Biological Assessment

Milwaukie Riverfront Park

Milwaukie, Oregon

Prepared for:

City of Milwaukie

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December 2008

Executive Summary

The purpose of this Biological Assessment (BA) is to address the effect of the Milwaukie Riverfront Park Project on species listed, proposed, or candidates for listing as endangered or threatened, under the federal Endangered Species Act of 1973 (ESA). This project proposes to redevelop the Riverfront Park in Milwaukie, Oregon.

The project elements include a children's play area, picnic facilities, restrooms, benches for viewing the river, natural vegetative areas with trails, a boat ramp and parking. The primary project elements that would occur below OHWE would be the removal of the existing boat ramp and construction of a new boat ramp and associated dock, construction of a transient dock, removal of deleterious material, and re-grading and bank restoration in the Willamette River. These activities would impact 1.54 acres below the ordinary high water elevation (OHWE), and would add a net increase of 0.6 acres new impervious surface.

Species addressed in this BA are summarized in the table below. Effects determinations are as follows:

- The project is determined to "may affect, likely to adversely affect" coho salmon, chinook salmon, and steelhead trout due to the in-water work proposed in the Willamette River, which supports these species.
- The project will have "no effect" on northern spotted owl, streak-horned lark, Willamette daisy, and Nelson's checker-mallow addressed here, because these species are not known to actually occur in the action area and no suitable habitat is present.

Common Name	Scientific Name	Agency with Jurisdiction	Federal Status	Actual Occurrence in Project Area
Fish				
Chum salmon – Lower Columbia River	*Oncorhynchus keta*	NMFS*	Threatened	None
Chinook salmon – Lower Columbia River and Upper Willamette River	*O. tshawytcha*	NMFS	Threatened	Rearing and migration may occur
Coho salmon – Lower Columbia River	*O. kisutch*	NMFS	Threatened	Rearing and migration may occur
Steelhead Trout – Lower Columbia River and Upper Willamette River	*O. mykiss*	NMFS	Threatened	Rearing and migration may occur
Wildlife				
Northern spotted owl	*Strix occidentalis caurina*	USFWS	Threatened	None
Streak-horned lark	*Eremophila alpestris strigata*	USFWS	Candidate	None
Plants				
Nelson's checkermallow	*Sidalcea nelsoniana*	USFWS	Threatened	None
Willamette daisy	*Erigeron decumbens* var. *decumbens*	USFWS	Endangered	None

** NMFS – National Marine Fisheries Service; *USFWS – U.S. Fish and Wildlife Service*

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1 INTRODUCTION

1.1 BACKGROUND

The purpose of this Biological Assessment (BA) is to address the effect of redevelopment of Riverfront Park on species that are listed, proposed, or candidates for listing as endangered or threatened, under the federal Endangered Species Act of 1973 (ESA).

The U.S. Army Corps of Engineers (COE) must permit in-water work for this project under Section 404 of the Clean Water Act, which creates a federal nexus. This report was prepared to satisfy requirements outlined in section 7(c) of the Endangered Species Act of 1973 (16 US 1531, *et seq.*).

1.2 LOCATION

The site consists of several parcels totaling approximately 6.5 acres that form the Milwaukie Riverfront Park owned by the City of Milwaukie The project site is located in Milwaukie, Oregon (T01S, R01E, Sec 38, W.M.) (Figure 1 and 2). The project area includes a portion of Willamette River at river mile (RM) 18.4 known as Milwaukie Bay, and its banks between Johnson and Kellogg creeks as well as a small parcel south of Kellogg Creek. The project is located in the Lower Willamette River sub-basin (HUC 17090012).

The aquatic and terrestrial action area for this project was determined based on the following factors. Sediment that enters the regulated work area during the installation and removal of work area isolation measures is likely to remain suspended in the water column for a distance of approximately 0.25 miles downstream of the project area, due to dilution. Therefore, the aquatic action area is defined as a 0.25-mile buffer downstream from the park to encompass any downstream effects. The terrestrial action area for this project is limited to the project site for all species addressed here because it is isolated from any other potential terrestrial habitat by the Willamette River and by urban development.

1.3 PROJECT PURPOSE AND NEED

Over the last ten years, the desire to develop a community amenity that will provide a catalyst to reinvigorate the community and more specifically downtown has driven the park planning process. In 1999 the City of Milwaukie began a process to develop a concept for the riverfront and downtown that would reflect the vision of its citizens and improve economic vitality of the downtown core. In 2000, the City of Milwaukie adopted into its comprehensive plan a Downtown and Riverfront Framework Plan. In May 2006, the Milwaukie City Council reviewed and endorsed the final concept plan for Riverfront Park.

The purpose of the proposed project is to redevelop the Riverfront Park to improve the recreational opportunities; increase the structural and vegetative diversity along the

waterways; create and enhance habitats that support native species while minimizing non-native species; protect and improve water quality in the Willamette River; where needed, provide stable riverbanks to protect existing and future urban development, infrastructure, significant natural resources, and public safety; provide safe, limited public access to the river in appropriate locations; and enhance the aesthetic qualities of the river's edge.

2 EVALUATION METHODS

A scoping visit and meeting were held at the proposed project site on July 16, 2008. Present at the meeting was Christy Fellas, National Marine Fisheries Service (NMFS); James Holm, US Army Corps of Engineers (COE); Mike McCabe, Oregon Department of State Lands (DSL); Corey Saxon, Oregon Department of Environmental Quality (DEQ); JoAnn Herrigel, City of Milwaukie and DEA staff members Gill Williams, Brynn Reimann, Jennifer Snyder Hogland and Kristine Marshall.

The main concerns raised during the scoping meeting were the proximity of the boat ramp and transient dock to Kellogg Creek and potential impacts to fish utilizing this area as well as the stormwater management including heavy metals in stormwater runoff from McLoughlin Blvd. Potential impacts from the boat ramp and transient dock are discussed further in Section 6. Stormwater management for this project is discussed further in Section 3.11.

Factors considered in evaluating project impacts included the species' dependence on specific habitat components that would be removed or modified; the abundance and distribution of habitat; habitat components in the project vicinity; distribution and population levels of the species (if known); the possibility of direct impact to fish, wildlife, and plants; the degree of impact to habitat; and the potential to mitigate the adverse effect. The methods outlined in *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFS 1996) were used to analyze the potential for project impacts on water quality as well as in-stream and riparian habitat quality. The strategy outlined in this document is to determine the environmental baseline for the watershed, discuss how the proposed action would affect the environmental baseline, then use that information in a dichotomous key to arrive at a determination of effect.

3 PROJECT DESCRIPTION

3.1 PROPOSED ACTION

The proposed project would develop Milwaukie Riverfront Park to have multiple uses including large grassy areas, a children's play area, picnic facilities, restrooms, benches for viewing the river, natural vegetative areas with trails, a boat ramp and parking, and transient boat dock. Key challenges include contouring the land to accommodate these many uses as well as working around the PGE power line that runs the length of the existing park area. The park development will occur in phases as funding becomes available. The proposed park plan will include the following elements:

Phase I

- Utility relocations – PGE power lines and a City water line would be relocated closer to McLoughlin Blvd behind the sidewalk that runs parallel to the west side

of the roadway. None of these utilities require work below OHW and would not result in the loss of riparian vegetation

Phase II

- Trails and scenic overlook - The north end of the park adjacent to Johnson Creek will feature trails and scenic overlook connections to the Willamette River and to an informal amphitheater proposed for construction in Phase III.

- Southern plaza - The plaza will be located south of Kellogg Creek and will provide a gathering place to overlook the Willamette River. It will be located at the top of a thirty foot high sheet pile wall formerly used as a log dump. Portions of the plaza will cantilever up to 10 feet over the river at the top of the sheet pile wall. A new parking area will be constructed adjacent to the plaza, where an informal parking area is currently located.

- Trail connections on the north end and south end of the park. These connections will allow access to regional recreational facilities by bikers and pedestrians.

Phase III

- A public plaza - This will provide a critical interface with downtown Milwaukie and will include a water feature, children's play area, and an outdoor theatre space.

- An informal amphitheater - This informal, grass amphitheater will hold approximately 150 people for community events. Stone seat steps will descend from the amphitheater to the waters edge, extending below OHW.

- A reconfigured boat ramp and boarding dock. These two features will replace existing facilities that have become deteriorated and functionally obsolete. The new configuration will better utilize the parks open space and simplify access. Improvements will also include a small restroom structure as required by the Oregon State Marine Board.

- Boat trailer and automobile parking. Access and parking will be provided adjacent to the boat ramp.

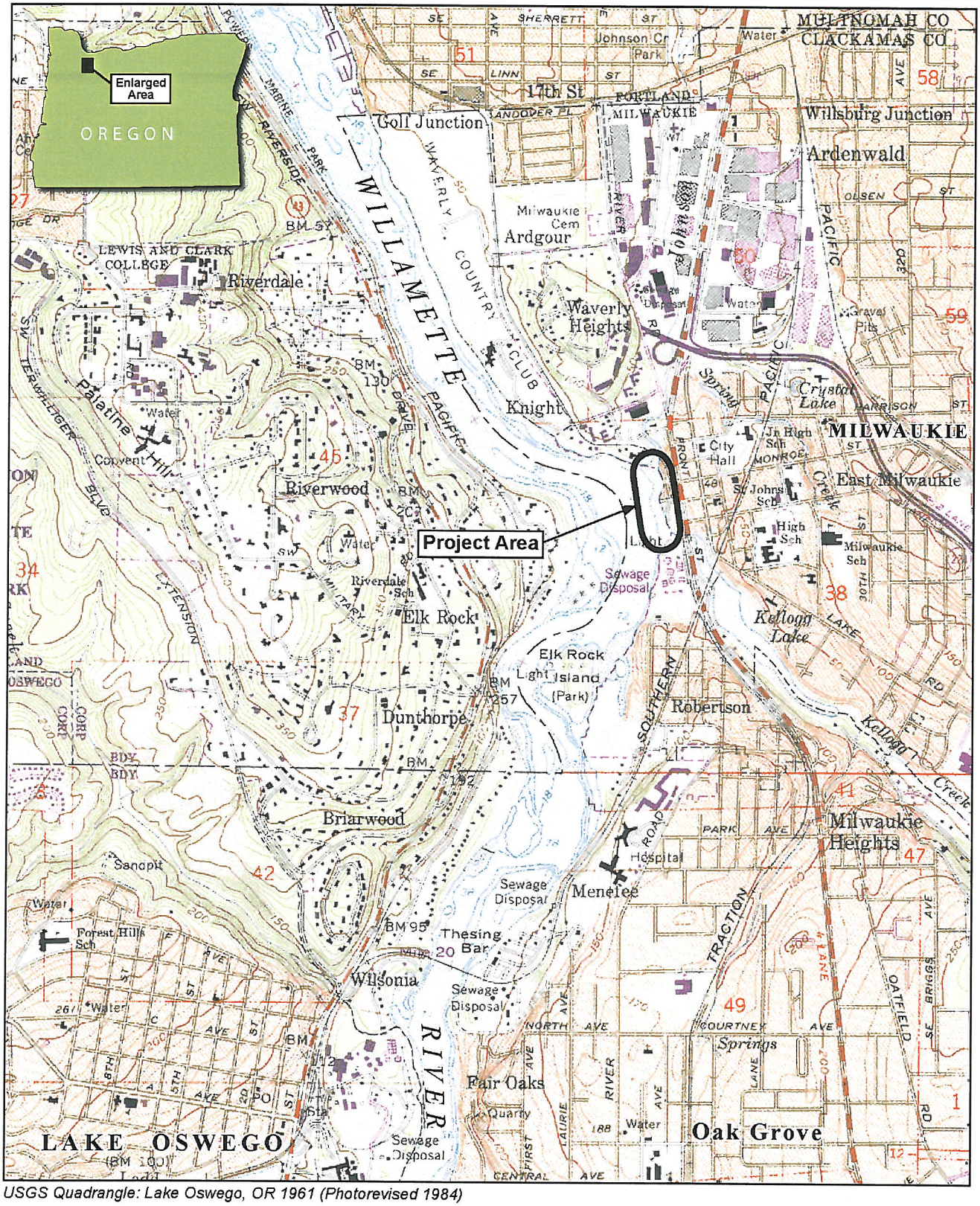
- Enhanced riverfront bank restoration and native plantings. The park design will include the removal of old wooden pilings and previously dumped rubble and debris along the banks of the Willamette River and Kellogg Creek. Native vegetation will be planted along Johnson and Kellogg creeks and along the Willamette River.

- A park entryway. The park's main entry will be on the portion of the site located south of Kellogg Creek. The two existing entryways will be removed.
- A pedestrian bridge over Kellogg Creek will connect the southern plaza with the boat ramp and the remainder of the park.

Phase IV

- A floating dock connected to the shore by an aluminum gangway. The dock will provide access to the City of Milwaukie for recreational boaters visiting the area.
- The restroom building located in the large public (pedestrian) plaza would be constructed.

The Milwaukie Riverfront Site Plans illustrating plan sections, plan details, bridge detail and images, and architectural design are attached as Appendix A.



USGS Quadrangle: Lake Oswego, OR 1961 (Photorevised 1984)

Figure 1
Vicinity

Scale - 1 : 24,000

PROJECT: Milwaukie Riverfront Park

TITLE: Aerial Site Photo

Photo Source: Google Earth Pro

SHEET: 2

DWG. REF.	PROJECT	SCALE	AMENDMENT NO.
C-1	MAEX0018	NTS	0.0
DRAWN BY	**DESIGN BY**	**APPROVED BY**	**DATE**
BAR	CRM, RGWI		11-01-08

DAVID EVANS AND ASSOCIATES INC.
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3.2 STAGING AREAS AND ACCESS

The contractor will be responsible for securing a staging area. The Contractor may elect to store equipment and materials off site at a different location for security reasons. Hazardous material containment booms and spill containment booms will be provided on site to facilitate the cleanup of hazardous material spills. After the project is completed, staging areas will be returned to pre-project grade and seeded, if the ground is disturbed.

If possible, areas for non-workshift storage of equipment and vehicles, other than track-mounted vehicles and cranes, will be located at least 150 feet away from the regulated work area. Areas for storing fuels and other potentially hazardous materials and areas for refueling and servicing construction equipment and vehicles will also be located at least 150 feet from the regulated work area, if feasible. Due to the location of the Willamette River, Kellogg Creek and Johnson Creek in addition to the need to maintain access to sections of the park, sufficient space may not be available to establish a staging area for storing hazardous materials and non-work shift vehicles 150 feet away from ordinary high water (OHW). If this is the case, full containment of potential contaminants will be provided to prevent soil and water contamination, as appropriate.

3.3 IN-WATER WORK WINDOW AND CONSTRUCTION TIMING

The in-water work period for this section of Willamette River is July 1 to October 31. During the agency scoping visit NMFS indicated construction activities below OHW were no longer permitted during the December 1 to January 31 in-window water work period. The in-water work period for Kellogg Creek is July 1 to September 30. There is no in-water work proposed in Johnson Creek. The in-water area for the park is identified as occurring below the OHW elevation of 18.4 feet for the Willamette River and Kellogg Creek (Goudzwaard pers comm. 2006).

The in-water work associated with this project includes removal of the existing boat ramp, construction of the new boat ramp and associated boarding dock, construction of the transient dock, recontouring and stabilizing the banks of the Willamette River, placing stepping stones to allow public access and removal of old wooden pilings and previously dumped rubble and debris from the Willamette River and Kellogg Creek.

3.4 EXISTING BOAT RAMP REMOVAL

The existing two lane boat ramp is located in the middle of the park. The ramp has been undermined and is not safe to use during low water conditions. A functioning boat ramp is needed at the park so the new ramp discussed below will be constructed in coordination with the removal of the existing ramp. The existing ramp will be removed during the in-water work window during low water conditions to minimize the need for construction equipment to enter the river. The ramp will be isolated from the active flowing channel with a turbidity curtain or other Engineer approved measures to prevent debris and sediment from leaving the project site. Construction equipment will be located

below OHW elevation but will not enter the water. The bank will be re-contoured to match upstream and downstream grades.

3.5 NEW BOAT RAMP AND BOARDING FLOAT CONSTRUCTION

In 2000, the City adopted the Milwaukie Downtown and Riverfront Plan into their Comprehensive Plan. The Riverfront Plan, as adopted, did not include a boat ramp for the Riverfront Park. The theory was that an alternative location for the existing Jefferson Street boat ramp would be identified by a City Council- appointed ramp location group. When the group failed to identify a suitable location, City staff began working with the Riverfront Board and boating advocates to determine whether and how a new boat ramp could be integrated in the Riverfront Park design. In 2005 the Riverfront Board conducted a direct mail survey of all City residents requesting design input regarding preferred park elements. The survey received a 10 percent response and 75 percent of the respondents identified a boat ramp and associated parking as desired integral parts of the Riverfront Park design.

The Riverfront Board and staff developed the current park design specifically to integrate the ramp while maximizing the uninterrupted open space in a fairly small space. The current layout minimizes the conflict between vehicles and pedestrians and uses the existing site contours as efficiently as possible.

A boat ramp is proposed to be constructed south of the existing ramp near Kellogg Creek. The boat ramp will be approximately 165 ft long by 26 ft wide and eight inches thick. The boat ramp is designed based on a single lane ramp and meets current Oregon State Marine Board standards. The section of the ramp below OHW elevation will be constructed with pre-cast concrete planks for driving surface. The section of the ramp above OHW elevation will be poured in place concrete. Construction below OHW will include slope grading, with 1-1/2 gravel base and steel rails placed on grade to support planks. Grading will be limited to slope modifications necessary to establish a flush and level ramp. The precast concrete planks will be placed on the rails and will interlock with each other. A perimeter of riprap will be placed around the ramp to prevent scour and undercutting of ramp surface. This rock will be approximately 4 ft wide and 4 ft deep and flush with ramp surface.

A 6-foot by 160-foot plastic 'wood' boarding float will be placed next to the ramp and secured with piling. The boarding float will provide safe access for boats using the ramp and will be permanent. The boarding float will be constructed of wood surrounding and encapsulating foam. The float will be secured with 8 16-inch steel pile driven into the ground. The pile will have a conical pile cap to prevent birds from perching on top.

3.6 TRANSIENT DOCK CONSTRUCTION

Redevelopment of the park includes a transient dock for boaters to access the city and its amenities. During the design development process, Milwaukie citizens and boaters from the area expressed great interest in providing boat tie-up facilities for transient boaters as well as boat launching facilities. The transient dock would be used by those who launched boats elsewhere along the river but wanted to use Milwaukie's Riverfront Park for recreation or to park their boats while they walked to downtown Milwaukie to eat or shop. A transient dock would serve to minimize conflicts between those launching boats and those tying up their boats, and is proposed to be located to the south of Kellogg Creek. An additional consideration for this facility was acknowledged when the City was approached by the owner of the Sternwheeler Rose (an 80-foot long paddlewheel recreational cruise vessel), investigating the opportunity to locate the boat's moorage near Milwaukie's Riverfront Park. The transient dock will be located in deeper water to minimize impacts and will be oriented to avoid debris accumulation and eliminate the need for a debris boom.

The transient dock will be 12 ft wide and 250 ft long and located in 20 ft deep water. It will include approximately 600 square feet (20 % of its area) metal grating for light transmission. The transient dock will be constructed of concrete encapsulated foam and have two types of walking surfaces: timber decking (treated with riparian-compatible preserving agents) or concrete; and enframed panels of metal grating to provide light transmission to minimize potential habitat for predatory fish. The dock will be secured to the bed of the river with steel piling. Piling will be 24-inch diameter and driven into the bottom using vibratory methods. The top of the pile will be closed with a conical pile cap. A maximum of 15 piling will be required to secure the dock.

Access to the dock will be provided by an elevated gangway. The gangway will be fabricated from aluminum to minimize future maintenance and avoid the need for painting over the water. The gangway will be 6 ft wide by 100 ft long. The decking for the gangway will include grating to provide light transmission to minimize impacts. An abutment or attachment will be provided above OHW for the gangway and will not require in-water work.

3.7 NEW PEDESTRIAN BRIDGE CONSTRUCTION

A pedestrian bridge is proposed to connect parking on the north side of Kellogg Creek with Riverfront Park. The pedestrian bridge provides a short, more direct route to the boat ramp to minimize the time the boaters are separated from their potentially unoccupied and vulnerable launched boats. The proposed pedestrian bridge will span Kellogg Creek and will not be located below OHW. The vertical profile will be slightly higher than the 100-year flood elevation to minimize flooding and to ensure a "no rise" in the 100-year floodplain. Construction of the new bridge will be accomplished during one construction season.

3.8 CHANNEL AND SLOPE STABILIZATION

Channel and slope stabilization work will be involved in this project. As shown in Table 1 below, there would be a 335 cubic yards (yd^3) increase in permanent fill volume but a 584 square feet (ft^2) decrease in permanent fill area associated with the relocation of the boat ramp and construction of the transient dock.

The riverbank slope below ordinary high water will be laid back slightly during grading, increasing flood volume capacity. Approximately 448 cubic yards of material will be removed below OHW elevation. Bank armoring and stabilization will include installing large boulders at key scour edges and protrusions at risk of erosion, including the former and proposed boat ramp areas and drainage points for the proposed swales. The boulders will be in-filled with river cobble varying in size from two to six inches. A weathered outcrop of exposed bedrock will be left intact among the plantings as a site amenity. Vegetated log crib walls will provide bank stabilization along the leeward banks, where pedestrian access is proposed. Soft gabion walls planted with native shrubs and forbs will protect the swales from erosion under inundation and enhance aesthetics. Large wood will be installed below OHW elevation at the toe of the swales to create habitat. Fish do not have access to the swales but in a high flood event, the swales are designed to prevent fish entrapment. The bank restoration work near Johnson Creek is based on developing a naturally functioning shoreline and riparian area. Soil engineering will include installation of coir matting in concert with re-vegetation to protect the engineered soil from erosion while planting becomes established and a matrix of roots binds the slope (see Appendix A – Existing and Proposed Site Plans and Appendix D – Revegetation Plan). The riverbank will then rely on the plantings for stability. To control further retreat of bank larger boulders will be placed behind the bio-engineering and combined with the root-wads. This system will establish a limit of erosion if the bio-engineering experiences a major flow/flood event before root systems are firmly established.

The areas of the bank that are re-contoured would be replanted with native vegetation. As part of the landscape rock cluster bank protection large boulders would be scattered along the high scour areas to provide streambank protection. The areas between these large boulders would either be planted with native vegetation or native river rock would be place in these areas. The bio-engineered log crib/root wad features would be used to provide bank stabilization in lower scour areas.

Table 1 Fill Impacting Jurisdictional Waterway

Project Component	Volume below OHW	Area of impact below OHW
Removal of existing boat ramp	- 333 cy	- 8,990 ft^2
Construction of new boat ramp and dock	+ 373 cy	+ 3,735 ft^2
Construction of new transient dock	+ 295 cy	+ 4,671 ft^2
Recontouring bank	-448 cy	- 39,404 ft^2
Bio-engineered bank protection	+ 369 cy	+ 28,435 ft^2
Landscape rock cluster bank protection	+268 cy	+ 3,630 ft^2
Removal of deleterious material and existing piles	- 35 cy	- 18,771 ft^{2*}
Total Change for the Project	+489 cy	-26,694 ft^2

Currently, concrete, rebar, chain link fencing, wood piles, and other debris are found along the banks of the Willamette River and Kellogg Creek. This material will be removed as part of this project. It is anticipated that approximately 35 cubic yards (611 cubic feet of material and 318 cubic feet of piles) will be removed below OHW.

3.9 UTILITY RELOCATION

PGE power lines and a water line are currently located in the northern half of the project area. The PGE poles and waterline would be relocated closer to McLoughlin Blvd behind the sidewalk. Both of these utility relocates are within existing developed park land and away from the top of bank. None of these utilities require work below OHW and would not result in the loss of riparian vegetation.

3.10 ILLUMINATION

Illumination is proposed for this project. All park and path lighting will be of a pedestrian scale and directed downward toward paths and will include hoods or shades to prevent light pollution on the river. Lighting associated with the floating docks will be housed near, and obtusely directed at, the walking surface.

3.11 STORMWATER COLLECTION AND TREATMENT

3.11.1 Water Quality Treatment

Stormwater runoff from McLoughlin Blvd is presently treated in two proprietary treatment manholes prior to discharging to Kellogg Creek to meet that project's permit conditions. Since the park restoration will not impact McLoughlin Blvd and no runoff from this roadway enters the project area, no change in the treatment of McLoughlin Boulevard runoff is proposed with this project.

The majority of the existing impervious areas in the project area will be removed for the new layout of parking and sidewalks. The total pre-development site impervious area is

approximately 103,960 square-feet (2.4 acres). An impervious area of 95,756 square-feet (2.2 acres) will be removed. An impervious area of 8,204 square-feet (0.2 acres) of sidewalk will remain.

Stormwater from the existing impervious surfaces presently flows down the river bank to the Willamette River. The existing stormwater system consists of two catch basins that collect part of the driveway stormwater runoff. These catch basins will be removed during construction since the driveway will be relocated.

The site improvements will add 122,821 square-feet (2.8 acres) of impervious area to the existing 8,204 square-feet (0.2 acres) that will remain. The parking area near Kellogg Creek, which is approximately 56,292 square feet (1.3 acres), will be constructed using pervious pavement technology. Although this technology will allow some infiltration to occur, the water quality treatment facilities have been designed as if this area were impervious. Based on this approach, the total impervious area for the site post-development will be 131,025 square-feet (3.0 acres). The project will create a net increase of 27,065 square-feet (0.6 acres) of impervious area.

For discussion of stormwater the site has been divided into three key areas. These areas are the north and south parking (intersected by Kellogg Creek connected by an existing vehicle bridge and the proposed pedestrian bridge) and the north pedestrian plaza (See Appendix B).

The proposed water quality facilities meet the design standards of the current City of Portland, Stormwater Management Manuel (SWMM). SWMM specifies that pollution reduction is required for all impervious areas created by development projects with the exception of roof areas. SWMM regulations require water quality facilities to treat stormwater runoff generated by 0.83-inches of rainfall over a 24 hour period when using the SBUH hydrograph-based analysis method.

Stormwater runoff in the south parking area is collected, treated and detained from three basins in three connected facilities; one vegetated swale and two wet detention ponds. The swale is connected to an adjacent wet pond. This pond collects and treats runoff through infiltration. This pond is connected to a larger pond, which also collects and treats runoff from the south parking area. For the water quality event the larger pond does not release any water, which means all water quality event runoff from the south parking area is stored and slowly infiltrated.

Stormwater runoff in the north parking area is treated and detained in two separate facilities; one vegetated swale and one flow-through planter. The vegetated swale, is 157-feet long and has a one foot bottom width, one foot depth, and 3L:1V side slopes. The swale also provides sufficient storage for the water quality storm event, and serves to infiltrate runoff from that event. The flow-through planter stores all the flows, which are slowly infiltrated.

The public plaza area, also referred to as the pedestrian plaza, includes the restrooms, water features, planters, and amphitheater. These areas also have two stormwater quality treatment features. A small wet pond is proposed on the south side of the plaza and a filter strip is proposed on the far north side of the plaza. A large percentage of the plaza is graded to sheet flow stormwater runoff into adjacent planters or grassy areas. These areas were not modeled for water quality purposes.

3.11.2 Water Quantity Treatment

Since infiltration rates in this area are not high enough to infiltrate the 2-, 5-, 10-, and 25-year storm event, it is necessary to provide a detention system in order to meet the pre-development discharge rate requirements. The proposed small pond/large pond facility provides detention for the south parking area runoff and the proposed swale provides detention for the north parking area. These facilities are designed to provide detention during the 100-year storm event. The water quality features for the Pedestrian Plaza are too small to provide any detention. Table 2 is a summary of the north and south parking flows that are detained and their summation. These facilities compensate for the pedestrian plaza, so that the total detained flow meets the requirements for the overall site.

Table 2. Pre- and Post-Development Flow and Detention Requirements and Proposed Detention Summary

Recurrence Interval (years)	Pre-Development Flow (cfs)	Post-Development Flow (cfs)	Required Flow Reduction (cfs)	Total Flow Reduction (cf)
2	1.31	1.50	0.19	0.52
5	1.52	1.74	0.22	0.48
10	1.67	1.91	0.24	0.42
25	1.93	2.21	0.28	0.30
100	2.29	2.62	NA	NA

3.12 MITIGATION

No additional mitigation is being proposed for this project. No wetland impacts are proposed. Aquatic habitat improvement has been incorporated into the project as part of the park redevelopment, and thus no separate Compensatory Mitigation plan has been produced for waterway impacts. A number of conservation measures designed to minimize potential adverse impacts to threatened and endangered species are described in Section 7.

3.13 INTERDEPENDENT AND INTERRELATED ACTIONS

An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification or "associated with" the proposed action. An interdependent activity is an activity that has no independent utility apart from the action under consultation or "because of" the proposed action. The proposed action only upgrades, realigns, and replaces existing facilities, and there are no interrelated or interdependent actions.

4 STATUS OF SPECIES AND CRITICAL HABITAT

Occurrence of listed, proposed, and candidate species was requested from the U.S. Fish and Wildlife Service (USFWS) and Oregon Natural Heritage Information Center (ONHIC). Data have been obtained from National Marine Fisheries Services (NMFS) and Oregon Department of Fish and Wildlife (ODFW) websites. As shown in Table 3, USFWS reports the potential occurrence of three listed species and one candidate species within Clackamas County (USFWS 2008).

The bald eagle (*Haliaeetus leucocephalus*) was removed from the list of federally threatened and endangered species on August 8, 2007. However, this species is protected by the Bald and Golden Eagle Protection Act (Eagle Act) and the Migratory Bird Treaty Act (MBTA). The MBTA and the Eagle Act protect bald eagles from a variety of harmful actions and impacts. The US Fish and Wildlife Service developed guidelines that are intended minimize impacts to bald eagles, particularly "disturbance," which is prohibited by the Eagle Act. The closest known bald eagle nest is over 1,500 feet from the project area, which is outside the 660 foot recommended distance to avoid disturbance to nesting bald eagles. The project will not disturb known nesting bald eagles and this species will not be discussed further in this document.

4.1 SALMONID FISH SPECIES

Federal status of the salmonids addressed here is summarized in Table 3. Critical habitat has been designated for Lower Columbia River chinook and steelhead within the project area. Critical habitat has not been designated for Lower Columbia River coho.

The Lower Columbia River chinook and steelhead, Upper Willamette River chinook and steelhead, and Lower Columbia River coho are identified as occurring within Clackamas County (NMFS 2008).

The Willamette River, Kellogg Creek, and Johnson Creek near the project have been designated as rearing and migration habitat for Lower Columbia River coho and Lower Columbia River winter steelhead (Streamnet 2008). According to ODFW (2008), the project area provides rearing and migration habitat for Lower Willamette River coho and winter steelhead. Kellogg Creek is listed as a water quality limited stream due to increased levels of bacteria. Johnson Creek is listed as a water quality limited stream for PCBs, polynuclear hydrocarbons, the pesticides dieldrin and DDT, dissolved oxygen,

flow modification, and fecal coliform. The lower Willamette River is listed as water quality limited for a number of parameters, including fecal coliform, dieldrin and DDT, biological criteria, and mercury, among other criteria (ODEQ 2006). Additionally, summer water temperatures can exceed the threshold for salmonids, which may limit use of the two creeks and Milwaukie Bay.

4.1.1 Steelhead Trout

The Lower Columbia River and Upper Willamette River Evolutionarily Significant Units (ESUs) of steelhead trout are federally listed threatened species. Critical habitat was established for these ESUs in the project area. Steelhead occur in the project area primarily as migrating and rearing juveniles and migrating adults, and they ascend Johnson and Kellogg Creeks to spawn (Streamnet 2008). Winter-run adult steelhead are most likely to occur in the project area from mid-January to end of April (ODFW 2003). Their abundance appears to peak between January and February and again between April and May (JCWC 2003). Juvenile steelhead may temporarily rear or rest in the lower reaches of Johnson Creek, in Kellogg Creek below the fish ladder, and in Milwaukie Bay. Extensive juvenile salmonids surveys in the Willamette River found very few juvenile steelhead in the main channel. The study concluded that juvenile steelhead rear primarily in their natal streams and larger tributaries and pass quickly through the river (Friesen 2005). Juvenile out-migration occurs from mid-February to mid-November with the peak occurring from March to mid-August (ODFW 2003). There is no spawning habitat near the project area.

Steelhead need water that is clean, cold, and well-oxygenated; deep pools; and cover such as large woody debris, undercut banks, and overhanging vegetation. Steelhead typically spawn during spring, in higher-gradient reaches of larger streams and tributaries. The length of freshwater rearing time for steelhead is highly variable, ranging from one to seven years (Busby et al. 1996). Steelhead are unlikely to occur in this reach during periods of high stream temperatures but could be within the river at any time of the year.

For general information on the life/habitat requirements and life history of this species, see the Federal Register determination of threatened status for Lower Columbia River and Upper Willamette River ESUs of steelhead trout (64 FR 14517).

4.1.2 Chinook Salmon

The Lower Columbia River and Upper Willamette River ESUs of chinook salmon are federally listed threatened species. Critical habitat was established for these ESUs within the project area. Chinook salmon are present in the Willamette River year around. Adult spring chinook enter the Columbia River in March and April and fall chinook enter in September and October. The lower Willamette River is primarily used for migration, although some rearing and feeding by juveniles likely occurs during their downstream migration. Adult spring and fall chinook do not ascend Kellogg or Johnson creeks to

spawn (Streamnet 2008). Friesen et al (2005) found juvenile chinook salmon were not highly associated with nearshore areas; they were distributed evenly across the river channel regardless of year, time of day (day or night), origin (hatchery or unmarked), or area (upper or lower study area). Summer water temperatures can exceed the threshold for salmonids, which may limit use of Johnson Creek, and Milwaukie Bay for rearing. There is no spawning habitat near the project area. Additionally, the water quality issues described above (Section 4.1) also affect the ability of local waters to support chinook. The lower reach of Kellogg Creek is not known to provide rearing or migration habitat for Chinook salmon (Streamnet 2008).

For general information on the life/habitat requirements and life history of this species, see the Federal Register determination of threatened status for Lower Columbia River and Upper Willamette River ESUs of chinook salmon (64 FR 14308).

4.1.3 Coho

The Lower Columbia River coho salmon are federally listed threatened species. Critical habitat is not designated for this ESU. The Willamette River is a migration corridor for adult and juvenile coho. Coho salmon migrate up both Johnson and Kellogg Creeks to spawn. The lower reaches of Johnson Creek and Kellogg Creek may also provide rearing habitat for juveniles. Adults begin migration in August, and are most likely to occur from mid-September through mid-November. Juvenile out-migration occurs from March to May. Friesen et al (2003) found a peak in out-migration for this species in May and June. In the Willamette River coho juveniles were found predominately along beach and rock habitat types but also occurred at riprap. Coho occur throughout the channel without showing a preference for near-shore habitat (Friesen et al 2003). As stated above, water quality conditions and summer stream temperatures can exceed the threshold for salmonids, which may limit use of the project area for rearing. Coho use of the action area is not limited during the rest of the year.

For general information on the life/habitat requirements and life history of the Lower Columbia River coho, see the Federal Register published June 14, 2004 (69 FR 33102).

4.2 NORTHERN SPOTTED OWL

The northern spotted owl (*Strix occidentalis caurina*) is federally listed as threatened under the ESA. Critical habitat has been designated for this species, but no critical habitat occurs within the action area for this project.

Throughout their range and during all seasons, spotted owls consistently concentrate their foraging and roosting in old-growth or mixed-age stands of mature and old-growth trees (Thomas et al. 1990). There is no suitable nesting, roosting, or foraging habitat for this species within the action area. There are no known occurrences of this species within two miles of the project site (ONHIC 2007).

4.3 STREAKED HORNED LARK

The streaked horned lark (*Eremophila alpestris strigata*) is a candidate for listing under the federal ESA.

The streaked horned lark requires native grassland and savanna, and prefers to nest in areas of sparse vegetation (USFWS 2001; Csuti et al. 1997). No streaked horned lark occurrences have been reported in the project area (ONHIC 2007). The project area includes no remnants of native grassland or savanna and does not contain suitable habitat for this species.

Table 3. Federally Listed, Proposed, and Candidate Fish and Wildlife Species that May Potentially Occur in the Action Area (ONHIC 2005; USFWS 2005)

Common Name	Scientific Name	Agency with Jurisdiction	Federal Status	Actual Occurrence in Project Area
Fish				
Chum salmon – Lower Columbia River	*Oncorhynchus keta*	NMFS*	Threatened	None
Chinook salmon – Lower Columbia River and Upper Willamette River	*O. tshawytcha*	NMFS	Threatened	Rearing and migration may occur
Coho salmon – Lower Columbia River	*O. kisutch*	NMFS	Threatened	Rearing and migration may occur
Steelhead Trout – Lower Columbia River and Upper Willamette River	*O. mykiss*	NMFS	Threatened	Rearing and migration may occur
Wildlife				
Northern spotted owl	*Strix occidentalis caurina*	USFWS	Threatened	None
Streak-horned lark	*Eremophila alpestris strigata*	USFWS	Candidate	None
Plants				
Nelson's checkermallow	*Sidalcea nelsoniana*	USFWS	Threatened	None
Willamette daisy	*Erigeron decumbens* var. *decumbens*	USFWS	Endangered	None

** NMFS – National Marine Fisheries Service; * USFWS – U.S. Fish and Wildlife Service*

4.4 NELSON'S CHECKER-MALLOW

Nelson's checker-mallow (*Sidalcea nelsoniana*) is listed as threatened under the federal ESA.

Nelson's checker-mallow occurs on moist, open ground in meadows and occasionally in wooded habitats. The soils range from poorly drained to well-drained clay, clay loam, and gravelly loam. Any potential habitat for Nelson's checker-mallow in the action area has been disturbed by development or occupied by exotic species. ORNHIC (2007)

reported no Nelson's checker-mallow occurrences in the project vicinity, and none were observed during project site studies.

4.5 WILLAMETTE DAISY

Willamette daisy (*Erigeron decumbens* var. *decumbens*) is federally listed endangered. Critical habitat has not been designated for Willamette daisy.

The primary habitat for the Willamette daisy is native wetland prairies where flooding creates anaerobic and strongly reduced soil conditions (USFWS 2000). The project site is in a disturbed landscape, with no native prairies. The plant community along Johnson Creek in the action area is heavily disturbed, with very little riparian vegetation. ONHIC (2007) reports no Willamette daisy in the action area.

5 ENVIRONMENTAL BASELINE

5.1 AQUATIC HABITAT

The Willamette River originates on the western slopes of the Cascade Mountains and flows north through the Willamette Valley until it enters the Columbia River at Portland, Oregon. Its course takes it through several different management areas including the following: U.S. Forest Service, private agricultural and forestry land, and urban development. The Willamette Valley was settled during the middle of the 19th century and has been subjected to extensive human influences such as cities, farmlands, logging, grazing, and other developments. The valley floor has a very gentle, north-facing slope. As a result the Willamette River is a sluggish stream with many meanders, especially from Oregon City southward (Franklin and Dyrness 1973). Extensive channelization of the Willamette River has reduced the historic river of meandering, braided channels with numerous sloughs and backwater areas and a broad floodplain to essentially a single channel (Altman et al. 1997).

Water quality in the project-area reach of the Willamette River reflects its urban location and disturbance history. The lower Willamette River, which extends from the mouth to Willamette Falls and includes the project site, is currently listed on the DEQ 303(d) List of Water Quality Limited Water Bodies. DEQ listed water quality problems identified in the project area include toxics (mercury levels), biological criteria (fish skeletal deformities), bacteria (fecal coliform) and temperature (DEQ 2006).

The ODFW defined in-water work period for the Willamette River, including the project site, is July 1 to October 31 and December 1 to January 31 (ODFW 2008). However, due to the high number of listed fish present during the December to January in-water work period, NMFS is not allowing construction activities to occur below OHW during this period. The permitted in-water work window is from July 1 to October 31.

5.2 AQUATIC HABITAT BASELINE CONDITIONS

The NMFS Matrix for the action area is presented in Table 4. The assessment addresses the action area rather than watershed scale, because the project encompasses the confluence of three watersheds. In addition, the Willamette watershed is too large to make reasonable generalizations about. The existing conditions in the action area were compared to standards established by NMFS (1996) to determine the "baseline conditions" category. The reasons for category determinations are noted in the table.

5.3 TERRESTRIAL HABITAT

Riverfront Park is located on the west side of McLoughlin Boulevard between Harrison Street and the Kellogg Creek. Land use adjacent to the park is primarily commercial development. The developed land occurs east of McLoughlin Boulevard, where gas stations, a bank, hair salon, restaurant, thrift store, and parking lots are located. The Kellogg Creek Waste Treatment Plant is located south of Kellogg Creek.

Black cottonwood (*Populus balsamifera*) trees of various ages line the shore of the Willamette River, while larger mature cottonwood and mid-mature big-leaf maple (*Acer macrophyllum*) (over 100 feet tall) grow on upland slopes. Himalayan blackberry (*Rubus armeniacus*) and/or English ivy (*Hedera helix*) dominate the understory of all forested areas. Non-forested areas are comprised of maintained grass, pavement, or commercial structures. The maintained grass areas are dominated by Kentucky bluegrass (*Poa pratensis*) and numerous weedy species. Surrounding areas that are not part of the Willamette River Greenway have been converted to commercial and public uses.

Table 4. Action Area Salmonid Environmental Baseline Condition Summary

PATHWAY	INDICATORS	BASELINE CONDITIONS
Water Quality	Temperature	Not properly functioning
		Waterways can exceed temperature thresholds for rearing habitat
	Sediment	Not properly functioning
		Johnson Creek listed on 303d list for sediment. Gravel and cobble substrate is more than 17% fines at surface.
	Chemical Contamination & Nutrients	Not Properly functioning
		303d listed for PCB, hydrocarbons, dieldrin, DDT, and high fecal coliform counts in addition to other parameters. Receives urban and agricultural runoff.
Habitat Access	Physical Barriers	Properly functioning
		No barriers on Willamette River, There are only partial barriers on Johnson and Kellogg Creeks, and these lay upstream of the action area.

PATHWAY	INDICATORS	BASELINE CONDITIONS
Habitat Elements	Substrate	Not Properly functioning
		Gravel and cobble substrate is generally embedded over 30%.
	Large Woody Debris	Not Properly functioning
		Densities are far below 80 pieces per mile, and potential recruitment trees have been removed in many reaches.
	Pool Frequency and Pool Quality/Size	Not applicable to mainstem Willamette or the mouths of Johnson and Kellogg Creeks.
	Off-Channel Habitat	Not properly functioning
		Extensive bank hardening and channel alterations have greatly reduced the number, quality, and accessibility of off-channel habitats.
	Refugia	Not properly functioning
		Action area and vicinity are fully urbanized.
Channel Conditions and Dynamics	Width/Depth Ratio	Properly functioning
	Streambank Condition	Properly funcitoning
		Less than 10% of bank in the action area is actively eroding.
	Floodplain Connectivity	Not properly functioning
		Development within the floodplain has eliminated off-channel floodplain habitat.
Flow/Hydrology	Change in Peak/Base Flows	Not properly functioning
		Hydrology reflects fully urbanized conditions
	Increase in Drainage Network	Not properly functioning
		Numerous roadside ditches, storm sewers, etc. throughout action area vicinity
Watershed Conditions	Road Density and Location	Not properly functioning
		High road density including valley bottom roads.
	Disturbance History	Not properly functioning
		Over 15% of action area vicinity has been disturbed, little or no "late successional old growth" forest remains.
	Riparian Reserve/Conservation Areas	Not properly functioning
		Riparian vegetation is fragmented and is less than 70% intact; commonly dominated by invasive/exotic species.

Note: Baseline conditions were assessed following NMFS (1996).

6 EFFECTS OF THE ACTION

This section includes an analysis of the direct and indirect effects of the proposed action on the species and/or critical habitat and its interrelated and interdependent activities. Factors considered in the analysis include the distribution, timing, duration, and nature of the action, as well as the frequency, severity, and intensity.

6.1 DIRECT IMPACTS

The action area of the Willamette River, Johnson Creek and Kellogg Creek provides rearing and migration habitat for chinook, coho and steelhead (ODFW 2008 and Streamnet 2008). Direct effects of the proposed project are those immediate impacts resulting from construction. Potential direct impacts to fish species and their habitats are typically related to earthmoving activities and in-water work.

Beneficial effects from the project include habitat improvements in riparian and shallow water areas. The river bank will be re-graded, stabilized, and replanted with native vegetation to prevent erosion and potential sedimentation/contamination of salmon habitat. Grading will create a shoreline that features areas of gradual elevation change containing distinct terraces and emergent vegetation. These emergent areas will provide juvenile salmonids additional cover during out-migration and an increased insect prey production. Invasive plants and metal debris will be removed from the riverbank and shoreline areas; larger pieces of concrete rubble will be broken up and removed or recycled onsite. Vegetation will be planted on the bank to create a variety of native plant communities that will eventually provide shade, potential woody debris reserves, allochthonous nutrient contributions to the river, and insect (salmonid prey) production. These actions will cumulatively provide a net benefit by establishing a total of approximately 1.89 acres of native vegetation in the shallow water, riparian, and upland areas impacted by the park's construction.

Fish Entrapment and Potential Take

In-water work areas will be isolated with turbidity curtains or another Engineer-approved isolation barrier to avoid contaminating river water and to exclude fish. Any adult fish are expected to leave the immediate vicinity when the isolation barriers are installed, avoiding adult entrapment. Fish trapped within the isolation barrier will be removed by a qualified biologist. It is possible that individuals could be injured or killed during the removal process. It is assumed that up to five percent of the fish handled during the removal process could be killed.

Hydro-acoustic Impacts from Pile Driving

Construction of the boarding dock associated with the new boat ramp and floating dock will require pile driving. All pilings will be 24 inches in diameter or smaller. Pile driving for in-water structures can cause intense temporary underwater sounds that may affect the behavior of salmon up to approximately 2,000 feet away (NMFS 2003). These hydro-

acoustic effects can kill salmonids (e.g., by ruptured swim bladders and causing lethal injury to other various organs) or can be sub-lethal (e.g., injury or harassment and displacement from productive feeding habitats) (Hastings 1995, 2002). Bubble-curtains or other approved measures will be used to reduce noise impacts when piles are driven. Due to the depth of the water more than one bubble generating ring may be required to prevent noise impacts. The currents within the channel will likely require confined bubble curtains as currents are expected to be greater than 1.7 miles per hour at the time piles are driven (See project specifications in Section 7).

Turbidity and Sedimentation

There will be short-term impacts to the aquatic habitat due to turbidity and sedimentation. There may be a short-term increase in suspended sediment associated with the placement and removal of the isolation barriers for demolition of the existing boat ramp and construction of the new boat ramp, installation and removal of the erosion control measures, and reconstruction of the bank slope and installation slope stabilization measures. Suspended sediment has been shown to change salmon behavior and cause mortality under high levels of turbidity. The effects of suspended sediments may be sub-lethal or lethal, and are generally correlated to the concentration of sediment within the water column. The sub-lethal effects of turbidity generally include avoidance and distribution, reduced feeding and growth, respiratory impairment, reduced tolerance to disease and toxicants, and physiological stress. Soils can also act as a delivery mechanism for transferring chemical pollutants from upland sources (MB&G 2004). The isolation measures will be installed during the proposed in-water work window when adult and juvenile salmonids are less likely to occur within the action area. The sediment plume associated with the installation of the containment system is anticipated to be localized. However, if the sediment plume exceeds water quality standards, measured by visual observation, additional erosion control measures such as turbidity curtains, will be installed to minimize potential impacts.

Vegetation Impacts

The redevelopment of the park will primarily impact non-native vegetation located along the banks of Kellogg Creek and the Willamette River. A few riparian trees will also be removed. The banks along the Kellogg Creek and the Willamette River will be re-vegetated using a native plant palette, including the following: *Acer macrophylla, Cornus nuttallii, Corylus cornuta var. californica, Fraxinus latifolia, Quercus garryana, Carex obnupta, Cornus sericea 'kelseyii', Deschampsia caespitosa, Gaultheria shallon, Juncus effuses, Mahonia repens, Physocarpus capitatus, Ribes triste, Salix spp.*, and Douglas spirea *(Spirea douglasii)* (see Appendix D – Revegetation Plan). This change in vegetation will improve the overall function of the existing riparian corridor. Erosion control measures will be installed to ensure that sediment from recently disturbed ground does not enter the river or streams.

Potential Chemical Contamination

Potential sources of contaminants associated with this project include refueling track-mounted equipment located on the banks, and "green" concrete (concrete that has cured for less than 24 hours) associated with boat ramp construction. Full containment of fuel, other hazardous materials, and green concrete will be required to prevent these materials from entering the waterway. If an accidental minor spill should occur, there would be a localized, temporary impact to water quality. The accidental introduction of chemical contamination can alter fecundity, increase disease, shift biotic communities, and reduce the overall health of migrating salmon (MB&G 2004). If contamination levels are high enough, they may disrupt biological processes, causing direct lethal effects. The introduction of chemicals can be acute, occurring as a result of an accidental spill or equipment leaks during construction activities, or chronic, resulting from increased stormwater runoff to waterways (MG&G 2004). Containment measures will be installed to minimize the likelihood of a major spill. Impacts to salmon within the action area due to potential contamination would be short-term.

Stormwater

The project will create a net increase of 27,065 square-feet (0.6 acres) of impervious area. The water quality facilities meet the design standards of the current City of Portland, Stormwater Management Manuel (SWMM). SWMM regulations require water quality facilities to treat stormwater runoff generated by 0.83-inches of rainfall over a 24 hour period. Stormwater runoff will be treated and detained in a series of vegetated swales, wet detention ponds, flow-through planter and filter strip. Several of these features, as described in Section 3.11, do not release any water, which means all water quality event runoff is stored and slowly infiltrated. Since infiltration rates in this area are not high enough to infiltrate the 2-, 5-, 10-, and 25-year storm event, a detention system was designed to meet the pre-development discharge rate requirements.

6.2 INDIRECT EFFECTS

Indirect effects are those caused by the action, but occurring later in time. Indirect effects of this project are primarily beneficial, including replacing non-native and invasive species with native riparian vegetation, stabilizing the banks with bioengineered methods where possible, and removing deleterious material along the banks of the Willamette River and Kellogg Creek. Marginally improved rearing habitat will result from these activities. Water quality will be improved compared to existing conditions due to the installation of stormwater treatment and detention facilities within the project area.

The proposed project will relocate the existing boat ramp from its current location to approximately 150 feet upstream of Kellogg Creek and construct a new transient dock approximately 145 feet from the mouth of Kellogg Creek. Concerns were raised during the agency pre-application meeting in regards to the transient dock location, in particular in combination with the existing boat ramp location. This conflict is of special concern to

NMFS given the potential for restoration of Kellogg Creek/Willamette River confluence if the dam is removed. The specific concerns include streambank erosion caused by boat wake, pollutants, and the potential for the combination of these two structures to inhibit successful juvenile migration.

Waves or wake produced by boats is the primary factor by which boats can influence shoreline erosion. River systems are likely to be most influenced by boat-induced waves, as boats may operate relatively close to shore. Loosely consolidated, steep, unvegetated banks are more susceptible to shoreline erosion (Asplund 2000). To address the concerns of streambank erosion a "no-wake zone" will be posted near the boat ramp and transient dock to limit boat wake caused by use of these facilities. With the "no wake zone", large boats using the transient dock would be required to approach the dock slowly, reducing the boats wake and wave intensity. The streambanks along Kellogg Creek and Willamette River are being re-contoured to eliminate steep banks and revegetated to minimize the risk of erosion.

A study in the Rogue River looked at the effects of boat traffic on juvenile salmonids. This study found most juvenile salmoids exhibit behavioral responses when boats passed directly overhead. In contrast few juvenile salmonids exhibited behavioral responses when boats passed at a lateral distance of 16 ft (5 meters) from fish. These findings suggested that boats must pass close to juvenile salmonids to stimulate behavioral response noticeable to observers. This study also compared juvenile salmonid responses to boat traffic levels. The study suggested that motorboat operation increased physiological stress in juvenile chinook salmon that inhabited side channel in the Rogue River where boat traffic was low. There was no evidence of physiological stress in resident juvenile chinook found in the mainstem where motorboat traffic frequently occurred (Satterthwaite 1995). It could be assumed that juvenile salmonids in the Willamette River would have similar responses. Juvenile salmonid recently entering the Willamette River could be more likely to exhibit behavioral changes than juveniles that had been exposed to boat traffic in the river. However there was no indication on how long it took the juveniles to become acclimated to boat traffic. The proposed transient dock is located over 100 feet from the closest point on the shore, allowing juveniles to migrate along the shoreline without boat traffic or overwater structure effects.

Construction of the transient dock and boarding dock along the boat ramp could provide habitat for predatory fish, potentially increasing predation on juvenile salmonids. Because salmonid smolts typically migrate out along the shallow water margins, placing the structure 100 feet out into the water will prevent most of the potential adverse effect to the threatened and endangered fish species addressed here. Piscivorous fish known to reside in the lower Willamette River, such as northern pikeminnow (*Ptychocheilus oregonensis*), walleye (*Sander vitreus*), smallmouth bass (*Micropterus dolomieu*), and largemouth bass (*M. salmoides*), prey on juvenile salmonids as a part of their diet (Stein 1970, Rieman et al. 1991, Farr and Ward 1993, Shrader and Moody 1997, Zimmerman

1999 as sited in Friesen et al 2005). A study was conducted to investigate to determine if these species pose a risk to threatened and endangered salmonids in the lower Willamette River. This study concluded that walleye are probably too rare in the lower Willamette River to have an effect on salmonid survival, and neither northern pikeminnow nor largemouth bass appeared to prey on salmonids in this vicinity. Considering their relative abundance (all size classes), diet, and ubiquity, smallmouth bass probably pose the most significant potential threat to juvenile salmonids in the lower Willamette River. Currently, densities of all large predator fishes are low, and their effects on juvenile salmonids are likely negligible (Friesen et al 2005).

Piscivores prefer low-light environments and overhanging structures that provide cover (Mesing and Wicker 1986, Probst et al. 1984 as sited in Friesen et al 2005). Low-light environments are generally preferred by piscivores, because many utilize a lie-in-wait strategy to capture prey. Friesen et al (2005) found that piscivores in the low Willamette River tended to be close to shore (within 20% of the total river width), and were often associated with pilings and rocky banks (rock outcrop, rock, riprap). Nearshore structures that provide cover may increase the risk of predation on prey fish, such as juvenile salmonids. Much of the natural bank habitat of the lower Willamette River has been transformed to control flooding, prevent erosion, and accommodate commercial shipping. The numerous piers, docks, seawalls, and armored banks (e.g. riprap) may provide an advantage to piscivores. The proposed transient dock and boarding dock located along the boat ramp will provide a small amount of shade and cover that could attract predatory fish. However, the transient dock would be located in deep water (at least 20 feet) and subject to flow velocities higher than optimum for the predators that may be attracted.. The dock will be designed to provide light penetrating panel or grates to minimize the shade effects of the dock. Approximately 20% of the dock will be composed of light transmitting material. Predatory fish tend to prefer shallow water with structural protection from high flow velocities. Thus the proposed transient dock is unlikely to provide habitat for piscivorous fish. Study in the Rogue River also examined susceptibility to predation of juvenile salmonids from squawfish in relation to tour boat traffic. The study found that the incidence of salmoinds as squawfish prey did not differ between areas with high tour-boat traffic compared to low boat traffic. This finding suggested that tour-boat operation had minimal effect, if any, on the susceptibility of the juvenile salmonids to predation by squawfish.

Replacement of the boat ramp would improve migration and rearing habitat by reducing the area of fill material along the banks of the Willamette River. Bank recontouring and stabilization with large wood would create temporary in-water work impacts, but would create long-term beneficial effects to juvenile outmigration and rearing habitat. Shoreline plantings would also improve these habitat functions. Removal of old rubble and pilings along the shoreline will also improve migration habitat for the salmon and steelhead smolts.

6.3 EFFECTS FROM INTERDEPENDENT AND INTERRELATED ACTIONS

An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification or "associated with" the proposed action. An interdependent activity is an activity that has no independent utility apart from the action under consultation or "because of" the proposed action. The proposed action upgrades, realigns, and replaces facilities, except for the new transient dock. The effects of this new transient dock are discussed above under Indirect Effects.

6.4 MINIMIZATION AND AVOIDANCE MEASURES

Conservation measures have been incorporated into the project design (Section 7) to minimize and avoid impacts to listed species and their habitat. These measures address in-water work, fish salvage and fish screen criteria, erosion control, containment of construction materials, handling of hazardous materials, and disturbance of riparian vegetation.

7 CONSERVATION MEASURES

The following mitigation and conservation measures are proposed to avoid, mitigate, or offset the adverse impacts of the proposed project on listed species, critical habitat, and EFH.

Project Design Measures

- Riparian shoreline native plantings
- Removal of existing debris and pilings
- Dock will be placed 100 feet offshore to avoid shoreline smolt migration corridors
- Dock will incorporate light-transmitting materials
- Stormwater-treatment design storm will be infiltrated to avoid pollutant discharges
- Project impervious surface will actually incorporate permeable pavement, reducing stormwater effects.

Erosion and Pollution Control Measures

- The contractor will adhere to permit conditions of NPDES 1200-C permit for the discharge of stormwater from construction sites. This permit is issued by DEQ under the authority delegated by the U.S. Environmental Protection Agency.

- An erosion and sediment control plan (ESCP) will be developed and implemented, in accordance with the conditions of the NPDES 1200-C permit. The ESCP may include, but is not limited to, the use of turbidity curtains, silt fences, temporary and permanent ground covers, and siltation ponds to protect water quality, with particular attention to safeguarding adjacent waterways.

- Erosion and sediment control measures will be implemented prior to ground disturbing activities, and shall remain in place until the project area is stabilized.

- Limit turbidity increase to 10 percent above background reading, as measured 100 ft downstream from the project.

- A pollution control plan will be developed and implemented, which includes limitations on chemical and fuel storage areas, as well as spill containment plans. Spill containment equipment must be stored on site, and the contractor must have the crew trained in its proper use. This plan shall satisfy all pertinent requirements of Federal, State, and Local laws and regulations.

- Construction equipment operating within 30 feet of any stream will contain appropriate spill containment measures, such as diapers.

- All construction equipment will be inspected and cleaned prior to operating within 150 feet of any stream. All construction equipment will be checked for fluid leaks and external oil, grease, dirt and caked mud will be removed. Untreated wash and rinse water will not be discharged into any stream. Temporary impoundments will be established to catch water from equipment cleansing, at least 150 feet from any stream and in a location that does not contribute untreated wastewater to any flowing stream.

- Non-work shift storage of equipment and vehicles, other than track-mounted vehicles and cranes, will occur at least 150 feet away from any stream, or within a fully contained area to prevent any contaminated runoff.

- If feasible, storage areas for fuels and other potentially hazardous materials and areas for refueling and servicing construction equipment and vehicles will be located at least 150 feet from any stream. If staging areas are located within 150 feet of any stream, full containment of potential contaminants will be provided to prevent soil and water contamination, as appropriate.

- Adequate containment measures will be implemented to prevent pollutants or construction and demolition materials from entering any stream.

- Maintain hazardous material containment booms and spill containment booms on site to facilitate the cleanup of hazardous material spills.

- If flooding of the work area is expected to occur within 24 hours, evacuate areas used for staging, access roads, or storage and remove materials, equipment, and fuel.

Habitat and Fish Impact Avoidance and Minimization Measures

- For the purpose of this project, the regulated work area (also defined as the in-water work area or ordinary high water elevation,) is defined as the area at or below the following elevation of 18.4 feet, as shown on the plans
- Construction below regulated work area will occur during the ODFW in-water work period, which extends from July 1 to October 31 in the Willamette River. The in-water work period for Kellogg Creek is July 1 to September 30. There is no in-water work proposed in Johnson Creek. An extension of the in-water work period requires approval by the Engineer, ODFW, NMFS, DSL, and USACE. Maintain passage for adult and juvenile fish for the duration of the project.
- Placement or removal of embankment material within the regulated work area is restricted to the in-water work period
- Impacts will be minimize through the use of appropriate construction techniques including work area isolation, turbidity monitoring, and other environmental protection controls. Where feasible, work would be conducted from upland areas to limit temporary impacts to waterways.
- Install isolation barriers or other Engineer approved containment method, to isolate in-water work areas from the aquatic environment. Installation and removal are restricted to the ODFW in-water work window. Isolation barriers are required for the removal of the existing boat ramp and construction of the new boat ramp.
- Notify the Engineer at least ten working days prior to completion of containment/isolation device construction. Provide qualified biologist access to the containment/isolation devices to remove fish trapped within the devices before beginning work within the containment/isolation devices. Entrapped fish will be removed in accordance with NMFS guidelines identified in the biological opinion.
- Contaminated or sediment-laden water from the project or water contained within a containment/isolation device will not be discharged directly into any waterway until satisfactorily treated (e.g., by bioswale, filter, settlement pond, pumping to a vegetated upland location, bio-bag or dirt-bag).
- Monitor turbidity during construction per DEQ section 401 permit requirements.
- Blasting is prohibited in any waterway.

- Screen water pump intakes according to the NMFS Juvenile Fish Screen Criteria for Pump Intakes (1997). [Note: this is online at http://swr.ucsd.edu/hcd/fishscrn.htm]

- Minimize alteration or disturbance of stream banks and existing riparian vegetation. Replant all areas temporarily disturbed by construction activities, as shown on the plans.

- Reinitiate ESA and EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect listed species, critical habitat or EFH, or if new information becomes available that affects the basis for NMFS conservation recommendations.

- Implement the following conservation measures where steel piles are driven within the wetted channel:

  - When using impact drivers to install a piling, use the smallest driver and the minimum force necessary. Use a drop hammer or hydraulic impact hammer when feasible and set the drop height to the minimum necessary to drive the piling.

  - If currents are 1.7 miles per hour or less, surround the piling being driven with an unconfined bubble curtain for the full depth of the water column.

  - If currents are greater than 1.7 miles per hour, surround the piling being driven with a confined bubble curtain (e.g., a bubble ring surrounded by a fabric or metal sleeve) for the full depth of the water column.

  - An additional bubble ring will be added for each 35 feet of water depth

8 EFFECTS DETERMINATION

8.1 FISH

The project **may affect**, and is **likely to adversely affect** steelhead trout, chinook salmon, and coho salmon. Because these species may be present in project area and extensive work below OHW elevation and in the water is proposed, a short-term incidental take is likely during project construction.

8.2 WILDLIFE

The project will have **no effect** on northern spotted owl because neither this species nor suitable habitat occurs within the project vicinity.

The project will have **no impact** on streaked horned lark, should this candidate species become listed, because there is no report or evidence of this species occurrence in the action area.

8.3 PLANTS

The project will have **no effect on any of the listed plant species** addressed here because there is no reported occurrence or apparent suitable habitat in the action area.

8.4 CRITICAL HABITAT

Critical habitat has been designated for chinook and steelhead within the project area. Project construction will have short term impacts to critical habitat. Design features have been incorporated into the new boat ramp and transient dock to minimize long term impacts. The proposed project **will not result in the destruction or adverse modification of designated critical habitat** for Lower Columbia River chinook or steelhead. No critical habitat has been designated for any listed wildlife or plant species addressed in this BA within the project action area.

9 ESSENTIAL FISH HABITAT

Public Law 104-267, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to establish new requirements for "Essential Fish Habitat" (EFH) descriptions in Federal fishery management plans and to require Federal agencies to consult with NMFS on activities that may adversely affect EFH. "Essential Fish Habitat" means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" as defined by the Magnuson-Stevens Act (PFMC 1998). The Pacific Fisheries Management Council (PFMC) has recommended an EFH designation for the Pacific salmon fishery that would include those waters and substrate necessary to ensure the production needed to support a long-term sustainable fishery.

The consultation requirements of section 305(b) of the Magnuson-Stevens Act (16 U.S.C. 1855(b)) provide that:

> Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;
>
> NMFS shall provide conservation recommendations for any Federal or State activity that may adversely affect EFH;
>
> Federal agencies shall, within 30 days after receiving conservation recommendations from NMFS, provide a detailed response in writing to NMFS regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NMFS, the Federal agency shall explain its reasons for not following the recommendations.

9.1 IDENTIFICATION OF ESSENTIAL FISH HABITAT

Salmon fishery EFH includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except above the impassable barriers identified by PFMC. Chief Joseph Dam, Dworshak Dam, and the Hells Canyon Complex (Hells Canyon, Oxbow, and Brownlee Dams) are among the listed man-made barriers that represent the upstream extent of the Pacific salmon fishery EFH. Salmon EFH excludes areas upstream of longstanding naturally impassable barriers (i.e., natural waterfalls in existence for several hundred years). In the estuarine and marine areas, proposed designated salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (230.2 mile) offshore of Washington, Oregon, and California, north of Point Conception.

9.2 CHINOOK AND COHO SALMON

The Willamette River, Johnson Creek and Kellogg Creek provides rearing and migration habitat for coho and chinook within the action area. However, suitable spawning habitat is not located within the vicinity of the project. Also, high toxicity and the lack of adequate riparian vegetation limit rearing habitat within the action area. In-water work isolation barriers could entrap juvenile chinook and coho. Impacts of this project on chinook and coho habitat are discussed in section 6. Fish passage will be maintained during construction.

9.3 CONCLUSION

The conservation measures and special provisions described in this BA (section 7.0) are considered adequate to minimize adverse effects on EFH for coho salmon and chinook salmon in this project. However, it is believed that the proposed action will still adversely affect EFH for these species due to construction and the new over-water structure as discussed above.

10 PREPARERS AND CONTRIBUTORS

Kristine Marshall, DEA Biologist, is the primary author of this report. John Macklin, DEA Biologist, provided Total Quality Management reviews. Gina Baragona, DEA Administrative Assistant, prepared the report drafts. Melissa Foltz, DEA Project Assistant, prepared the graphics.

Preparer _____

Reviewer _____

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BIBLIOGRAPHY

Asplund, T. 2000. The effects of motorized watercraft on aquatic ecosystems. Wisconsin Department of Natural Resources, Bureau of Integrated Science Services and University of Wisconsin – Madison , Water chemistry Program PUBL-SS-948-00

Busby, P.J., T.C. Wainwright, G.J. Bryant, L.J. Lierheimer, R.S. Waples, f.W. Waknitz, and I.V. Lagomarsino. 1996. *Status review of west coast steelhead from Washington, Idaho, Oregon and California.* U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-27.

Csuti, B, A.J. Kimerling, T.A. O'Neil, M.M. Shoughnessy, E. P. Gaines , and M.P. Huso. 1997. Atlas of Oregon Wildlife. Corvallis, Oregon: Oregon State University Press.

Frank.in, J.F. and C.T. Dyrness. 1973. *Natural vegetation of Oregon and Washington.* Pacific Northwest Forest and Range Experiment Station, USDA Forest Service, Portland, Oregon.

Friesen, T.A., H.K. Takata, J.S. Vile, J.C. Graham, R.A. Farr, M.J. Reesman, B.S. Cunningham. 2003. *Relationships between bank treatment/nearshore development and anadromous/resident fish in the lower Willamette River.* Annual Progress Report, July2001-June2002. Prepared for the City of Portland, Bureau of Environmental Services, Endangered Species Act Program, Portland, Oregon; and the Oregon Department of Fish and Wildlife. February 2003.

Friesen, T.A. et al 2005. *Biology, behavior, and resources of resident and anadromous fish in the lower Willamette River. Final Report of Research, 2000-2004.* Prepared for the City of Portland, Bureau of Environmental Services, Endangered Species Act Program, Portland, Oregon; and the Oregon Department of Fish and Wildlife. March 2005.

Hastings, M.C. 1995. Physical effects of noise on fishes. In Proceedings of INTER-NOISE 95, The 1995 International Congress on Noise Control Engineering-Volume II. Pp. 979-984. Newport Beach, California, July 10-12, 1995 as cited in U.S. Fish and Wildlife Service (USFWS) and NMFS (National Marine Fisheries Service). 2004. Endangered Species Act section 7 consultation, information concurrence and formal biological opinion and conference and Magnuson-Stevens fishery conservation and management act essential fish habitat consultation for Oregon Department of Transportation OTIA III Statewide Bridge Delivery Program, Oregon. USFWS and NMFS, Northwest Region, June 28, 2004.

Hastings, M.C. 2002. Clarification of the meaning of sound pressure levels and the known effects of sound on fish. August 26, 2002; revised. August 27, 2002. pp. 8 as cited in U.S. Fish and Wildlife Service (USFWS) and NMFS (National Marine Fisheries Service). 2004. Endangered Species Act section 7 consultation, information concurrence and formal biological opinion and conference and Magnuson-Stevens fishery conservation and management act essential fish habitat consultation for Oregon Department of Transportation OTIA III Statewide Bridge Delivery Program, Oregon. USFWS and NMFS, Northwest Region, June 28, 2004.

Johnson Creek Watershed Council (JCWC). 2003. Johnson Creek Watershed Action Plan An Adaptive Approach. http://www.jcwc.org/actionPlan/TOC.htm.

Mason, Bruce and Girard (MB&G). 2004. Biological Assessment for ODOT OTIA III Statewide Bridge Delivery Program. Portland, Oregon. March 1, 2004.

National Marine Fisheries Service (NMFS). 1996. *Making Endangered Species Act determinations of effect for individual or grouped actions at the watershed scale.* Environmental and Technical Services Division, Habitat Conservation Branch.

National Marine Fisheries Service (NMFS). 2003. Endangered Species Act section 7 programmatic formal consultation and Magnuson-Stevens fishery conservation and management act essential fish habitat consultation for the oil spill response activities conducted under the Northwest Area Contingency Plan (NWACP). National Marine Fisheries Service, Seattle, Washington as cited in U.S. Fish and Wildlife Service (USFWS) and NMFS (National Marine Fisheries Service). 2004. Endangered Species Act section 7 consultation, information concurrence and formal biological opinion and conference and Magnuson-Stevens fishery conservation and management act essential fish habitat consultation for Oregon Department of Transportation OTIA III Statewide Bridge Delivery Program, Oregon. USFWS and NMFS, Northwest Region, June 28, 2004.

Oregon Department of Environmental Quality (ODEQ). 2006. ODEQ web-site. http://www.deq.state.or.us/

Oregon Department of Fish and Wildlife (ODFW). 2008. Natural Resources Information Management Program. Distribution/Habitat maps for steelhead, chinook, and coho in Willamette River, Kellogg Creek and Johnson Creek. ftp://rainbow.dfw.state.us/nrimp/information/index.htm

Oregon Department of Fish and Wildlife (ODFW). *Oregon Guidelines for Timing of In-water Work to Protect Fish and Wildlife Resources.* June 2008

Oregon National Heritage Information Center (ONHIC). 2005. Data system search for rare, threatened, and endangered plant and animal records for Johnson Creek Bridge Replacement Project, October 14, 2005.

Satterthwaite, T.D. 1995. *Effects of boat traffic on juvenile salmonids in the Rogue River.* Oregon Department of fish and Wildlife and Bureau of Land Management

Streamnet. 2008. Data system search for steelhead, chinook and coho distribution in Willamette River, Kellogg Creek and Johnson Creek. http://www.streamnet.org/online-data/query_intro.html

Thomas, J.W. et al 1990. A Conservation Strategy for the Northern Spotted Owl. Interagency Scientific Committee to address the Conservation of the Northern Spotted Owl.

U.S. Fish and Wildlife Service (USFWS). 2000. Endangered and threatened wildlife and plants: Endangered status for Erigeron decumbens var. decumbens (Willamette daisy) and Fender's blue butterfly (Icaricia icarioldes fenderi) and proposed threatened status for Lupinus sulphureus spp. kincaidii (Kincaid's lupine). Federal Register 65 FR 3875.

U.S. Fish and Wildlife Service (USFWS). 2001. Vol. 66 No. 143, Wed., July 25, 2001. Endangered and Threatened Wildlife and Plants: 12-month Finding for a Petition to List the Yellow-billed Cuckoo (*Coccyzus americanus*) in the Western Continental United States.

U.S. Fish and Wildlife Service (USFWS). 2008. USFWS website. Federally Listed and Proposed Endangered and Threatened Species, Candidate Species, and Species of

Concern That May Occur in Clackamas County.
http://www.fws.gov/oregonfwo/species/list Dated November 29, 2008

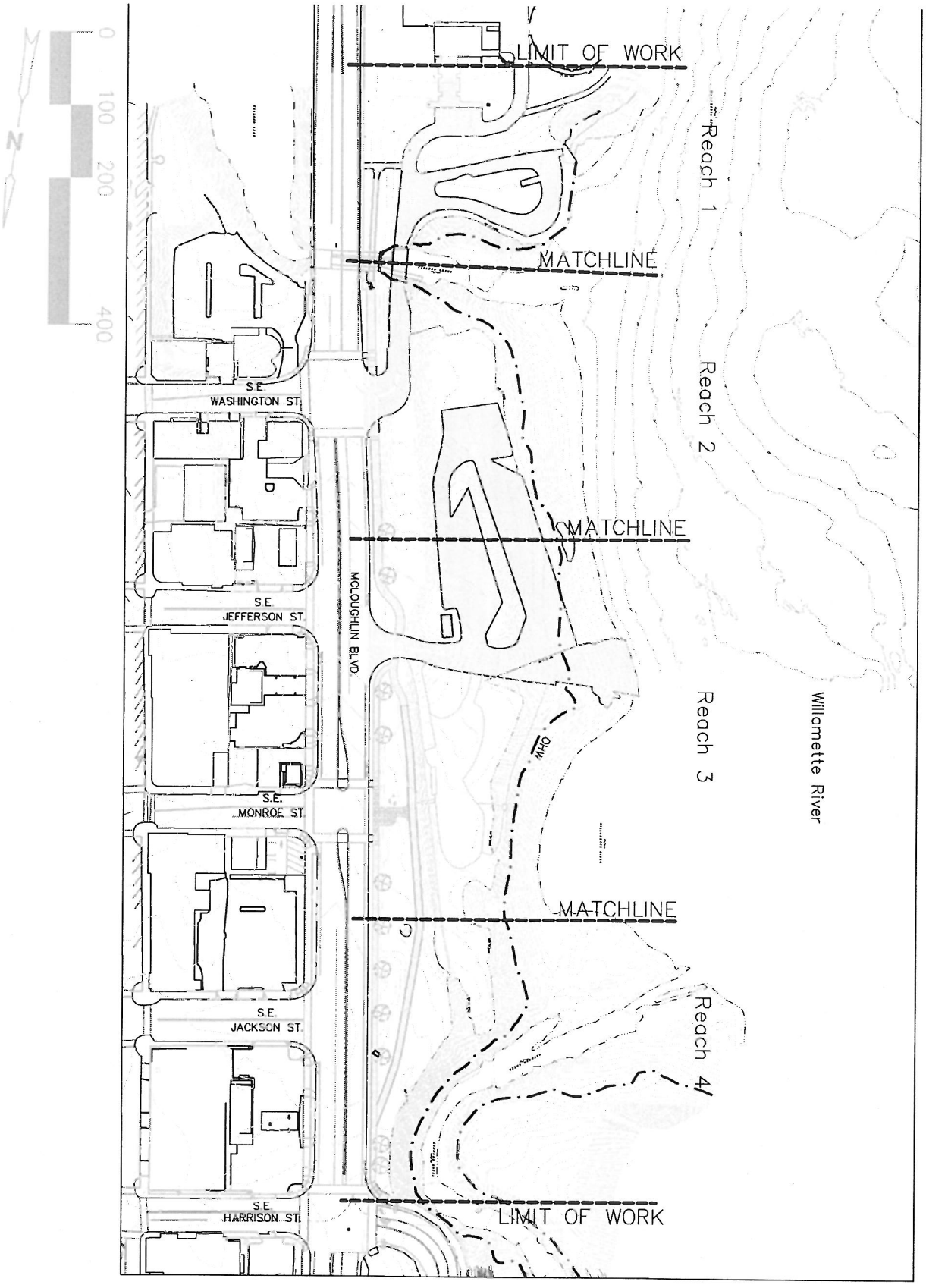
Woodward-Clyde Consultants. 1995. Johnson Creek Resources Management Plan. Prepared for Johnson Creek Corridor Committee. May 1995.

Personal Communications

Goudzwaard, Jim. US Army Corps of Engineers. 2006. Personnel communication regarding ordinary high water elevation at the project site. August 2006

APPENDICES

APPENDIX A – EXISTING AND PROPOSED SITE PLANS



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TITLE: Existing Site Plan

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210 West River Parkway
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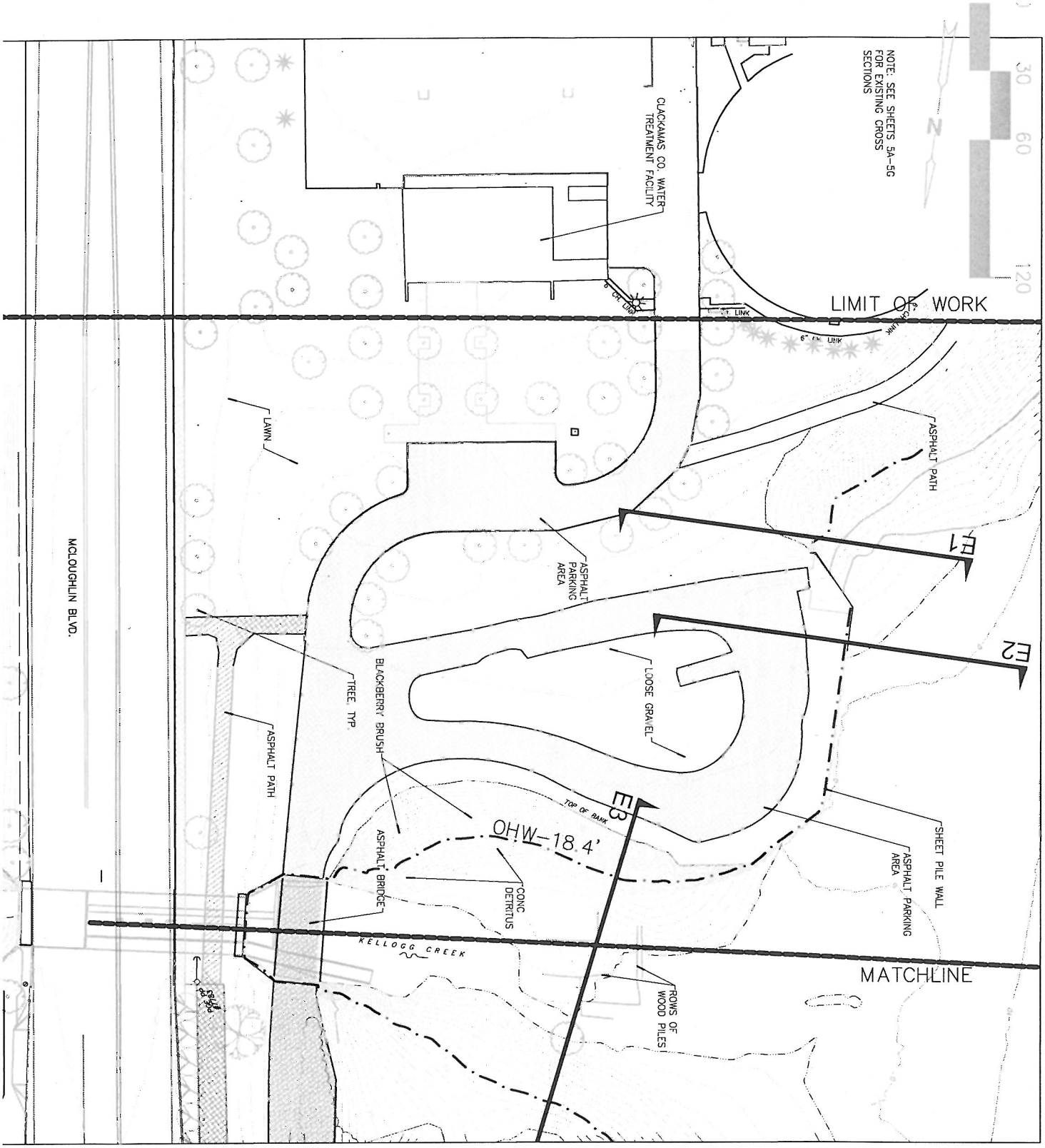

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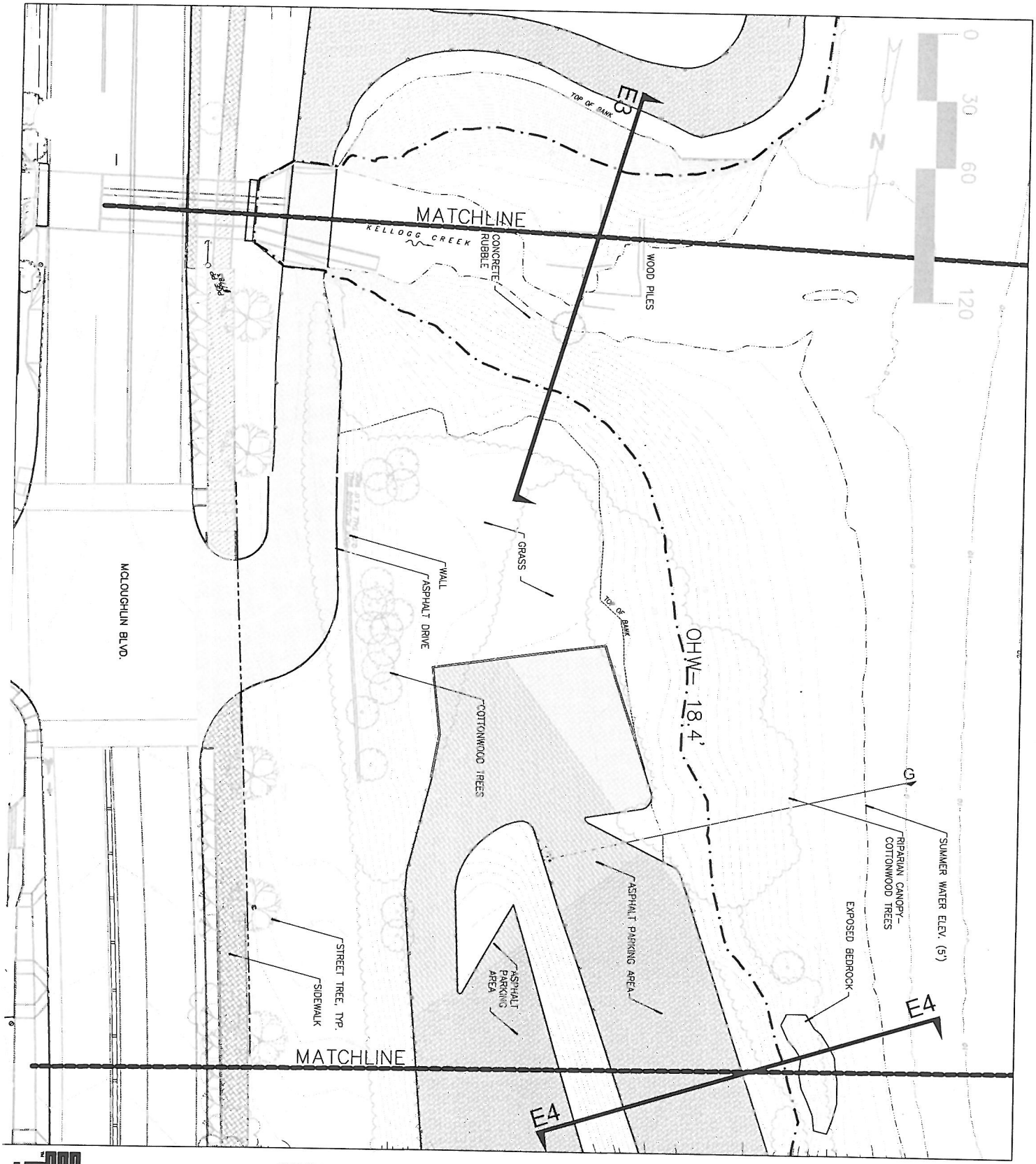

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TITLE: Existing Site Plan

Reach 2

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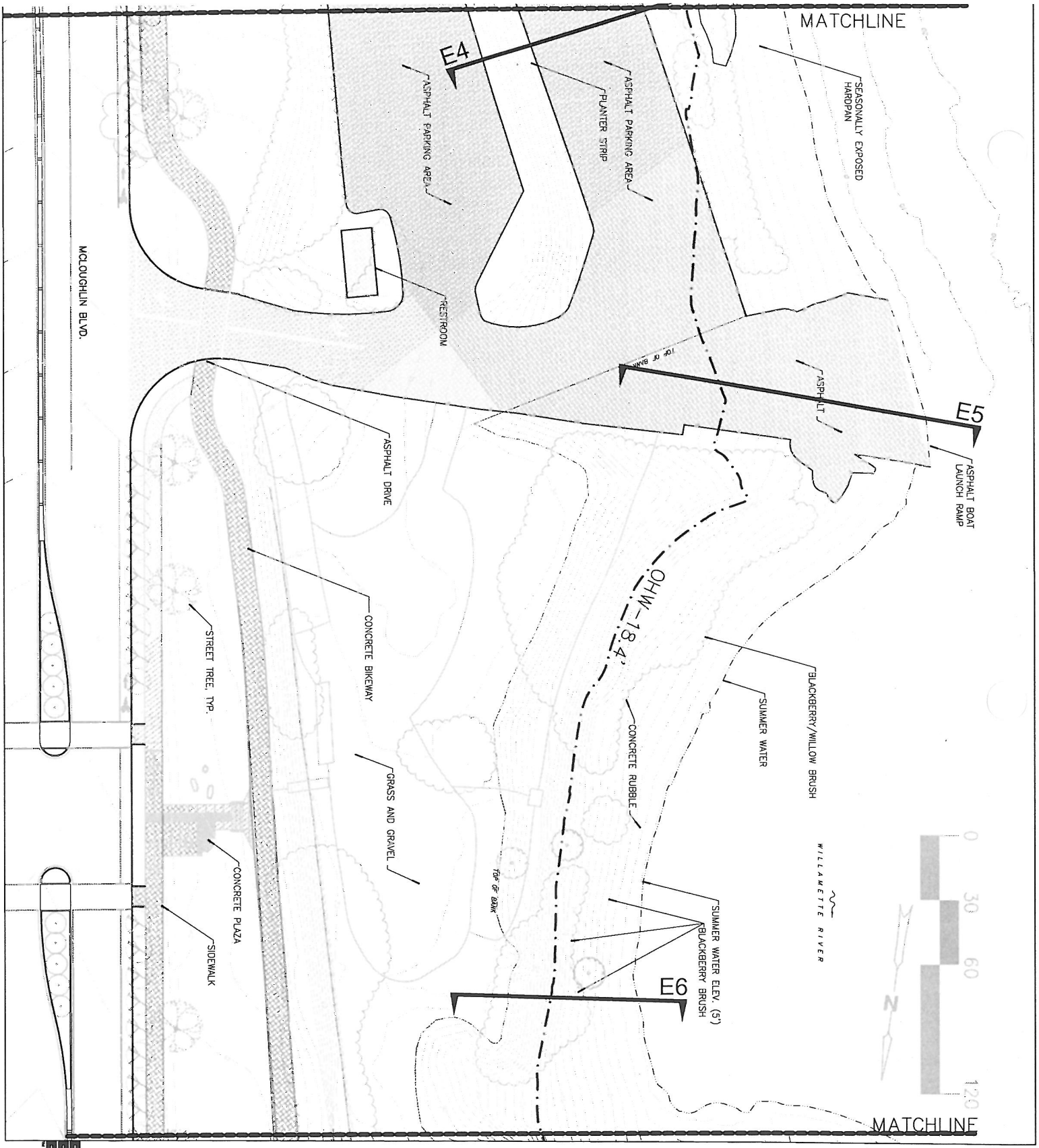

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Portland Oregon 97201
Phone 503.223.6663

PROJECT: Milwaukie Riverfront Park

TITLE: Existing Site Plan

Reach 3

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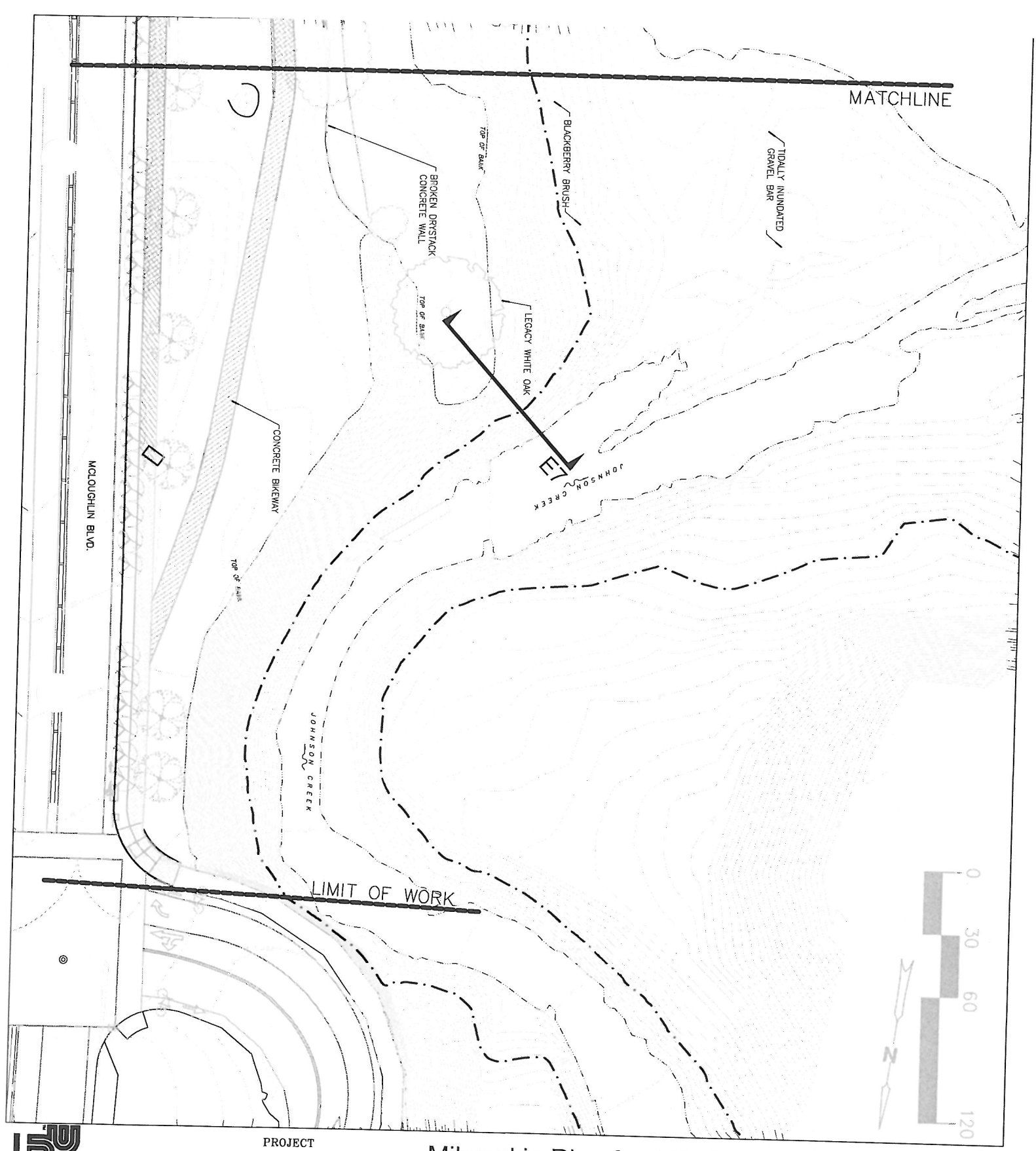

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Reach 4

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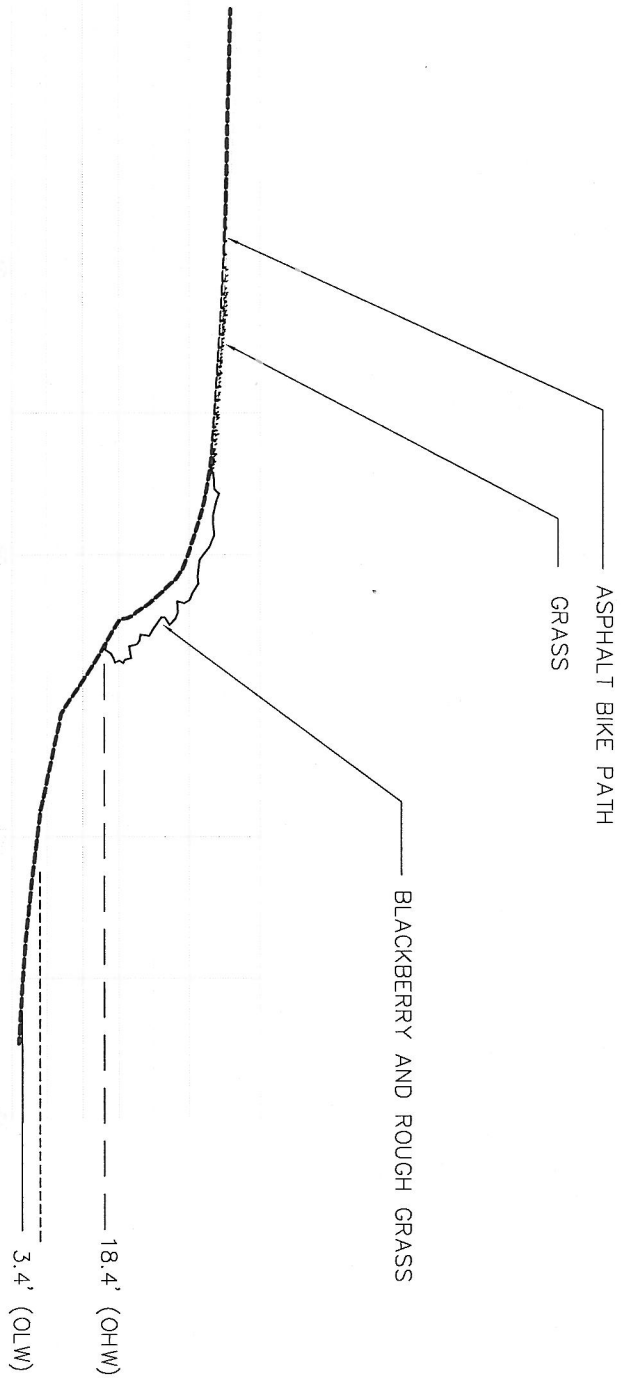

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SOUTH OF KELLOGG CRK

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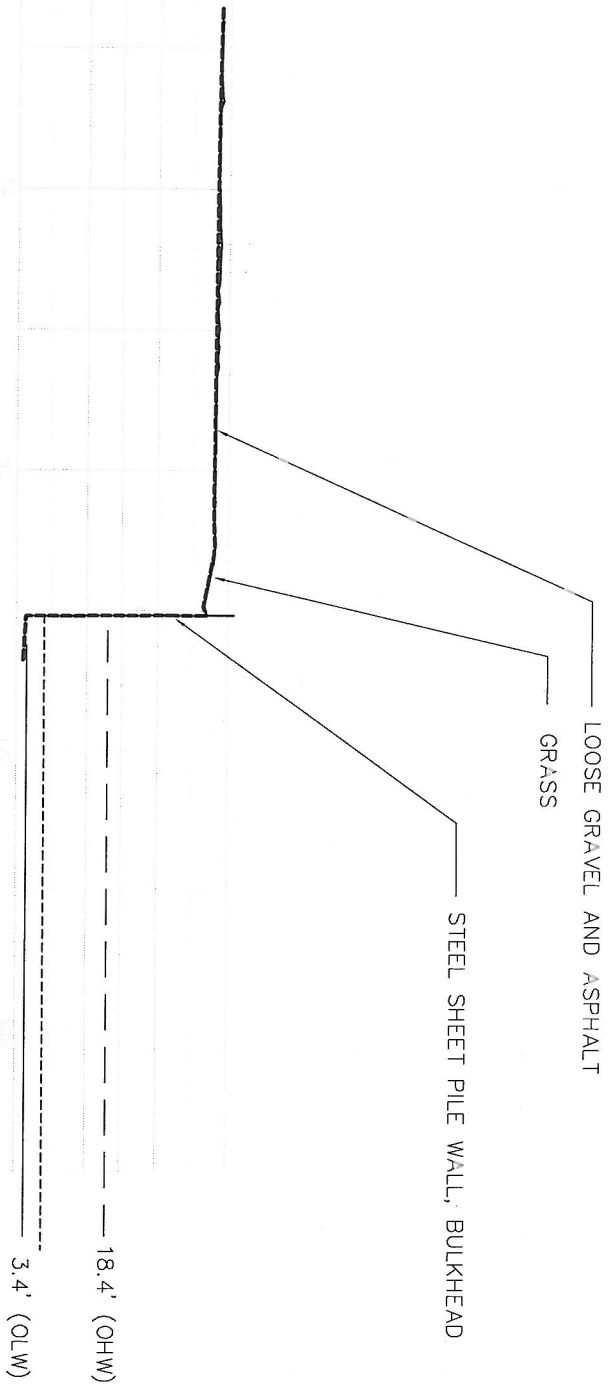

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210 West River Parkway
Oregon 97201
503.223.6663

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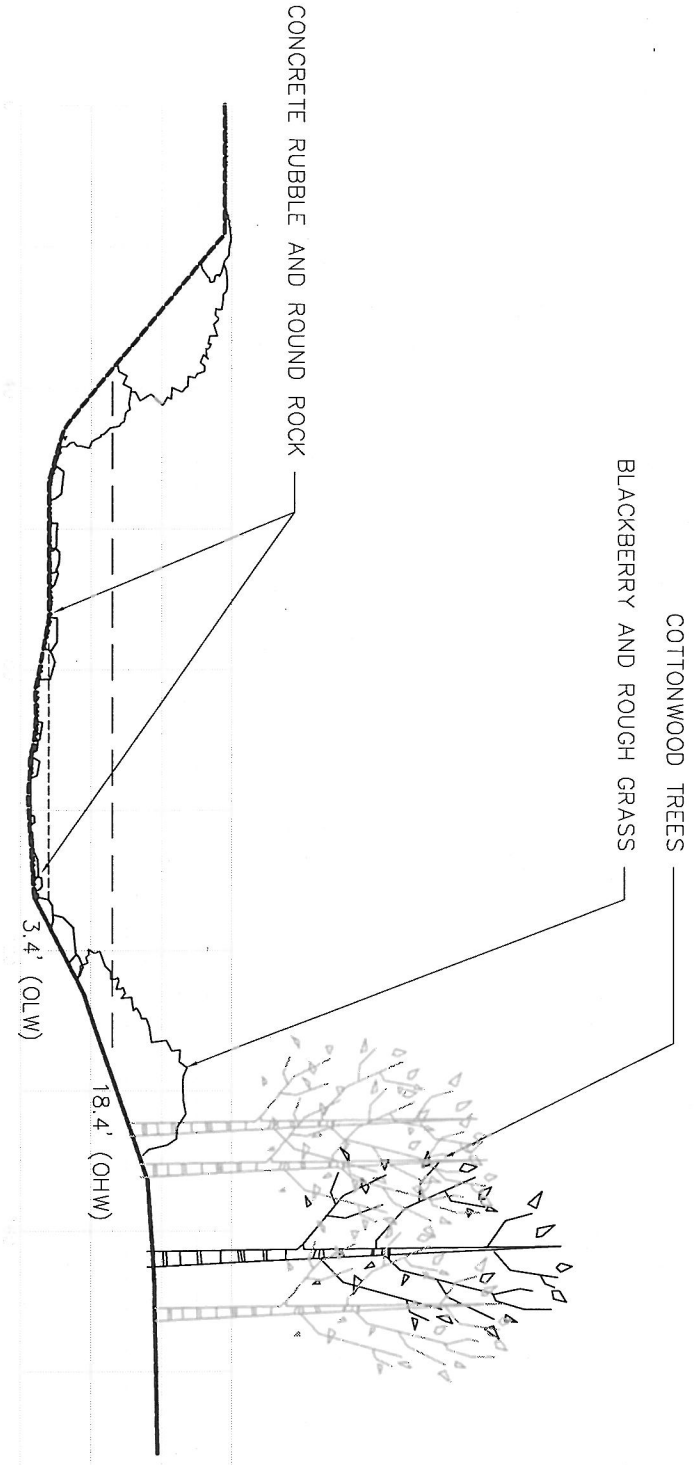
EXISTING CONDITIONS

TYPICAL OF KELLOGG
CRK WEST OF MCLOUGHLIN BLVD

SCALE: NONE

SECTION E3



DAVID EVANS AND ASSOCIATES INC.
2100 Southwest River Parkway
Portland Oregon 97201
Phone: 503.223.6663

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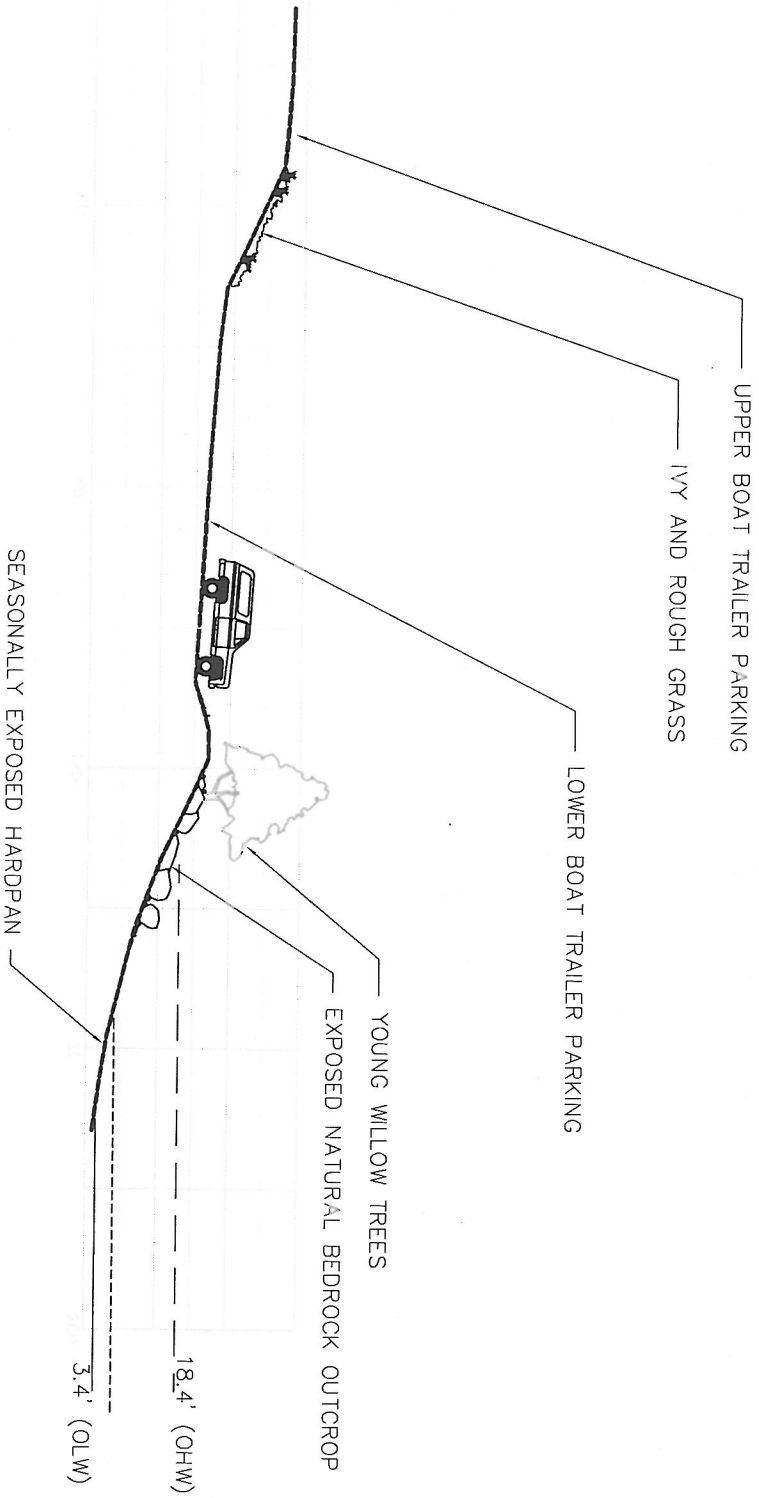

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TYPICAL OF BOAT LAUNCH RAMP

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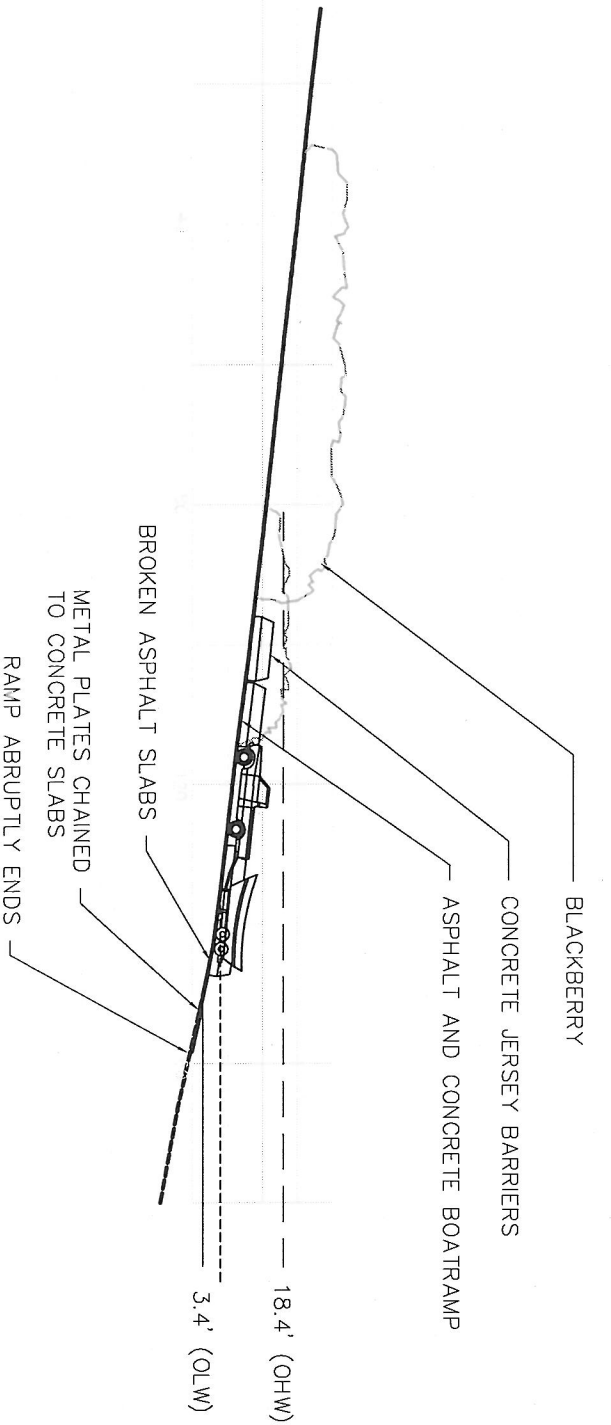

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DAVID EVANS AND ASSOCIATES INC.
2100 Southwest River Parkway
Portland Oregon 97201
Phone: 503.223.6663

PROJECT	Milwaukie Riverfront Park		SHEET
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TYPICAL OF BANK CONDITION FROM
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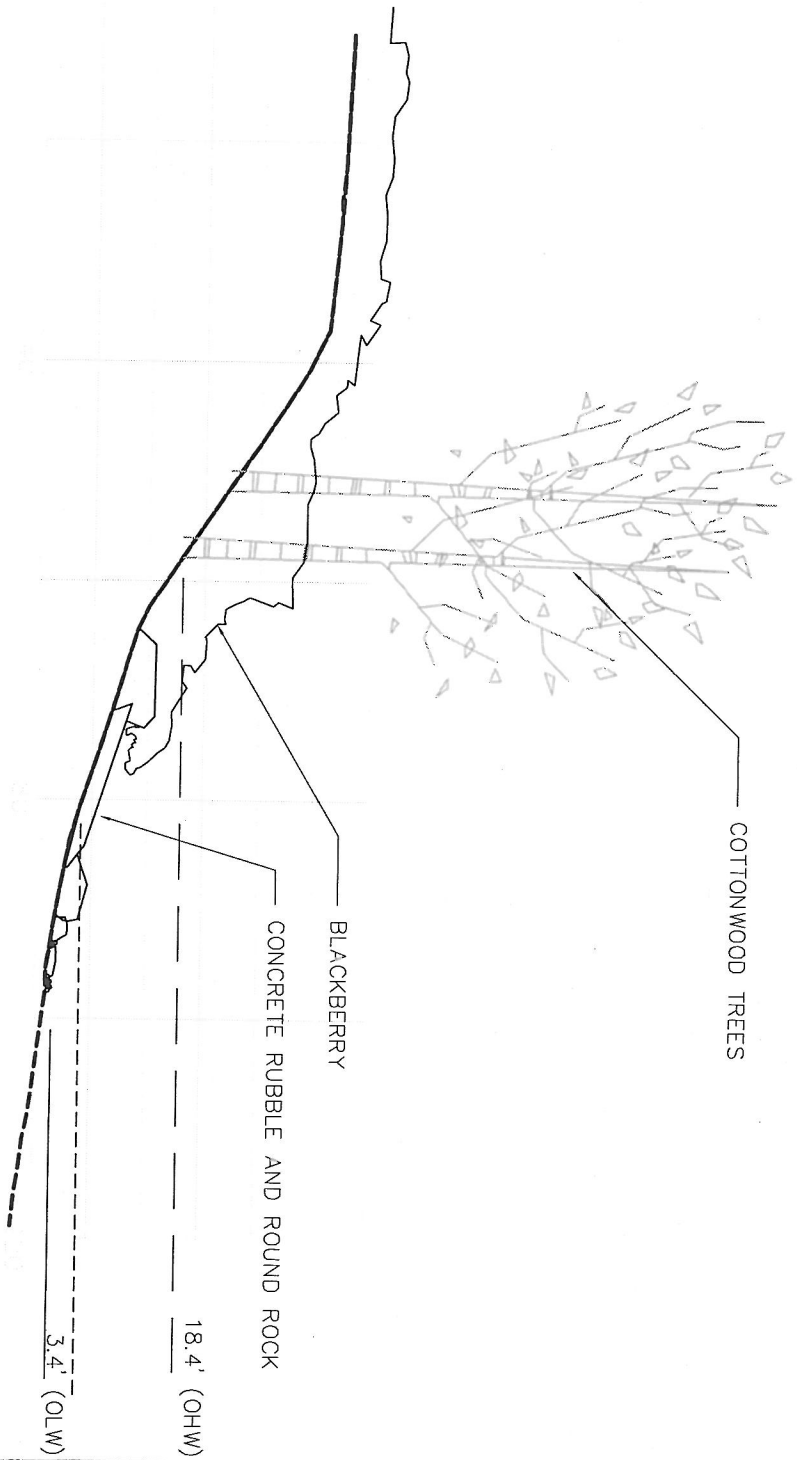
SECTION E6



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Oregon 97201
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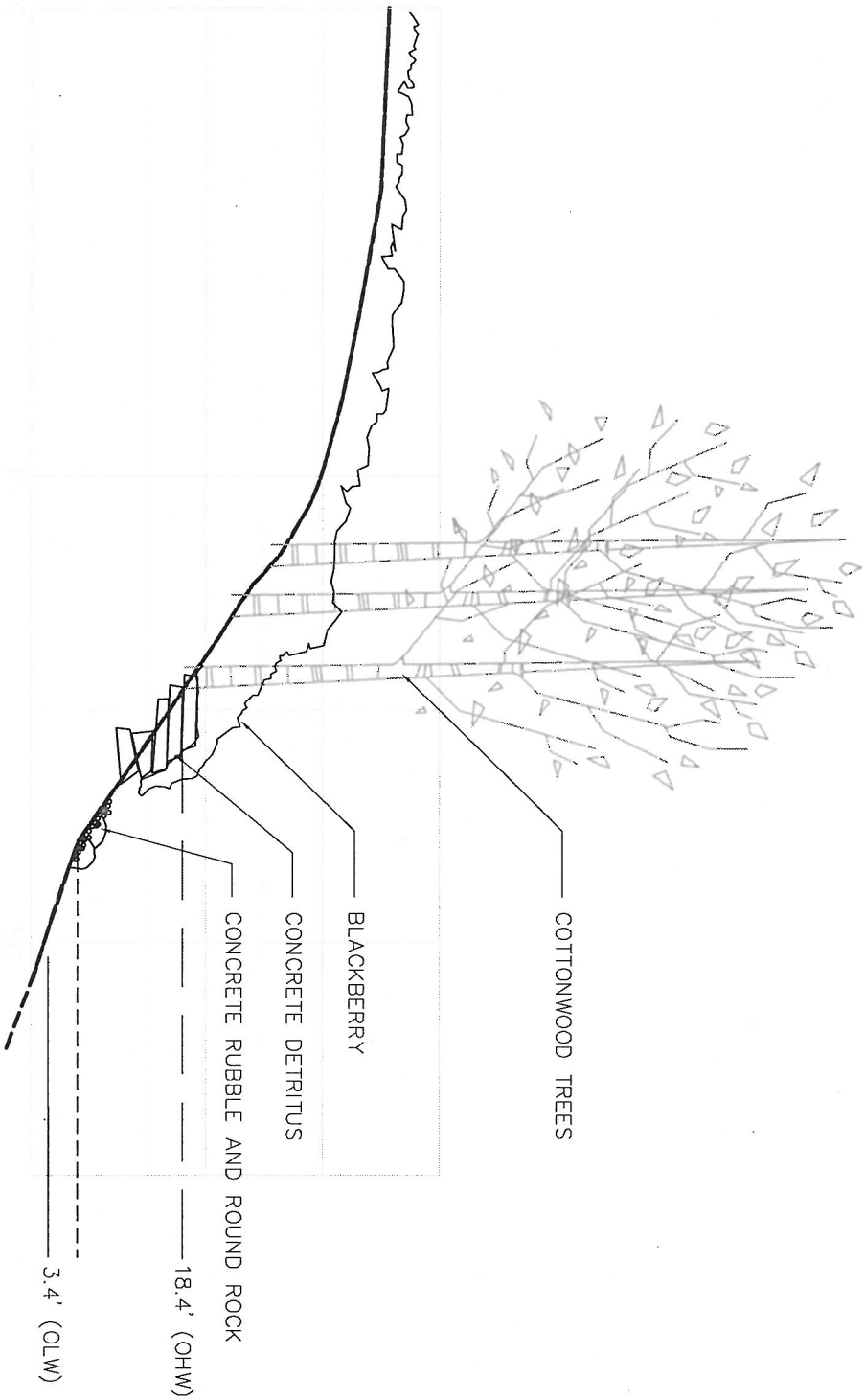

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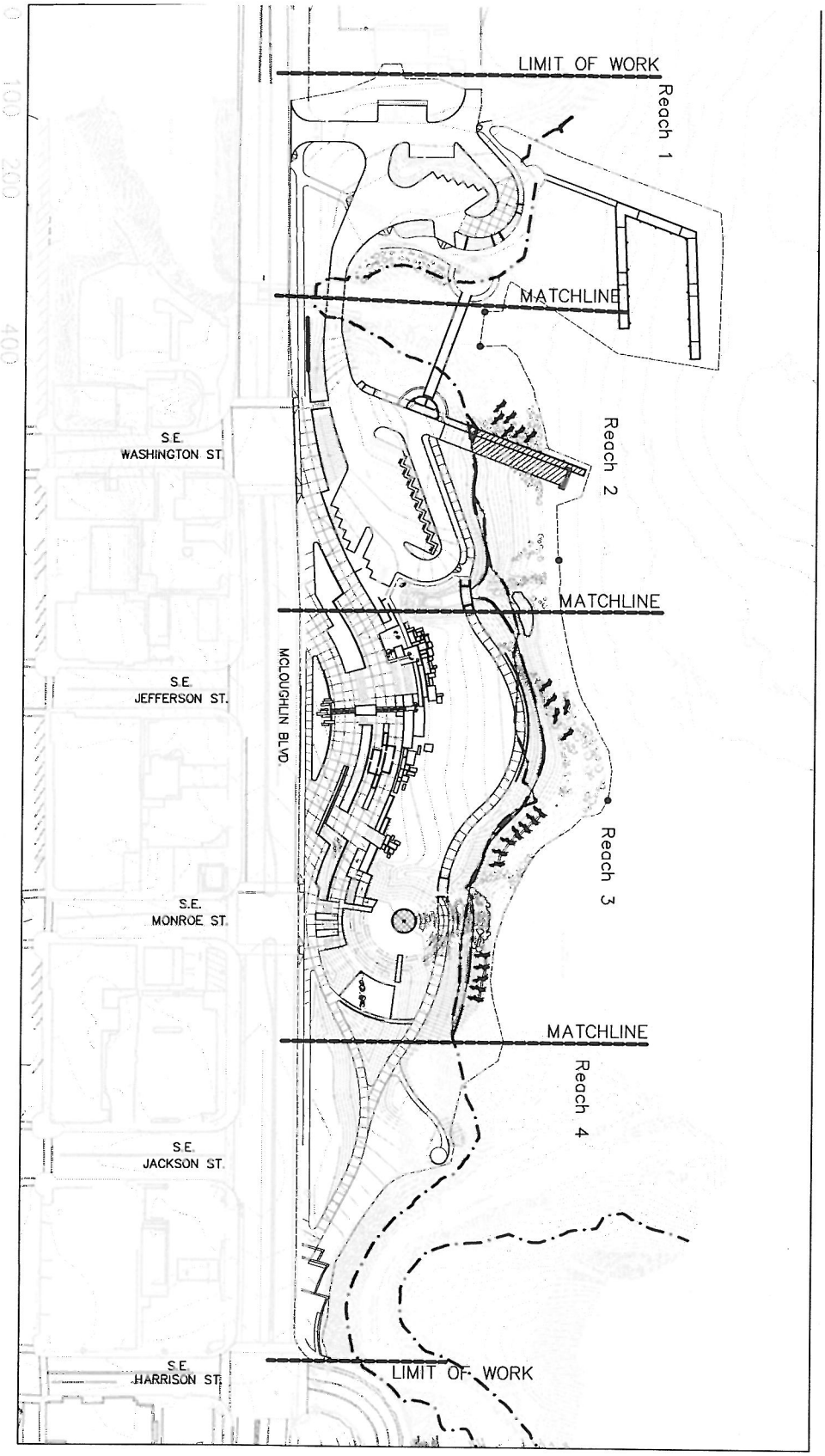

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2100 Southwest River Parkway
Portland Oregon 97201
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PROJECT	Milwaukie Riverfront Park
TITLE	Proposed Site Plan
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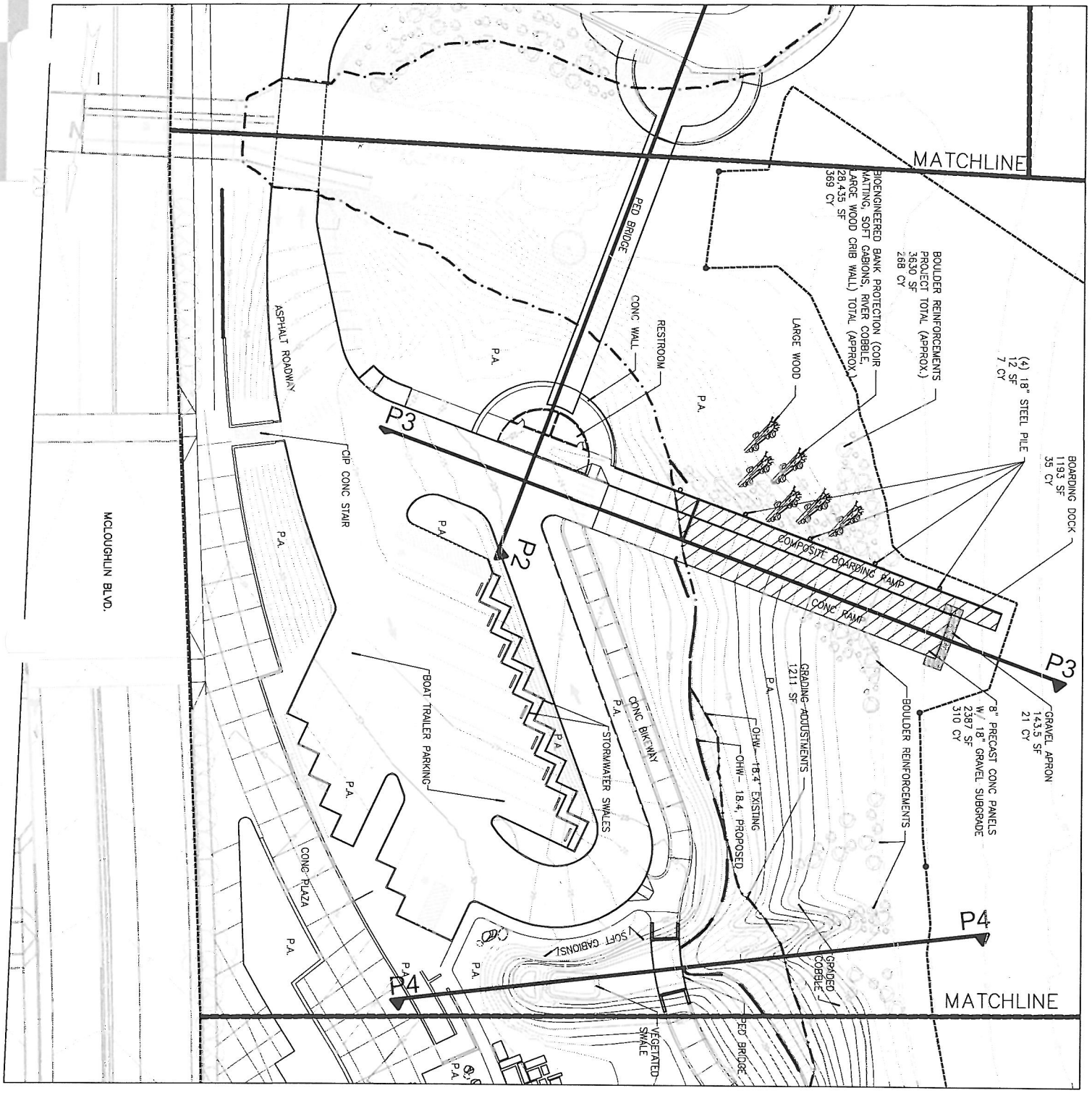

DAVID EVANS AND ASSOCIATES INC.
2100 Southwest River Parkway
Portland, Oregon 97201
503.223.6663

PROJECT: Milwaukie Riverfront Park

TITLE: Proposed Site Plan

Reach 2

SHEET: 6B

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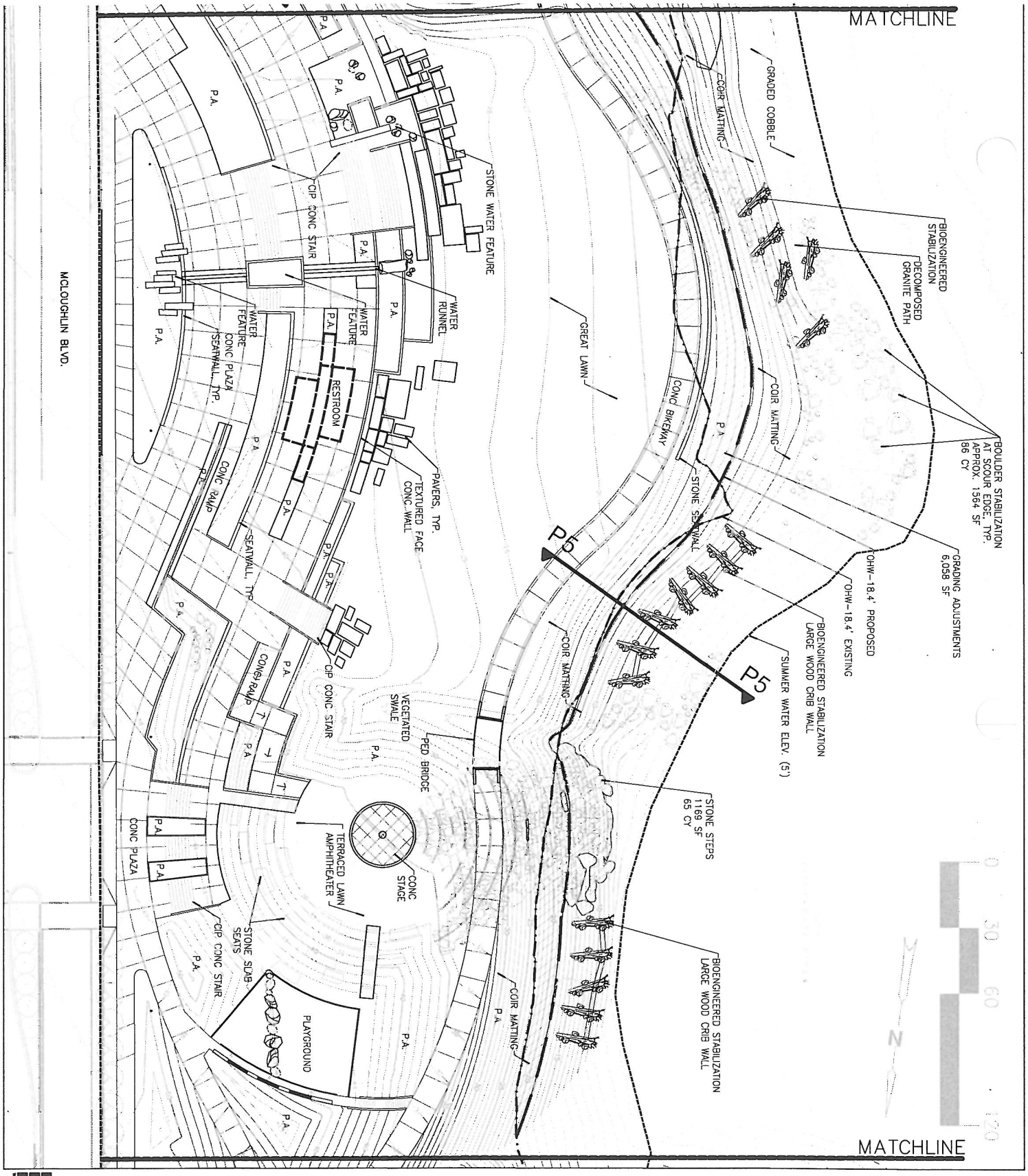

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2100 Southwest River Parkway
Portland Oregon 97201
Phone: 503.223.6663

PROJECT: Milwaukie Riverfront Park

TITLE: Proposed Site Plan

Reach 3

SHEET: 6C

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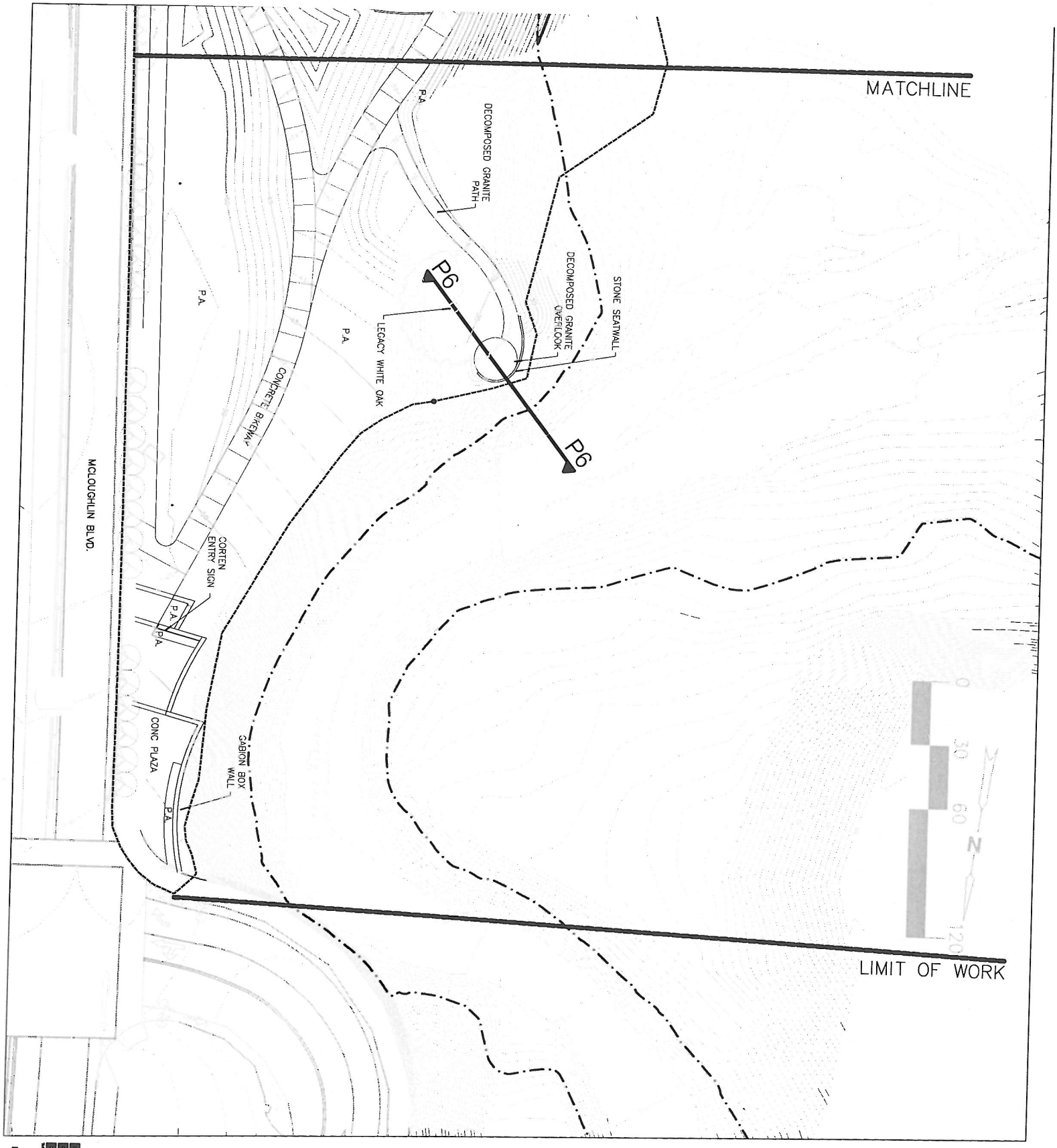

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TITLE: Proposed Site Plan

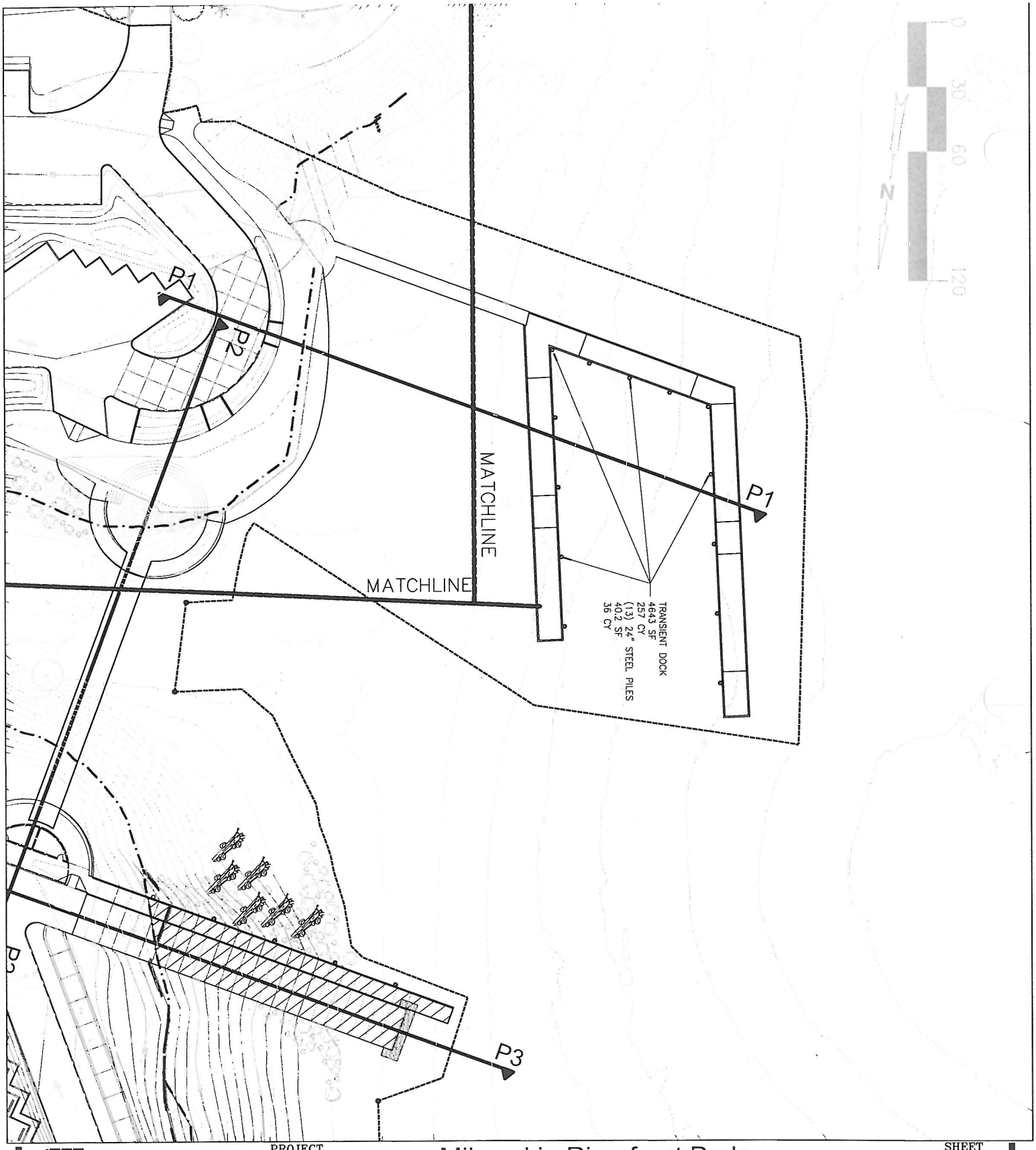
Reach 4

SHEET: 6D

DWG. REF.	PROJECT	SCALE	AMENDMENT NO.
C-1	MAEX0018	1" = 60'	0.0
DRAWN BY	DESIGN BY	APPROVED BY	DATE
BAR	CRM. RGWI		11-01-08

DAVID EVANS ASSOCIATES INC.
...west River Parkway
...nd Oregon 97201
Phone: 503.223.6663

M\MAEX00000018\0400CAD\DWG\Sheets\PERMIT DRAWINGS\JPA dwgs\Wh-SiteMap-Prop-JPA.dwg Dec 04, 2008 - 1:41



DAVID EVANS AND ASSOCIATES INC.
2100 Southwest River Parkway
Portland Oregon 97201
Phone: 503.223.6663

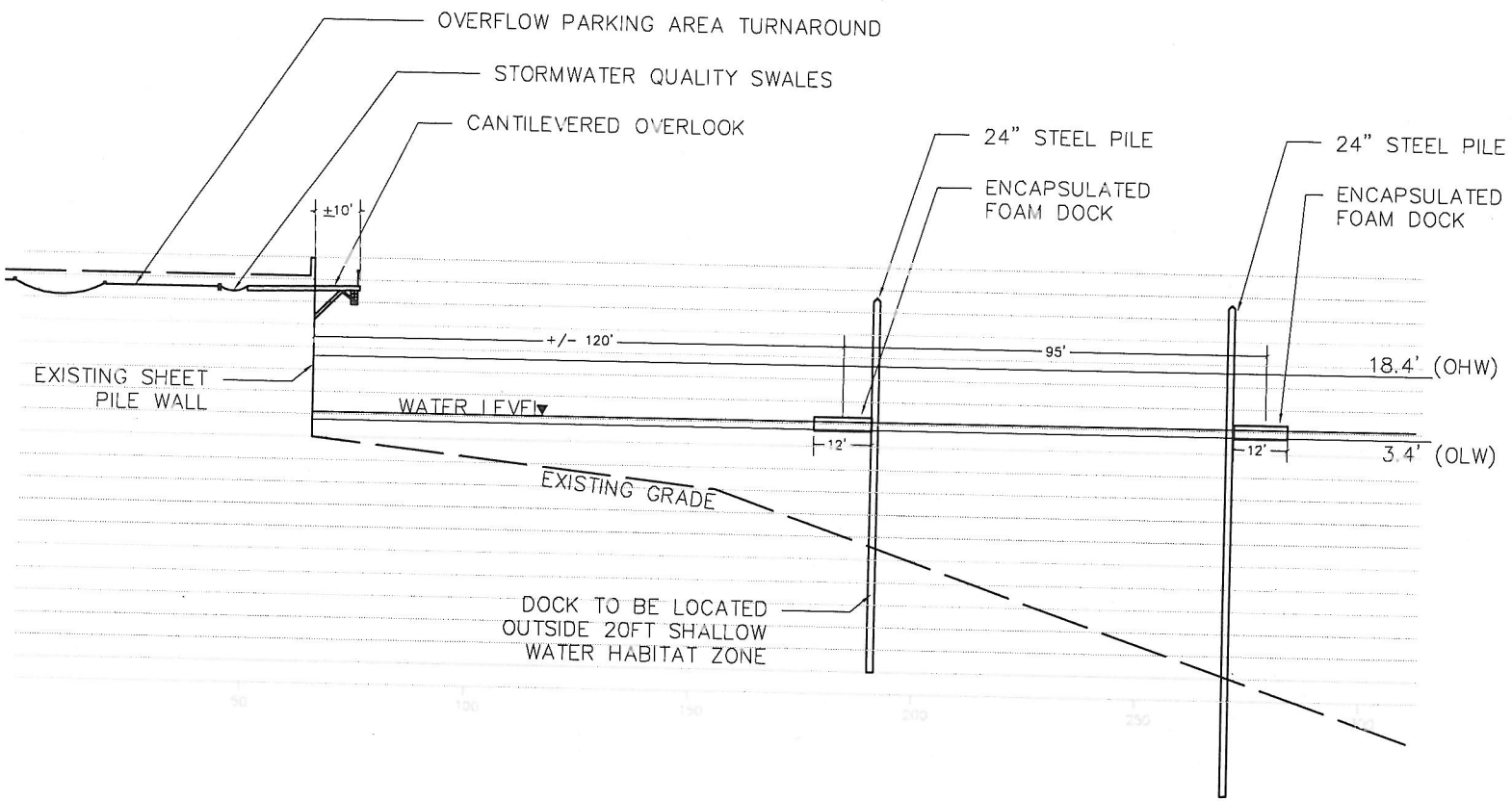
PROJECT: Milwaukie Riverfront Park

TITLE: Proposed Site Plan

Transient Dock

SHEET: 6E

DWG. REF.	PROJECT	SCALE	AMENDMENT NO.
C-1	MAEX0018	1" = 60'	0.0
DRAWN BY	**DESIGN BY**	**APPROVED BY**	**DATE**
BAR	CRM. RGWI		11-01-08



SECTION P1
(REFER TO FIGURE 6A)

PROPOSED CONDITIONS

TYPICAL OF BULKHEAD AREA AND TR[illegible]IENT DOCK

PROJECT Milwaukie Riverfront Park

TITLE Proposed Site Plan

Cross Section P1

SHEET 7A

DWG. REF.	PROJECT	SCALE	AMENDMENT NO.
C-1	MAEX0018	1"=40'	0.0
DRAWN BY	DESIGN BY	APPROVED BY	DATE
BAR	CRM, RGWI		11-01-08

DAVID EVANS AND ASSOCIATES INC.
2100 S[illegible]est River Parkway
P[illegible]egon 97201
F[illegible]3.223.6663

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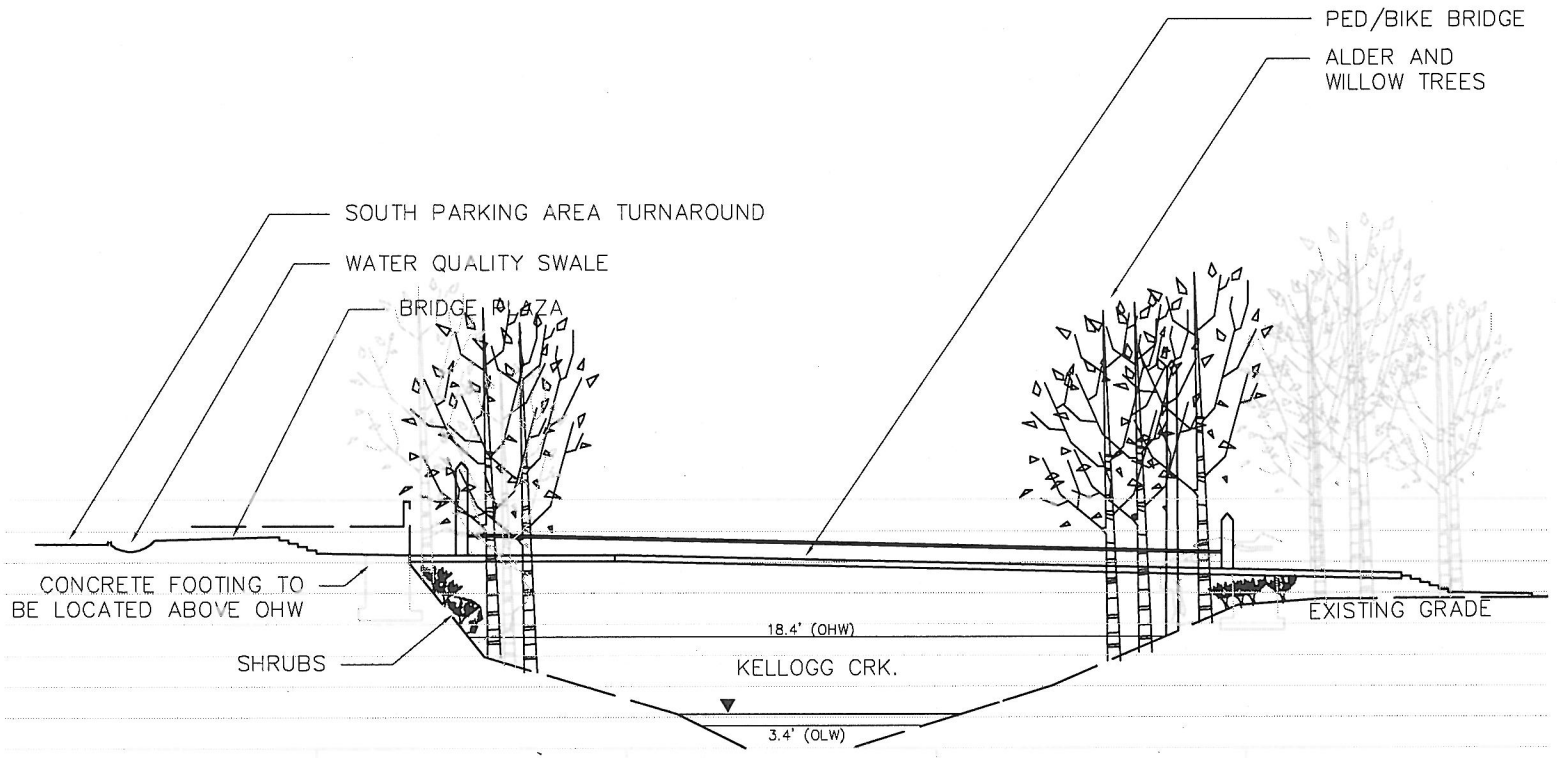

SECTION P2
(REFER TO FIGURE 6A)

PROPOSED CONDITIONS

TYPICAL FOR KELLOGG CRK
NOTE: NO CUT/FILL
ACTIVITY IN THIS AREA

PROJECT: Milwaukie Riverfront Park

TITLE: Proposed Site Plan

Cross Section P2

SHEET 7B

DWG. REF.	PROJECT	SCALE	AMENDMENT NO.
C-1	MAEX0018	1"=30'	0.0
DRAWN BY	DESIGN BY	APPROVED BY	DATE
BAR	CRM, RGWI		11-01-08

DAVID EVANS AND ASSOCIATES INC.
2100 Southwest River Parkway
Portland Oregon 97201
Phone: 503.223.6663

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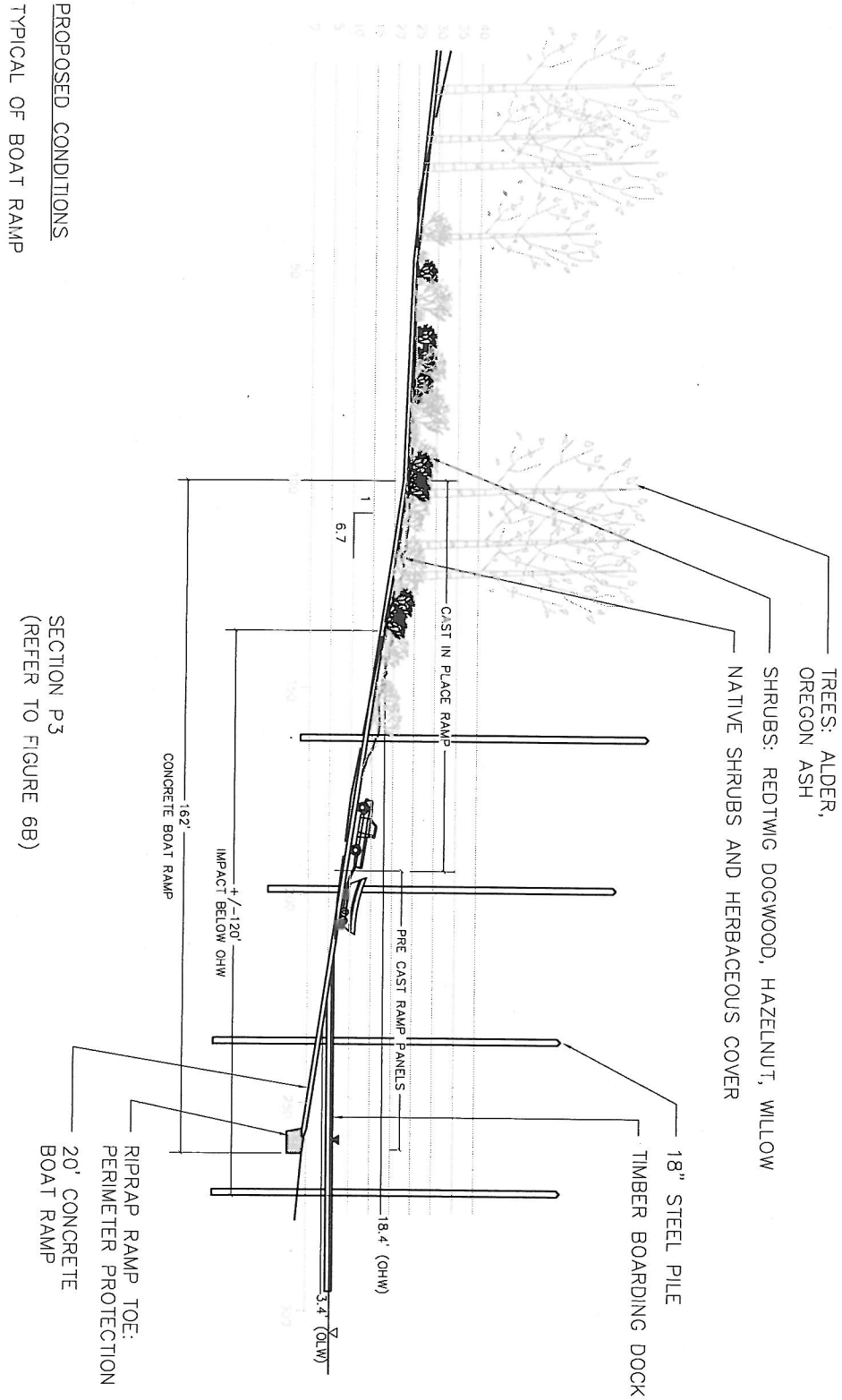
PROPOSED CONDITIONS

TYPICAL OF BOAT RAMP



SECTION P3
(REFER TO FIGURE 6B)

DAVID EVANS AND ASSOCIATES INC.
2100 Southwest River Parkway
Portland Oregon 97201
Phone 223.6663

PROJECT	Milwaukie Riverfront Park		SHEET
TITLE	Proposed Site Plan		
	Cross Section P3		7C
DWG. REF. C-1	PROJECT MAEX0018	SCALE 1"= 40'	AMENDMENT NO. 0.0
DRAWN BY BAR	DESIGN BY JANSKY	APPROVED BY	DATE 11-01-08

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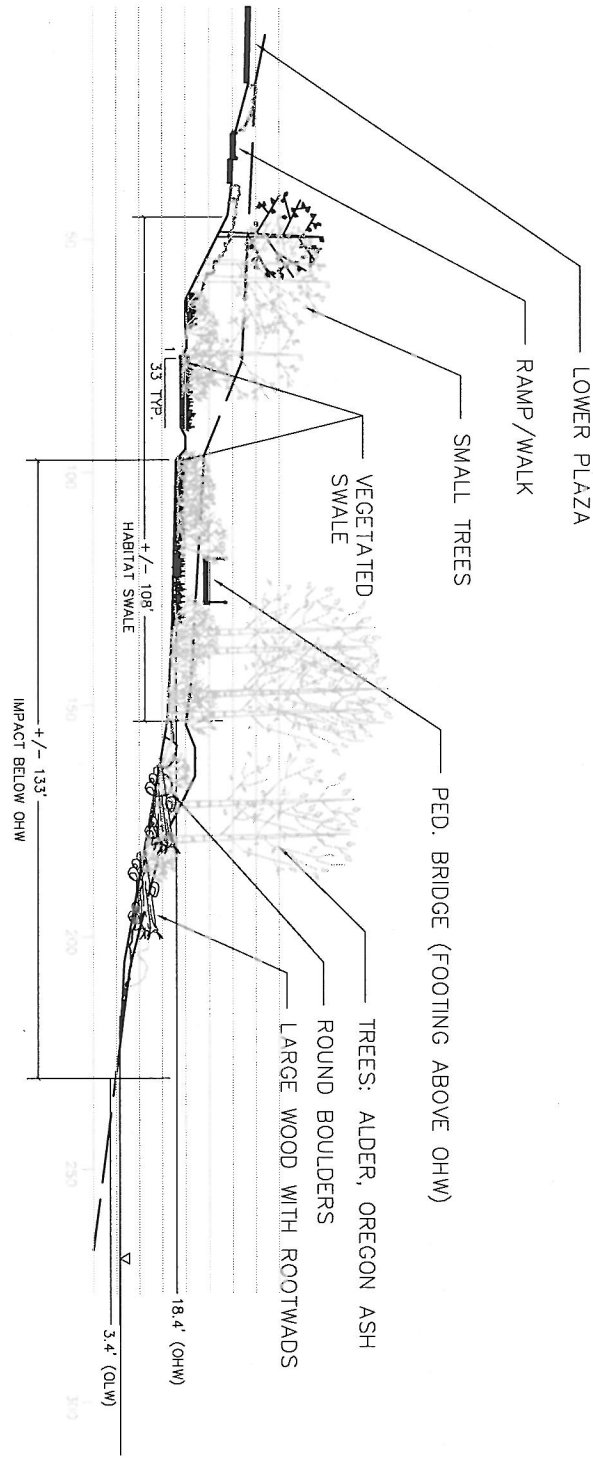
PROPOSED CONDITIONS

TYPICAL OF VEGETATED SWALES



SECTION P4
(REFER TO FIGURE 6B)

DAVID EVANS AND ASSOCIATES INC.
2100 Southwest River Parkway
Portland Oregon 97201
Phone: 503.223.6663

PROJECT	Milwaukie Riverfront Park		SHEET
TITLE	Proposed Site Plan		7D
	Cross Section P4		
DWG. REF.	PROJECT	SCALE	AMENDMENT NO.
C-1	MAEX0018	1"= 40'	0.0
DRAWN BY	DESIGN BY	APPROVED BY	DATE
BAR	BXM, RGWI		11-01-08

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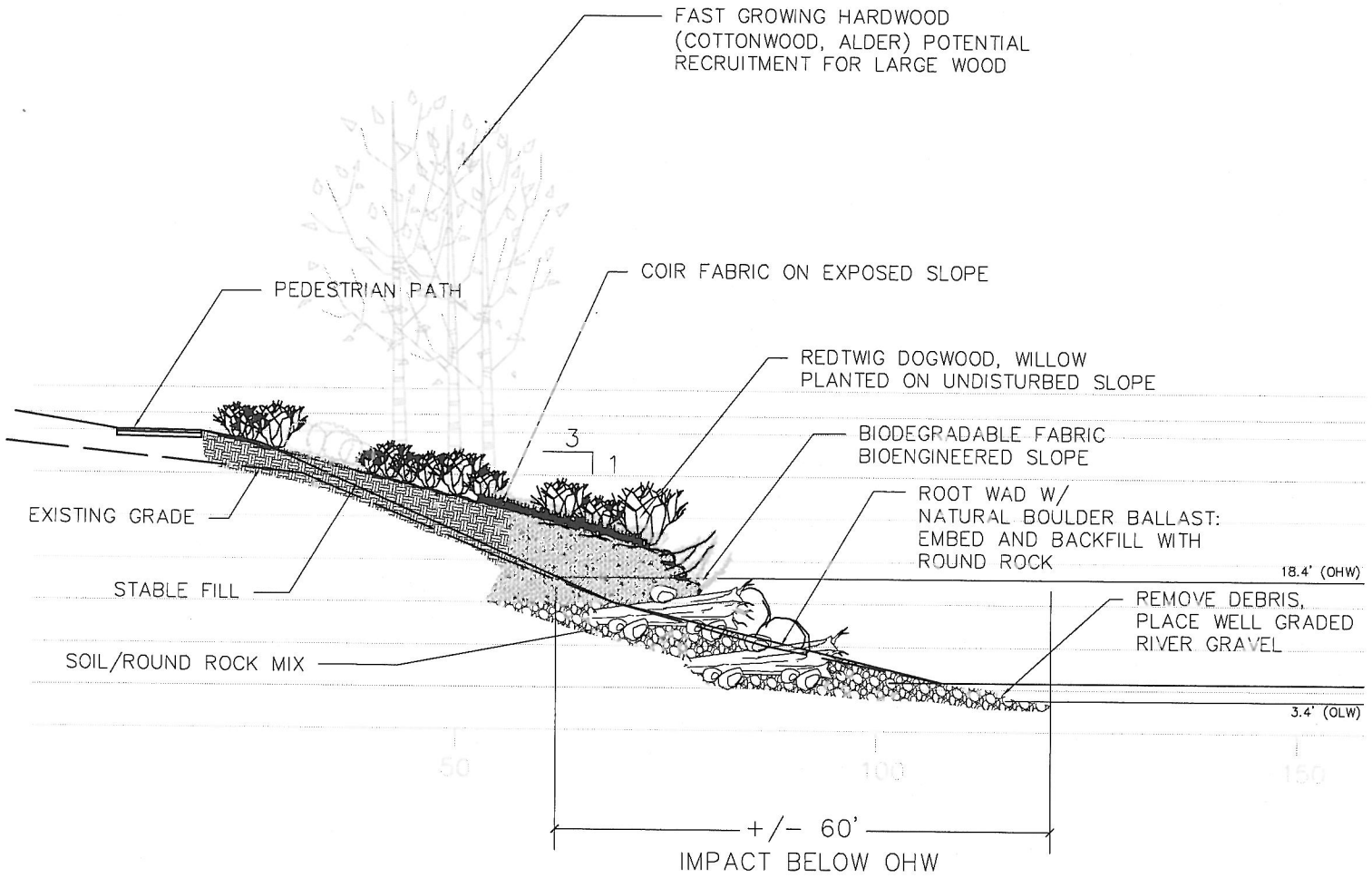

PROPOSED CONDITIONS

TYPICAL OF BANK RESTORATION
NORTH OF GREAT LAWN

SECTION P6
(REFER TO FIGURE 6C)

PROJECT
Milwaukie Riverfront Park

TITLE
Proposed Site Plan
Cross Section P6

SHEET
7E

DWG. REF.	PROJECT	SCALE	AMENDMENT NO.
C-1	MAEX0018	1"=20'	0.0
DRAWN BY	DESIGN BY	APPROVED BY	DATE
BAR	JANSKY		11-01-08

DAVID EVANS AND ASSOCIATES INC.
2100 Southwest River Parkway
Portland Oregon 97201
Phone: 503.223.6663

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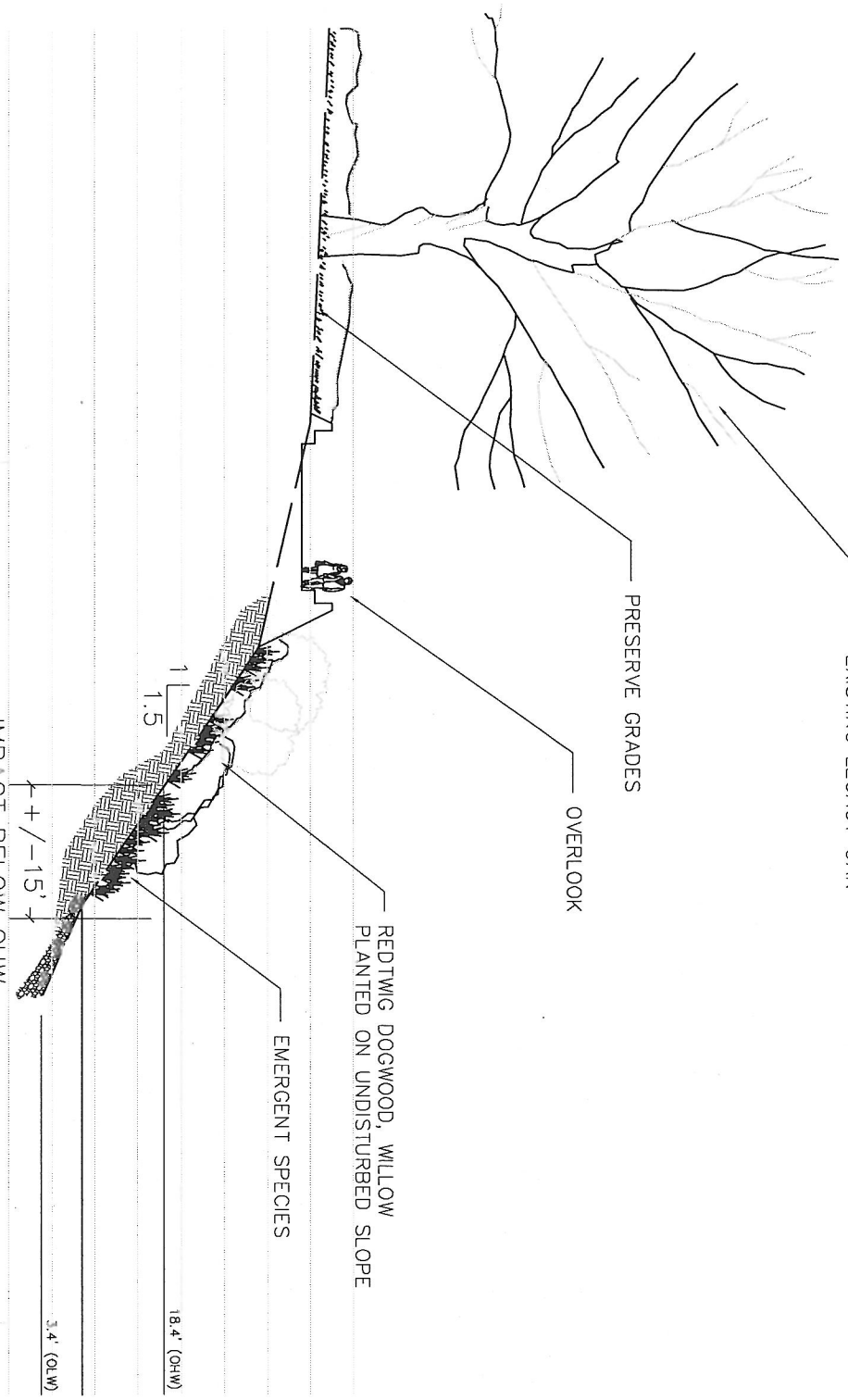
PROPOSED CONDITIONS

TYPICAL OF NORTHERN LIMITS
OF PROJECT GRADING



SECTION P7
(REFER TO FIGURE 6D)

DAVID EVANS AND ASSOCIATES INC.
2100 Southwest River Parkway
Portland Oregon 97201
Phone: 503.223.6663

PROJECT	Milwaukie Riverfront Park		SHEET
TITLE	Proposed Site Plan		7F
	Cross Section P7		
DWG. REF.	PROJECT	SCALE	AMENDMENT NO.
C-1	MAEX0018	1"= 20'	0.0
DRAWN BY	DESIGN BY	APPROVED BY	DATE
BAR	CRM, RGWI		11-01-08

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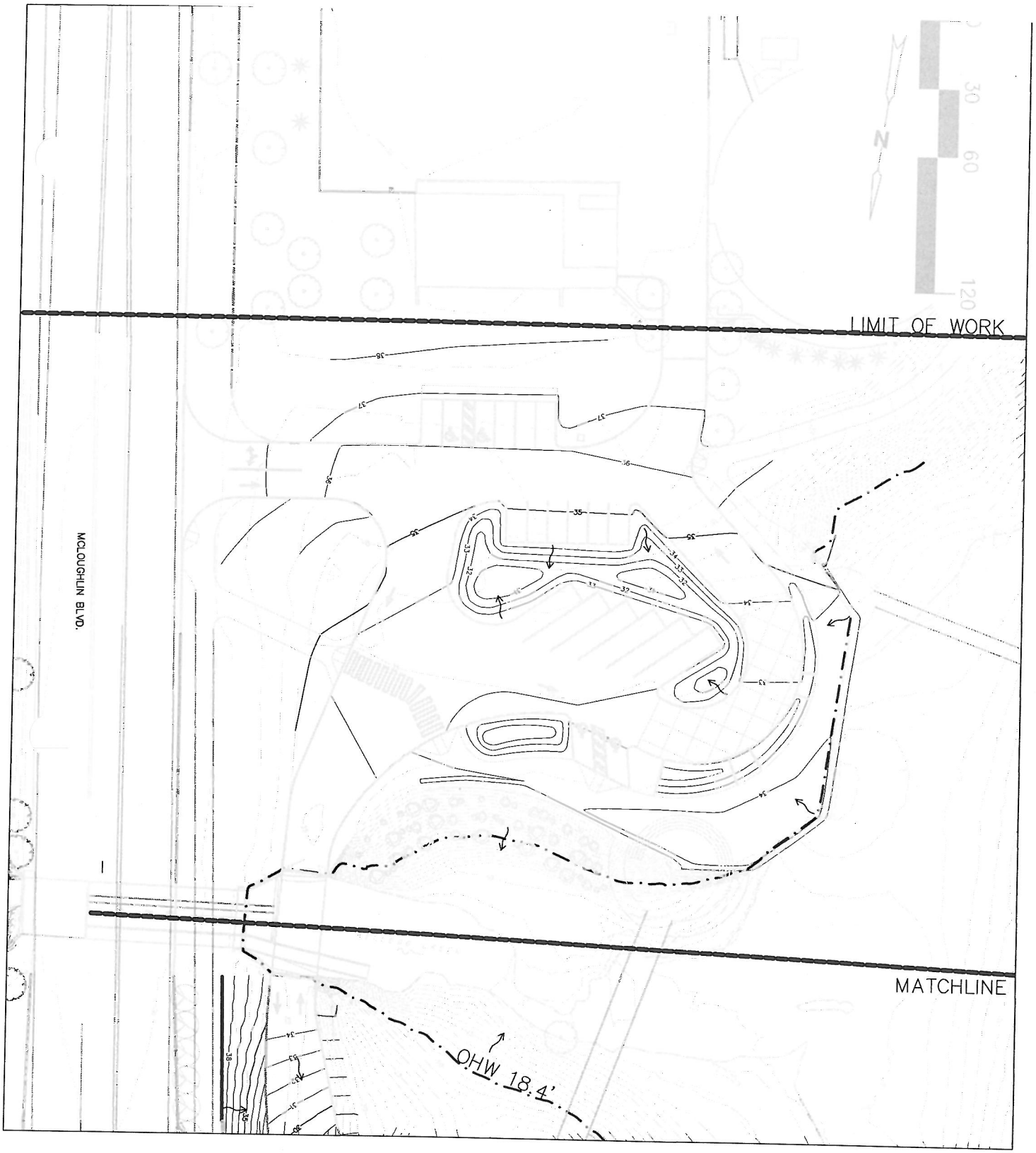

DAVID EVANS AND ASSOCIATES INC.
2100
F
Pl
il River Parkway
egon 97201
503.223.6663

PROJECT	Milwaukie Riverfront Park		SHEET
TITLE	Proposed Earthwork Grading Plan		
	Reach 1		8A
DWG. REF. C-1	PROJECT MAEX0018	SCALE 1" = 60'	AMENDMENT NO. 0.0
DRAWN BY BAR, RFH	DESIGN BY BXM, RGWI	APPROVED BY	DATE 11-01-08

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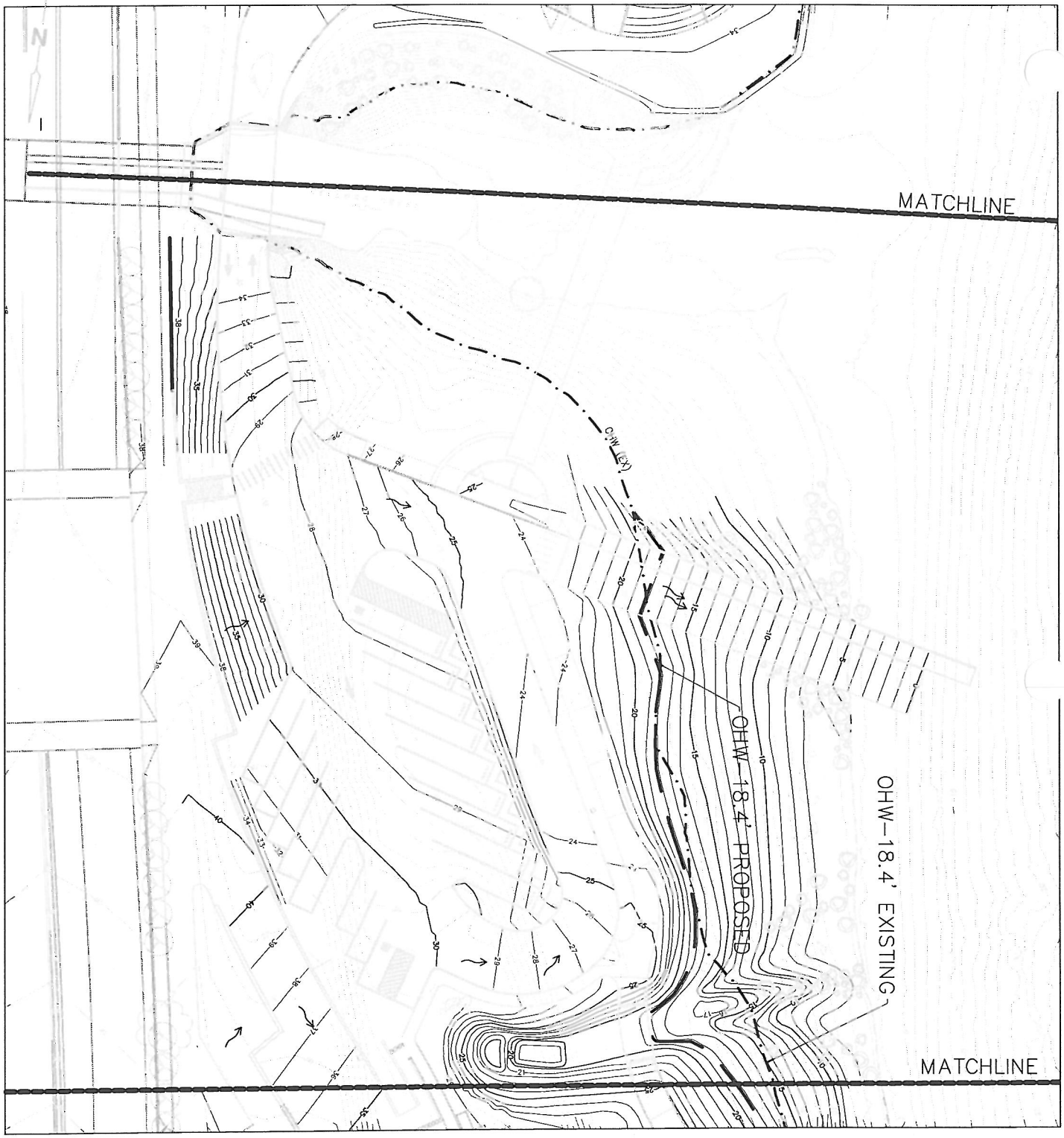


DAVID EVANS AND ASSOCIATES INC.
2100 Southwest River Parkway
Portland Oregon 97201
Phone: 503.223.6663

PROJECT: Milwaukie Riverfront Park

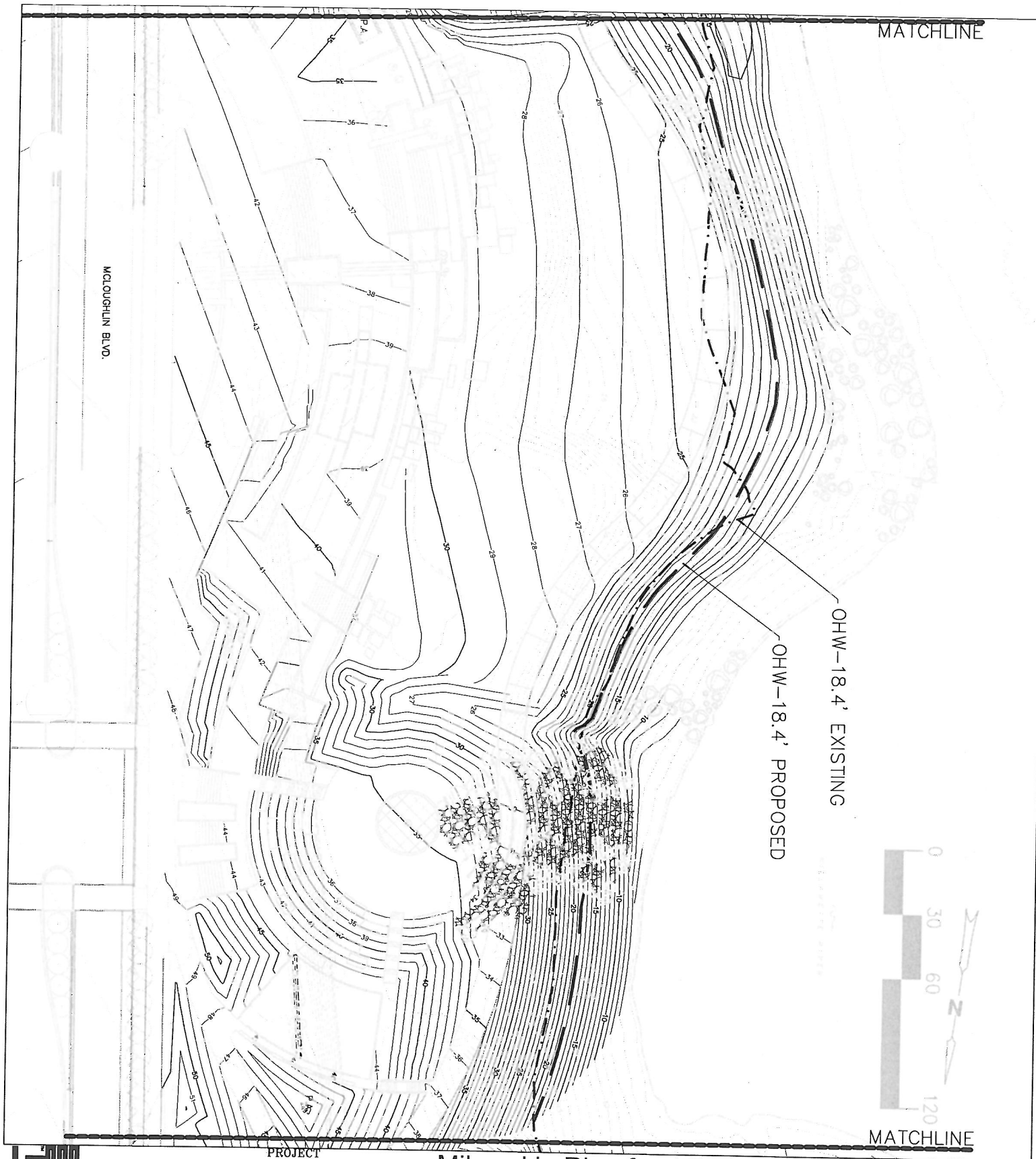
TITLE: Proposed Earthwork Grading Plan

Reach 2

SHEET: 8B

DWG. REF.	PROJECT	SCALE	AMENDMENT NO.
C-1	MAEX0018	1" = 60'	0.0
DRAWN BY	**DESIGN BY**	**APPROVED BY**	**DATE**
BAR, RFH	BXM, RGWI		11-01-08

\M\MAEX00000018\0400CAD\DWG\Sheets\PERMIT DRAWINGS\JPA dwgs\GR-Grading-JPA.dwg Dec 04, 2008 - 4:16pm



PROJECT: Milwaukie Riverfront Park

TITLE: Proposed Earthwork Grading Plan

Reach 3

SHEET: 8C

DWG. REF.	PROJECT	SCALE	AMENDMENT NO.
C-1	MAEX0018	1" = 60'	0.0
DRAWN BY	**DESIGN BY**	**APPROVED BY**	**DATE**
BAR, RFH	BXM, RGWI		11-01-08

DAVID EVANS AND ASSOCIATES, INC.
2100 SW River Parkway
Portland, Oregon 97201
503.223.6663

\M\MAEX00000018\0400CAD\DWG\Sheets\PERMIT DRAWINGS\JPA dwgs\GR-Grading-JPA.dwg Dec 04, 2008 - 4:17pm

PROJECT: Milwaukie Riverfront Park

TITLE: Proposed Earthwork Grading Plan

Reach 4

SHEET: 8D

DWG. REF.	PROJECT	SCALE	AMENDMENT NO.
C-1	MAEX0018	1" = 60'	0.0
DRAWN BY	**DESIGN BY**	**APPROVED BY**	**DATE**
BAR, RFH	BXM, RGWI		11-01-08

DAVID EVANS AND ASSOCIATES INC.
2100 Southwest River Parkway
Portland Oregon 97201
Phone: 503.223.6663

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APPENDIX B – STORMWATER REPORT

Stormwater Report
Milwaukie Riverfront Park

City of Milwaukie

Prepared for:

City of Milwaukie
DEA Project No. MAEX0000-0018

December 2008