.2.6 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[1]	In-water piles	One 12- to 14-inch creosote-treated timber pile[1]	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)[3]	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
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/relocated overwater cover installed[2]**	**Net decrease of approximately 5 sf of overwater cover**

Notes:

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.

3.3 Planting Plan

To construct the new access pathways, plaza paving, and expanded north beach, up to 12 trees located along the shoreline and in the uplands will be removed and replaced with 20 new trees (Table 3; Figures 13 and 14). Approximately 3,860 sf of riparian and upland vegetation will be removed during construction, and 1,940 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 proposed project will install diverse native planting palette, including variety of groundcover, shrubs, and both deciduous and coniferous trees, which will increase the function of the riparian buffer compared to existing conditions.

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

Project Component	Location	Quantity or Area
Vegetation removal	North beach	1,430 sf (riparian)
	South on-grade pathway	2,430 sf (upland)
	Total	**3,860 sf removed**
Shrub and groundcover planting	North beach	710 sf (riparian)
	South on-grade pathway	1,230 sf (upland)
	Total	**1,940 sf installed**
Tree removal	North beach	6 trees (deciduous)
	South on-grade pathway and ramp	3 trees (deciduous)
	Plaza	3 trees (deciduous)
	Total	**12 trees removed**
Tree installation	North beach	11 trees
	South on-grade pathway	8 trees
	Plaza	1 tree
	Total	**20 trees installed**

3.4 Project Schedule

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. Overwater or upland activities may occur outside of the in-water work window. The following construction phase and sequences are proposed:

1. **Phase 1: July 2023 to January 2024**
    a. Boiler Building Repairs
    b. Boiler Building Restroom Annex Renovation
    c. Concession Stand Repairs
2. **Phase 2: June 2024 to November 2024**
    a. North Dock Repairs
    b. Central Dock Reconfiguration
    c. South Dock Reconfiguration
    d. Overwater Access Platform
    e. Waterfront Plaza Renovation and Access Upgrades
    f. North Beach Enhancements
    g. Waterfront LID
    h. Irrigation Intake System

4 Best Management Practices

Avoidance and minimization measures are incorporated into the design of the Project. They include replacing overwater cover with grated decking to the extent practicable, replacing or encapsulating creosote-treated timber piles, shifting replacement dock components waterward to open more nearshore habitat for migrating salmonids, and enhancing riparian vegetation and public beach area. The design balances upland stormwater management and shoreline access improvements to maintain shoreline and riparian habitat functions. To avoid or minimize potential adverse impacts to the aquatic environment, the following 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.
- In-water work will occur during the approved regulatory work window for Lake Washington; expected to be July 16 to March 15.
- 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 (see Figure 4). 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 ordinary high water mark 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 (Figure 4). 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 for 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 USTs 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 review will be incorporated into the Project to avoid impacts on federally listed species.

5 References

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Figures

Refer to previously provided figures and revised plan set