City of West Linn

Planning & Development • 22500 Salamo Rd #1000 • West Linn, Oregon 97068
Telephone 503.656.4211 • Fax 503.656.4106 • westlinnoregon.gov

DEVELOPMENT REVIEW APPLICATION

For Office Use Only		
STAFF CONTACT JOHN BOYD	PROJECT NO(S). DR-1503	
NON-REFUNDABLE FEE(S) 0	REFUNDABLE DEPOSIT(S) 0	TOTAL 0

Type of Review (Please check all that apply):

- [ ] Annexation (ANX)
- [ ] Appeal and Review (AP) *
- [ ] Conditional Use (CUP)
- [x] Design Review (DR)
- [ ] Easement Vacation
- [ ] Extraterritorial Ext. of Utilities
- [ ] Final Plat or Plan (FP)
- [x] Flood Management Area
- [ ] Hillside Protection & Erosion Control
- [ ] Historic Review
- [ ] Legislative Plan or Change
- [ ] Lot Line Adjustment (LLA) */**
- [ ] Minor Partition (MIP) (Preliminary Plat or Plan)
- [ ] Non-Conforming Lots, Uses & Structures
- [ ] Planned Unit Development (PUD)
- [ ] Pre-Application Conference (PA) */**
- [ ] Street Vacation
- [ ] Subdivision (SUB)
- [ ] Temporary Uses *
- [ ] Time Extension *
- [ ] Variance (VAR)
- [ ] Water Resource Area Protection/Single Lot (WAP)
- [ ] Water Resource Area Protection/Wetland (WAP)
- [ ] Willamette & Tualatin River Greenway (WRG)
- [ ] Zone Change
- [x] Willamette & Tualatin River Protection Area

Home Occupation, Pre-Application, Sidewalk Use, Sign Review Permit, and Temporary Sign Permit applications require different or additional application forms, available on the City website or at City Hall.

Site Location/Address:

4600 Elmran Drive, West Linn, Oregon 97068

Assessor's Map No.: 2 1E 24

Tax Lot(s): 200

Total Land Area: 7.73 acres

Brief Description of Proposal:

Reconstruction of the Cedaroak Boat Ramp

Applicant Name: (please print) Ken Worcester, Director, City of West Linn Parks and Recreation
Phone: 503-557-4700
Address: 22500 Salamo Road #1100
Email: kworcester@ci.west-linn.or.us
City State Zip: West Linn, Oregon 97068

Owner Name (required): (please print) City of West Linn
Phone:
Address:
Email:
City State Zip:

Consultant Name: (please print) Jacqueline Gruber, Maul Foster & Alongi, Inc
Phone: 971-400-6727
Address: 411 First Avenue S, Suite 610
Email: jgruber@maulfoster.com
City State Zip: Seattle, Washington 98104

1. All application fees are non-refundable (excluding deposit). **Any overruns to deposit will result in additional billing.**
2. The owner/applicant or their representative should be present at all public hearings.
3. A denial or approval may be reversed on appeal. No permit will be in effect until the appeal period has expired.
4. **Three (3) complete hard-copy sets (single sided) of application materials must be submitted with this application. One (1) complete set of digital application materials must also be submitted on CD in PDF format. If large sets of plans are required in application please submit only two sets.**

* No CD required / ** Only one hard-copy set needed

The undersigned property owner(s) hereby authorizes the filing of this application, and authorizes on site review by authorized staff. I hereby agree to comply with all code requirements applicable to my application. Acceptance of this application does not infer a complete submittal. All amendments to the Community Development Code and to other regulations adopted after the application is approved shall be enforced where applicable. Approved applications and subsequent development is not vested under the provisions in place at the time of the initial application.

Ken Worcester — 03/31/2015

Applicant's signature — Date — Owner's signature ***(required)*** — Date

CEDAROAK BOAT RAMP PERMITTING APPLICATION

4600 ELMRAN DRIVE, WEST LINN, OREGON 97068

Prepared for

CITY OF WEST LINN PARKS AND RECREATION

22500 Salamo Road #1100
West Linn, OR 97068
March 31, 2015
Project No. 0161.01.05

MAUL FOSTER ALONGI

Prepared by
Maul Foster & Alongi, Inc.
411 First Ave S. Suite 610
Seattle, WA 98104

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LAND USE NARRATIVE

SITE INFORMATION

Address: 4600 Elmran Drive, West Linn, OR 97068

Zoning: Designated Park in R-20 (Single-Family Residential Detached)

Tax Parcel: 2 1E 24 200

Site Size: 7.73 acres

River Mile: 23.2

PROPOSAL AND REASON FOR REQUEST

Maul Foster & Alongi, Inc. (MFA) has prepared this application and the attachments on behalf of the City of West Linn Parks and Recreation Department (the applicant) to request review and approval of Cedaroak Boat Ramp reconstruction project (the Project).This narrative addresses the applicable criteria of Chapter 27 Flood Management Areas, Chapter 28 Willamette and Tualatin River Protection, and Chapter 56 Parks and Natural Areas Design Review (Class II) under the City of West Linn Community Development Code (CDC).

OVERVIEW OF PROJECT

The Parks and Recreation Department is proposing to reconstruct the existing Cedaroak Boat Ramp in order to maintain public boating access to this section of the Willamette River. The existing boat launch facility is in need of renovation to reduce regular maintenance dredging, upgrade the ramp to current standards, and address user safety issues. The project proposal includes the replacement of steel piles and abutments, placement of rock armor along perimeter of ramp and toe of fill, as well as upgrades to the parking lot to include stormwater treatment. Improvements will include modernization of the facility to meet current Oregon State Marine Board (OSMB) standards of design and will increase the site safety and functionality.

The ramp will be relocated further into the river than the existing facility in order to reduce sedimentation and future dredge requirements. Recent years have seen the steady buildup of silt and sand deposits on the river bottom which have reduced the river depth and thus the functionality of the existing dock at Cedaroak during typical and low water conditions. To address this issue, the Parks Department has dredged the launching area approximately every five years. The current proposal is to extend the ramp and dock further out into deeper waters with the expectation that it will provide a longer term solution.

The existing dock and ramp are approximately 220 feet long .The new facility will be shifted 115 feet further out into the Willamette River, however the dock and ramp length will remain the same at 220 feet long. The ordinary high water mark (OHWM) is approximately 270 feet inland from the existing top of ramp.

The proposal includes excavation of approximately 400 cubic yards of sediment and placement of approximately 9,800 cubic yards of fill on the shoreline and about 280 feet into the river to form the elevated base for the approach, boat ramp, and dock support. This fill allows the dock ramp to begin further out into the water. The length of the new ramp and dock will be 220 feet.

The fill on the shoreline will accommodate a new driveway from the main parking lot to the ramp. This new driveway is intended to allow vehicles towing boat trailers to get closer to the launch point. With this improvement, drivers will not have to maneuver backwards from the parking lot and provide additional staging area for boat launching.

The fill (disturbed area) associated with this driveway will extend about 130 feet to the upstream of the existing ramp and about 70 feet to the downstream. It will entail the removal and replacement of riparian, native vegetation and trees and grading in both these areas. The fill on lower slopes will be protected with rock armor. Armoring is generally intended to protect the fill and structure by deflecting the forces of the river and floods. Large rock armoring will be covered with small rounded river gravel to maintain habitat value. Upper fill slopes will be vegetated with native plants.

The project is located in a park, which offers picnicking and nature-viewing opportunities, as well as shoreline and fishing access. The upland part of the park includes a paved parking lot and restroom facilities. The combined area of the park and boat ramp is 7.73 acres. The park and restroom facilities will remain unaltered. The adjacent parking lot will be retrofitted to include a small driveway and turn-around area. A 2,900-square foot stormwater swale will be constructed between the ramp, parking area, and turn-around to capture, filter, and infiltrate stormwater. The driveway and stormwater facility will require the removal of 3 standard parking spaces.

The facility is owned by the City of West Linn and located on property under public ownership. The project has received regulatory approvals from DSL and the Army Corps of Engineers.

PROJECT PURPOSE

Reconstruction of the boat ramp is critical to maintaining public access to the Willamette River. The Cedaroak boat ramp provides access for trailerable boats to the Willamette River and connected waterways. The boat ramp is heavily used, serving an estimated 18,136 recreational boaters each year. There are no other ramps available on the west side of the river and alternative locations for a new boat ramp do not exist due to the lack of public ownership of large waterfront parcels.

The project is being partially funded with state funding provided by a grant from the OSMB. Expediency of the permitting is critical in order to effectively utilize the available funding and implement the project in the 2015 construction window.

PRE-APPLICATION CONFERENCE

The applicant attended pre-application conferences related to this effort on August 19, 2010 and February 6, 2014. During the most recent pre-application conference, the applicant was informed of the need to acquire a Flood Management Area Permit, Willamette and Tualatin River Protection Area Permit, and Parks and Natural Areas Design Review (Class II). The remainder of the narrative addresses the approval criteria relevant to each of these review processes.

FLOOD MANAGEMENT AREAS (CHAPTER 27)

The purpose of Chapter 27 of the CDC is to create a Flood Management Area Overlay Zone in order to protect flood management areas that are identified on the flood management area map. Flood management areas provide the following functions: protect life and property from dangers associated with flooding; flood storage, reduction of flood velocities, reduction of flood peak flows and reduction of wind and wave impacts; maintain water quality by reducing and sorting sediment loads, process chemical and organic wastes and reduce nutrients; recharge, store, and discharge groundwater; provide plant and animal habitat; and support riparian ecosystems.

A flood management area permit is required for all development in the Flood Management Area Overlay Zone. The standards that apply to flood management areas apply in addition to State or federal restrictions governing floodplains or flood hazard areas.

The proposed improvements to the existing Cedaroak Boat Launch in West Linn, Oregon will place fill within the mapped floodway of the Willamette River. A "No-Rise" certification report was completed in order to show that the project will not cause an increase in FEMA flood levels. This application narrative addresses findings from the No-Rise report. The full report is attached (Attachment C).

Approval Criteria for CDC 27.060

A. Development, excavation, and fill shall be performed in a manner to maintain or increase flood storage and conveyance capacity and not increase design flood elevations.

The proposed project will not jeopardize the flood storage or capacity, nor increase design flood elevations of the Willamette River floodway. As part of this application process, a "No-Rise" analysis was conducted in January of 2015. The analysis revealed that, although the proposed project results in a net increase in blocked channel area of approximately 2,000 square feet, the hydraulic impact is insignificant. The result of the flow constriction is a very slight increase in average channel velocity, and a corresponding minor decrease in regulatory flood levels. Overall, the impacts are extremely small, with the maximum decrease in 100-year water surface elevation of 0.03-ft at the project location, tapering to a decrease of approximately 0.01 feet immediately upstream.

The model results demonstrate that the project will not increase 100-year floodplain or floodway water surface elevation and therefore satisfies No-Rise requirement. An Engineering No-Rise Certification was issued on January 22, 2015.

The proposal satisfies this criterion.

B. No net fill increase in any floodplain is allowed. All fill placed in a floodplain shall be balanced with an equal amount of soil material removal. Excavation areas shall not exceed fill areas by more than 50 percent of the square footage. Any excavation below bankful stage shall not count toward compensating for fill.

The project proposes to place a net fill of approximately 9,400 cubic yards of material (rock, soil, concrete) below the ordinary high water line in the mapped FEMA 100 year floodplain. Despite this addition of fill, the No-Rise Certification demonstrates that this fill will not have an impact on the level of the floodway.

The proposal satisfies this criterion.

C. Excavation to balance a fill shall be located on the same parcel as the fill unless it is not reasonable or practicable to do so. In such cases, the excavation shall be located in the same drainage basin and as close as possible to the fill site, so long as the proposed excavation and fill will not increase flood impacts for surrounding properties as determined through hydrologic and hydraulic analysis.

Excavation and fill activities will occur on the same parcel (Tax Lot 21E2400200).

The proposal satisfies this criterion.

D. Minimum finished floor elevations must be at least one foot above the design flood height or highest flood of record, whichever is higher, for new habitable structures in the flood area.

No new habitable structures will be constructed as part of the project.

This criterion does not apply.

E. Temporary fills permitted during construction shall be removed.

No temporary fill will be placed during construction.

This criterion does not apply.

F. Prohibit encroachments, including fill, new construction, substantial improvements, and other development in floodways unless certification by a professional civil engineer licensed to practice in the State of Oregon is provided demonstrating that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.

The proposed construction activities will occur within the Willamette River floodway. However, the No-Rise certification issued on January 22, 2015 demonstrates that the encroachments into the floodway will not result in increased flood levels.

The proposal satisfies this criterion.

G. All proposed improvements to the floodplain or floodway which might impact the flood-carrying capacity of the river shall be designed by a professional civil engineer licensed to practice in the State of Oregon.

The project and associated improvements were designed Jacob Faust, Professional Engineer licensed in the State of Oregon (No. 83172PE).

The proposal satisfies this criterion.

H. New culverts, stream crossings, and transportation projects shall be designed as balanced cut and fill projects or designed not to significantly raise the design flood elevation. Such projects shall be designed to minimize the area of fill in flood management areas and to minimize erosive velocities. Stream crossings shall be as close to perpendicular to the stream as practicable. Bridges shall be used instead of culverts wherever practicable.

The project consists of reconstruction of a boat ramp, as well as modifications to the existing, accessory parking lot. The project does not contain any elements pertaining to culverts, stream crossings, bridges, or other transportation projects.

This criterion does not apply.

I. Excavation and fill required for the construction of detention facilities or structures, and other facilities, such as levees, specifically shall be designed to reduce or mitigate flood impacts and improve water quality. Levees shall not be used to create vacant buildable land.

The proposed project does not include the construction of detention facilities or levees, nor any other facilities specifically designed to reduce or mitigate flood impacts or improve water quality.

This criterion does not apply.

J. The applicant shall provide evidence that all necessary permits have been obtained from those federal, State, or local governmental agencies from which prior approval is required. (Ord. 1522, 2005)

Cedar Oak Boat Launch Joint Permit NWP-2005-384

WILLAMETTE AND TUALATIN RIVER PROTECTION AREAS (CHAPTER 28)

The project is located within the Willamette River Protection Area, also referred to as the Habitat Conservation Area (HCA). The purpose of the HCA is to protect, conserve, enhance, and maintain the natural, scenic, historical, economic, and recreational qualities of lands along the Willamette River. The HCA overlay implements policies from the West Linn Comprehensive Plan and the State of Oregon's Willamette River Greenway program and establishes standards for existing and future uses along the Willamette River. The HCA and corresponding regulations encourage local stewardship and habitation preservation while protecting public access along the shoreline.

Approval Criteria for CDC 28.110

A. All sites. Sites shall first be reviewed using the HCA Map to determine if the site is buildable or what portion of the site is buildable. HCAs shall be avoided to the greatest degree possible. The goal is to, at best, avoid or, at least, minimize disturbance of the HCAs. (Water-dependent uses are exempt from this provision.)

The proposed project area is located entirely within the HCA designation on the METRO Habitat Map. No portion of the property falls outside of this designation. The HCA extends beyond the site, north and south, along the banks of the Willamette River. Alternative locations of sufficient size, under public ownership, and with access on the west side of the river are not available on this section of the river. Alternative ramps are provided on the east side of the river; however, reaching them from the west side is difficult because of limited bridge crossing and road connections.

The proposed boat ramp is a water-dependent use and is exempt from this criterion.

4. All development, including exempted activities of CDC 28.040, shall have approved erosion control measures per Chapter 31 CDC in place prior to site disturbance.

An erosion control plan has been prepared for the project according to the City of West Linn Erosion Prevention and Sediment Control Manual (Dec. 2008), and is included in Attachment A. Erosion control methods during construction will include a floating sediment curtain and upland sediment fences. The contractor will mobilize equipment and establish a staging area that is fenced and secure. The floating sediment curtain will be placed as close to the work area as possible to minimize the area initially enclosed. Work will be conducted during the Oregon Department of Fish and Wildlife (ODFW) approved in-water work window for this section of the Willamette River (July 1 through October 21 and/or December 1 through January 31). ODFW will be notified and fish salvage efforts using electroshock equipment will be conducted. Material will be imported to the site via land and will be staged in the stockpile area. Fill will be placed near shore initially, using hydraulic excavators and dump trucks. As the work progresses riverward, the floating sediment curtain will be moved outward, maintaining a small volume of enclosed water and reducing the chance of straining and/or trapping fish.

After the fill is placed and graded, the slope treatment will be installed. This will consist of larger rock armor at the toe, then rock of smaller size progressing up the slope. This site is generally sheltered; however, during a flood event water is directed around the upstream island and the site is exposed to increased current. To minimize habitat impacts, the rock armor will be covered with round rock native to the area, and the upper slopes will be covered with soil and vegetation. A layer, approximately 3 feet thick, of round rock will be placed over the rock armor. This round rock will be the size and gradation similar to those of the adjacent shoreline, approximate mean diameter of three inches.

The soil placed on the upper slope zone near ordinary high water will be stabilized with biodegradation coir fabric and anchored in place. Native plant species will be installed in this zone to provide riparian cover and to replace the function value of this area lost because of construction. Several large trees exist in the area to be disturbed. The root system for these trees will be excavated and the trees will be salvaged without cutting for the restoration element. The full-length trees will be used for shoreline stability and habitat enhancement by laying the root wad portion on the top of the bank and directing the canopy down into the river, similar to the way vegetation falls into the river naturally. The trees will be anchored with

12-inch diameter wood pins driven into the ground and crossing the tree in a v-form. No cables or chains will be used.

Topsoil in the disturbed area will be scraped and stockpiled with erosion-control protection for later use in plantings.

The proposal satisfies this criterion.

D. Development of lands designated for industrial, commercial, office, public and other non-residential uses. Development of lands designated for industrial, multi-family, mixed use, commercial, office, public and other non-single-family residential uses shall be permitted on the following land designations and in the following order of preference with "a" being the most appropriate for development and "d" being the least appropriate:

a. "Habitat and Impact Areas Not Designated as HCAs"

b. Low HCA

c. Moderate HCA

d. High HCA

The boat ramp is a water-dependent use and is, thereby, exempt from this criterion.

2. Developing HCA land. Where non-HCA or areas designated as "Habitat and Impact Areas Not Designated as HCAs" are lacking or are in such limited supply as to render uses allowed by the underlying zone (e.g., general industrial) functionally impractical, the HCA may be utilized.

The boat ramp is a water-dependent use and is, thereby, exempt from this criterion.

E.1. Hardship provisions and non-conforming structures. For the purpose of this chapter, non-conforming structures are existing structures whose building footprint is completely or partially on HCA lands. Any additions, alterations, replacement, or rehabilitation of existing non-conforming non-water-related structures (including decks), roadways, driveways, accessory uses and accessory structures shall avoid encroachment upon the HCAs.

The boat ramp is a water-dependent use as well as an existing use.

This criterion does not apply.

F. Access and property rights.

1. Private lands within the protection area shall be recognized and respected.

The proposed project area is located on upland property owned by the City of West Linn. Construction activities will not encroach on private property. The project has received regulatory approvals from DSL and the Army Corps of Engineers.

The proposal satisfies this criterion.

2. Where a legal public access to the river or elsewhere in the protection area exists, that legal public right shall be recognized and respected.

Long-term public access to the river will be maintained through the reconstruction of the Cedaroak Boat Ramp. The new ramp will ensure accessibility to the river and reduce the need for periodic maintenance dredging.

The proposal satisfies this criterion.

3. To construct a water-dependent structure such as a dock, ramp, or gangway shall require that all pre-existing legal public access or similar legal rights in the protection area be recognized and respected.

Reconstruction of the Cedaroak Boat Ramp will protect the long-term accessibility of the public to the shoreline. During construction the boat ramp will be closed, however the park, excluding areas for construction and staging, will remain open for public access. Access will be maintained through the use of temporary fencing, barricades, and flagging. The duration of construction will be approximately four months.

The proposal satisfies this criterion.

4. Any public or private water-dependent use or facility shall be within established DSL-authorized areas.

All areas of the facility below the ordinary high water line are under a lease from the Oregon Department of State Lands. The new facility will continue to operate inside of the DSL lease area.

The proposal satisfies this criterion.

I. <u>Docks and other water-dependent structures</u>.

1. Once the preference rights area is established by DSL, the property owner identifies where the water-dependent use will be located within the authorized portion of the preference rights area. The water-dependent use should be centered or in the middle of the preference rights/authorized area or meet the side yard setbacks of the underlying zone.

The new boat ramp will be located in the same location as the existing boat ramp, which was originally constructed in 1970. The reconstruction of the boat ramp in the same location is important for maintaining continued recreational access to the Willamette River.

The proposal satisfies this criterion.

2. Both joint and single use docks shall not extend into the water any further than necessary to provide four feet between the ship's keel or fixed propeller/rudder and the bottom of the water at any time during the water's lowest point.

The proposed boat ramp has been carefully designed to both maintain the safety of recreational boaters and to minimize impacts to the natural habitat. The design ensures that boats of 20-foot length are able to dock at boat ramp while maintaining at least 4 feet between the rudder and the bottom of the water.

The proposal satisfies this criterion.

3. In no case except as provided in this section shall the ramp and dock extend more than 100 feet from OLW towards the center of the river or slough. In the case of L-shaped docks, the 100 feet shall be measured from the OLW to the furthest part of the dock closest to the center of the river.

The proposed boat ramp will measure 220 feet long. The ramp extends approximately 115 feet toward the center of the river from the ordinary low water line. However, per CDC 28.040.DD, public docks, gangways, and other water related accessory facilities are exempt from this requirement.

This criterion does not apply.

4. Docks on sloughs and similar channels shall not extend more than 30 percent of the distance between two land masses at OHW, such as between the mainland and an island or peninsula, measured in a lineal manner at right angle to the dominant shoreline. In no way shall a dock impede existing public usage or block navigation of a channel.

The proposed boat ramp will extend approximately 25 percent of the distance between West Linn on the west bank and Jennings Lodge on the east bank.

The proposal satisfies this criterion.

5. Boat storage associated with a rail launch facility shall be located above the OHW, either vertically raised above the ordinary high water line or set back behind the OHW. Such boat storage structure will be natural wood colors or similar earth tones.

No boat storage structures are being proposed as part of this project.

This criterion does not apply.

6. The width of each deck section shall be no more than 12 feet wide.

The proposed floating dock will be 6 feet wide.

The proposal satisfies this criterion.

7. For both single-user and joint-user docks, pilings shall not exceed a maximum height of eight feet above the 100-year flood elevation.

The pilings will be installed to a top elevation of approximately 50' (NAVD88 vertical datum) which is 4 feet above the 100 year flood elevation (46' NAVD88).

The proposal satisfies this criterion.

8. A single user non-commercial dock shall not exceed 400 square feet in deck area. The boat slip is not included in the calculation of this square footage limitation.

The dock is a public access point and does not classify as a single user non-commercial dock.

This criterion does not apply.

9. Private non-commercial boat houses are allowed but only if they are within 50 feet of OLW and/or in locations sufficiently screened from view so that they do not have a significant visual impact on views from adjacent and nearby homes.

No private non-commercial boat houses are being proposed as part of this project.

This criterion does not apply.

K. <u>Non-conforming docks and other water-related structures</u>. Pre-existing non-conforming structures, including docks, ramps, boat houses, etc., as defined in this chapter may remain in place. Replacement in kind (e.g., replacement of decking and other materials) will be allowed provided the replacement meets the standards of this chapter. However, if any non-conforming structure that is damaged and destroyed or otherwise to be replaced to the extent that the rebuilding or replacing (including replacement in kind) would exceed 50 percent of the current replacement cost of the entire structure, the owner shall be required to meet all the standards of this chapter.

The ramp and dock structure are considered a replacement in kind and does not increase dimensions of the existing ramp and dock.

The proposal satisfies this criterion.

L. <u>Roads, driveways, utilities, or passive use recreation facilities</u>. Roads, driveways, utilities, public paths, or passive use recreation facilities may be built in those portions of HCAs that include wetlands, riparian areas, and water resource areas when no other practical alternative exists but shall use water-permeable materials unless City engineering standards do not allow that. Construction to the minimum dimensional standards for roads is required.

Existing roads, driveways, utilities, public paths, and passive recreational facilities will be maintained as is. Minor improvements will be made to the parking lot to incorporate a turnabout for trailers and shifting of the ramp into the river. 11,665 square feet of impervious asphalt will be added to

construct the turnabout and ramp approach. The center of the turnabout will be planted with native vegetation and grasses to allow for better management of on-site stormwater.

The proposal satisfies this criterion.

M. Structures.

There are no structures proposed as part of this project.

This criterion does not apply.

N. Water-permeable materials for hardscapes. The use of water-permeable materials for parking lots, driveways, patios, and paths as well as flow-through planters, box filters, bioswales and drought tolerant plants are strongly encouraged in all "a" and "b" land classifications and shall be required in all "c" and "d" land classifications.

Water permeable asphalt is not feasible for the location of the boat ramp within the flood plain where there is potential for river sediment to enter and clog the asphalt pores (from boar trailer tracking as well as flood water). The center of the turnabout will be planted with native plants and grasses for better management of stormwater run-off.

The proposal satisfies this criterion.

O. Signs and graphics. No sign or graphic display inconsistent with the purposes of the protection area shall have a display surface oriented toward or visible from the Willamette or Tualatin River. A limited number of signs may be allowed to direct public access along legal routes in the protection area.

The existing signage is minimal and serves a specific need for the distribution of information to park visitors. The Cedaroak Boat Ramp park contains the following signage:

- Park identification sign at entry
- Park hours
- Designated parking spaces for trailers
- Designated handicapped parking spaces
- Informational sign board with river map and regulations.

No additional signs are being proposed as part of this effort. This criterion does not apply.

P. Lighting. Lighting shall not be focused or oriented onto the surface of the river except as required by the Coast Guard. Lighting elsewhere in the protection area shall be the minimum necessary and shall not create off-site glare or be omni-directional. Screens and covers will be required.

There is one existing street lamp within the park parking lot. The lamp is oriented downward to avoid light pollution. No additional lighting is being proposed as part of this project.

This criterion does not apply.

Q. Parking. Parking and unenclosed storage areas located within or adjacent to the protection area boundary shall be screened from the river in accordance with Chapter 46 CDC, Off-Street Parking, Loading and Reservoir Areas. The use of water-permeable material to construct the parking lot is either encouraged or required depending on HCA classification per CDC 28.110(N)(4).

Major modifications to the existing parking lot will not be made. Water permeable asphalt is not feasible for the location of the boat ramp within the flood plain where there is potential for river sediment to enter and clog the asphalt pores (from boar trailer tracking as well as flood water).

This criterion does not apply.

R. Views. Significant views of the Willamette and Tualatin Rivers shall be protected as much as possible as seen from the following public viewpoints: Mary S. Young Park, Willamette Park, Cedar Oak Park, Burnside Park, Maddox Park, Cedar Island, the Oregon City Bridge, Willamette Park, and Fields Bridge Park. Where options exist in the placement of ramps and docks, the applicant shall select the least visually intrusive location as seen from a public viewpoint. However, if no options exist, then the ramp, pilings and dock shall be allowed at the originally proposed location.

The Cedaroak boat ramp provides direct views of the Willamette River and the Cedar Island Park. Views to the north and east are obstructed by trees and landscaping to provide screening between adjacent residential properties. View to the south are somewhat obstructed due to the existence of the natural area to the south of the park. Screening to the north and east will be maintained, as well as vegetation to the south of the park, in order to protect the adjacent habitats in Cedar Island Park. The boat ramp will be reconstructed in the current location, and existing views will not be affected.

The proposal satisfies this criterion.

S. Aggregate deposits. Extraction of aggregate deposits or dredging shall be conducted in a manner designed to minimize adverse effects on water quality, fish and wildlife, vegetation, bank stabilization, stream flow, visual quality, noise and safety, and to promote necessary reclamation.

An erosion control plan has been prepared and is included in Attachment A. Erosion control methods will include a floating sediment curtain and upland sediment fences. The contractor will mobilize equipment and establish a staging area that is fenced and secure. The floating sediment curtain will be placed as close to the work area as possible to minimize the area initially enclosed. Work will be conducted during the ODFW approved in-water work window for this section of the Willamette River (July 1 through October 21 and/or December 1 through January 31). ODFW will be notified and fish salvage efforts using electroshock equipment will be conducted. Material will be imported to the site via land and will be staged in the stockpile area. Fill will be placed near shore initially, using hydraulic excavators and dump trucks. As the work progresses riverward, the floating sediment curtain will be moved outward, maintaining a small volume of enclosed water and reducing the chance of straining and/or trapping fish.

The proposal satisfies this criterion.

T. <u>Changing the landscape/grading</u>.

1. Existing predominant topographical features of the bank line and escarpment shall be preserved and maintained except for disturbance necessary for the construction or establishment of a water related or water dependent use. Measures necessary to reduce potential bank and escarpment erosion, landslides, or flood hazard conditions shall also be taken. Any construction to stabilize or protect the bank with rip rap, gabions, etc., shall only be allowed where there is clear evidence of erosion or similar hazard and shall be the minimum needed to stop that erosion or to avoid a specific and identifiable hazard. A geotechnical engineer's stamped report shall accompany the application with evidence to support the proposal.

There are no predominant topographical features within the project area.

This criterion does not apply.

2. The applicant shall establish to the satisfaction of the approval authority that steps have been taken to minimize the impact of the proposal on the riparian environment (areas between the top of the bank and the low water mark of the river including lower terrace, beach and river edge).

The bank fill slopes will be planted with native vegetation, and large woody debris will be installed to enhance the riparian habitat disturbed as a result of the project.

The proposal satisfies this criterion.

3. The applicant shall demonstrate that stabilization measures shall not cause subsequent erosion or deposits on upstream or downstream properties.

Adjacent properties are of sufficient distance that erosion or sediment deposits resulting from the project construction are not likely. The nearest adjacent property is 1,300 feet (along the bank line) upstream of the project, and 310 feet downstream of the project.

This proposal satisfies this criterion.

4. Prior to any grading or development, that portion of the HCA that includes wetlands, creeks, riparian areas and water resource area shall be protected with an anchored chain link fence (or approved equivalent) at its perimeter and shall remain undisturbed except as specifically allowed by an approved Willamette and Tualatin River Protection and/or water resource area (WRA) permit. Such fencing shall be maintained until construction is complete. That portion of the HCA that includes wetlands, creeks, riparian areas and water resource area shall be identified with City-approved permanent markers at all boundary direction changes and at 30- to 50-foot intervals that clearly delineate the extent of the protected area.

A chain-link fence will be placed around the upland construction area for the duration of the project. A floating sediment curtain will be placed around the in-water work area. As the work

progresses riverward, the floating sediment curtain will be moved outward, maintaining a small volume of enclosed water and reducing the chance of straining and/or trapping fish.

The proposal satisfies this criterion.

5. Full erosion control measures shall be in place and approved by the City Engineer prior to any grading, development or site clearing.

The contractor will implement erosion control measures as shown in the drawings in Attachment A. The Contractor will be responsible for obtaining approval of erosion control measures before the start of ground disturbing activities.

The proposal satisfies this criterion.

U. Protect riparian and adjacent vegetation. Vegetative ground cover and trees upon the site shall be preserved, conserved, and maintained according to the following provisions:

1. Riparian vegetation below OHW removed during development shall be replaced with indigenous vegetation, which shall be compatible with and enhance the riparian environment and approved by the approval authority as part of the application.

Disturbed areas will be planted with native shrubs, trees, and ground cover. Vegetation will be planted to approximate elevation 15 feet. Large wood debris will also be installed on the bank to enhance the riparian environment.

The proposal satisfies this criterion.

2. Vegetative improvements to areas within the protection area may be required if the site is found to be in an unhealthy or disturbed state by the City Arborist or his designated expert. "Unhealthy or disturbed" includes those sites that have a combination of native trees, shrubs, and groundcover on less than 80 percent of the water resource area and less than 50 percent tree canopy coverage in the primary and secondary habitat conservation area to be preserved. "Vegetative improvements" will be documented by submitting a revegetation plan meeting CDC 28.160 criteria that will result in the primary and secondary habitat conservation area to be preserved having a combination of native trees, shrubs, and groundcover on more than 80 percent of its area, and more than 50 percent tree canopy coverage in its area. The vegetative improvements shall be guaranteed for survival for a minimum of two years. Once approved, the applicant is responsible for implementing the plan prior to final inspection.

The project area has not been determined unhealthy or disturbed by a City Arborist.

This criterion does not apply.

3. Tree cutting shall be prohibited in the protection area, with exceptions for diseased trees or trees endanger of falling, trees permitted by the City Arborists for removal, or selective cutting in accordance with the Oregon Forest Practices Act.

Several trees are located within the project area, primarily cottonwood and alder trees. These trees will be removed as needed and used as part of the bank rehabilitation effort. Replacement trees will be planted following completion of the bank stabilization effort.

This proposal satisfies this criterion.

PARK AND NATURAL AREAS DESIGN REVIEW – CLASS II (CHAPTER 56)

The purpose of the parks and natural area design review provisions is to establish a process and standards for the review of park and natural area development proposals to ensure that the intent of the Parks Master Plan is satisfied. Due to the significance of the proposed work, namely the addition of more than 10 percent of total square footage of the existing structure, the proposed project will be considered under a Class II Parks Design Review. Each approval criteria is listed and addressed below according to the project specifications, per CDC 56.100.

Approval Criteria for CDC 56.100

A. Park classification. The proposed park and park programs shall conform to, and agree with, the Parks Master Plan and the parks definitions of CDC 56.015. Reclassifying the purpose of a park and the programs shall require an amendment to the Parks Master Plan. Park facilities that are not discussed in the Parks Master Plan shall be classified using the criteria of CDC 56.015 and the Parks Master Plan. Once the classification is made, the approval criteria shall take into consideration those program needs and the standards for the specific park type and evaluate the application accordingly.

The Cedaroak Boat Ramp is designated as a Special Use Area listed in the Parks Master Plan (West Linn Parks, Recreation, and Open Space Plan) and is identified as one of the primary points of waterfront access. According to CDC 56.015, Special Use Areas are defined as single-purpose sites or areas occupied by specialized facilities. Uses include boat ramps, stand-alone recreation centers, botanical or community gardens, and sports field complexes. Special Use Areas follow the development guidelines listed in Section 5.5 of the Parks Master Plan. The plan requires that all Special Use Areas provide the following amenities:

- **Site identification signage**. A sign is located at the entrance of the park, identifying it as the Cedaroak Boat Landing (Appendix A). The sign will remain as part of this proposal.

- **Appropriate furnishings (e.g., picnic tables, benches, bike racks, drinking fountain, trash receptacles, etc.) intended for the scale and use of the park.** The park contains a drinking fountain, trash and recycling receptacles, a bench, as well as a dispenser for bags to be used for pet waste.

- **Special use facility or facilities.** The proposed improvements will replace the existing boat ramp with a new boat ramp measuring 220 feet long by 6 feet wide made of pre-cast concrete.

- **Permanent restrooms (if special use facility is not an indoor structure).** The current facility includes public restroom facilities, which will be maintained as part of the improvement project.

- **General landscaping improvements.** Approximately 1.6 acres of the 7.7-acre site is comprised of an impervious, asphalt parking lot, with the exception of two narrow parking strips. The remainder of the site consists of vegetation and trees, primarily cottonwood and alder. The proposed project would retrofit the parking lot adding 11,665 square feet of asphalt. A parking island with a stormwater bioswale facility in the middle will be installed in the middle of the turnaround. The turnaround and bioswale will be planted with native plants and grasses.

- **On-street or off-street parking in compliant with West Linn's code and adequate to accommodate site's use. Green design should be used when possible.** The park includes a surface parking lot that accommodates 84 parking stalls, including 59 trailer-only parking stalls (40 ft x 10 ft), 1 trailer-only ADA (40 ft x 10 ft), 19 standard (9 ft x 20 ft), and 4 standard ADA parking stalls (9 ft x 20 ft). Three standard parking stalls will be removed to accommodate the trailer turnaround. The parking sufficiently meets demand. Green design (i.e. pervious pavement) is not feasible due to the location of the parking area within the floodplain. The stormwater bioswale will filter stormwater and infiltrate it.

  Chapter 46 of the West Linn Community Development Code provides code provisions for Off-street Parking, Loading, and Reservoir Areas. The following code sections apply:

  - **46.060 Storage In Parking and Loading Areas Prohibited** – Signage is currently posted in the park's parking lot prohibiting the parking of vehicles or trailers between 10pm and 3am (Appendix A). This signage will remain as part of the park improvements.

  - **46.070(B) Maximum Distance Allowed Between Parking Area and Use –** Off-street parking spaces shall be located not father than 200 feet from an entryway to the building or use they are required to serve, measured in a straight line from the building. The existing parking lot contains 84 parking stalls, which sufficiently meets and exceeds peak parking demand. Parking stalls are located within 80 to 350 feet from the dock. Approximately three quarters of these stalls are located within 200 feet from the boat ramp. This spacing is appropriate given the number of stalls and the setback necessary to allow for the maneuvering of trailers to and from the boat ramp. Per 46.070(B)(5), all disabled parking is located closest to the boat ramp and public restroom than all other parking. The parking lot is ADA compliant.

  - **46.090(B)(10) Minimum Parking Space Requirements**- For boat ramps, the code requires 40 spaces per launch ramp, with 50 percent of stalls (at least 20 stalls) measuring 9' x 20' and 50 percent (at least 20 stalls) measuring 10' x 40' marked "trailers only." The Cedaroak parking lot currently contains 84 parking stalls, with 60 trailer-only stalls measuring 40' x 10' and 23 standard stalls measuring 9' x 20 ft.

- **46.090(F) Maximum Parking** – The code states that parking spaces shall not exceed the minimum required number of spaces by more than 10 percent. The existing lot exceeds the minimum standard, but is grandfathered in under former regulations. Current parking capacity is fully utilized during times of high use, particularly during fishing season. The existing proposal will remove three parking spaces to mitigate this exceedance. However, given the existing nature of the lot, the uniqueness of the amenity, and the need for all existing parking stalls, the parking facility will not be significantly altered.

- **46.150(A) Design Standards –** Standard parking stalls shall measure 9 feet by 16 feet. Compact stalls measure 8 feet by 16 feet, and disabled parking spaces shall be consistent with current federal dimensional standards and subsection B of this section, and placed nearest to accessible buildings and entryways. The existing parking spaces exceed these dimensions. The parking is improved with asphalt, and parking spaces are clearly delineated with paint.

  Access from the street is limited to one driveway to facilitate the flow of traffic and provide maximum safety for pedestrians and vehicular traffic on site. Directional arrows are painted on the asphalt to facilitate the flow of traffic. The lot frontage is screened with vegetation and is not visible from the street. Stormwater flows to perimeter ditches and eventually to the Willamette River. The parking area has an average grade of 1-2%. There is one street lamp in the parking lot used to illuminate the parking lot. The light is oriented towards the ground to minimize reflection that might otherwise disturb neighboring properties.

  Additional improvements regarding the configuration of parking spaces and pedestrian pathways is not part of this proposal. The existing lot will be maintained in its current configuration.

The proposed improvements to the park are in keeping with the plan's guidelines.

The proposal satisfies these criterion.

B. <u>Visual and physical accessibility</u>. Many of the City's parks suffer from inadequate visibility, such as Sunburst Park and North Willamette Park, surrounded as they are by housing. Increased frontage on streets allows greater use of on-street parking and less park space being used for parking. The surrounding streets also provide transitions between on- and off-site activities as discussed in subsection (D)(1) of this section. Physical access is also facilitated by having good cognitive locations that can be safely accessed by bike paths and sidewalks. Improved visual access amplifies the investment and positive benefits of parks in that many people who do not stop the car and actually use the park derive emotional benefits by exposure to scenes of open space, trees, and grass fields in a world increasingly dominated by built environments.

- **Visibility.** The boat ramp facility is located in a heavily forested area in a residential area. The existing trees and landscaping serve as a screening mechanism between the boat ramp and the adjacent residential properties in order to minimize disturbance and protect the privacy of neighboring properties. Park identification signage is posted to ensure that people

passing through the area are aware of the boat ramp. One street lamp exists within the parking area; however, the park is closed in the evenings between 10 p.m. and 3 a.m.

- **On-street versus off street parking.** The adjacent Elmran Drive is narrow and does not accommodate for on-street parking. In addition, the park use as a boat ramp facility makes the use of any potential on-street parking unlikely as it would not accommodate large vehicles or boat trailers. Therefore, all parking will continue to be provided on site.

- **Physical access for bike and pedestrian traffic.** No bicycle or pedestrian facilities are provided on the adjacent Elmran Drive and Nixon Avenue. The City's Transportation System Plan does not encourage the installation of bicycle facilities or sidewalks due to the perceived low feasibility and desirability of these facilities in the immediate area.

The proposal satisfies this criterion.

C. Relationship to the natural environment.

1. The buildings and other site elements shall be designed and located so that all heritage trees, as defined in the municipal code, shall be saved. Diseased heritage trees, as determined by the City Arborist, may be removed at the direction of the City Manager.

There are no heritage trees identified on the property.

This criterion does not apply.

2. All heritage trees, as defined in the municipal code, and all trees and clusters of trees ("cluster" is defined as three or more trees with overlapping driplines; however, native oaks need not have an overlapping dripline) that are considered significant by the City Arborist, either individually or in consultation with certified arborists or similarly qualified professionals, based on accepted arboricultural standards including consideration of their size, type, location, health, long term survivability, and/or numbers, shall be protected pursuant to the criteria of CDC 55.100(B)(2). It is important to acknowledge that all trees are not significant.

a. Areas of the park that include non-Type I and II lands shall protect all heritage trees and all significant trees through the careful layout of streets, building pads, playing fields, and utilities. The method for delineating the protected trees or tree clusters ("dripline + 10 feet") is explained in CDC 55.100(B)(2)(a) and in subsection (C)(2)(b) of this section.

No trees/heritage trees are being removed as part of the park development.

The proposal satisfies this criterion.

b. Areas of the park that include Type I and II lands shall protect all heritage, significant and non-significant trees. Groundcover, bushes, etc., shall be protected and may only be disturbed to allow the construction of trails or

accessing and repairing utilities. Exemptions permitted under CDC 55.100(B)(2)(c) through (f) shall apply.

The existing boat ramp site is subject to frequent boating activity. Because of the frequent disturbance and seasonal flooding, there is a lack of groundcover and bushes in the project area. Regardless, disturbance will be minimized during construction by stockpiling materials upland in the existing parking lot. Materials will be covered and protected during rain events. To prevent in-water disturbance to shallow-water fish species, work will be conducted from land and perimeter controls will be established around the piles.

The proposal satisfies these criterion.

3. In the case of natural resource areas, the topography shall be preserved to the greatest degree possible. Conversely, in non-natural resource areas, it is recognized that in order to accommodate level playing fields in an active-oriented park, extensive grading may be required and the topography may be modified.

The redesigned boat ramp will be constructed over the footprint of the existing boat ramp. The ramp itself will be constructed with a 14.5% slope. The boat ramp slopes will be covered with native round rock (3-inch mean diameter) in a 3-foot thick layer and will be stone sized to minimize movement. Upper portions of the slope will be planted with native species. Riprap will be placed at the toe of the slope perimeter only 3 feet wide to protect from undercutting.

The extension of the existing boat ramp would make the access to the ramp too long to be safe and manageable for recreational boaters. A turnaround for boats and trailers is proposed to decrease the distance that trailers will need to back down the ramp. The edge of the fill will be graded at and approximately 3:1 slope to create a natural transition with the adjacent riverbanks.

The proposal satisfies this criterion.

4. The structures shall not be located in areas subject to slumping and sliding. The Comprehensive Plan Background Report's Hazard Map, or updated material as available and as deemed acceptable by the Planning Director, shall be the basis for preliminary determination.

According to the Comprehensive Plan background Report's Hazard Map, the proposed boat ramp is not located on a steep slope or in an area vulnerable to landslides. It is located in a Zone C (low-moderate) earthquake zone.

The purpose of the boat ramp reconstruction is to improve upon the resiliency of the current structure. The new boat ramp will be constructed to reduce accumulation of sediments and will be covered in rock armor to protect the placed fill from erosion.

The proposal satisfies this criterion.

5. The park shall be designed in such a way as to take advantage of scenic views and vistas from the park site, as long as such views can be obtained without eliminating significant trees or other natural vegetated areas.

The Cedaroak boat ramp provides direct views of the Willamette River and the Cedar Island Park. Views to the north and east are obstructed by trees and landscaping to provide screening between adjacent residential properties. View to the south are somewhat obstructed due to the existence of the natural area to the south of the park. Screening to the north and east will be maintained. Vegetation to the south of the park will also be maintained to protect the adjacent habitats in Cedar Island Park.

The proposal satisfies this criterion.

D. <u>Facility design and relationship to the human environment.</u>

1. <u>Architecture</u>. Whereas most park buildings are small in size and compatible with existing structure(s) on site and on adjoining sites, the possibility of larger facilities exists. Larger buildings are defined as those over 1,000 square feet and under 10,000 square feet in size. In those cases, contextual design is required. "Contextual design" means respecting and incorporating prominent architectural styles, building lines, roof forms, rhythm of windows, building scale and massing, materials and colors of surrounding buildings in the proposed structure. Also important is breaking the larger building into smaller visual components so that the mass of the building is not so apparent. This is especially relevant when the building is near the perimeter of the park. However, certain uses, by virtue of their functional and spatial requirements, are large and can never be made visually equal or even compatible with nearby homes. Such uses shall not be prohibited from locating at active-oriented park facilities on architectural grounds so long as the applicant's architect has broken down the building's horizontal plane into smaller visual components and stepped down the building at the end closest to the off-site structure(s). "Smaller visual components" shall be defined as changes in the horizontal plane every 100 feet created by indentations or pop-outs at least three feet in depth. "Stepping down" shall be defined as bringing the park building's end section that is closest to off-site dwellings to half the distance between the highest ridgeline of the park structure and the highest ridgeline of the nearest off-site structure. In those cases where visual component breakdown or stepping down is not feasible, the applicant may rely on transitions in terms of distance as reasonable mitigation between on- and off-site buildings. An appropriate minimum distance to achieve mitigation shall be either 150 feet or an existing public right-of-way.

No buildings are being proposed as part of the proposed project.

This criterion does not apply.

2. <u>Material</u>. Park structures shall emphasize natural materials such as exposed timbers, wood with brick and stone detail. Colors are subdued earth tones: grays, brown, off-whites, black, slate, and greens.

The boat ramp surface will be made out of 4-foot pre-cast concrete planks with a v-groove finish. One floating dock will be constructed of recycled wood material and encapsulated foam. The floating dock will be anchored by 6 steel pilings measuring 16 inches in diameter. The floating docks are designed to facilitate fish passage.

Materials were selected for their structural integrity, durability, and ability to withstand high volume traffic and environmental conditions over long periods of time. The materials selected will have no adverse impacts on the natural environment. In addition, the materials reflect a color neutral palette that will blend in to the natural surroundings.

3. Human scale is a term that seeks to accommodate the users of the building and the notion that buildings should be designed around the human scale (e.g., average range of human perception). For large buildings, defined as over 1,000 square feet and less than 10,000 square feet in size, human scale shall be accommodated by, for example, multi-light windows that are broken up into numerous panes, intimately scaled entryways, visual breaks (exaggerated eaves, indentations, belly boards, ledges, cornices, awnings, engaged columns, etc.) in the facades of buildings, both vertically and horizontally, but particularly within the first 10 to 15 feet as measured vertically.

No buildings are being proposed as part of the proposed project.

This criterion does not apply.

4. Transparency. For all enclosed buildings in the park, with the exception of public restrooms, storage and utility buildings, the main/front building elevation shall provide at least 60 percent windows or transparency at the pedestrian level to create a more interesting building elevation, allow natural/ambient interior lighting and enhance defensible space. One side elevation shall provide at least 30 percent transparency. Transparency on other elevations is optional. The transparency is measured in lineal fashion. For example, a 100-foot long building elevation shall have at least 60 feet (60 percent of 100 feet) in length of windows. The window height shall be, at minimum, three feet tall. The exception to transparency would be cases where demonstrated functional constraints or topography restrict that elevation from being used. When this exemption is applied to a building elevation(s), the square footage of transparency that would ordinarily be required by the above formula shall be installed on the remaining elevations in addition to any transparency required by a side elevation, and vice versa. The transferred transparency is not required to be at pedestrian level and may be incorporated into clerestories or dormers. The rear of the building is not required to include transparency. The transparency must be flush with the building elevation.

No buildings are being proposed as part of the proposed project.

This criterion does not apply.

E. Transportation Planning Rule (TPR) compliance. The TPR is a State requirement to reduce dependence upon the private automobile, reduce the total number of vehicle miles traveled and reduce carbon monoxide emissions. One way this can be achieved is by

providing greater connectivity within the City from one neighborhood to the next so that circuitous, fuel-consuming trips are reduced. Where park space is bisected by a planned arterial connector as identified in the City's Transportation Master Plan, then that arterial shall be constructed as part of the park project. Where proposed collector or local streets are shown on the Transportation Master Plan or where existing roads stub out adjacent to the parks property, the road shall also go through, except in those cases where one of the following criteria is met:

1. The road will eliminate or adversely affect the functional value of the park (e.g., it would go through the only reasonable location for a planned soccer field).

2. The road will adversely affect the quality or quantity of a natural resource area/open space (e.g., construction of the road will require grading or fill in the resource area; the increased traffic associated with the road will diminish the restorative, contemplative, and natural interpretative opportunities associated with the resource; the impact of the traffic, such as noise, pollutants, and glare, will make the area less attractive as a wildlife habitat or corridor, and/or have adverse environmental impacts on the resource, etc.).

3. The road will be in conflict with the City Charter languages.

No additional roads are being proposed since existing traffic volumes will not change as a result of the project.

These criterion do not apply.

F. <u>Compatibility between adjoining uses</u>.

1. On-site screening from view from adjoining properties of such things as service and storage areas shall be provided and the following factors will be considered in determining the adequacy of the type and extent of the screening:

a. What needs to be screened?

b. The direction from which it is needed.

c. How dense the screen needs to be.

d. Whether the viewer is stationary or mobile.

e. Whether the screening needs to be year-round.

f. Consideration shall be given to the proper screening of lights so that no off-site glare is produced.

2. Rooftop air cooling and heating systems and other mechanical equipment shall be screened from view from adjoining properties.

The Cedaroak Boat Ramp is located adjacent to a single-family residential zone (R-10). Residential properties are located to the north and west of the property. The Willamette River is located to the east of the boat ramp and the Cedar Island Park to the south. An existing screen is located between the park and the residential units to the north and west. The screen will continue to be maintained year-round to minimize disturbance and to ensure privacy. Only one street lamp is located in the park. The lighting is pointed downward to minimize glare and protect residential properties from light pollution.

The proposal satisfies this criterion.

G. <u>Crime prevention and safety/defensible space</u>.

1. Windows shall be located so that areas vulnerable to crime can be surveyed by the occupants.

No structures are being proposed as part of the development.

This criterion does not apply.

2. The exterior lighting levels shall be selected and the angles shall be oriented towards areas vulnerable to crime, to enhance public safety, and away from natural resource areas to minimize disturbance of wildlife.

There is one street lamp in the park in order to minimize disturbance to neighboring residences and wildlife. The street lamp is oriented towards the ground to reduce any light pollution. The park is closed at 10 p.m. each evening and, therefore, additional lighting is not required at this time.

3. Light fixtures shall be provided in areas having heavy pedestrian or vehicular traffic and in potentially dangerous areas such as large parking lots, stairs, ramps, and abrupt grade changes during hours of intended use or operation.

The park is not open during the evening hours. Therefore, no additional lighting is proposed.

4. Fixtures shall be placed at a height so that light patterns overlap at a height of seven feet, which is sufficient to illuminate a person. All projects undergoing design review shall use low- or high-pressure sodium bulbs and be able to demonstrate effective shielding so that the light is directed downwards rather than omni-directional.

No additional lighting is being proposed as part of this project. The park is not open during the evening hours and, therefore, no additional lighting is needed.

6. Lines of sight shall be reasonably established so that the park and its facilities are visible to police and nearby residents.

Police regularly patrol the facility during evening and daytime hours. Residential properties have view of the river and partial view of the park to the south and west of the parking lot.

7. Large or visually inaccessible parks should ensure that at least some emergency vehicle access is provided to the park's interior.

The driveway access to the park measures a minimum 22 feet wide with sufficient width and turn radius to permit access and turnaround space for emergency vehicles.

8. Closure times may be posted and/or gates may be installed at City parks to discourage their use at night if necessary for crime prevention and/or public safety.

The park is closed from 10 p.m. to 3 a.m. These times are posted at the park entrance.

9. Park landscaping shall accommodate safety concerns with appropriate use of plant types and ease of maintenance.

The vegetation in the park consists of grasses and trees that require little maintenance.

The proposal satisfies this criterion.

H. Public facilities.

1. Streets. Sufficient right-of-way and slope easement shall be dedicated to accommodate all abutting streets to be improved to the City's Improvement Standards and Specifications. In determining the appropriate sizing of the street, the street should be the minimum necessary to accommodate anticipated traffic load and needs and should provide substantial accommodations for pedestrians and bicyclists and in keeping with the character of the neighborhood. Road and driveway alignment should consider and mitigate impacts on adjacent properties and in neighborhoods in terms of increased traffic loads, noise, vibrations, and glare. Streets shall be installed per Chapter 85 CDC standards. Sidewalks shall be installed per CDC 85.200(A)(16) and 92.010(H). Both chapters allow reduced sidewalk widths to accommodate topographic limitations or to preserve trees.

No changes are being proposed to the adjacent street network. Access to the site will not be altered and traffic volumes will not increase as a result of this project. In addition, sidewalks along streets leading to the site are non-existent. The 2008 West Linn Transportation System Plan has designated adjacent streets, including Nixon Avenue and Elmran Drive, as areas where the future installation of sidewalks is not feasible or desirable. Due to these factors, this criterion does not apply.

The proposal satisfies this criterion.

2. Parking lots. CDC 46.090 explains the parking requirements for the various categories of parks and open space areas. City squares, malls or plazas are exempt from the parking requirements of Chapter 46 CDC. Reduced parking requirements are explained in CDC 56.170. Except for areas accommodating ADA disabled parking and ADA access, parking lots may be constructed with grasscrete.

CDC 46.090 requires 40 spaces per launch ramp. Fifty percent of these stalls must measure 9 feet by 20 feet. The other fifty percent must measure 10 feet by 40 feet and must be marked "trailers only."

The proposal satisfies this criterion.

I. <u>Paths and trails</u>. Paths and trails connect the various activity areas within the park. They can also serve as part of a greater system of connective trails from one neighborhood or destination to another. Just like streets, there is a hierarchy of paths and trails.

4. Nature trails are typically three to six feet wide, gravel, hog fuel, or packed earth. These trails are especially attractive to persons seeking quieter parts of the park for natural interpretation or solitude. Other user groups often use them for exercise loops. Trails and footbridges in natural areas should be designed to minimize disturbance of significant resources. Limiting access to creek beds, potentially erosive slopes, or wetlands by humans and dogs is an important measure if habitat or resource protection is to be addressed. At least initially, the use of these trails by all user groups should be encouraged. Changes or restrictions to some user groups shall be based on empirical observations at that specific site.

7. All paths and trails shall be clearly identified with signs. They shall be laid out to attract use and to discourage people from cutting across landscaped areas or impacting environmentally sensitive areas.

The trailhead of an unpaved trail begins at the parking lot adjacent to the Cedaroak Boat Ramp. The trail continues south and connects to the Cedar Island Park. The existing trail will be maintained and will not be affected as part of the proposed construction. No other trails are located within the immediate proximity of the Cedaroak Boat Ramp. No user groups will be changed or restricted as part of the proposal.

The proposal satisfies this criterion.

J. <u>Provisions for persons with disabilities</u>. The needs of a person with a disability shall be provided for. Accessible routes shall be provided between parking lot(s) and principal buildings and site facilities. The accessible route shall be the most practical direct route between accessible building entries, accessible site facilities, and the accessible entry to the site. All facilities shall conform to, or exceed, the Americans with Disabilities Act (ADA) standards, including those included in the Uniform Building Code.

ADA access currently exists between the boat ramp and ancillary parking lot. Five ADA parking stalls currently exist and will be maintained as part of the improvements. The pathway between the parking lot and boat ramp is paved and at maximum 2% grade. ADA access will be maintained as part of the park improvements.

The proposal satisfies this criterion.

K. <u>Miscellaneous criteria</u>. Selected elements of the following chapters shall be met. It is not necessary to respond to all the submittal standards or approval criteria contained in these

chapters, only those elements that are found to be applicable by the Planning Director at the pre-application conference pursuant to CDC 99.030(B) and (C):

1. Chapter 33 CDC, Stormwater Management.

The proposed dock facility will not impact the current nature of the stormwater management system on site. Management adjacent to the dock and turnaround will be improved with the installation of a stormwater bioswale.

This criterion does not apply.

2. Chapter 34 CDC, Accessory Structures, Accessory Dwelling Units, and Accessory Uses.

No buildings or accessory structures are being proposed.

This criterion does not apply.

3. Chapter 38 CDC, Additional Yard Area Required; Exceptions to Yard Requirements; Storage in Yards; Projections into Yards.

No structures are being proposed along the property line.

This criterion does not apply.

4. Chapter 40 CDC, Building Height Limitations, Exceptions.

No buildings are being proposed.

This criterion does not apply.

5. Chapter 42 CDC, Clear Vision Areas.

The proposed use is not located on the corner of an intersection or within a Clear Vision Area.

This criterion does not apply.

6. Chapter 44 CDC, Fences.

There is no existing or proposed fence on the property.

This criterion does not apply.

7. Chapter 46 CDC, Off-Street Parking, Loading and Reservoir Areas.

Chapter 46 CDC requires that off-street parking be located no more than 200 feet from the use in which the parking area is intended to serve. Parking stalls are located within appropriate

proximity. This is addressed as part of the response for West Linn Community Development Code **46.070(B)** on page 15 of this narrative.

The proposal satisfies this criterion.

8. Chapter 48 CDC, Access, Egress and Circulation.

The proposed project will continue to utilize existing access and egress points currently used for the existing boat ramp. No increase in traffic volumes is anticipated.

The proposal satisfies this criterion.

9. Chapter 52 CDC, Signs.

City signs are exempt from the provisions of Chapter 52 CDC.

This criterion does not apply.

10. Chapter 54 CDC, Landscaping. In addition, landscape plans shall incorporate plants which minimize irrigation needs without compromising recreational facilities or an attractive park environment. (Ord. 1604 §§ 55, 56, 2011)

Drought tolerant and native plant species will be selected that minimize maintenance and watering needs. Temporary watering of new vegetation may be required until it is established. This will likely be completed by City Parks and Recreation employees.

The proposal satisfies this criterion.

ATTACHMENT A

PLAN SET

CEDAROAK BOAT LAUNCH

PREPARED FOR:

CITY OF WEST LINN PARKS AND RECREATION

LOCATED AT RIVER MILE 23.2+/-

PROJECT CONTACTS

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CITY OF WEST LINN PARKS AND RECREATION 22500 SALAMO ROAD, PO BOX 1100 WEST LINN, OREGON 97068 P: 503.557.4700 CONTACT: KEN WORCESTER	MAUL, FOSTER & ALONGI, INC. 2001 NW 19TH AVENUE, SUITE 200 PORTLAND, OREGON 97209 P: 971.544.2139 CONTACT: JACOB FAUST, PE
SURVEYOR MINISTER-GLAESER SURVEYING, INC. 2200 E. EVERGREEN BLVD. VANCOUVER, WASHINGTON 98661 P: 360.694.3313 CONTACT: DAN RENTON, PLS	

PROJECT SUMMARY

SITE ADDRESS:
4600 ELMRAN DRIVE
WEST LINN, OREGON 97068

NEW IMPROVEMENTS:
THE PROJECT WILL CONSIST OF DEMOLITION AND REPLACEMENT OF AN EXISTING TWO-LANE BOAT LAUNCH FACILITY OPERATED AND MAINTAINED BY THE CITY OF WEST LINN. THE FACILITY WILL BE CONSTRUCTED APPROXIMATELY 115 FEET FURTHER INTO THE RIVER TO MITIGATE SEDIMENTATION BUILDUP OVER THE LOWER PORTION OF THE EXISTING RAMP.

VICINITY MAP

SCALE: 1"=1000'

SHEET INDEX

GENERAL NOTES

1. SURVEY PERFORMED BY MINISTER GLAESER-SURVEYING, INC. IN 2014.
2. HORIZONTAL DATUM: OREGON STATE PLANE COORDINATE SYSTEM NORTH ZONE, NAD 83 (INTERNATIONAL FEET). ELEVATION DATUM: NAVD 88
3. CONTRACTOR TO VERIFY ALL UTILITY LOCATIONS AND DEPTHS PRIOR TO CONSTRUCTION. A MINIMUM OF TWO FULL BUSINESS DAYS PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL CALL 811 (UTILITY NOTIFICATION CENTER) FOR LOCATION MARK-UP OF EXISTING UTILITIES.
4. ALL CONSTRUCTION, MATERIALS, AND WORKMANSHIP SHALL CONFORM TO THE LATEST STANDARDS AND PRACTICES OF THE CITY OF WEST LINN AND THE LATEST EDITION OF THE THE "OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION" PREPARED BY ODOT.
5. IN CASE OF A CONFLICT BETWEEN THE REGULATORY STANDARDS OR SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT WILL PREVAIL.
6. ANY CHANGES TO THE DESIGN AND/OR CONSTRUCTION SHALL BE APPROVED BY THE OWNER OR ENGINEER.
7. APPROVAL OF THESE PLANS DOES NOT CONSTITUTE AN APPROVAL OF ANY OTHER CONSTRUCTION NOT SPECIFICALLY SHOWN ON THE PLANS.
8. A COPY OF THESE APPROVED PLANS SHALL BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS.
9. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL CONSTRUCTION EASEMENTS AND PERMITS NECESSARY TO PERFORM THE WORK.
10. THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION STAKING.
11. PUBLIC AND PRIVATE DRAINAGE WAYS SHALL BE PROTECTED FROM POLLUTION. NO MATERIAL IS TO BE DISCHARGED TO OR DEPOSITED IN STORMWATER SYSTEMS THAT MAY RESULT IN VIOLATION OF STATE OR FEDERAL WATER QUALITY STANDARDS.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE SAFEGUARDS, SAFETY DEVICES, PROTECTIVE EQUIPMENT, FLAGGERS, AND ANY OTHER NEEDED ACTIONS TO PROTECT THE LIFE, HEALTH, AND SAFETY OF THE PUBLIC, AND TO PROTECT PROPERTY IN CONNECTION WITH THE PERFORMANCE OF WORK COVERED BY THE CONTRACTOR. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE LATEST ADOPTED EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) PUBLISHED BY THE U.S. DEPARTMENT OF TRANSPORTATION. TWO-WAY TRAFFIC MUST BE MAINTAINED AT ALL TIMES ON THE ADJACENT PUBLIC STREETS.
13. ANY PUBLIC OR PRIVATE CURB, GUTTER, SIDEWALK, OR ASPHALT DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED TO CITY OF WEST LINN STANDARDS AND PRACTICES.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE INTEGRITY OF ADJACENT UTILITIES WHICH MAY INCLUDE, BUT ARE NOT LIMITED TO, WATER, SANITARY SEWER, STORMWATER, POWER, TELEPHONE, CABLE TV, GAS, IRRIGATION, AND STREET LIGHTING. THE CONTRACTOR SHALL NOTIFY RESIDENTS AND BUSINESSES 48 HOURS IN ADVANCE OF ANY WORK AFFECTING ACCESS OR SERVICE AND SHALL MINIMIZE INTERRUPTIONS TO DRIVEWAYS FOR RESIDENTS AND BUSINESSES ADJACENT TO THE PROJECT.
15. ALL LAWN AND VEGETATED AREAS DISTURBED WILL BE RESTORED TO ORIGINAL CONDITION. ANY DISTURBANCE OR DAMAGE TO OTHER PROPERTY ON ADJACENT PARCELS OR IN THE PUBLIC RIGHT OF WAY SHALL ALSO BE REPAIRED OR RESTORED TO ORIGINAL CONDITION.

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PHONE: 971.544.2139
www.maulfoster.com

CEDAROAK BOAT LAUNCH
CITY OF WEST LINN PARKS AND REC.
WEST LINN, OREGON

ISSUE	DATE	DESCRIPTION
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PROJECT: 0161.01.05
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SCALE
0 30' 60'
NOTE: BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET, ADJUST SCALE ACCORDINGLY.
SHEET TITLE
COVER
SHEET
C0

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PLOTTED ON: 2015-03-30 11:38 AM PLOTTED BY: Jacob Faust FILENAME: G:\00_MFA Civil\30\00_PROJECTS\0161.01 Cedar Oak Boat Launch\PLANS\C-COVER.dwg

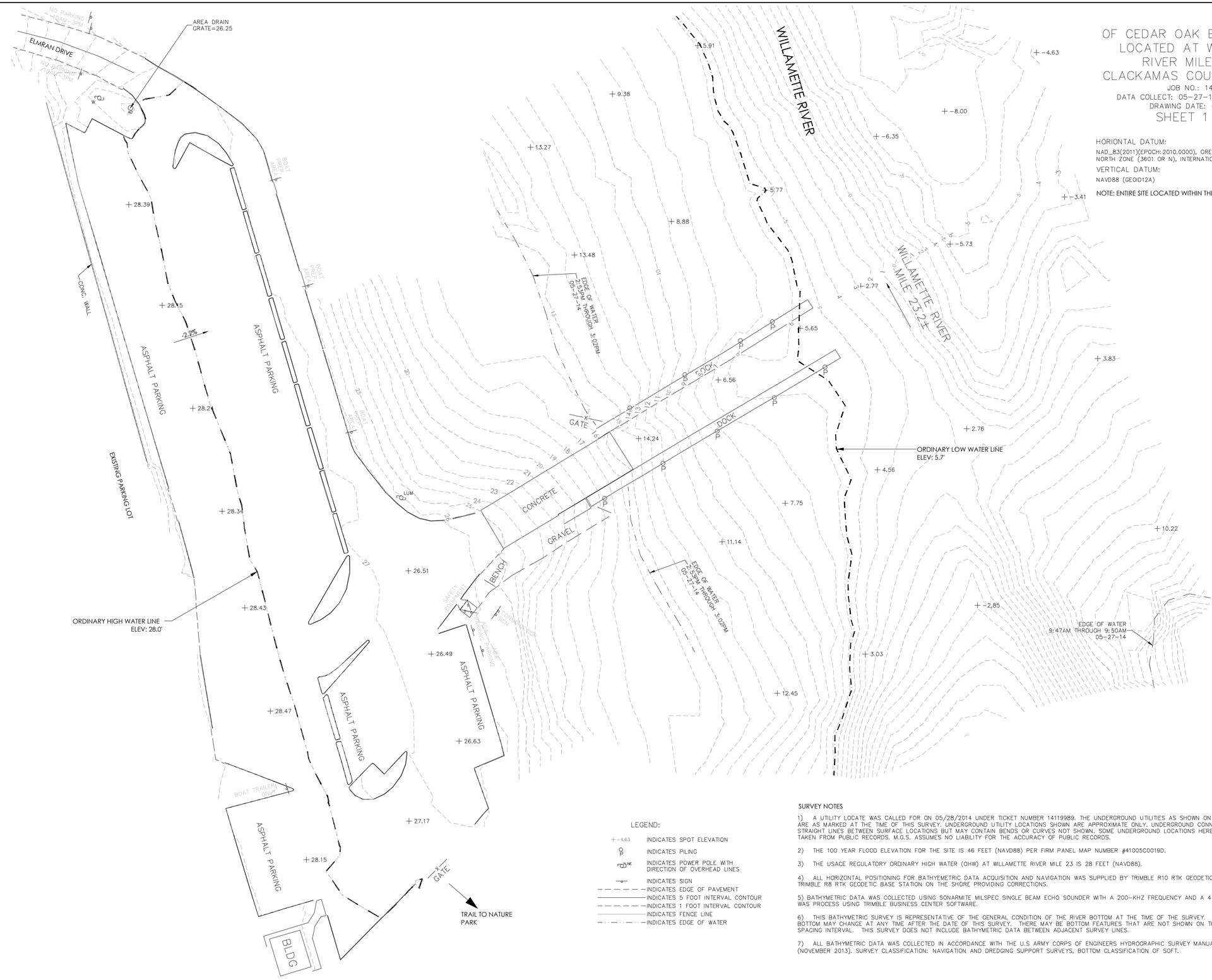
OF CEDAR OAK BOAT LAUNCH LOCATED AT WILLAMETTE RIVER MILE 23.2± CLACKAMAS COUNTY, OREGON

JOB NO.: 14-098
DATA COLLECT: 05-27-14 THRU 05-28-14
DRAWING DATE: 06-09-14
SHEET 1 OF 1

HORIONTAL DATUM:
NAD_83(2011)(EPOCH:2010.0000), OREGON STATE PLANE COORDINATE SYSTEM, NORTH ZONE (3601 OR N), INTERNATION FEET

VERTICAL DATUM:
NAVD88 (GEOID12A)

NOTE: ENTIRE SITE LOCATED WITHIN THE FEMA 100 YEAR FLOOD PLAIN.



LEGEND:

+4.63	INDICATES SPOT ELEVATION
	INDICATES PILING
	INDICATES POWER POLE WITH DIRECTION OF OVERHEAD LINES
	INDICATES SIGN
	INDICATES EDGE OF PAVEMENT
	INDICATES 5 FOOT INTERVAL CONTOUR
	INDICATES 1 FOOT INTERVAL CONTOUR
	INDICATES FENCE LINE
	INDICATES EDGE OF WATER

SURVEY NOTES

1) A UTILITY LOCATE WAS CALLED FOR ON 05/28/2014 UNDER TICKET NUMBER 14119989. THE UNDERGROUND UTILITIES AS SHOWN ON THIS TOPOGRAPHIC MAP ARE AS MARKED AT THE TIME OF THIS SURVEY. UNDERGROUND UTILITY LOCATIONS SHOWN ARE APPROXIMATE ONLY. UNDERGROUND CONNECTIONS ARE SHOWN AS STRAIGHT LINES BETWEEN SURFACE LOCATIONS BUT MAY CONTAIN BENDS OR CURVES NOT SHOWN. SOME UNDERGROUND LOCATIONS HEREON MAY HAVE BEEN TAKEN FROM PUBLIC RECORDS. M.G.S. ASSUMES NO LIABILITY FOR THE ACCURACY OF PUBLIC RECORDS.

2) THE 100 YEAR FLOOD ELEVATION FOR THE SITE IS 46 FEET (NAVD88) PER FIRM PANEL MAP NUMBER #41005C0019D.

3) THE USACE REGULATORY ORDINARY HIGH WATER (OHW) AT WILLAMETTE RIVER MILE 23 IS 28 FEET (NAVD88).

4) ALL HORIZONTAL POSITIONING FOR BATHYEMETRIC DATA ACQUISITION AND NAVIGATION WAS SUPPLIED BY TRIMBLE R10 RTK GEODETIC RECIEVER WITH A TRIMBLE R8 RTK GEODETIC BASE STATION ON THE SHORE PROVIDING CORRECTIONS.

5) BATHYMETRIC DATA WAS COLLECTED USING SONARMITE MILSPEC SINGLE BEAM ECHO SOUNDER WITH A 200-KHZ FREQUENCY AND A 4-DEGREE BEAM. THE DATA WAS PROCESS USING TRIMBLE BUSINESS CENTER SOFTWARE.

6) THIS BATHYMETRIC SURVEY IS REPRESENTATIVE OF THE GENERAL CONDITION OF THE RIVER BOTTOM AT THE TIME OF THE SURVEY. THE CONDITION OF THE BOTTOM MAY CHANGE AT ANY TIME AFTER THE DATE OF THIS SURVEY. THERE MAY BE BOTTOM FEATURES THAT ARE NOT SHOWN ON THIS MAP DUE TO THE LINE SPACING INTERVAL. THIS SURVEY DOES NOT INCLUDE BATHYMETRIC DATA BETWEEN ADJACENT SURVEY LINES.

7) ALL BATHYMETRIC DATA WAS COLLECTED IN ACCORDANCE WITH THE U.S ARMY CORPS OF ENGINEERS HYDROGRAPHIC SURVEY MANUAL EM-1110-02-1003 (NOVEMBER 2013). SURVEY CLASSIFICATION: NAVIGATION AND DREDGING SUPPORT SURVEYS, BOTTOM CLASSIFICATION OF SOFT.

####

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CEDAROAK BOAT LAUNCH
CITY OF WEST LINN PARKS AND REC.
WEST LINN, OREGON

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SCALE
0 30' 60'
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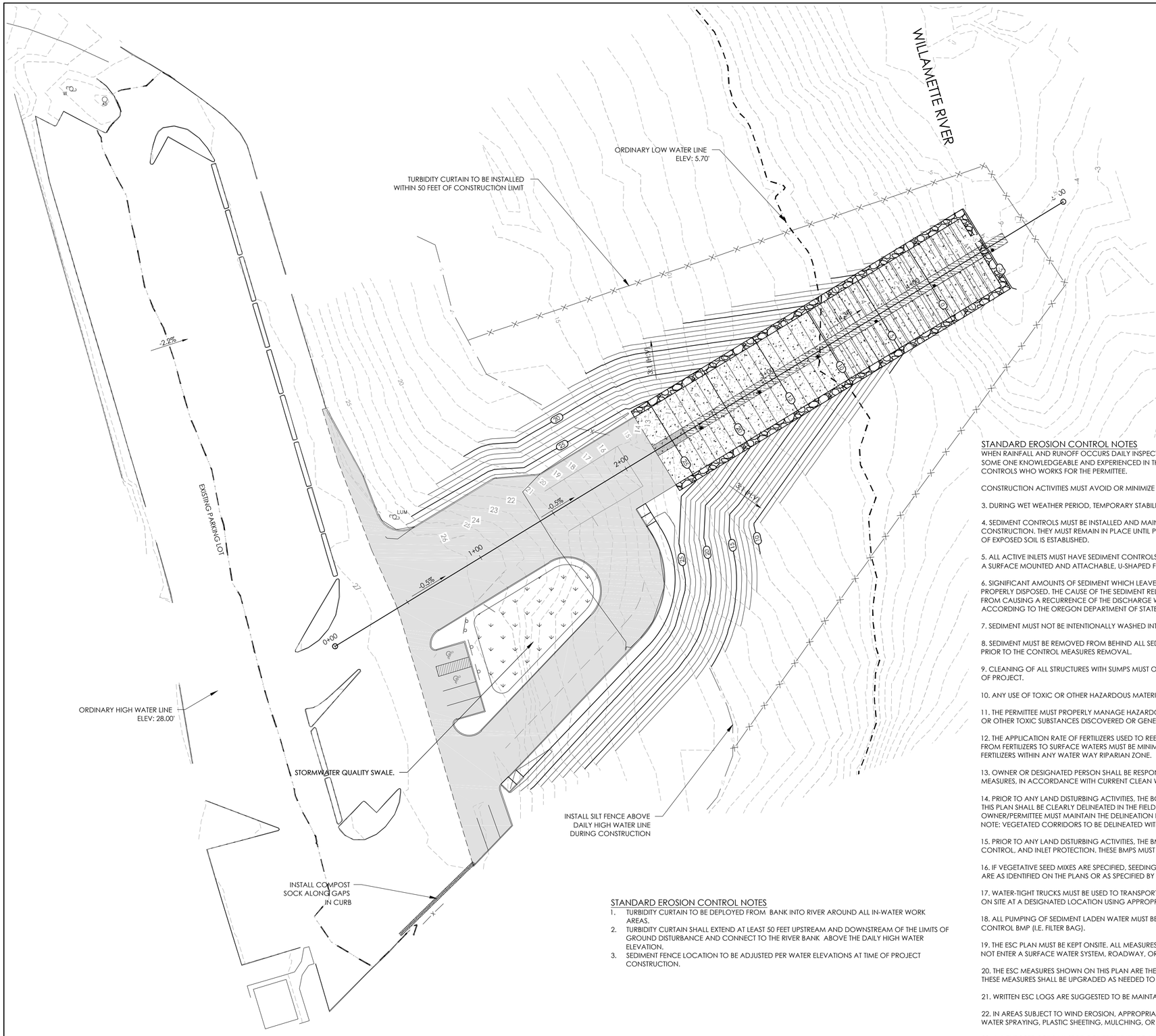
SHEET TITLE
EXISTING CONDITIONS

SHEET
C1.0

PLOTTED ON: 2015-03-30 11:40 AM
PLOTTED BY: Jacob Faust
FILENAME: G:\01_MFA Civil 3D\01_PROJECTS\0161.01 Cedar Oak Boat Launch\PLANS\C1EXCOND.dwg



STANDARD EROSION CONTROL NOTES

1. TURBIDITY CURTAIN TO BE DEPLOYED FROM BANK INTO RIVER AROUND ALL IN-WATER WORK AREAS.
2. TURBIDITY CURTAIN SHALL EXTEND AT LEAST 50 FEET UPSTREAM AND DOWNSTREAM OF THE LIMITS OF GROUND DISTURBANCE AND CONNECT TO THE RIVER BANK ABOVE THE DAILY HIGH WATER ELEVATION.
3. SEDIMENT FENCE LOCATION TO BE ADJUSTED PER WATER ELEVATIONS AT TIME OF PROJECT CONSTRUCTION.

STANDARD EROSION CONTROL NOTES

WHEN RAINFALL AND RUNOFF OCCURS DAILY INSPECTIONS OF THE EROSION AND SEDIMENT CONTROLS AND DISCHARGE OUTFALLS MUST BE PROVIDED BY SOME ONE KNOWLEDGEABLE AND EXPERIENCED IN THE PRINCIPLES, PRACTICES, INSTALLATION, AND MAINTENANCE OF EROSION AND SEDIMENT CONTROLS WHO WORKS FOR THE PERMITTEE.

CONSTRUCTION ACTIVITIES MUST AVOID OR MINIMIZE EXCAVATION AND CREATION OF BARE GROUND FROM OCTOBER 1 THROUGH MAY 31 EACH YEAR.

3. DURING WET WEATHER PERIOD, TEMPORARY STABILIZATION OF THE SITE MUST OCCUR AT THE END OF EACH WORK DAY.

4. SEDIMENT CONTROLS MUST BE INSTALLED AND MAINTAINED ON ALL DOWN GRADIENT SIDES OF THE CONSTRUCTION SITE AT ALL TIMES DURING CONSTRUCTION. THEY MUST REMAIN IN PLACE UNTIL PERMANENT VEGETATION OR OTHER PERMANENT COVERING OF EXPOSED SOIL IS ESTABLISHED.

5. ALL ACTIVE INLETS MUST HAVE SEDIMENT CONTROLS INSTALLED AND MAINTAINED AT ALL TIMES DURING CONSTRUCTION. UNLESS OTHERWISE APPROVED, A SURFACE MOUNTED AND ATTACHABLE, U-SHAPED FILTER BAG IS REQUIRED FOR ALL CURB INLET CATCH BASINS.

6. SIGNIFICANT AMOUNTS OF SEDIMENT WHICH LEAVES THE SITE MUST BE CLEANED UP WITHIN 24 HOURS AND PLACED BACK ON THE SITE AND STABILIZED OR PROPERLY DISPOSED. THE CAUSE OF THE SEDIMENT RELEASE MUST BE FOUND AND PREVENTED FROM CAUSING A RECURRENCE OF THE DISCHARGE WITHIN THE SAME 24 HOURS. ANY IN-STREAM CLEAN UP OF SEDIMENT SHALL BE PREFORMED ACCORDING TO THE OREGON DEPARTMENT OF STATE LANDS REQUIRED TIME FRAME.

7. SEDIMENT MUST NOT BE INTENTIONALLY WASHED INTO STORM SEWERS, DRAINAGE WAYS, OR WATER BODIES.

8. SEDIMENT MUST BE REMOVED FROM BEHIND ALL SEDIMENT CONTROL MEASURES WHEN IT HAS REACHED A HEIGHT OF 1/3RD THE BARRIER HEIGHT, AND PRIOR TO THE CONTROL MEASURES REMOVAL.

9. CLEANING OF ALL STRUCTURES WITH SUMPS MUST OCCUR WHEN THE SEDIMENT RETENTION CAPACITY HAS BEEN REDUCED BY 50% AND AT COMPLETION OF PROJECT.

10. ANY USE OF TOXIC OR OTHER HAZARDOUS MATERIALS MUST INCLUDE PROPER STORAGE, APPLICATION, AND DISPOSAL.

11. THE PERMITTEE MUST PROPERLY MANAGE HAZARDOUS WASTES, USED OILS, CONTAMINATED SOILS, CONCRETE WASTE, SANITARY WASTE, LIQUID WASTE, OR OTHER TOXIC SUBSTANCES DISCOVERED OR GENERATED DURING CONSTRUCTION.

12. THE APPLICATION RATE OF FERTILIZERS USED TO REESTABLISH VEGETATION MUST FOLLOW MANUFACTURER'S RECOMMENDATIONS, NUTRIENT RELEASES FROM FERTILIZERS TO SURFACE WATERS MUST BE MINIMIZED. TIME RELEASE FERTILIZERS SHOULD BE USED AND CARE SHOULD BE MADE IN APPLICATION OF FERTILIZERS WITHIN ANY WATER WAY RIPARIAN ZONE.

13. OWNER OR DESIGNATED PERSON SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES, IN ACCORDANCE WITH CURRENT CLEAN WATER SERVICES STANDARDS AND STATE, AND FEDERAL REGULATIONS.

14. PRIOR TO ANY LAND DISTURBING ACTIVITIES, THE BOUNDARIES OF THE CLEARING LIMITS, VEGETATED BUFFERS, AND ANY SENSITIVE AREAS SHOWN ON THIS PLAN SHALL BE CLEARLY DELINEATED IN THE FIELD. UNLESS OTHERWISE APPROVED, NO DISTURBANCE IS PERMITTED BEYOND THE CLEARING LIMITS. THE OWNER/PERMITTEE MUST MAINTAIN THE DELINEATION FOR THE DURATION OF THE PROJECT.
NOTE: VEGETATED CORRIDORS TO BE DELINEATED WITH ORANGE CONSTRUCTION FENCE OR APPROVED EQUAL.

15. PRIOR TO ANY LAND DISTURBING ACTIVITIES, THE BMPS THAT MUST BE INSTALLED ARE GRAVEL CONSTRUCTION ENTRANCE, PERIMETER SEDIMENT CONTROL, AND INLET PROTECTION. THESE BMPS MUST BE MAINTAINED FOR THE DURATION OF THE PROJECT.

16. IF VEGETATIVE SEED MIXES ARE SPECIFIED, SEEDING MUST TAKE PLACE NO LATER THAN SEPTEMBER 1ST; THE TYPE AND PERCENTAGES OF SEED IN THE MIX ARE AS IDENTIFIED ON THE PLANS OR AS SPECIFIED BY THE DESIGN ENGINEER.

17. WATER-TIGHT TRUCKS MUST BE USED TO TRANSPORT SATURATED SOILS FROM THE CONSTRUCTION SITE. AN APPROVED EQUIVALENT IS TO DRAIN THE SOIL ON SITE AT A DESIGNATED LOCATION USING APPROPRIATE BMPS; SOIL MUST BE DRAINED SUFFICIENTLY FOR MINIMAL SPILLAGE.

18. ALL PUMPING OF SEDIMENT LADEN WATER MUST BE DISCHARGED OVER AN UNDISTURBED, PREFERABLY VEGETATED AREA, AND THROUGH A SEDIMENT CONTROL BMP (I.E. FILTER BAG).

19. THE ESC PLAN MUST BE KEPT ONSITE. ALL MEASURES SHOWN ON THE PLAN MUST BE INSTALLED PROPERLY TO ENSURE THAT SEDIMENT LADEN WATER DOES NOT ENTER A SURFACE WATER SYSTEM, ROADWAY, OR OTHER PROPERTIES.

20. THE ESC MEASURES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE MEASURES SHALL BE UPGRADED AS NEEDED TO MAINTAIN COMPLIANCE WITH ALL REGULATIONS.

21. WRITTEN ESC LOGS ARE SUGGESTED TO BE MAINTAINED ONSITE AND AVAILABLE TO DISTRICT INSPECTORS UPON REQUEST.

22. IN AREAS SUBJECT TO WIND EROSION, APPROPRIATE BMPS MUST BE USED WHICH MAY INCLUDE THE APPLICATION OF FINE WATER SPRAYING, PLASTIC SHEETING, MULCHING, OR OTHER APPROVED MEASURES.

23. ALL EXPOSED SOILS MUST BE COVERED DURING WET WEATHER PERIOD.

####

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CEDAROAK BOAT LAUNCH

CITY OF WEST LINN PARKS AND REC.
WEST LINN, OREGON

ISSUE	DATE	DESCRIPTION	
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PROJECT: 0161.01.05
DESIGNED: ----
DRAWN: ----
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SCALE

0 20' 40'

NOTE: BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET, ADJUST SCALE ACCORDINGLY.

SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN

SHEET

C2.0

PLOTTED ON: 2015-03-30 11:41 AM
PLOTTED BY: Jacob Faust
FILENAME: G:\00_MFA Civil 3D\00_PROJECTS\0161.01 Cedar Oak Boat Launch\PLANS\C1ESCP.dwg

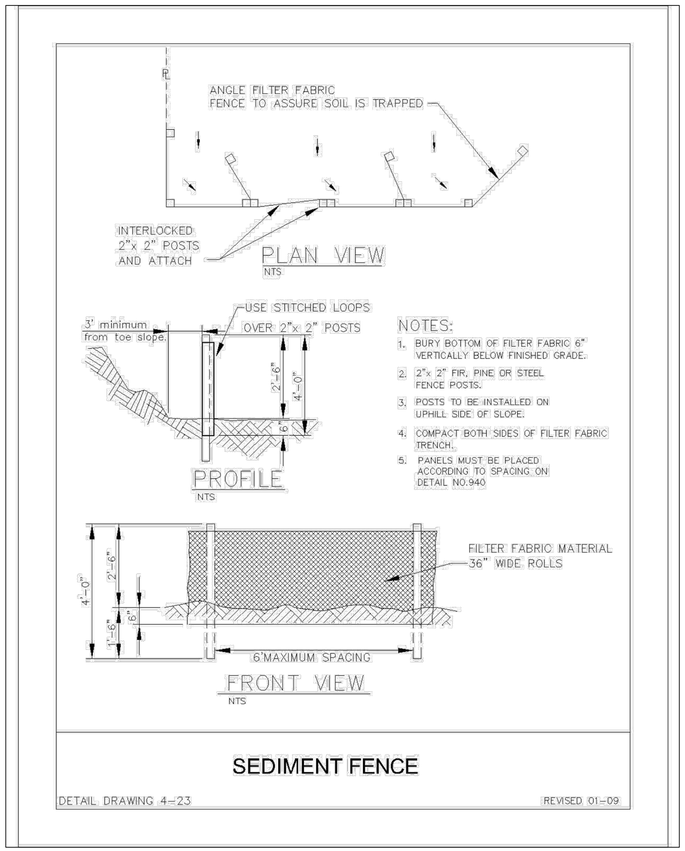
GENERAL EROSION CONTROL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THE DEQ EROSION & SEDIMENT CONTROL MANUAL (2005) PRIOR TO THE START OF CONSTRUCTION AND INSTALLATION OF EROSION CONTROL BMPs.
2. ALL EROSION CONTROL BMPs SHALL BE INSTALLED AND MAINTAINED PER THE DEQ EROSION & SEDIMENT CONTROL MANUAL (APRIL 2005).
3. APPROVAL OF THIS EROSION, SEDIMENT AND POLLUTION CONTROL PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G., SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES)
4. THE IMPLEMENTATION OF THIS ESPCP AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESPCP FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND LANDSCAPING IS ESTABLISHED AND INSPECTED.
5. THE ESPCP FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.
6. THE ESPCP FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESPCP FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.
7. THE ESPCP FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
8. THE ESPCP FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF EVERY TWO WEEKS OR WITHIN THE 24 HOURS FOLLOWING A STORM EVENT AS DEEMED NECESSARY BY THE CITY/COUNTY EROSION CONTROL MANUAL.
9. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

DEQ EROSION CONTROL NOTES

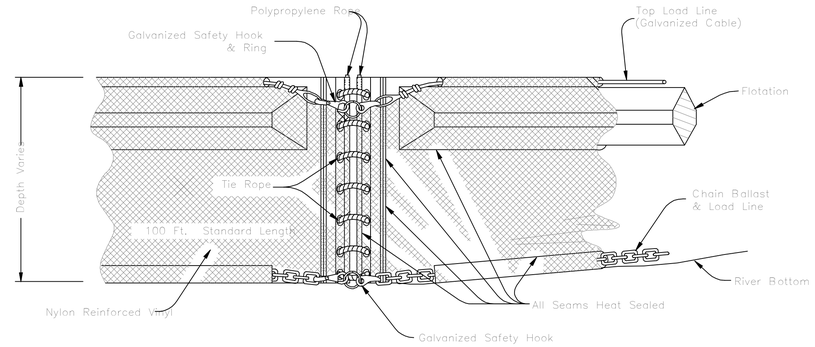
STANDARD NOTES FOR SEDIMENT FENCES

1. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO MINIMIZE USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND BOTH ENDS SECURELY FASTENED TO THE POST, OR OVERLAP 2 INCH X 2 INCH POSTS AND ATTACH AS SHOWN ON DETAIL SHEET 4.3-A.
2. THE FILTER FABRIC FENCE SHALL BE INSTALLED TO FOLLOW THE CONTOURS. THE FENCE POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 12 INCHES.
3. THE FILTER FABRIC SHALL HAVE A MINIMUM VERTICAL BURIAL OF 6 INCHES. ALL EXCAVATED MATERIAL FROM FILTER FABRIC FENCE INSTALLATION, SHALL BE BACKFILLED AND COMPACTED, ALONG THE ENTIRE DISTURBED AREA.
4. STANDARD OR HEAVY DUTY FILTER FABRIC FENCE SHALL HAVE MANUFACTURED STITCHED LOOPS FOR 2 INCH X 2 INCH POST INSTALLATION. STITCHED LOOPS SHALL BE INSTALLED ON THE UP HILL SIDE OF THE SLOPED AREA.
5. FILTER FABRIC FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY PROTECTED AND STABILIZED.
6. FILTER FABRIC FENCES SHALL BE INSPECTED BY AN OWNER APPROVED INSPECTOR IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.



SEDIMENT FENCE

DETAIL DRAWING 4-23 REVISED 01-09



TURBIDITY CURTAIN DETAIL
NOT TO SCALE

MAUL FOSTER ALONGI
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CEDAROAK BOAT LAUNCH
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SHEET TITLE
EROSION AND SEDIMENT CONTROL DETAILS

SHEET
C2.1

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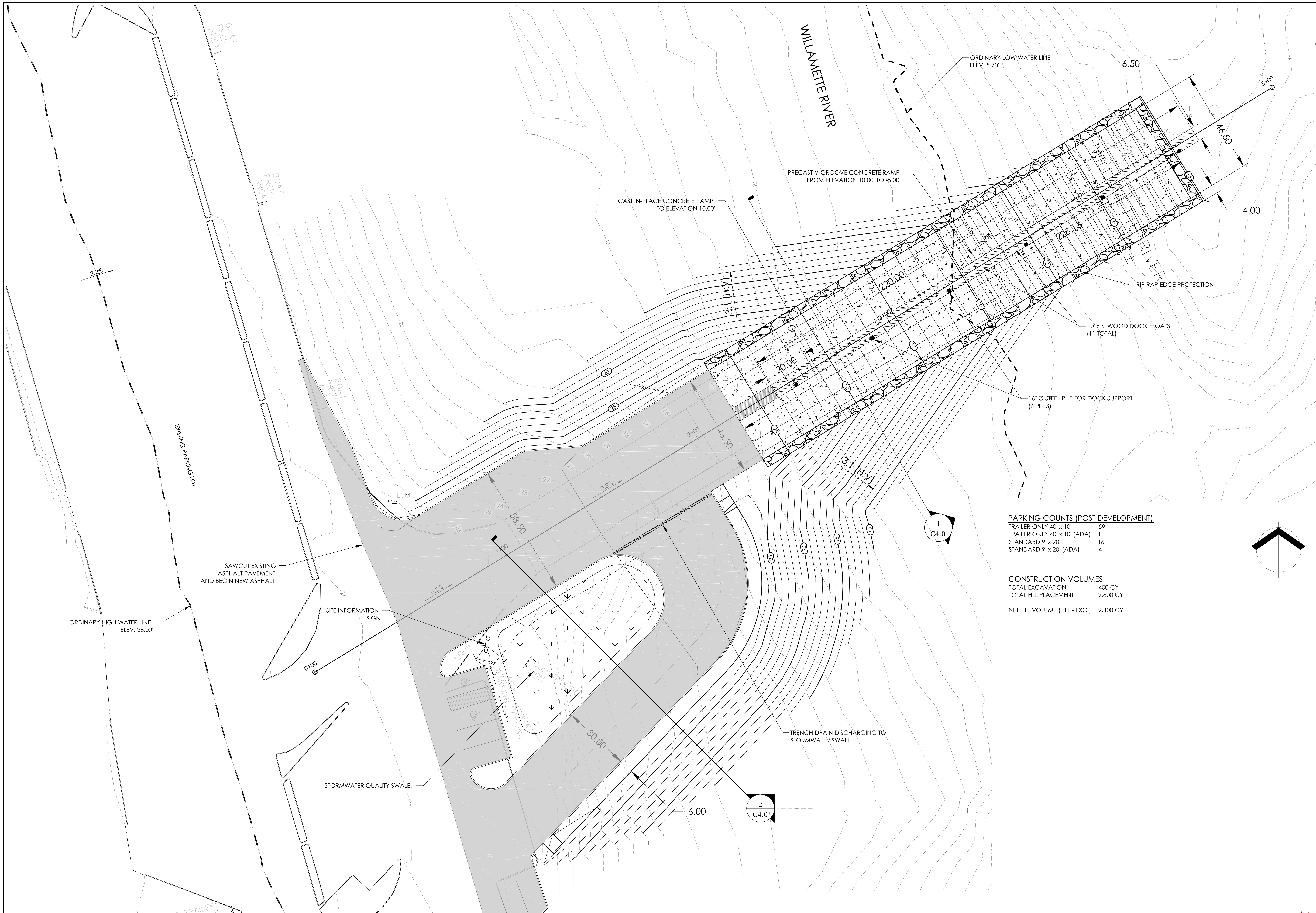
PLOTTED ON: 2015-03-30 11:41 AM PLOTTED BY: Jacob Foust FILENAME: G:\00_MFA Civil 3D\00_PROJECTS\0161.01 Cedar Oak Boat Launch\PLANS\C2-ESCP.dwg


WILLAMETTE RIVER
ORDINARY LOW WATER LINE
ELEV: 5.70'
6.50
46.50
4.00
PRECAST V-GROOVE CONCRETE RAMP
FROM ELEVATION 10.00' TO -5.00'
CAST IN-PLACE CONCRETE RAMP
TO ELEVATION 10.00'
228.13
220.00
RIP RAP EDGE PROTECTION
20' x 6' WOOD DOCK FLOATS
(11 TOTAL)
16" Ø STEEL PILE FOR DOCK SUPPORT
(6 PILES)
3:1 (H:V)
30.00
46.50
58.50
BOAT PREP. AREA
EXISTING PARKING LOT
LUM
-2.2%
-0.5%
SAWCUT EXISTING
ASPHALT PAVEMENT
AND BEGIN NEW ASPHALT
SITE INFORMATION
SIGN
ORDINARY HIGH WATER LINE
ELEV: 28.00'
0+00
1+00
2+00
3+00
4+00
5+00
STORMWATER QUALITY SWALE.
TRENCH DRAIN DISCHARGING TO
STORMWATER SWALE
6.00
1
C4.0
2
C4.0
BOAT TRAILER ONLY

PARKING COUNTS (POST DEVELOPMENT)

TRAILER ONLY 40' x 10'	59
TRAILER ONLY 40' x 10' (ADA)	1
STANDARD 9' x 20'	16
STANDARD 9' x 20' (ADA)	4

CONSTRUCTION VOLUMES

TOTAL EXCAVATION	400 CY
TOTAL FILL PLACEMENT	9,800 CY
NET FILL VOLUME (FILL - EXC.)	9,400 CY

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SHEET TITLE

SITE PLAN

SHEET

C3.0

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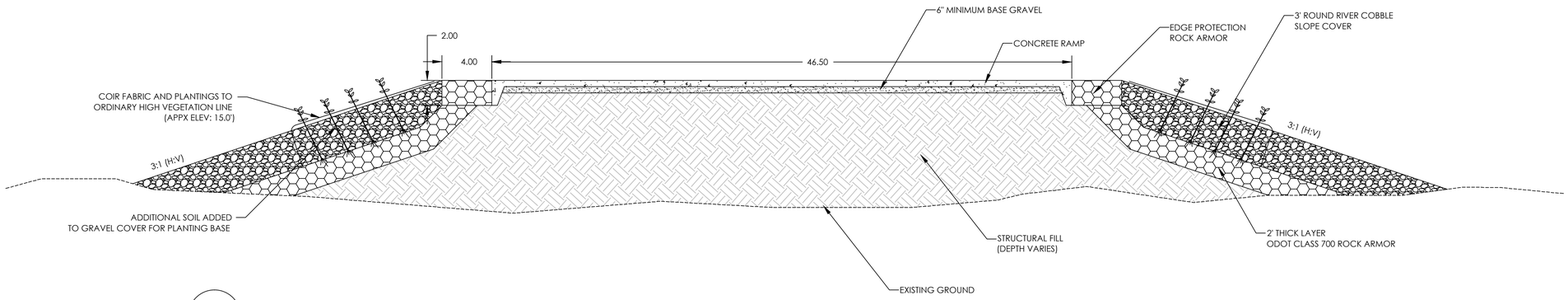

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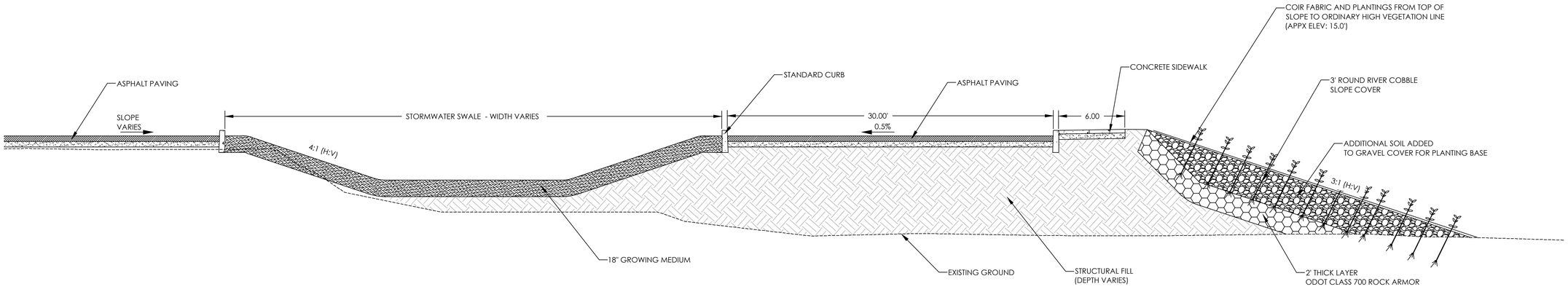
TYPICAL RAMP AND FILL SECTION



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SWALE AND TURNAROUND TYPICAL SECTION

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ISSUE	DATE	DESCRIPTION
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PROJECT: 0161.01.05
DESIGNED: ----
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SCALE
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SHEET TITLE
TYPICAL SECTIONS

SHEET
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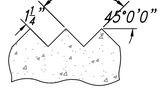
PLOTTED ON: 2015-03-30 11:41 AM PLOTTED BY: Jacob Faust FILENAME: G:\00_MFA Civil 3D\00_PROJECTS\0161.01 Cedar Oak Boat Launch\PLANS\C-SITE.dwg



V-GROOVE DETAIL

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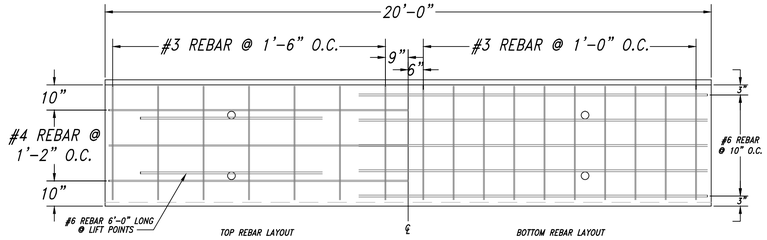

REBAR SCHEDULE - PLAN

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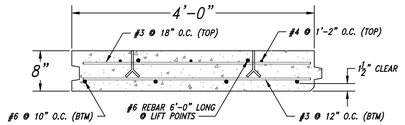
SCALE IN FEET



SECTION

0 1 2

SCALE IN FEET

REBAR SCHEDULE - ELEVATION

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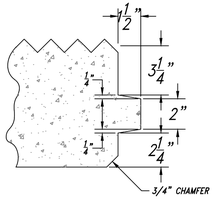
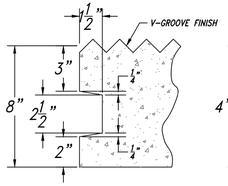
SCALE IN FEET

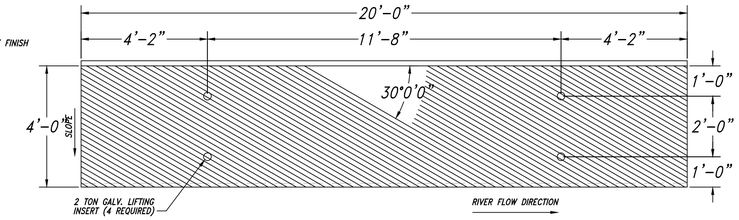




TONGUE & GROOVE DETAIL

0 3 6 9 12

SCALE IN INCHES



LIFTING INSERT LOCATION

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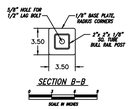
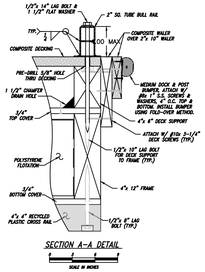
SCALE IN FEET



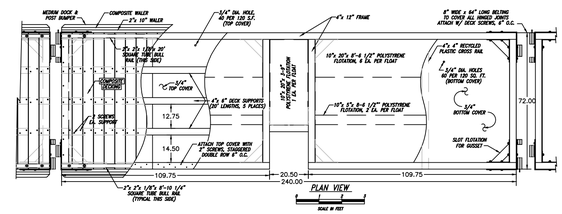
SECTION B-B

SCALE IN INCHES



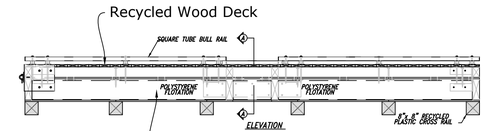
SECTION A-A DETAIL

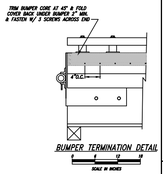
SCALE IN INCHES



PLAN VIEW

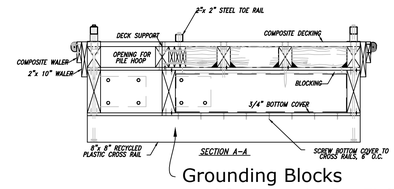
SCALE IN FEET



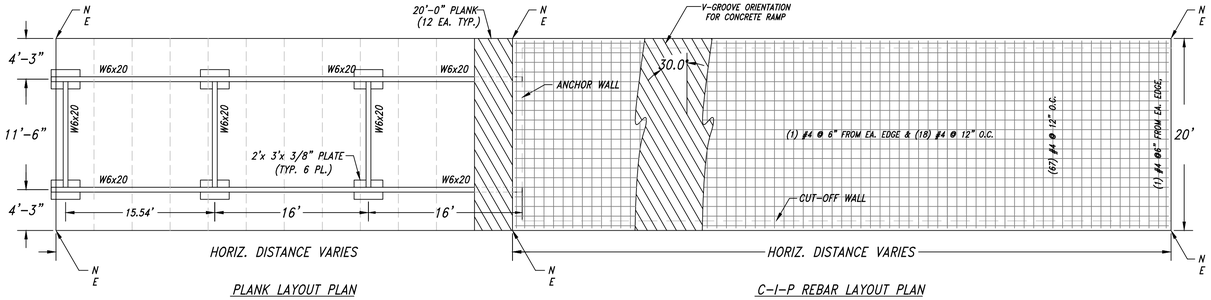


BUMPER TERMINATION DETAIL

SCALE IN INCHES



-- C3.0 PRECAST V-GROOVE PANEL TYPICAL DETAIL



RAMP LAYOUT PLAN

0 5 10 15

SCALE IN FEET

-- C3.0 CONCRETE RAMP AND RAIL TYPICAL DETAIL

-- C3.0 WOOD FLOAT STRUCTURE TYPICAL DETAIL

MAUL FOSTER ALONGI
2001 NW 19TH AVENUE
SUITE 200
PORTLAND, OREGON 97209
PHONE: 971.544.2139
www.maulfoster.com

CEDAROAK BOAT LAUNCH
CITY OF WEST LINN PARKS AND REC.
WEST LINN, OREGON

ISSUE	DATE	DESCRIPTION
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PROJECT: 0161.01.05
DESIGNED:---
DRAWN: ----
CHECKED: ----
SCALE

0 50' 100

NOTE: BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET, ADJUST SCALE ACCORDINGLY.

SHEET TITLE

DETAILS

SHEET

C5.0

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PLOTTED ON: 2015-03-30 11:41 AM PLOTTED BY: Jacob Faust FILENAME: G:\00_MFA Civil 3D\00_PROJECTS\0161.01 Cedar Oak Boat Launch\PLANS\C-SITE.dwg

PLANT MATERIAL LEGEND

TREES

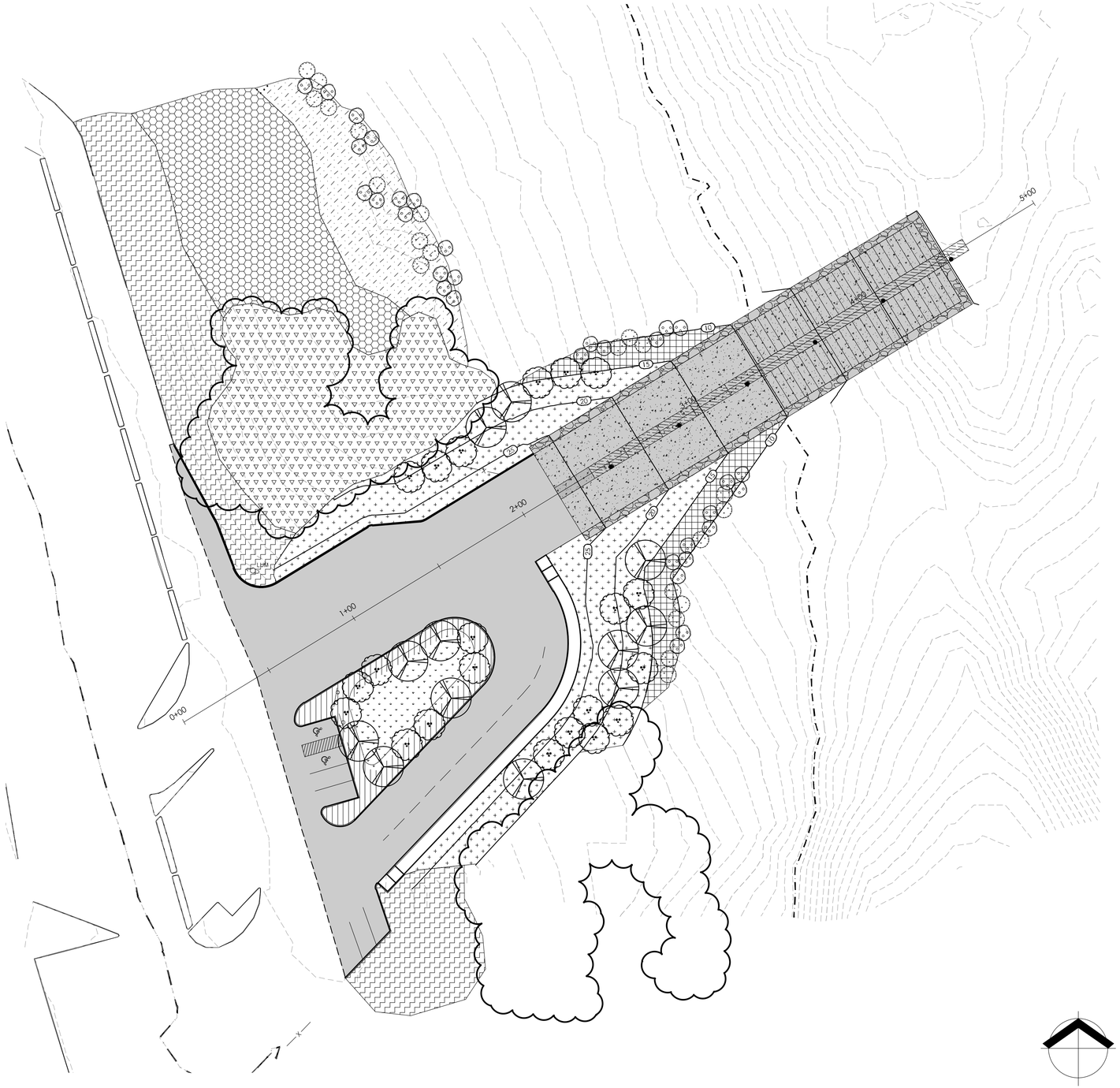
SYM	COMMON NAME
	BLACK COTTONWOOD
	RED ALDER
	SANDBAR WILLOW
	COLUMBIA RIVER WILLOW

PLANTING ZONES

- FILL BANK LOWER PLANTING ZONE
- FILL BANK UPPPER PLANTING ZONE
- EXISTING BANK LOWER PLANTING ZONE
- EXISTING BANK MID PLANTING ZONE
- EXISTING BANK UPPER PLANTING ZONE
- EXISTING BANK UNDERSTORY PLANTING ZONE
- STORMWATER FACILITY BOTTOM PLANTING ZONE
- STORMWATER FACILITY SIDE SLOPE PLANTING ZONE
- EXISTING TREES TO REMAIN

GENERAL LANDSCAPE NOTES:

1. PROTECT EXISTING NATIVE PLANT MATERIAL. CONTACT LANDSCAPE ARCHITECT FOR LIST OF EXISTING PLANT MATERIAL TO PROTECT.
2. PRIOR TO PLANT INSTALLATION, REMOVE NON-NATIVE, INVASIVE PLANT SPECIES (INCLUDING BUT NOT LIMITED TO HIMALAYAN BLACKBERRY, REED CANARY GRASS, AND CANADIAN THISTLE) FROM ALL AREAS WITHIN 10 FEET OF PLANTING AREAS, USING HANDHELD EQUIPMENT.
3. ALL PLANT MATERIAL IS TO BE USED FOR RESTORATION PURPOSES. STANDARD NURSERY PRACTICES FOR GROWING LANDSCAPE PLANTS, SUCH AS USE OF PESTICIDES, FUNGICIDES, OR FERTILIZERS MUST NOT BE EMPLOYED.
4. ALL PLANT MATERIAL SHALL BE INSTALLED SHORTLY AFTER SOIL IS PREPARED, WEATHER PERMITTING. TO MINIMIZE EROSION AND COMPACTION, INSTALL PLANTS AT SAME LEVEL AS GROWING NURSERY.
5. PLANT MATERIAL SHALL BE SUPPORTED WHEN NECESSARY DUE TO EXTREME WINDS AT THE PLANTING SITE. STAKES, GUY WIRES OR OTHER MEASURES MUST BE REMOVED AS SOON AS THE PLANT CAN SUPPORT ITSELF.
6. A TEMPORARY IRRIGATION SYSTEM SHALL BE INSTALLED ON SITE TO ADEQUATELY PROVIDE WATER FOR ALL NEW PLANTS. THE PLANT MATERIAL SHOULD RECEIVE REGULAR WATER DURING THE FIRST GROWING SEASON. AFTER THE INITIAL SEASON, WATERING SHALL OCCUR AS NEEDED TO ENSURE PLANT SURVIVAL UNTIL ESTABLISHED.



PERMIT SET

MAUL FOSTER ALONGI
2001 NW 19TH AVENUE
SUITE 200
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PHONE: (971) 544-2139
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CEDAROAK BOAT LAUNCH
CITY OF WESTLINN
WESTLINN, OREGON

ISSUE	DATE	DESCRIPTION
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PROJECT: 0161.01
DESIGNED: C. RILEY
DRAWN: C. RILEY
CHECKED: J. FAUST

SCALE

0 30' 60'

NOTE: BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET, ADJUST SCALE ACCORDINGLY.

SHEET TITLE

PLANTING PLAN

SHEET

L1.0

PLOTTED ON: 2015-03-30 11:42 AM PLOTTED BY: Jacob Faust FILENAME: G:\00_MFA Civil 3D\00_PROJECTS\0161.01 Cedar Oak Boat Launch\PLANS\L-PLANTING.dwg

PLANT MATERIAL SCHEDULE

TREES

SYM	COMMON NAME	BOTANICAL NAME	SIZE	SPACING	COMMENTS
	BLACK COTTONWOOD	POPULUS TRICHOCARPA	5 GAL	AS SHOWN	
	RED ALDER	ALNUS RUBRA	5 GAL	AS SHOWN	
	SANDBAR WILLOW	SALIX EXIGUA 'MELANOPSIS'	1 GAL	3'-0", O.C., TRI	GROUPINGS OF 3
	COLUMBIA RIVER WILLOW	SALIX FLUVIATILIS	1 GAL	3'-0", O.C., TRI	GROUPINGS OF 3

PLANTING ZONES

FILL BANK LOWER PLANTING ZONE

SHRUBS

REDTWIG DOGWOOD	CORNUS SERICEA	1 GAL	3'-0", O.C.	GROUPINGS OF 5, 7 & 9
PACIFIC NINEBARK	PHYSOCARPUS CAPITATUS	1 GAL	3'-0", O.C.	GROUPINGS OF 5, 7 & 9

GROUNDCOVER, GRASSES & PERENIALS

COLUMBIA SEDGE	CAREX APERTA	12"-18", B.R.	2'-0", O.C.	35%
SLOUGH SEDGE	CAREX OBNUPTA	12"-18", B.R.	2'-0", O.C.	20%
OVATE SPIKERUSH	ELEOCHARIS OVATA	12"-18", B.R.	2'-0", O.C.	15%
SOFT RUSH	JUNCUS EFFUSUS	12"-18", B.R.	2'-0", O.C.	15%
PATH RUSH	JUNCUS TENUIS	12"-18", B.R.	2'-0", O.C.	15%

FILL BANK UPPER PLANTING ZONE

SHRUBS

REDTWIG DOGWOOD	CORNUS SERICEA	1 GAL	3'-0", O.C.	GROUPINGS OF 5, 7 & 9
DOUGLAS' SPIRAEA	SPIRAEA DOUGLASII	1 GAL	3'-0", O.C.	GROUPINGS OF 5, 7 & 9
CLUSTER ROSE	ROSA PISOCARPA	1 GAL	3'-0", O.C.	GROUPINGS OF 5, 7 & 9

SEED MIX: 2 LBS. PER 100 SQ.FT.

BLUE WILD RYE	ELYMUS GLAUCUS	35 % BY WEIGHT
MEADOW BARLEY	HORDEUM BRACHYANTHERUM	25 % BY WEIGHT
MANNAGRASS	GLYCERIA OCCIDENTALIS	15 % BY WEIGHT
NATIVE RED FESCUE	FESTUCA RUBRA RUBRA	15 % BY WEIGHT
TUFTED HAIRGRASS	DESCHAMPSIA CESPITOSA	5.5 % BY WEIGHT
SLOUGH SEDGE	CAREX OBNUPTA	4.3 % BY WEIGHT
PATH RUSH	JUNCUS TENUIS	.2 % BY WEIGHT

EXISTING BANK LOWER PLANTING ZONE

GROUNDCOVER, GRASSES & PERENIALS

MANNAGRASS	GLYCERIA OCCIDENTALIS	12"-18", B.R.	2'-0", O.C.	30%
COLUMBIA SEDGE	CAREX APERTA	12"-18", B.R.	2'-0", O.C.	25%
SLOUGH SEDGE	CAREX OBNUPTA	12"-18", B.R.	2'-0", O.C.	15%
TUFTED HAIRGRASS	DESCHAMPSIA CESPITOSA	12"-18", B.R.	2'-0", O.C.	15%
SOFT RUSH	JUNCUS EFFUSUS	12"-18", B.R.	2'-0", O.C.	10%
PATH RUSH	JUNCUS TENUIS	12"-18", B.R.	2'-0", O.C.	5%

EXISTING BANK MID PLANTING ZONE

SHRUBS

REDTWIG DOGWOOD	CORNUS SERICEA	1 GAL	3'-0", O.C.	GROUPINGS OF 5, 7 & 9
PACIFIC NINEBARK	PHYSOCARPUS CAPITATUS	1 GAL	3'-0", O.C.	GROUPINGS OF 5, 7 & 9
DOUGLAS' SPIRAEA	SPIRAEA DOUGLASII	1 GAL	3'-0", O.C.	GROUPINGS OF 5, 7 & 9
CLUSTER ROSE	ROSA PISOCARPA	1 GAL	3'-0", O.C.	GROUPINGS OF 5, 7 & 9

SEED MIX: 2 LBS. PER 100 SQ.FT.

BLUE WILD RYE	ELYMUS GLAUCUS	35 % BY WEIGHT
MEADOW BARLEY	HORDEUM BRACHYANTHERUM	25 % BY WEIGHT
MANNAGRASS	GLYCERIA OCCIDENTALIS	15 % BY WEIGHT
NATIVE RED FESCUE	FESTUCA RUBRA RUBRA	15 % BY WEIGHT
TUFTED HAIRGRASS	DESCHAMPSIA CESPITOSA	5.5 % BY WEIGHT
SLOUGH SEDGE	CAREX OBNUPTA	4.3 % BY WEIGHT
PATH RUSH	JUNCUS TENUIS	.2 % BY WEIGHT

EXISTING BANK UPPER PLANTING ZONE

SHRUBS

COMMON NAME	BOTANICAL NAME	SIZE	SPACING	COMMENTS
TWINBERRY	LONICERA INVOLUCRATA	B.R.	3'-0", O.C.	GROUPINGS OF 3
RED FLOWERING CURRANT	RIBES SANGUINEUM	B.R.	3'-0", O.C.	GROUPINGS OF 3
SNOWBERRY	SYMPHORICARPOS ALBUS	1 GAL	3'-0", O.C.	GROUPINGS OF 3
DOUGLAS' SPIRAEA	SPIRAEA DOUGLASII	1 GAL	3'-0", O.C.	GROUPINGS OF 5, 7 & 9
BALDHIP ROSE	ROSA GYMNOCARPA	1 GAL	3'-0", O.C.	GROUPINGS OF 5, 7 & 9

SEED MIX: 2 LBS. PER 100 SQ.FT.

BLUE WILD RYE	ELYMUS GLAUCUS	35 % BY WEIGHT
MEADOW BARLEY	HORDEUM BRACHYANTHERUM	25 % BY WEIGHT
ROEMER'S FESCUE	FESTUCA ROEMERI	15 % BY WEIGHT
NATIVE RED FESCUE	FESTUCA RUBRA RUBRA	15 % BY WEIGHT
TUFTED HAIRGRASS	DESCHAMPSIA CESPITOSA	5.5 % BY WEIGHT
OREGON SUNSHINE	ERIOPHYLLUM LANATUM	4.3 % BY WEIGHT
COMMON CAMAS	CAMASSIA QUAMASH	.2 % BY WEIGHT

EXISTING BANK UNDERSTORY PLANTING ZONE

SHRUBS

SNOWBERRY	SYMPHORICARPOS ALBUS	1 GAL	3'-0", O.C.	GROUPINGS OF 3
EVERGREEN HUCKLEBERRY	VACCINIUM OVATUM	1 GAL	3'-0", O.C.	GROUPINGS OF 5, 7 & 9
LOW OREGON GRAPE	MAHONIA NERVOSA	1 GAL	3'-0", O.C.	GROUPINGS OF 5, 7 & 9
SWORDFERN	POLYSTICHUM MUNITUM	1 GAL	3'-0", O.C.	GROUPINGS OF 5, 7 & 9

SEED MIX: 2 LBS. PER 100 SQ.FT.

NATIVE RED FESCUE	FESTUCA RUBRA RUBRA	35 % BY WEIGHT
MEADOW BARLEY	HORDEUM BRACHYANTHERUM	25 % BY WEIGHT
CALIFORNIA BROME	BROMUS CARINATUS	20 % BY WEIGHT
OREGON PERENIAL RYEGRASS	LOLIUM PERENNE	15 % BY WEIGHT
BLUE WILDRYE	ELYMUS GLAUCUS	5 % BY WEIGHT

STORMWATER FACILITY BOTTOM PLANTING ZONE

SEED MIX: 2 LBS. PER 100 SQ.FT.

MEADOW BARLEY	HORDEUM BRACHYANTHERUM	30 % BY WEIGHT
MANNAGRASS	GLYCERIA OCCIDENTALIS	20 % BY WEIGHT
SLOUGH SEDGE	CAREX OBNUPTA	15 % BY WEIGHT
SAWBEAK SEDGE	CAREX STIPATA	15 % BY WEIGHT
TUFTED HAIRGRASS	DESCHAMPSIA CESPITOSA	10 % BY WEIGHT
CREEPING SPIKE RUSH	ELEOCHARIS PALUSTRIS	4 % BY WEIGHT
SPREADING RUSH	JUNCUS PATENS	5.5 % BY WEIGHT
PATH RUSH	JUNCUS TENUIS	.5 % BY WEIGHT

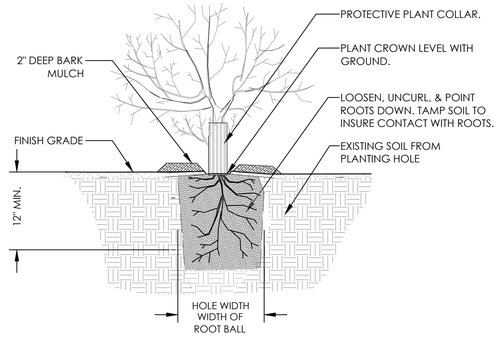
STORMWATER FACILITY SIDE SLOPE PLANTING ZONE

SHRUBS

REDTWIG DOGWOOD	CORNUS SERICEA	1 GAL	3'-0", O.C.	GROUPINGS OF 5, 7 & 9
DOUGLAS' SPIRAEA	SPIRAEA DOUGLASII	1 GAL	3'-0", O.C.	GROUPINGS OF 5, 7 & 9
CLUSTER ROSE	ROSA PISOCARPA	1 GAL	3'-0", O.C.	GROUPINGS OF 5, 7 & 9
SNOWBERRY	SYMPHORICARPOS ALBUS	1 GAL	3'-0", O.C.	GROUPINGS OF 3

SEED MIX: 2 LBS. PER 100 SQ.FT.

BLUE WILDRYE	ELYMUS GLAUCUS	35 % BY WEIGHT
NATIVE RED FESCUE	FESTUCA RUBRA RUBRA	25 % BY WEIGHT
MEADOW BARLEY	HORDEUM BRACHYANTHERUM	15 % BY WEIGHT
CALIFORNIA BROME	BROMUS CARINATUS	15 % BY WEIGHT
TUFTED HAIRGRASS	DESCHAMPSIA CESPITOSA	5 % BY WEIGHT
LARGE LEAVED LUPINE	LUPINUS POLYPHULLUS	3 % BY WEIGHT
COMMON CAMAS	CAMASSIA QUAMASH	2 % BY WEIGHT



NOTES

1. REMOVE THE BULK OF THE PLANTING MEDIA FROM THE PLANT'S ROOTS SO PLANTS WILL BE IN CONTACT WITH EXISTING GROUND AND UNCURL ANY CIRCLING ROOTS.
2. REPAIR DAMAGE AND DISTURBANCE TO GROUND COVER AND RESEED AREAS 12 INCHES AWAY FROM NEW PLANT.
3. REMOVE A 12 INCH DIAMETER CIRCLE OF GRASS AND WEEDS AROUND THE NEW PLANT AND PLACE A PLANT COLLAR AROUND THE PLANT.
4. ALL SHRUBS PLANTED ON THE SIDE SLOPE OF THE STORMATER FACILITY AND EXISTING MID AND UPPER PLANTING ZONES SHALL RECEIVE A 2 INCH DEEP LAYER OF BARK MULCH AROUND THE BASE OF THE PLANT IN A 12 INCH DIAMETER CIRCLE. PULL THE MULCH AWAY FROM THE CROWN OF THE PLANT SO IT IS NOT TOUCHING THE PLANT.

A POTTED PLANT DETAIL
NOT TO SCALE

PERMIT SET

MAUL FOSTER ALONGI
2001 NW 19TH AVENUE
SUITE 200
PORTLAND, OREGON
PHONE: (971) 544-2139
www.maulfoster.com

CEDAROAK BOAT LAUNCH
CITY OF WESTLINN
WESTLINN, OREGON

ISSUE	DATE	DESCRIPTION
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PROJECT: 0161.01
DESIGNED: C. RILEY
DRAWN: C. RILEY
CHECKED: C. FAUST
SCALE

DRAWING NOT TO SCALE

SHEET TITLE

PLANT SCHEDULE, NOTES & DETAILS

SHEET

L1.1

PLOTTED ON: 2015-03-30 11:42 AM PLOTTED BY: Jacob Foust FILENAME: G:\00_MFA Civil 3D\00_PROJECTS\0161.01 Cedar Oak Boat Launch\PLANS\L1_PLANTING.dwg

ATTACHMENT B

LAND USE REVIEW APPLICATION FORM

City of West Linn
Planning & Development • 22500 Salamo Rd #1000 • West Linn, Oregon 97068
Telephone 503.656.4211 • Fax 503.656.4106 • westlinnoregon.gov

DEVELOPMENT REVIEW APPLICATION

For Office Use Only		
STAFF CONTACT	PROJECT NO(S).	
NON-REFUNDABLE FEE(S)	REFUNDABLE DEPOSIT(S)	TOTAL

Type of Review (Please check all that apply):

- ☐ Annexation (ANX)
- ☐ Appeal and Review (AP) *
- ☐ Conditional Use (CUP)
- ☒ Design Review (DR)
- ☐ Easement Vacation
- ☐ Extraterritorial Ext. of Utilities
- ☐ Final Plat or Plan (FP)
- ☒ Flood Management Area
- ☐ Hillside Protection & Erosion Control
- ☐ Historic Review
- ☐ Legislative Plan or Change
- ☐ Lot Line Adjustment (LLA) */**
- ☐ Minor Partition (MIP) (Preliminary Plat or Plan)
- ☐ Non-Conforming Lots, Uses & Structures
- ☐ Planned Unit Development (PUD)
- ☐ Pre-Application Conference (PA) */**
- ☐ Street Vacation
- ☐ Subdivision (SUB)
- ☐ Temporary Uses *
- ☐ Time Extension *
- ☐ Variance (VAR)
- ☐ Water Resource Area Protection/Single Lot (WAP)
- ☐ Water Resource Area Protection/Wetland (WAP)
- ☐ Willamette & Tualatin River Greenway (WRG)
- ☐ Zone Change
- ☒ Willamette & Tualatin River Protection Area

Home Occupation, Pre-Application, Sidewalk Use, Sign Review Permit, and Temporary Sign Permit applications require different or additional application forms, available on the City website or at City Hall.

Site Location/Address:

4600 Elmran Drive, West Linn, Oregon 97068

Assessor's Map No.: 2 1E 24

Tax Lot(s): 200

Total Land Area: 7.73 acres

Brief Description of Proposal:

Reconstruction of the Cedaroak Boat Ramp

Applicant Name: (please print) Ken Worcester, Director, City of West Linn Parks and Recreation
Phone: 503-557-4700
Address: 22500 Salamo Road #1100
Email: kworcester@ci.west-linn.or.us
City State Zip: West Linn, Oregon 97068

Owner Name (required): (please print) City of West Linn
Phone:
Address:
Email:
City State Zip:

Consultant Name: (please print) Jacqueline Gruber, Maul Foster & Alongi, Inc
Phone: 971-400-6727
Address: 411 First Avenue S, Suite 610
Email: jgruber@maulfoster.com
City State Zip: Seattle, Washington 98104

1. All application fees are non-refundable (excluding deposit). **Any overruns to deposit will result in additional billing.**
2. The owner/applicant or their representative should be present at all public hearings.
3. A denial or approval may be reversed on appeal. No permit will be in effect until the appeal period has expired.
4. **Three (3) complete hard-copy sets (single sided) of application materials must be submitted with this application. One (1) complete set of digital application materials must also be submitted on CD in PDF format. If large sets of plans are required in application please submit only two sets.**

* No CD required / ** Only one hard-copy set needed

The undersigned property owner(s) hereby authorizes the filing of this application, and authorizes on site review by authorized staff. I hereby agree to comply with all code requirements applicable to my application. Acceptance of this application does not infer a complete submittal. All amendments to the Community Development Code and to other regulations adopted after the application is approved shall be enforced where applicable. Approved applications and subsequent development is not vested under the provisions in place at the time of the initial application.

Ken Worcester — 03/31/2015

Applicant's signature | Date | Owner's signature ***(required)*** | Date

ATTACHMENT C

NO-RISE REPORT & CERTIFICATION

WATERSHED
SCIENCE & ENGINEERING
110 Prefontaine Place South, Suite 508
Seattle, WA 98104

Memorandum

To: Jacob Faust, Maul Foster & Alongi

From: Chris Frei, P.E. (WA), WSE

Date: 1/22/2015

Re: Cedar Oak Boat Launch No-Rise Analysis and Certification

Proposed improvements to the existing Cedar Oak Boat Launch (project) in West Linn, Oregon would place fill within the mapped floodway of the Willamette River, and the City of West Linn requires that a "No-Rise" determination be completed in order to show that the project will not cause an increase in FEMA flood levels.

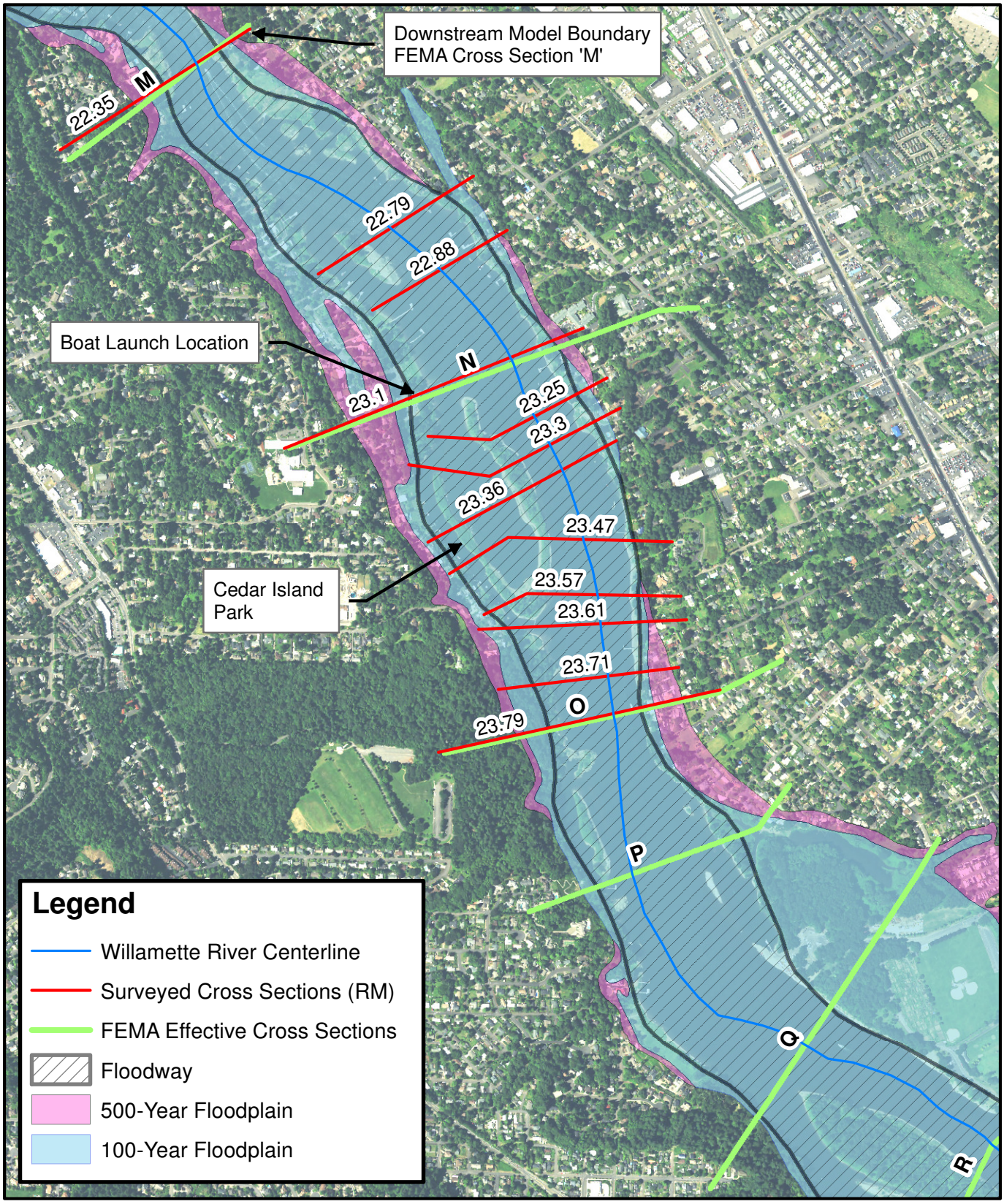
The report herein is explicitly written to provide the City of West Linn with the information necessary to confirm that the proposed project meets their own and FEMA's "No-Rise" requirements. FEMA guidelines state that the Effective FEMA hydraulic model is the primary tool that should be used to demonstrate "No-Rise". At this site, the Effective model is based upon the Army Corps of Engineers' backwater program HEC-2, a predecessor to HEC-RAS. Watershed Science & Engineering (WSE) followed FEMA guidelines and modified the Effective model to create a HEC-RAS model that contains sufficient detail to evaluate existing conditions and the proposed project configuration. Model results demonstrate that the project will not increase 100-year floodplain or floodway water surface elevations and therefore satisfies the "No-Rise" requirement. Certification of "No-Rise" is provided.

Study Area

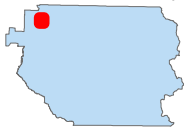
The Cedar Oak Boat Launch is located on the left (west) bank of the Willamette River in West Linn, Oregon (See Figure 1). The existing facilities are located just north (downstream) of Cedar Island. The proposed project is located entirely within the FEMA Floodway. Effective FEMA floodplain boundaries and cross sections are shown in Figure 1, along with the approximate location of cross section bathymetric survey completed by the Oregon State Marine Board (OSMB) to support hydraulic analysis completed by Maul Foster Alongi (MFA) in 2009.

Hydrology

The 100-year based flood instantaneous peak discharge for this investigation is 375,000 cfs, based on the Effective FEMA HEC-2 model and FEMA Flood Insurance Study (FIS) for this reach of the Willamette River (FEMA 2008).



Clackamas County, OR



Cedar Oak Boat Launch Location Map West Linn, Oregon

0 850 1,700 Feet

N

Scale: 1:15,000
NAD 1983 HARN
StatePlane Oregon North
FIPS 3601 Feet Intl

28 Jan 2015

WATERSHED SCIENCE & ENGINEERING

F:\14-025 West Linn Boat Ramp\GIS\Figure1.mxd 1/28/2015 9:01:44 AM

Figure 1

Datum

All elevations in this report reference the NAVD 88 vertical datum, consistent with elevation reporting in the Effective FIS (FEMA 2008). Hydraulic modeling was completed in the NGVD 29 vertical datum, which is the datum used in the Effective HEC-2 hydraulic model. Elevation values taken directly from the model can be compared to NAVD88 using the following conversion:

NAVD 88 = NGVD 29 + 3.5 feet (Source: FEMA, 2008)

Proposed Project Elements

Proposed project elements include extension of the existing boat ramp, replacement and extension of the floating docks, and replacement of steel piles that support the docks. As detailed below, the existing boat ramp and dock piles were represented in the existing condition hydraulic model based on OSMB survey of the boat launch location. To model proposed conditions, the boat launch cross section was updated to represent proposed fill and dock pile placement based on site plans provided in the project Joint US Army Corps of Engineers and Department of State Lands Application (2011, Appendix A). The floating dock structure was not represented in the hydraulic model because the dock is removed during flood conditions.

FEMA Effective, Duplicate Effective, and Corrected Effective Models

The "Effective" FEMA FIS HEC-2 model of the Willamette River (Appendix B) provides the baseline for determination of project impact. Because the HEC-2 model code is outdated, WSE first converted the Effective HEC-2 model to HEC-RAS before beginning the analysis. This converted Effective FEMA model is known as a "Duplicate Effective" model, and is provided with this submittal.

During conversion, a number of errors were found within the Effective model that result in an inaccurate representation of river cross section geometry. Specifically, a number of negative elevation values were incorrectly represented as positive values, resulting in erroneous "spikes" in the channel cross section (See Figure 2). This issue was discussed with FEMA Region X, and it was determined that WSE would correct the errors during model conversion, and recalibrate the model to approximate Effective FEMA water surface elevations. WSE corrected the errors, and adjusted Manning's n channel roughness values until the model reproduced the Effective model water surface elevations to within 0.5 ft at all locations. This corrected model is known as the "Corrected Effective" model, and is provided with this submittal. A comparison of water surface elevations from the Effective and Corrected Effective models are shown in Table 1.

Figure 2. Example Cross Section from Effective HEC-2 Model Conversion.

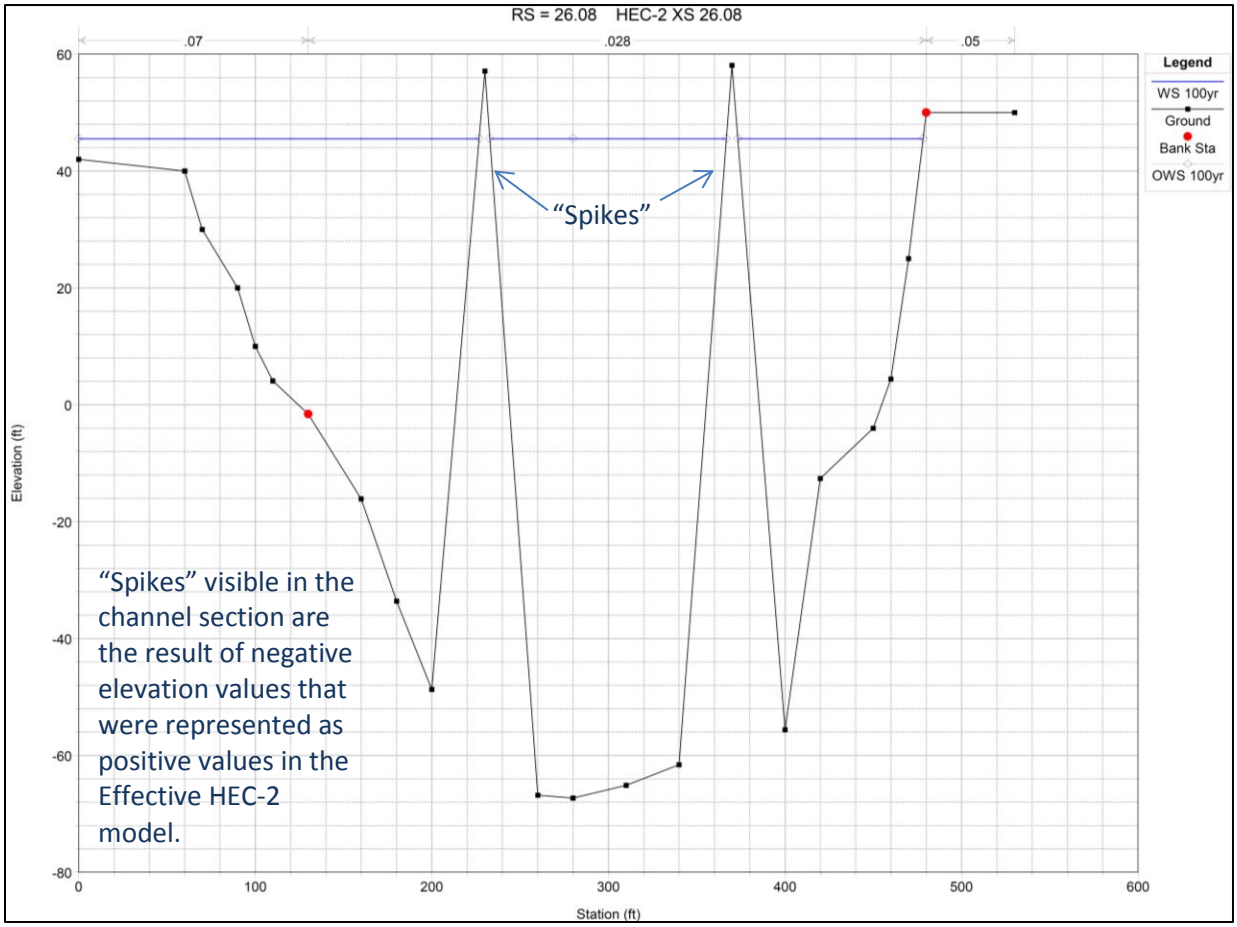


Table 1. Comparison of FEMA Base Flood Elevations and Floodway Elevations and Water Surface Results from the Corrected Effective Model.

Cross Section		100 Year (Base Flood Elevation)			Floodway		
FEMA Letter	River Mile	FEMA	Corrected Effective	Increase*	FEMA	Corrected Effective	Increase*
M	22.35	44.0	44.0	0.0	44.7	44.7	0.0
N	23.1	46.1	45.8	-0.3	46.8	46.5	-0.3
O	23.79	46.2	46.3	0.1	46.9	47.0	0.1
P	24.06	46.8	46.8	0.0	47.5	47.4	-0.1
Q	24.5	47.2	47.3	0.1	47.9	48.0	0.1
R	24.9	47.7	47.7	0.0	48.4	48.3	-0.1

*must be within ±-0.5 ft

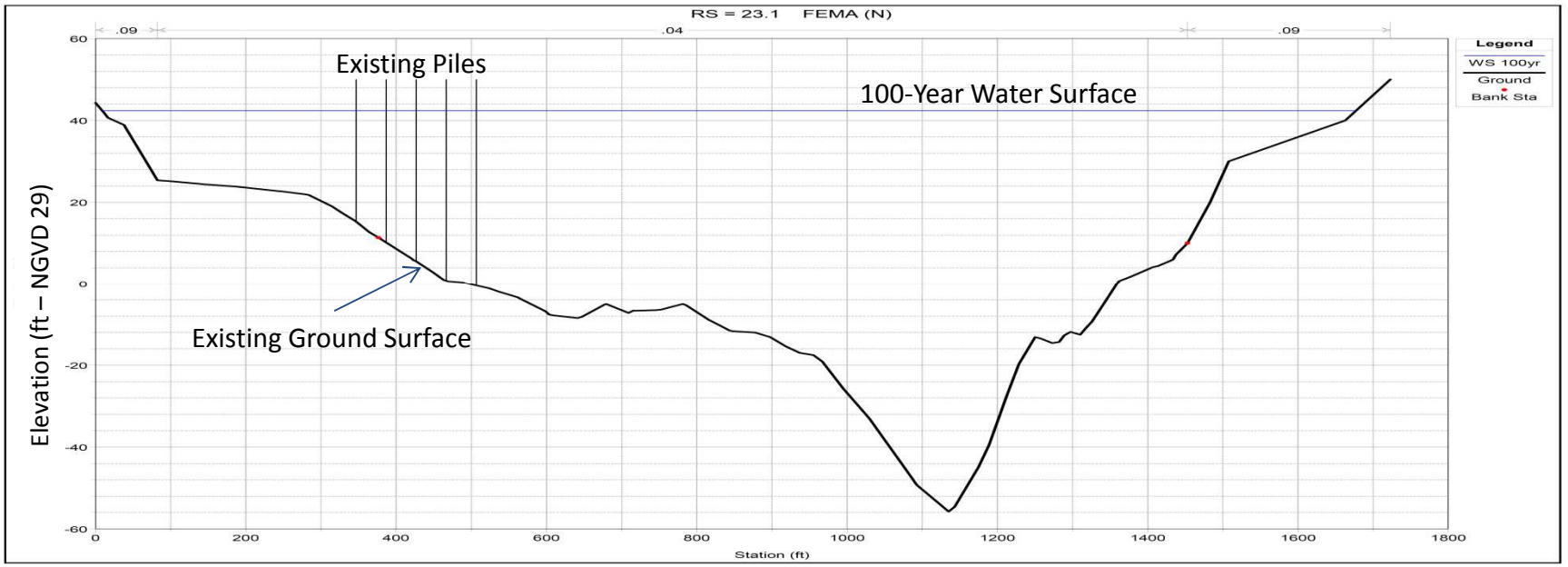
Existing Condition Models

An "Existing Condition" model geometry for the Boat Launch No-Rise analysis began with the Corrected Effective model (described earlier). Cross sections were added or updated near the boat launch location based on survey data provided to WSE by MFA in the form of HEC-RAS cross sections (MFA, 2009). Updates included incorporating new in-channel data at cross sections 22.35, 23.1, and 23.79 (FEMA section M, N and O), and adding 11 new cross sections. The new and updated sections improve model resolution near the project location, and allow a better representation of potential impacts of the proposed project. Floodway encroachment stationing at the new cross sections was based on Floodway widths shown on the Effective FEMA maps. Manning's n roughness values, channel overbank data, and model reach lengths were made to be consistent with the Corrected Effective model. The existing boat launch is represented at RM 23.1, based on OSMB survey completed at the boat ramp location. Blocked obstructions were additionally included to represent existing steel piles that support the floating dock. The resulting geometry represents the "Existing Condition" for the Cedar Oak Boat Launch No-Rise Investigation.

Proposed Condition Model

A "Proposed Condition" model was then created by updating model cross section 23.1 to represent the proposed boat ramp fill. Blocked obstructions representing the dock piles were then adjusted to match the proposed configuration. A comparison of the existing and proposed boat launch cross sections from the hydraulic model is included in Figure 3.

Both the existing and proposed condition models were run for the 100-year base flood (un-encroached floodplain) and floodway (with encroachments). The resulting water surface elevations are listed in Table 2 along with the observed change in water surface elevation. Although the proposed project results in a net increase in blocked area of approximately 2000 square feet, the hydraulic impact is insignificant. The result of the flow constriction is a very slight increase in average channel velocity, and a corresponding minor decrease in regulatory flood levels. Overall, impacts are extremely small, with the maximum decrease in 100-year water surface elevation of 0.03-ft at the project location (cross sections 23.1), tapering to approximately 0.01-ft immediately upstream. Changes resulted in "No-Rise" in FEMA base flood or floodway water surface elevations.



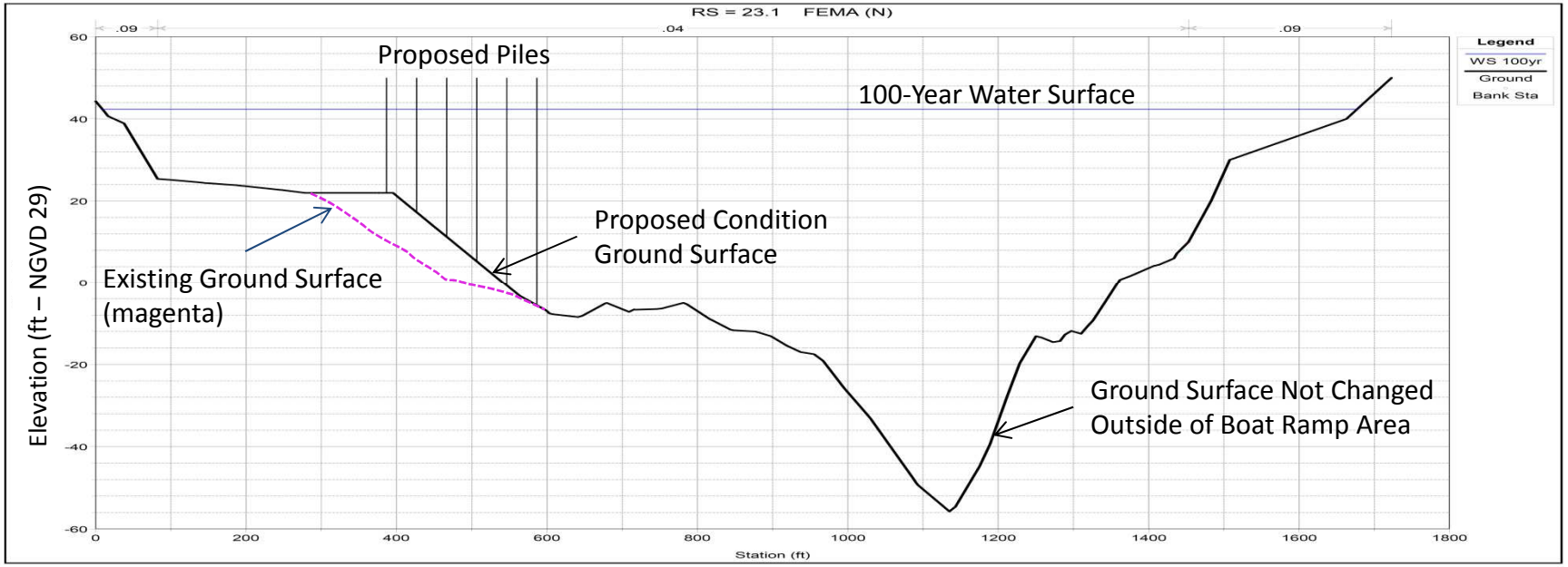


Figure 3. Comparison of Existing and Proposed Condition Boat Ramp Cross Section (RM 23.1)

Table 2. 100-Year Base Flood Elevation Willamette River

Cross Section		100 Year (Base Flood Elevation)			Floodway		
FEMA Letter	Station	Existing Conditions	Proposed Conditions	Increase	Existing Conditions	Proposed Conditions	Increase
M	22.35	44.02	44.02	0.00	44.72	44.72	0.00
	22.79	45.35	45.35	0.00	46.08	46.08	0.00
	22.88	45.80	45.80	0.00	46.52	46.52	0.00
	23.09	45.82	45.82	0.00	46.55	46.55	0.00
N*	23.1	45.88	45.85	-0.03	46.61	46.57	-0.03
	23.13	45.81	45.80	-0.01	46.54	46.53	-0.01
	23.25	45.91	45.90	-0.01	46.58	46.57	-0.01
	23.3	45.99	45.98	-0.01	46.74	46.73	-0.01
	23.36	46.05	46.04	-0.01	46.79	46.78	-0.01
	23.47	46.26	46.25	-0.01	47.00	46.99	-0.01
	23.57	46.06	46.05	-0.01	46.81	46.80	-0.01
	23.61	46.30	46.29	-0.01	47.02	47.01	-0.01
	23.71	46.23	46.22	-0.01	46.95	46.94	-0.01
O	23.79	46.48	46.47	-0.01	47.10	47.09	-0.01
P	24.06	46.83	46.82	-0.01	47.48	47.47	-0.01
Q	24.5	47.30	47.29	-0.01	48.02	48.01	-0.01
R	24.9	47.71	47.70	-0.01	48.40	48.39	-0.01
	25.32	48.40	48.39	-0.01	49.09	49.08	-0.01
	25.73	49.52	49.51	-0.01	50.33	50.32	-0.01
	25.98	49.29	49.29	-0.01	50.10	50.09	-0.01
	26.08	49.58	49.57	-0.01	50.30	50.29	-0.01
	26.42	50.75	50.74	-0.01	51.72	51.71	-0.01

*Location of Boat Launch

No-Rise Certification

WSE certifies that the analysis described herein was completed using methods that are consistent with industry standards and adhere to FEMA guidelines and requirements. A signed and stamped copy of the FEMA form "Certification of a 'No-Rise' Determination for a Proposed Floodway Development" is included in Appendix C.

FEMA typically asks that a copy of the effective FEMA Floodplain / Floodway Map for the project area is included with a No-Rise submittal. A "Firmette" of the project reach is included as Appendix D. Additionally, FEMA Floodway Data Tables for the Willamette are included in Appendix E.

No-Rise modeling was based on the Joint US Army Corps of Engineers and Department of State Lands Application Form (NWP-2005-384) provided to WSE by Maul Foster Alongi (Appendix A). If project elements have (or continue to) evolve as part of the permitting process, it may be necessary to revisit or update this No-Rise analysis.

Thank you for the opportunity to assist you with this project. Please don't hesitate to contact WSE with any questions.

Sincerely,

Chris Frei, P.E. (WA)
Watershed Science & Engineering

References

FEMA (2008). “Flood Insurance Study: Clackamas County, Oregon and Incorporated Areas. 41005CV001A. Federal Emergency Management Agency, Revised June 17, 2008.

JPA (2011) “Joint Permit Application NWP-2005-384” Cedar Oak Public Launch Ramp, West Linn, Oregon. May 19, 2011

MFA (2009). “RE: Cedar Oak Boat Ramp Hydraulic Technical Memo”, Maul Foster Along. June 5, 2009.

USACE (2010). HEC-RAS. Hydrologic Engineering Center’s River Analysis System, U.S. Army Corps of Engineers.

WSE (2014). “Cedar Oak Boat Launch No-Rise Analysis Review”. Watershed Science and Engineering, December 16, 2014.

Appendix A
Cedar River Boat Launch Joint Permit Application NWP-2005-384

NWP-2005-384

US Army Corps Of Engineers (Portland District)

Joint Permit Application Form

DATE STAMP

AGENCIES WILL ASSIGN NUMBERS

Corps Action ID Number

Oregon Department of State Lands No

SEND ONE SIGNED COPY OF YOUR APPLICATION TO EACH AGENCY

US Army Corps of Engineers:		DSL - West of the Cascades:		DSL - East of the Cascades:		Send DSL Application Fees to:
District Engineer		State of Oregon		State of Oregon		State of Oregon
ATTN: CENWP-OD-GPPO	**AND**	Department of State Lands	**OR**	Department of State Lands	**AND**	Department of State Lands
Box 2946		775 Summer Street, Suite 100		1645 NE Forbes Road, Suite 112		PO Box 4395, Unit 18
Portland, OR 97208-2946		Salem, OR 97301-1279		Bend, Oregon 97701		Portland, OR 97208-4395
503-808-4373		503-986-5200		541-388-6112		**(Attach a copy of the first page of the application)**

(1) APPLICANT INFORMATION

Applicant Name and Address	Ken Worcester, Director City of West Linn Parks and Recreation 22500 Salamo RD # 1100 West Linn, OR 97068	Business Phone #	(503) 557-4700
		Home Phone #	
		Fax #	(503) 656-4106
		Email	kworcester@ci.west-linn.or.us
Authorized Agent Name and Address		Business Phone #	
		Home Phone #	
Check one		Fax #	
Consultant ☐		Email	
Contractor ☐			
Property Owner Name and Address If different from above[1]		Business Phone #	
		Home Phone #	
		Fax #	
		Email	

(2) PROJECT LOCATION

Street, Road or Other Descriptive Location		Legal Description (attach *tax lot map**)			
Cedar Oak Boat Ramp East end of Elmran Road		Township	Range	Section	Quarter/Quarter
		2S	1E	13	SWSE
In or near (City or Town)	County	Tax Map #		Tax Lot #[2]	
West Linn	Clackamas	2 1E 24		200	
Wetland/Waterway (pick one)	River Mile (if known)	Latitude (in DD.DDDD format)		Longitude (in DD.DDDD format)	
Willamette River	23.2	45.39231		-122.62824	
Directions to the site	Highway 43 to Elmran, follow past school, down hill. Road dead-ends at ramp.				

[1] If applicant is not the property owner, permission to conduct the work must be attached.
[2] Attach a copy of all tax maps with the project area highlighted.

- ***Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.***

(3) PROPOSED PROJECT INFORMATION

Type: Fill ☒ Excavation (removal) ☐ In-Water Structure ☒ Maintain/Repair an Existing Structure ☒

Brief Description: Rebuild existing boat launch, docks and pile in location to reduce future maintenance dredge need.

Fill

Riprap ☒ Rock ☒ Gravel ☒ Organics ☐ Sand ☒ Silt ☐ Clay ☐ Other: ☐

Wetlands	Permanent (cy)	Temporary (cy)							Total cubic yards for project (including outside OHW/wetlands)		
	Impact Area in Acres	Dimensions (feet)									
		L'		W'		H'					
Waters below OHW	Permanent (cy)	Temporary (cy)							Total cubic yards for project (including outside OHW/wetlands)	9500	
	9,500										
	Impact Area in Acres	Dimensions (feet)									
	1.54	L'	216	W'	400	H'	5				

Removal

Wetlands	Permanent (cy)	Temporary (cy)							Total cubic yards for project (including outside OHW/wetlands)		
	Impact Area in Acres	Dimensions (feet)									
		L'		W'		H'					
Waters below OHW	Permanent (cy)	Temporary (cy)							Total cubic yards for project (including outside OHW/wetlands)	200	
	200										
	Impact Area in Acres	Dimensions (feet)									
	.2	L'	150	W'	40	H'	2				

Total acres of construction related ground disturbance (If 1 acre or more a 1200-C permit may be required from DEQ) 1.54

Is the disposal area upland? Yes ☒ No ☐ Impervious surface created? 0<1 acre ☒ 0>1 acre? ☐

	Yes	No
Are you aware of any state or federally listed species on the project site?	x	
Are you aware of any Cultural/Historic Resources on the project site?		x
Is the project site within a national Wild & Scenic River?		x
Is the project site within a State Scenic State Scenic Waterway? *		x

If yes, please explain in the project description (in block 4)

(4) PROPOSED PROJECT PURPOSE AND DESCRIPTION

Purpose and Need:

*Provide a description of the public, social, economic, or environmental benefits of the project along with any supporting formal actions of a public body (e.g. city or county government), as appropriate.**

Purpose: To maintain public boating access to this section of the Willamette River
Need: The existing boat launch facility is in need of renovation to reduce regular maintenance dredging, upgrade the ramp to current standards, and address user safety issues. Alternative locations of sufficient size, under public ownership, and with access on the west side are not available on this section of river. Alternative ramps are provided on the east side of the river; however, reaching them from the west side is difficult because of limited bridge crossings and road connections.

Public Benefits: The Cedar Oak boat ramp provides trailerable boats public access to the Willamette River and connected waterways. The proposed project will allow the continued safe operation of this public facility. The boat ramp is heavily used, serving an estimated 18,136 recreational boaters each year. There are few public boat ramps in this area, so this facility is particularly important to the local fishing and boating community. The park in which the ramp is located also offers picnicking and nature-viewing opportunities as well as shoreline and fishing access. The upland part of the park includes a paved parking lot and restroom facilities. The facility is owned by the City of West Linn and is located on property under public ownership. The in-water portions are on leased land with public use. State funding of portions of the project has been provided by the Oregon State Marine Board (OSMB).

- ***Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.***

Environmental Benefits: This project has been designed to minimize potential impacts associated with renovation of a boat ramp and to improve ecological conditions of the site. The site of the ramp was previously disturbed when the boat ramp was originally constructed in 1970. Construction activities were conducted again during dredging and reconstruction following extreme flooding in 1996. Sediment deposition patterns and river hydrology have exacerbated the siltation on the existing ramp. The City of West Linn has an active permit for maintenance dredging at the boat ramp (Corps of Engineers permit #200500384). The boat ramp was most recently dredged in 2007. The proposed reconstruction of the boat ramp is designed to work with the hydraulics and sediment dynamics of the site to reduce the need for future maintenance dredging and consequently reduce the associated potential impacts to benthic habitat and water quality. The new floating dock is designed to allow fish passage when it rests on the river bottom during periods of low water. Additional features of the proposed design that will improve environmental conditions relative to the existing facility include an infiltration basin to treat parking lot stormwater runoff, and riparian habitat enhancement including gravel sloping shoreline with native plantings.

Supporting Actions / Plans: The proposed project has been identified as a priority in planning documents approved by both the City of West Linn and the OSMB. The OSMB has placed this facility on the six-year facility plan for float replacement, ramp repair, and a debris boom. Improvements to the boat ramp are also detailed in the City of West Linn's five-year capital improvement plan.

Project Description:

Please describe in detail the proposed removal and fill activities, including the following information:

- Volumes and acreages of all fill and removal activities in waterway or wetland separately
- Permanent and temporary impacts
- Types of materials (e.g., gravel, silt, clay, etc.)
- How the project will be accomplished (i.e., describe construction methods, equipment, site access)
- *Describe any changes that the project may make to the hydraulic and hydrologic characteristics (e.g., general direction of stream and surface water flow, estimated winter and summer flow volumes.) of the waters of the state, and an explanation of measures taken to avoid or minimize any adverse effects of those changes.*
- Is any of the work already complete? Yes ☐ No ☒ If yes, please describe the completed work.

In addition, for fish habitat or wetland restoration or enhancement activities, complete the information requested in supplemental Fish Habitat or Wetland Restoration and Enhancement form.

Project Drawings

State the number of project drawing sheets included with this application: 10

A complete application must include a location map, site plan, cross-section drawings and recent aerial photo as follows and as applicable to the project:

- **Location map** (must be legible with street names)
  - Site plan, including:
  - Entire project site and activity areas
  - Existing and proposed contours
  - Location of ordinary high water, wetland boundaries or other jurisdictional boundaries
  - Identification of temporary and permanent impact areas within waterways or wetlands
  - Map scale or dimensions and north arrow
  - Location of staging areas
  - Location of construction access
  - Location of cross section(s), as applicable
  - Location of mitigation area, if applicable
- **Cross section drawing**(s) including;
  - Existing and proposed elevations
  - Identification of temporary and permanent impact areas within waterways or wetlands
  - Ordinary high water and/or wetland boundary or other jurisdictional boundaries
  - Map scale or dimensions
- **Recent Aerial photo** (1:200, or if not available for your site, the highest resolution available)

Will any construction debris, runoff, etc., enter a wetland or waterway? Yes ☐ No ☒

If yes, describe the type of discharge and show the discharge location on the site plan.

- ***Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.***

Project Description

The project is a reconstruction of the existing boat ramp including: replacement of steel piles; replacement of docks; replacement of abutments and rock armor along perimeter of ramp and toe of fill; and upgrades to the parking lot, including stormwater treatment. The ramp will be relocated farther into the river to reduce sedimentation and future dredge requirements. Improvements will include modernization of the facility to meet current OSMB standards of design and will increase project safety and functionality.

Project Details:

Project Feature	Description
Boat Ramp	Proposed: 8,760 sq. ft., 220' long, 40' wide, surface made of precast concrete
Edge of Ramp Slopes	3.5:1 slope. Native round rock (7" minus) in 3-ft.-thick layer. Upper portion of slope planted with live cuttings of native species. Stone sized to minimize movement. Riprap perimeter shall be only 3 ft. wide to protect from undercutting.
Floating Dock	Proposed: Located on each side of the ramp 2,860 sq. ft. (220' long, 6' wide), constructed with blocks to stand 4" above river bottom at low water
Pilings	Proposed: Twelve 16"-diameter steel pilings
Infiltration bioswale	5,250 sq. ft.

Abutment—Two 20 ft. x 6 ft. wide

Permanent and Temporary Impacts

Permanent impacts of the project include loss of shallow water habitat from placing fill into the river to extend the boat ramp. The area impacted by this fill is subject to frequent boating activity. Because of this frequent disruption, lack of vegetative cover, and highly disturbed character, it is believed that this site does not currently provide significant habitat functions or values to the aquatic environment. The floating dock will also create overwater coverage of the river; however, the total area will be reduced relative to the existing dock system. The proposed reconstruction of the dock is not designed to increase the capacity of the facility, so there is no anticipated increase in boating activity as a result of the project.

Temporary impacts include sediment disturbance during construction, noise from operation of heavy equipment, and interruption of ramp operations. Water quality impacts from sediment disturbance will be minimized through use of silt curtains and construction best management practices (BMPs). Construction noise will be minimized through the use of vibratory rather than impact pile driver to remove old pilings and install new piling.

More detailed analysis of potential impacts is provided in the biological evaluation (see attached).

Construction Methods

Work shall progress from the land side and will utilize land-based equipment for most of the work, except pile driving. The first step will include installation of erosion-control measures, including a floating sediment curtain and upland sediment fences. The contractor will mobilize equipment and establish a staging area that is fenced and secured. The floating sediment curtain will be placed as close to the work area as possible to minimize the area enclosed initially. Work will be conducted during the Oregon Department of Fish and Wildlife (ODFW) approved in-water work window for this section of the Willamette River (July 1 through October 31 and/or December 1 through January 31). ODFW will be notified and fish salvage efforts using electroshock equipment will be conducted. Material will be imported to the site via land and will be staged in the stockpile area. Fill will be placed near shore initially, using hydraulic excavators and dump trucks. As the work progresses riverward, the floating sediment curtain will be moved outward, maintaining a small volume of water and reducing the chance of stranding and/or trapping fish.

After the fill is placed and graded, the slope treatment will be installed. This will consist of larger rock armor at the toe, then rock of smaller size progressing up the slope. This site is generally sheltered; however, during a flood event water is directed around the upstream island and the site is exposed to significant current. To minimize habitat impacts the rock fill will be covered with round rock native to the area, and the upper slopes will be covered with soil and vegetated. A layer, approximately 3 ft thick, of round rock will be placed over the rock fill. This round rock will be of size and gradation similar to those of the adjacent shoreline. Size is approximately 6" and smaller down to gravel, typical of the shorelines nearby.

The soil placed on the upper slope zone near ordinary high water will be stabilized with biodegradable coir fabric and anchored in place. Native plant species will be installed in this zone to provide riparian cover and to replace the functional value of the area lost because of construction. Several large trees exist in the area to be disturbed. The root system for these trees will be excavated and the trees will be salvaged without cutting for the restoration element. The full-length trees will be used for shoreline stability and habitat enhancement by laying the root wad portion on the top of the bank and directing the canopy down into the river, similar to the way vegetation falls into the river naturally. The trees will be anchored with 12"-diameter wood pins driven into the ground and crossing the tree in a v-form. No cables or chain will be used.

Topsoil in the disturbed area will be scraped and stockpiled with erosion-control protection for later use in plantings.

Hydraulic and Hydrologic Changes

No water flows in the river will be increased, decreased, or redirected by the proposed work. The project is not expected to cause flooding or erosion at any point on or near the waterway. No modifications to the hydraulic or hydrologic characteristics of the waterway are anticipated as a result of this project. Hydraulic modeling has indicated that placement of the fill to extend the boat ramp will not cause a net rise in flood elevations.

Estimated project start date:	2012— Grant Funding Dependent	Estimated project completion date:	2014

(5) PROJECT IMPACTS AND ALTERNATIVES

Alternatives Analysis:

Describe alternative sites and project designs that were considered to avoid or minimize impacts to the waterway or wetland. (Include alternative design(s) with less impact and reasons why the alternative(s) were not chosen. Reference OAR 141-085-0565 (1) through (6) for more information).*

- ***Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.***

OPTION 0—No Action: This option would consist of minor maintenance to the docks and no work on the ramp. Dredging would be required under the existing docks to allow level and safe function of the floats. Future maintenance dredging would be anticipated based on past experience. This option is not considered acceptable because it does not adequately address the public safety and functionality issues of the existing facility and incurs the cost and environmental impact of maintenance dredging.

OPTION 1—Preferred Option: The preferred option extends the existing ramp into deeper water and replaces the existing floating dock system. Extension of the ramp reduces future maintenance dredging requirements by allowing the river currents to naturally flush sediment away from the ramp surface. This option does require fill below ordinary high water; however, this impact will be offset by avoiding future maintenance dredge impact and site development elsewhere. Shoreline planting and habitat diversity structures are included to minimize and mitigate impacts. This option is preferred because it upgrades the docks to meet current OSMB standards for function and safety, reduces dredging needs, and provides overall environmental improvement of the site.

OPTION 2—Relocate Ramp Upstream: This option would locate the ramp approximately 200 ft. upstream in a deeper section of the cove. After review of historical photos and hydraulic model study, this location appears problematic. The location would be suitable during lower water times and would function. However, when river levels are high enough to activate the side channel upstream, flow velocity past the ramp would be unacceptable for users. Significant debris would also pass the docks and cause additional maintenance issues. Because a small shoal currently exists just downstream of this location, future maintenance dredge work would likely be required to keep the channel open. Avoiding long-term impact was a specific design criterion, and thus this option was abandoned.

OPTION 3—Relocate Ramp Downstream: The shoreline downstream of the current ramp location appears to be filling in with fine-grain sediment over time. The shoreline consists of mud and silt, indicating slow velocity. Relocating in this area would not address the problem of future maintenance dredging. This option was abandoned.

OPTION 4—Relocate Ramp to New Site: Limited options exist for an alternative location. Most of the shoreline in the area is either under private ownership for residential uses or is open space parkland and sensitive riparian area. No suitable sites with sufficient acreage for parking and access exist nearby. Alternative boat ramp locations are across the river in other jurisdictions and are separated by distant bridge crossings.

OPTION 5—Alternative Configurations of Preferred Design. These options included more fill to reach farther into deep water; however, impacts were deemed too significant. Other configurations included steeper side slopes armored with riprap. Fill volume was less; however, exposed riprap was not preferred. These options were abandoned because of limited impact reduction.

Measures to Minimize Impacts

Describe what measures you will use (before and after construction) to minimize impacts to the waterway or wetland. These may include but are not limited to the following:

- *For projects with ground disturbance include an erosion control plan or description of other best management practices (BMP's) as appropriate. (For more information on erosion control practices see DEQ's Oregon Sediment and Erosion Control Manual)*
- *For work in waterways where fish or flowing water are likely to be present, discuss how the work area will be isolated from the flowing water.*
- *If native migratory fish are present (or were historically present) and you are installing, replacing or abandoning a culvert or other potential obstruction to fish passage, complete and attach a statement of how the Fish Passage Requirements, set by the Oregon Department of Fish and Wildlife will be met.*

This project includes a number of measures to avoid and minimize impacts:

- The outer portion of the docks will be removed during high water periods when it is not necessary for safe boat launching (fall through early spring). Removal of sections of the dock will reduce debris damage and accumulation on the floats. It also decreases overwater cover during much of the season when listed salmonids migrate through this area.
- Existing pile will be removed and only steel pile will be installed as replacement. Pile caps will be placed on piling to reduce the number of potential perches for piscivorous birds that prey on listed salmonids.
- Blocks are integrated into the bottom of the floating docks to lift the dock 4″ off the ground to allow fish passage beneath the docks during low water. When floating, the docks are designed to draw no more than 6″ in the water.
- A boating education kiosk including information on boating safety, invasive species, and endangered species will be provided to increase public awareness of these issues.
- Work below ordinary high water will be completed during approved in-water work windows, when listed fish are least likely to be present in the action area.
- Pilings will be removed and installed using vibratory equipment.
- A pollution- and erosion-control plan will be prepared and implemented to prevent pollution related to construction operations. This plan will meet the requirements of all applicable laws and regulations.
- A sediment fence and floating silt curtain will be used during dredging to isolate turbid water in the work area from the river and allow for settling of suspended solids. The silt curtain will be installed and fish removed from the impounded area by electroshocking. This area will be minimized initially and then expanded as work progresses.
- Staging—work will be conducted from land to minimize in-water disturbance. Materials will be stockpiled on the upland site and perimeter controls established around the piles. The material will be tarped and protected during rain events. Work areas will be maintained and sediment sources managed to reduce chance of in-water turbidity.
- When heavy equipment is used, the equipment selected will have the least adverse effects on the environment (e.g., minimally sized, low ground pressure equipment).
- Vehicle staging, maintenance, refueling, and fuel storage areas will be at least 150 feet from top of bank.
- All construction equipment will be operated and stored in a manner that minimizes discharge of contaminants into the Willamette River.
- A section of the renovated facility will be set aside and graded to allow collection of water and potential future treatment for invasive species management. Future improvements may include a wash-down and collection area as invasive management techniques advance.
- Vegetation removal will be minimized and limited to the fill area; therefore, no herbicides will be used for vegetation clearing. Removed trees will be reused as habitat.
- Accepted BMPs appropriate to the project, including those described in OSMB's Best Management Practices for Environmental and Habitat Protection during Operation and Maintenance of Recreational Boating Facilities, will be incorporated in the design and construction of the project to minimize potential adverse effects associated with the project.

Notwithstanding the applicant's best efforts to minimize project effects, short-term impacts, e.g., increases in noise levels, traffic and turbidity, are unavoidable. Such impacts, including those described above, will be limited in scope and duration, will occur only in the previously developed project area, and will not substantially change the character or function of the water resource.

Description of resources in project area

Ocean ☐ Estuary ☐ River ☒ Lake ☐ Stream ☐ Freshwater Wetland ☐

Describe the existing **physical and biological characteristics** of the wetland/waterway site by area and type of resource (Use separate sheets and photos, if necessary).

For wetlands, include, as applicable:

- *Cowardin and Hydrogeomorphic(HGM) wetland class(s)**
- *Dominant plant species by layer (herb, shrub, tree)**
- Whether the wetland is freshwater or tidal
- *Assessment of the functional attributes of the wetland to be impacted**
- Identify any vernal pools, bogs, fens, mature forested wetland, seasonal mudflats, or native wet prairies in or near the project area.)

For waterways, include a description of, as applicable:

- *Channel and bank conditions**
- *Type and condition of riparian vegetation**
- *Channel morphology (i.e., structure and shape)**
- *Stream substrate**
- Fish and wildlife (type, abundance, period of use, significance of site)
- *General hydrological conditions (e.g. stream flow, seasonal fluctuations)**

- ***Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.***

The project is located on the Willamette River. Figure 3 shows the bathymetry of the project area, based on a survey conducted by the OSMB in July 2004. The channel in this reach is approximately 1120 ft. wide and depth varies nearby, but is generally 20 to 30 ft. Cedar Island is situated immediately upstream of the site. Water flows are decreased downstream of the island, resulting in sediment deposition in the project area. Depositional materials are generally small- to medium-grained sandy silt.

The riverbank in the project area includes some areas of exposed soil, primarily below elevation 10 ft., and vegetation above that elevation. Plants adjacent to the boat ramp are mostly native trees and nonnative grass. The riparian vegetation includes a narrow band of forest-type cover, which typically includes trees such as cottonwood (*Populus trichocarpa*), Douglas fir (*Pseudotsuga menziesii*), and Oregon ash (*Fraxinus latifolia*). No aquatic vegetation exists on site.

Tidal impacts are limited to very low water and low flow; however, the river level is impacted by tides.

ODFW has designated this reach of the waterway as essential salmonid habitat. Species listed under the federal Endangered Species Act that occur in this area include Upper Willamette River (UWR) Chinook salmon (*Oncorhynchus tshawytscha*) and UWR steelhead (*O. mykiss*). The area is also designated as Essential Fish Habitat for Chinook and coho salmon (*O. kisutch)*. In the action area, critical habitat has been designated for UWR Chinook salmon and UWR steelhead.

There are no freshwater wetlands and no aquatic vegetation on this previously developed site. The project site is a concrete boat ramp. This reach of the waterway is identified in the National Wetland Inventory as Cowardin class R1UBV: [R] Riverine, [1] Tidal, [UB] Unconsolidated Bottom, [V] Permanent-Tidal.

Environmental baseline conditions of this site are typical of those found in the Willamette Basin, which are at risk or not properly functioning based on the following indicators: temperature, turbidity, chemical contamination/nutrients, substrate, large woody debris, pool frequency, pool quality, off-channel habitat, refugia, width-to-depth ratio, floodplain connectivity, peak/base flows, drainage network, road density, and riparian reserves.

This project, at RM 23.2, is within a reach of the Willamette River with impaired water quality. The lower Willamette River (RM 0 to RM 24.8) is on DEQ's 2002 303(d) List for Fecal Coliform, Winter/Spring/Fall; Dieldrin, Year Around; DDT, Year Around; DDT Metabolite (DDE), Year Around; Polynuclear Aromatic Hydrocarbons, Year Around; Biological Criteria; Mercury, Year Around; Aldrin, Year Around; Temperature, Summer; PCB, Year Around; DDT, Year Around; Manganese, Year Around; Iron, Year Around; and Pentachlorophenol.

The aquatic habitat near the site consists of a boat ramp and riverbank with 8% to 12% slopes. The site was disturbed when the boat ramp was originally constructed and during subsequent dredging. The existing boat ramp site is subject to frequent boating activity. The park in which the facility is located and the associated upland amenities are subject to frequent human activity. Because of the frequent disruption, lack of vegetative cover, and highly disturbed character, this site does not currently provide significant habitat functions or values to the aquatic environment.

The following description of the potential adverse impacts from the project is being provided to comply with OAR 141-085-0025(3)(h).

The project site is an existing concrete boat ramp, which does not provide significant habitat value or functions to any fish, wildlife or plant populations or individuals. Turf grass and landscape trees are maintained in the park immediately west of the ramp. Fish and wildlife described above typically do not inhabit the project site, although they do occur in the areas surrounding the project site. Any contact with the project site is incidental and transitory.

Activities such as silt removal and disposal have the potential to disturb aquatic habitat. These activities may cover benthic habitat and aquatic vegetation.

Modification of bottom topography and water circulation patterns varies with the size of the project. These effects are negligible, as the project is small in proportion to the channel size. This project covers an area of 400 ft. by 216 ft. at a point where the river is about 1120 ft. wide. The proposed work will affect less than 15% of the channel width.

*Describe the existing **navigation, fishing and recreational** use of the waterway or wetland.**

- ***Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.***

Use of the boat ramp (the project site) is estimated at 18,136 recreational use days each year. Fishermen, water skiers, boaters, kayakers, and swimmers use this section of river. Because the river at this point is largely controlled by releases from upstream reservoirs, water levels are artificially moderated during much of the year. However, low flows generally occur in the river by late summer. These low flows can restrict fish presence and boat access. Boats cannot launch from the existing ramp during such periods of low water.

The project will not interfere with the federally authorized Willamette River navigation channel, which is adjacent to the project site. The channel is 8 ft. deep and 200 ft. wide from river mile 14.0 at the Ross Island Bridge in Portland to river mile 23.0 at the foot of Cedar Island. The Willamette River is a federally designated navigable waterway. The park in which the ramp is located supports other recreational uses such as picnicking and sightseeing as well as boating.

Site Restoration/Rehabilitation

- *For temporary disturbance of soils and/or vegetation in waterways, wetlands or riparian areas, please discuss how you will restore the site after construction including any monitoring, if necessary**

RESTORATION

The slopes along the fill area will be planted with native vegetation. Willow and dogwood stakes will be used along the lower slopes and riparian plants will be planted on the upper portions of the slope for the boat ramp. The willow and dogwood root systems will protect the side slope and reduce the amount of riprap required for slope protection and erosion control. See the landscape plan for planting details.

- The boat ramp access fill area slopes will be covered with coir mat and then planted with riparian vegetation and willow and dogwood cuttings. In addition, the banks will have large woody debris, obtained from tree removal at the fill site, placed along the bank in combination with the planting.
- The boat ramp access fill area between the existing parking and the slope will have an infiltration basin to collect stormwater from the new access paving and portions of the existing parking lot.
- Stockpiled topsoil will be placed over the fill material and the area will be planted with a combination of riparian trees, shrubs, and forbs.
- The infiltration area offers options for a future boat wash facility.
- The area will be monitored and maintained for seven years.

Mitigation

*Describe the reasonably expected adverse effects of the development of this project and how the effects will be mitigated.**

- *For permanent impact to wetlands, complete and attach a Compensatory Wetland Mitigation (CWM) Plan. (See OAR 141-085-0705 for plan requirements)**
- *For permanent impact to waters other than wetlands, complete and attach a Compensatory Mitigation (CM) plan (See OAR 141-085-0765 for plan requirements)**
- *For permanent impact to estuarine wetlands, you must submit a CWM plan.**

Mitigation Location Information (Fill out only when mitigation is proposed or required)

Proposed mitigation (Check all that apply):	☐ *Onsite Mitigation*	*Type of mitigation:*
	☐ *Offsite Mitigation*	☐ *Wetland Mitigation*
	☐ *Mitigation Bank*	☐ *Mitigation for impacts to other waters*
	☐ *Payment to Provide*	☐ *Mitigation for impacts to navigation, fishing, or recreation*

Street, Road or Other Descriptive Location	*Legal Description (attach tax lot map*)*

- ***Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.***

ALDER JOHN ALAN & CATHERINE D
19120 NIXON AVE
WEST LINN, OR 97068

BECKETT DONNA LOUISE TRUSTEE
18670 NIXON AVE
WEST LINN, OR 97068

BERNERT MICHAEL J & KATHI R
18920 NIXON AVE
WEST LINN, OR 97068

BOUCHARD JOHN S & JOAN C
18950 NIXON AVE
WEST LINN, OR 97068

BRYCK CAROL D
18840 NIXON AVE
WEST LINN, OR 97068

CENA ROBERT E 1/2
19150 NIXON AVE
WEST LINN, OR 97068

CHARGOIS JAN V & PAT PARRIS
18880 NIXON AVE
WEST LINN, OR 97068

CRAINE DIANA L
18560 NIXON AVE
WEST LINN, OR 97068

HILL MARY M TRUSTEE
19050 NIXON AVE
WEST LINN, OR 97068

JAMESON PETER W AND PAMELA
18480 NIXON AVE
WEST LINN, OR97068

KELYMAN MICHAEL & JACQUELINE
648 BRIDGEWAY LN
NAPLES, FL 34108

KINGSBOROUGH DOUGLAS & SHARON
19090 NIXON AVE
WEST LINN, OR 97068

KURTIN TOBIN T & ANDREA K
19010 NIXON AVE
WEST LINN, OR 97068

LESSER KATY V E & KEVAN J
18690 NIXON AVE
WEST LINN, OR 97068

OBRIEN ELIZABETH TRUSTEE
18740 NIXON AVE
WEST LINN, OR 97068

ORR ELDA JANE CO-TRUSTEE
4626 PHELPS CREEK RD
HOOD RIVER, OR 97031

RALSTON MARTIN ROBERT
18490 NIXON AVE
WEST LINN, OR97068

RASMUSSEN ALDEAN D TRUSTEE
18730 NIXON AVE
WEST LINN, OR 97068

SORBER DONALD E & L K SCHIRO-SORBER
18780 NIXON AVE
WEST LINN, OR 97068

TEETER MICHAEL S & JANET O
4580 ELMRAN DR
WEST LINN, OR 97068

	Quarter/Quarter	*Section*	*Township*	*Range*

In or near (City or Town)	*County*	*Tax Map #*	*Tax Lot #*[3]
Wetland/Waterway (pick one)	*River Mile (if known)*	*Latitude (in DD.DDDD format)*	*Longitude (in DD.DDDD format)*

Name of waterway/watershed/HUC	*Name of mitigation bank (if applicable)*

(6) ADDITIONAL INFORMATION

Adjoining Property Owners and Their Address and Phone Numbers *(if more than 5, attach printed labels*)*

See attachment-

Has the proposed activity or any related activity received the attention of the Corps of Engineers or the Department of State Lands in the past, e.g., wetland delineation, violation, permit, lease request, etc.?

Yes ☒ No ☐

If yes, what identification number(s) were assigned by the respective agencies:

Corps #	200500384	State of Oregon #	

Has a wetland delineation been completed for this site? *Yes* ☐ *No* ☐

*If yes by whom?**	

Has the wetland delineation been approved by DSL or the COE? *Yes* ☐ *No* ☐

*If yes, attach a concurrence letter. **

[3] Attach a copy of all tax maps with the project area highlighted.

- ***Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.***

(7) CITY/COUNTY PLANNING DEPARTMENT AFFIDAVIT
*(TO BE COMPLETED BY LOCAL PLANNING OFFICIAL) **

I have reviewed the project outlined in this application and have determined that:

- ☐ This project is not regulated by the comprehensive plan and land use regulations.
- ☐ This project is consistent with the comprehensive plan and land use regulations.
- ☒ This project will be consistent with the comprehensive plan and land use regulations when the following local approval(s) are obtained.
  - ☐ Conditional Use Approval
  - ☒ Development Permit
  - ☐ Other

This project is not consistent with the comprehensive plan. Consistency requires a

- ☐ Plan Amendment
- ☐ Zone Change
- ☐ Other

An application has ☐ has not ☒ been filed for local approvals checked above.

Local planning official name (print)	Signature	Title	City / County	Date
JOHN SONNEN	John Sonnen	Planning Director	West Linn	5/19/2011
Comments:				

- ***Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.***

(8) *COASTAL ZONE CERTIFICATION* *

If the proposed activity described in your permit application is within the Oregon coastal zone, the following certification is required before your application can be processed. A public notice will be issued with the certification statement, which will be forwarded to the Oregon Department of Land Conservation and Development for its concurrence or objection. For additional information on the Oregon Coastal Zone Management Program, contact the department at 635 Capitol Street NE, Suite 150, Salem, Oregon 97301 or call 503-373-0050.

CERTIFICATION STATEMENT

I certify that, to the best of my knowledge and belief, the proposed activity described in this application complies with the approved Oregon Coastal Zone Management Program and will be completed in a manner consistent with the program.

Print /Type Name	Title
Applicant Signature	Date

(9) SIGNATURES FOR JOINT APPLICATION

Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and, to the best of my knowledge and belief, this information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities. By signing this application I consent to allow Corps or Dept. of State Lands staff to enter into the above-described property to inspect the project location and to determine compliance with an authorization, if granted. I herby authorize the person identified in the authorized agent block below to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

I understand that the granting of other permits by local, county, state or federal agencies does not release me from the requirement of obtaining the permits requested before commencing the project. *I understand that payment of the required state processing fee does not guarantee permit issuance. The fee for the state application must accompany the application for completeness.*

Amount enclosed	*$*

Print /Type Name	Title	Print /Type Name	Title
KEN WORLESTEL	PARKS & RECREATION DIR		
Applicant Signature	Date	**Authorized Agent Signature**	Date
Ken Worlestel	05/19/11		

Landowner signatures: *For projects and /or mitigation work proposed on land not owned by the applicant, including state-owned submerged and submersible lands, please provide signatures below. A signature by the Department of State Lands for activities proposed on state-owned submerged/submersible lands only grants the applicant consent to apply for authorization to conduct removal/fill activities on such lands. This signature for activities on state-owned submerged and submersible lands grants no other authority, express or implied.*

Print /Type Name	Title	Print /Type Name	Title

- ***Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.***

Property Owner Signature	Date	***Mitigation Property Owner Signature***	Date

- ***Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.***

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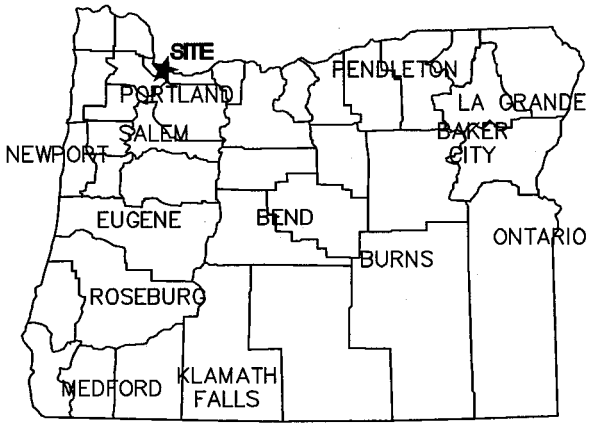

Flowing solutions SM Flowing Solutions 3305 SW 87th Avenue Portland, OR 97225 Phone (503) 297-6331 Fax (503) 297-6053	SHEET TITLE: LOCATOR	DATE: 4/27/11
	PROJECT: CEDAR OAK PUBLIC LAUNCH RAMP NIXON AVE & ELMRAN DR WEST LINN, OR 97068	SCALE: NTS
	RIVER/MILE: WILLAMETTE, RM 23.2 — DATUM: NGVD	SHEET: 1/10

FIGURE 1

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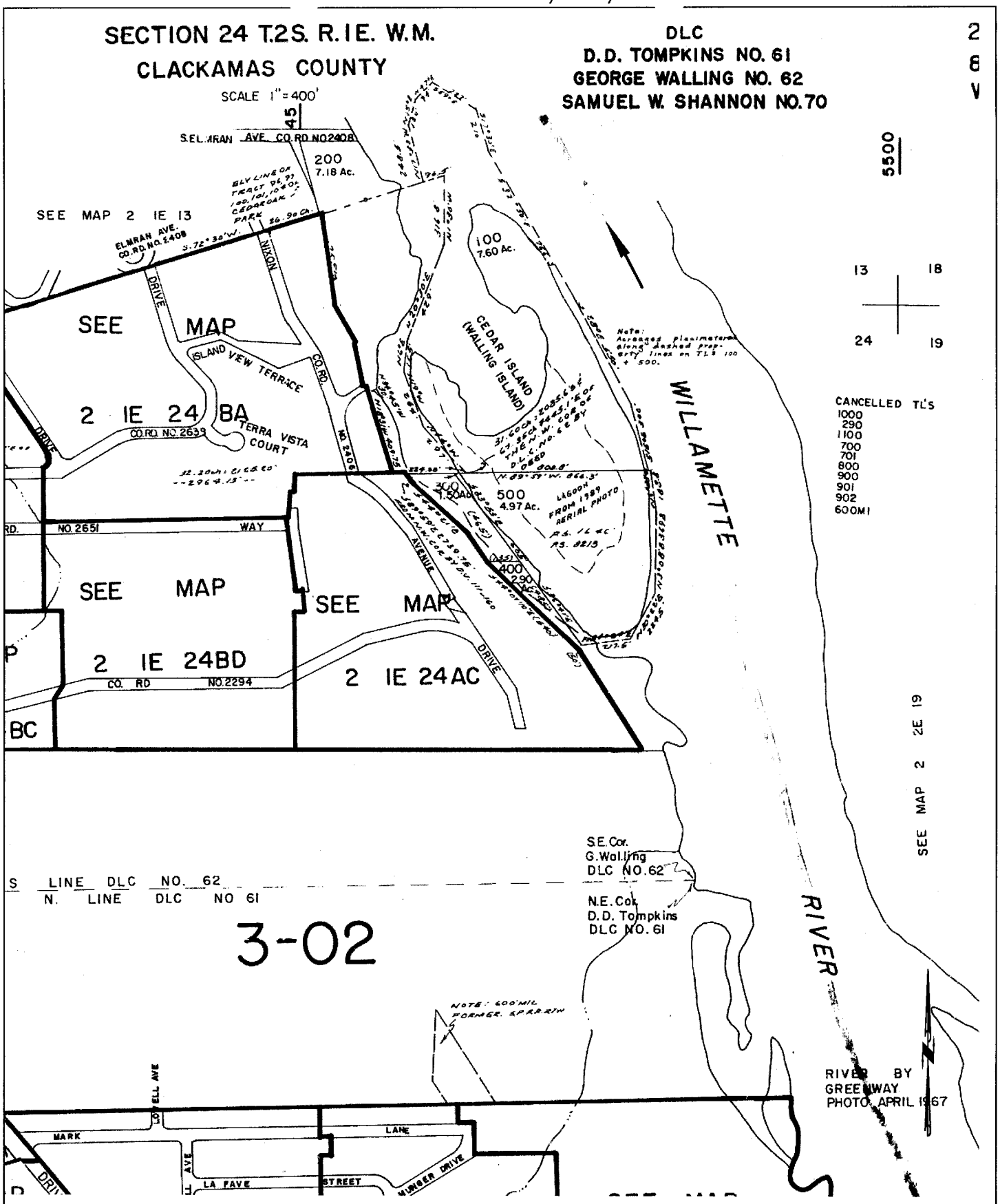
REVISED 4/27/2011



Flowing solutions SM Flowing Solutions 3305 SW 87th Avenue Portland, OR 97225 Phone (503) 297-6331 Fax (503) 297-6053	SHEET TITLE: TAX MAP		DATE: 4/27/11
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	RIVER/MILE: WILLAMETTE, RM 23.2	DATUM: NGVD	SHEET: 2/10

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FIGURE 2

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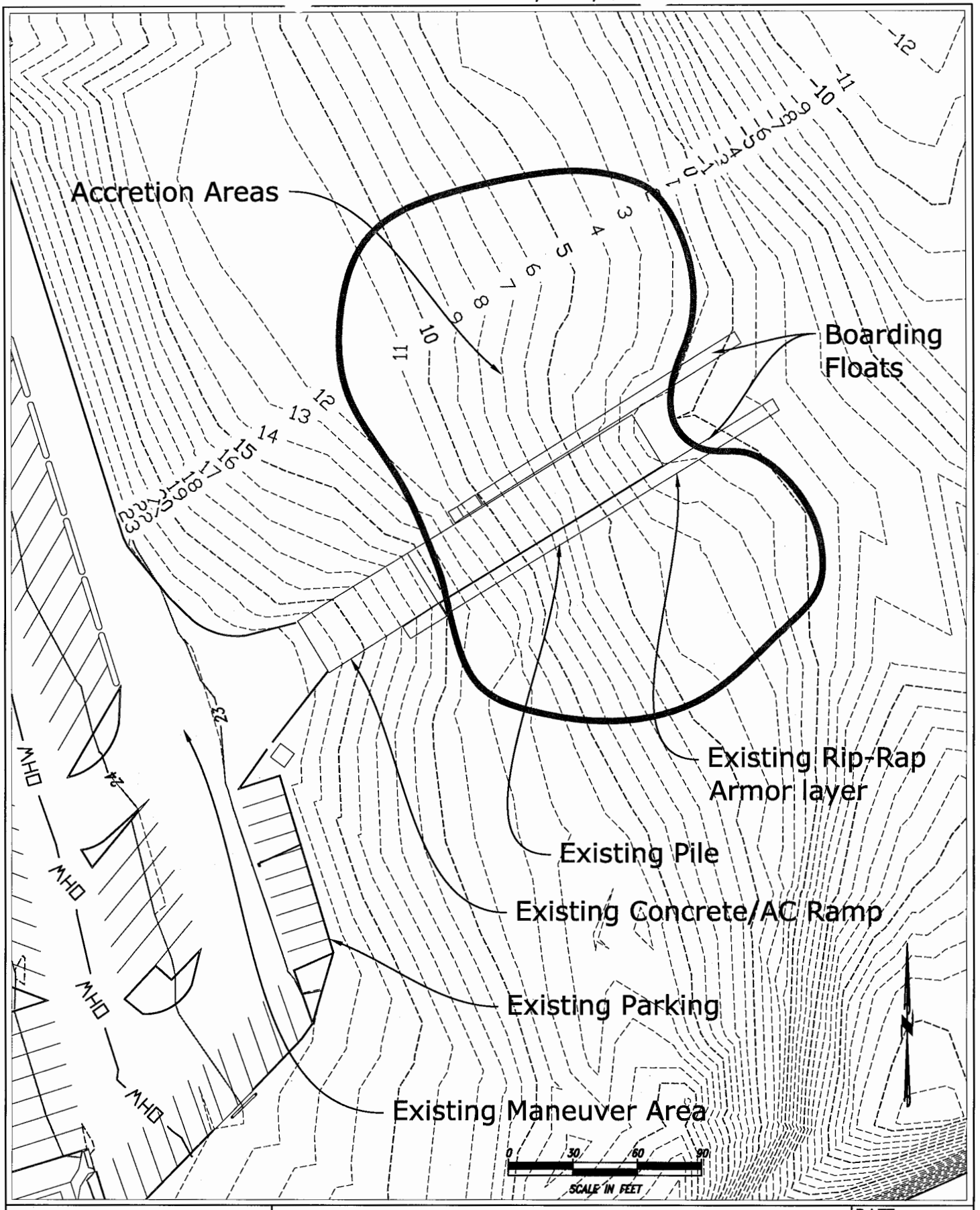

Flowing solutions Flowing Solutions 3305 SW 87th Avenue Portland, OR 97225 Phone (503) 297-6331 Fax (503) 297-6053	SHEET TITLE: EXISTING SITE PLAN	DATE: 4/27/11
	PROJECT: CEDAR OAK PUBLIC LAUNCH RAMP NIXON AVE & ELMRAN DR WEST LINN, OR 97068	SCALE: 1"=60'
	RIVER/MILE: WILLAMETTE, RM 23.2 DATUM: NGVD	SHEET: 3 /10

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FIGURE 3

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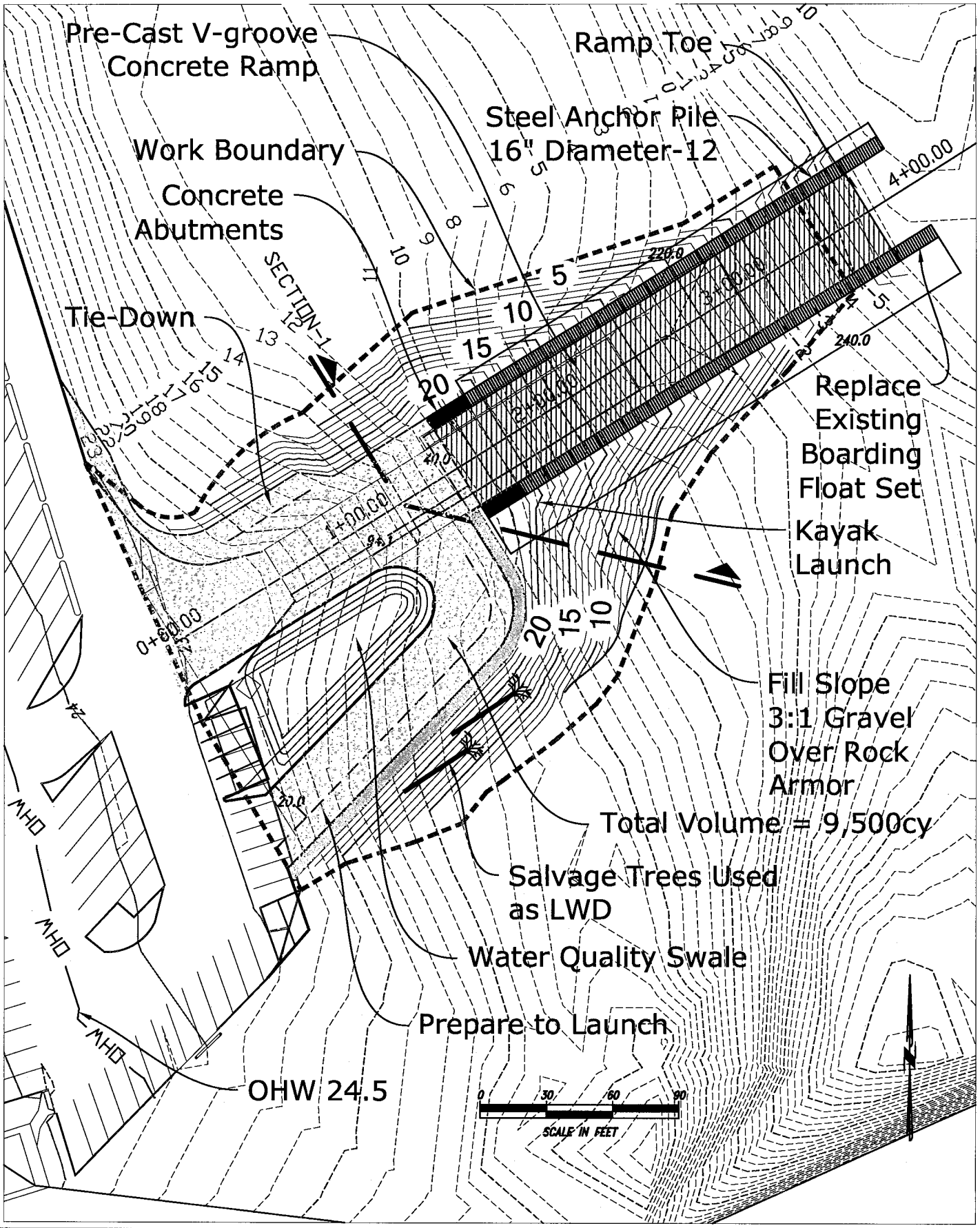

Flowing solutions SM Flowing Solutions 3305 SW 87th Avenue Portland, OR 97225 Phone (503) 297-6331 Fax (503) 297-6053	SHEET TITLE: PROPOSED PLAN		DATE: 4/27/11
	PROJECT: CEDAR OAK PUBLIC LAUNCH RAMP NIXON AVE & ELMRAN DR WEST LINN, OR 97068		SCALE: 1"=60'
	RIVER/MILE: WILLAMETTE, RM 23.2	DATUM: NGVD	SHEET: 4/10

FIGURE 4

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Portland, OR 97225
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Fax (503) 297-6053

SHEET TITLE: PROFILE

PROJECT: CEDAR OAK PUBLIC LAUNCH RAMP
NIXON AVE & ELMRAN DR
WEST LINN, OR 97068

RIVER/MILE: WILLAMETTE, RM 23.2

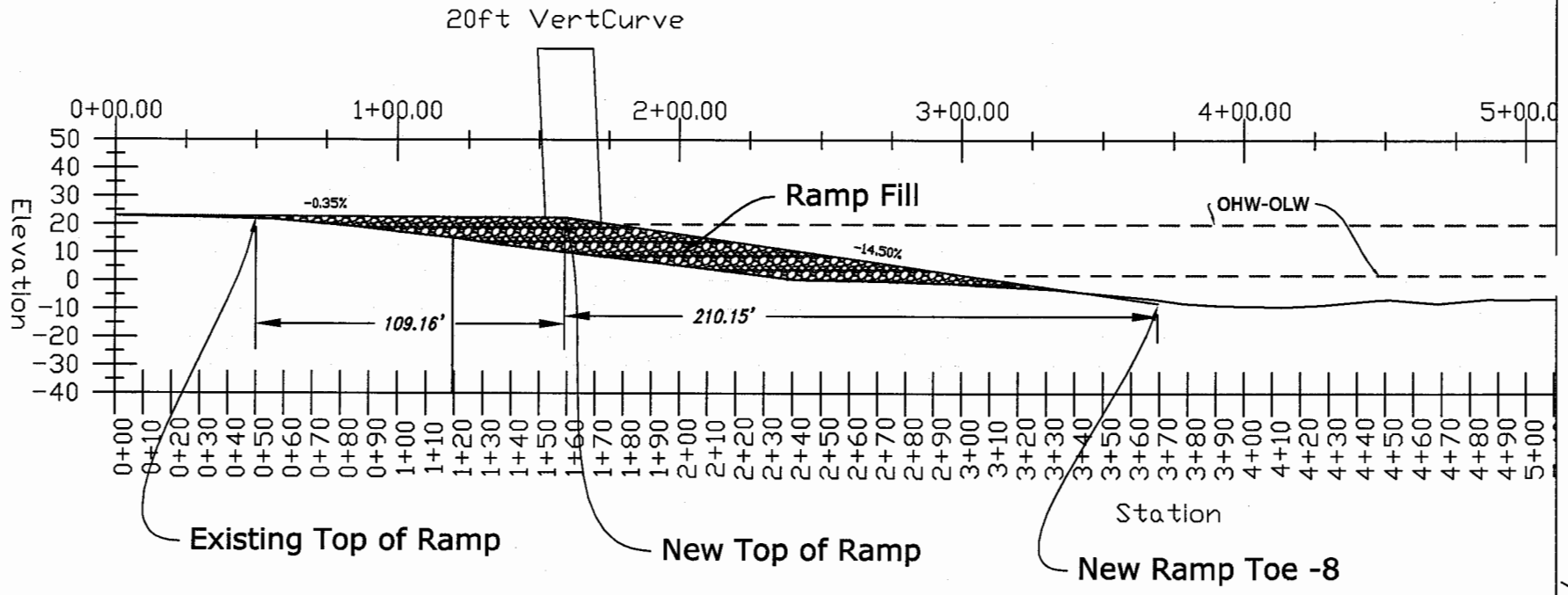
DATUM: NGVD

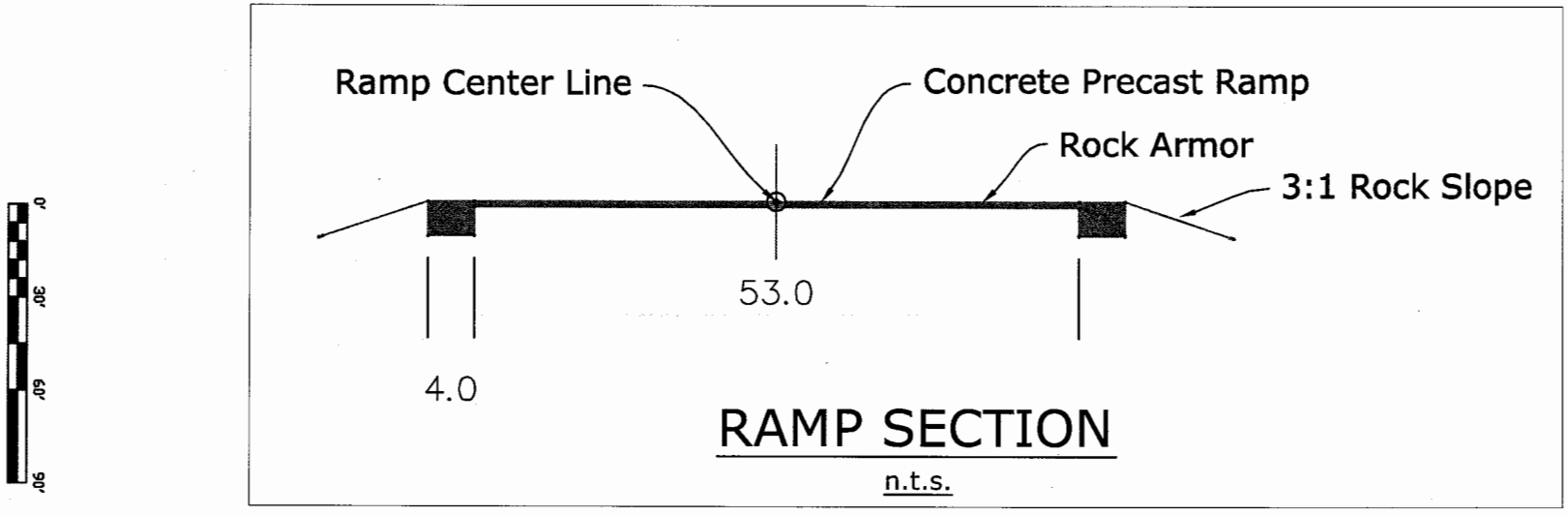
DATE: 4/27/11

SCALE: 1"=60'

SHEET: 5 /10

RAMP PROFILE





RAMP SECTION

n.t.s.

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FIGURE 5

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Flowing Solutions
3305 SW 87th Avenue
Portland, OR 97225
Phone (503) 297-6331
Fax (503) 297-6053

SHEET TITLE: FILL SECTION AND BANK TREATMENT

PROJECT: CEDAR OAK PUBLIC LAUNCH RAMP
NIXON AVE & ELMRAN DR
WEST LINN, OR 97068

RIVER/MILE: WILLAMETTE, RM 23.2

DATUM: NGVD

DATE: 4/27/11

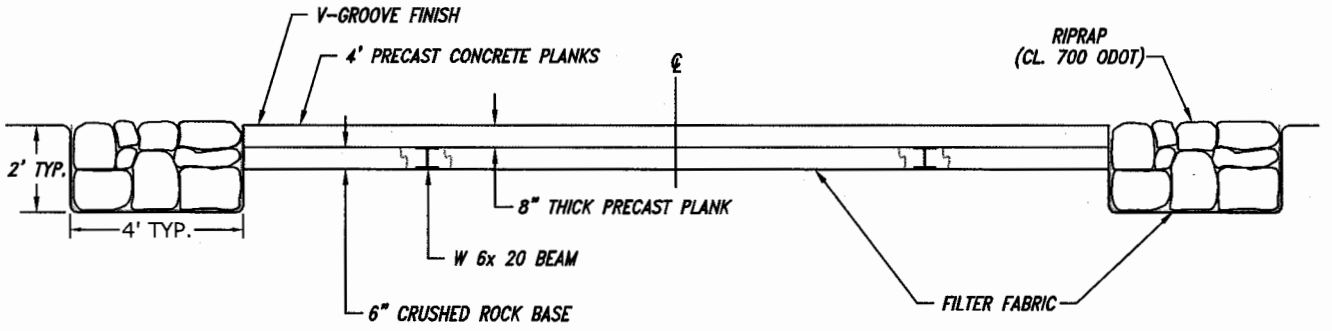
SCALE: VAR

SHEET: 6/10

REVISED 4/27/2011

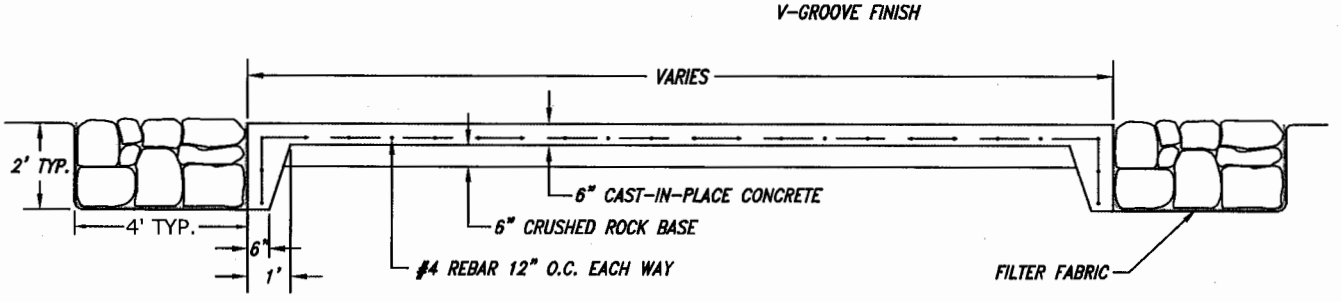
FIGURE 6

REVISED 4/27/2011



PRECAST RAMP SECTION

NTS



CAST-IN-PLACE RAMP SECTION

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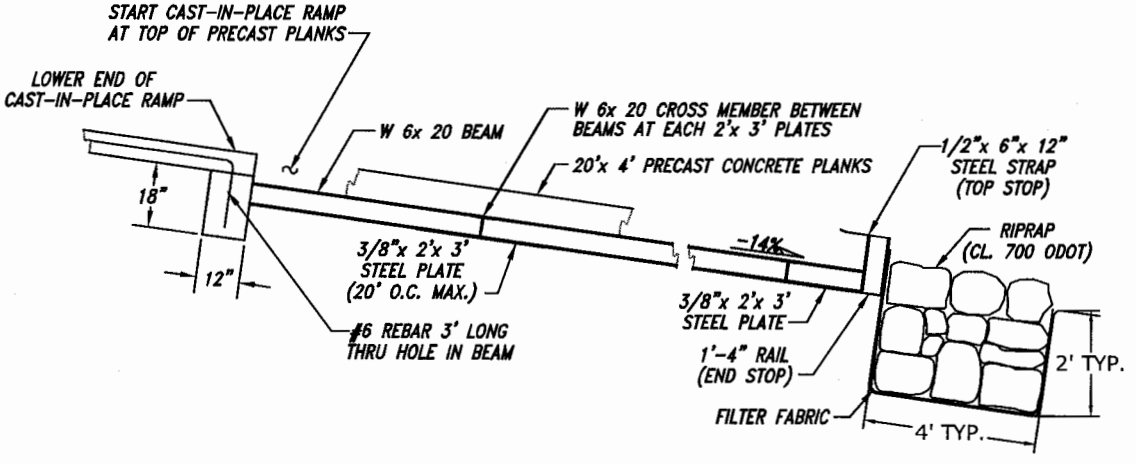

PRECAST PLANK/RAIL PROFILE

NTS

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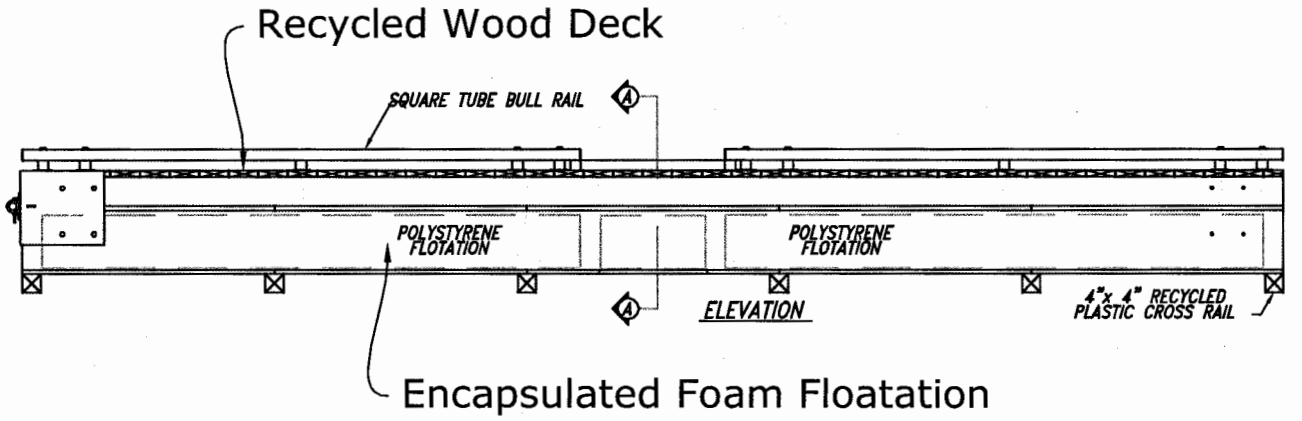
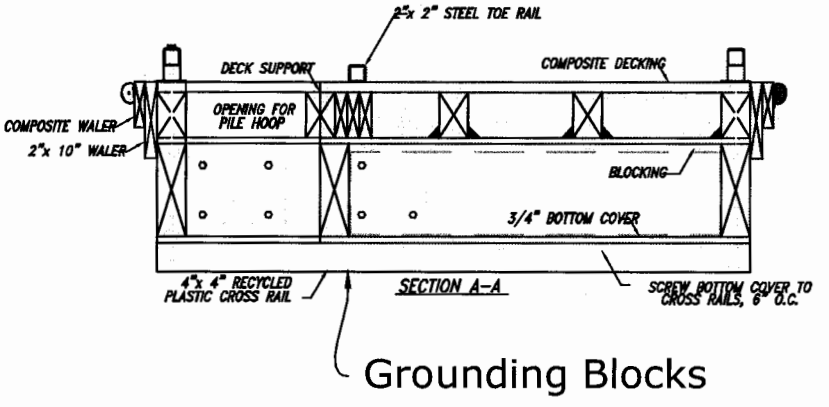
Flowing Solutions
3305 SW 87th Avenue
Portland, OR 97225
Phone (503) 297-6331
Fax (503) 297-6053

SHEET TITLE: RAMP DETAILS		DATE: 4/27/11
PROJECT: CEDAR OAK PUBLIC LAUNCH RAMP NIXON AVE & ELMRAN DR WEST LINN, OR 97068		SCALE: NTS
RIVER/MILE: WILLAMETTE, RM 23.2	DATUM: NGVD	SHEET: 7/10

z:\cedaroakramp\fs-cedaroak-re-design.dwg

FIGURE 7



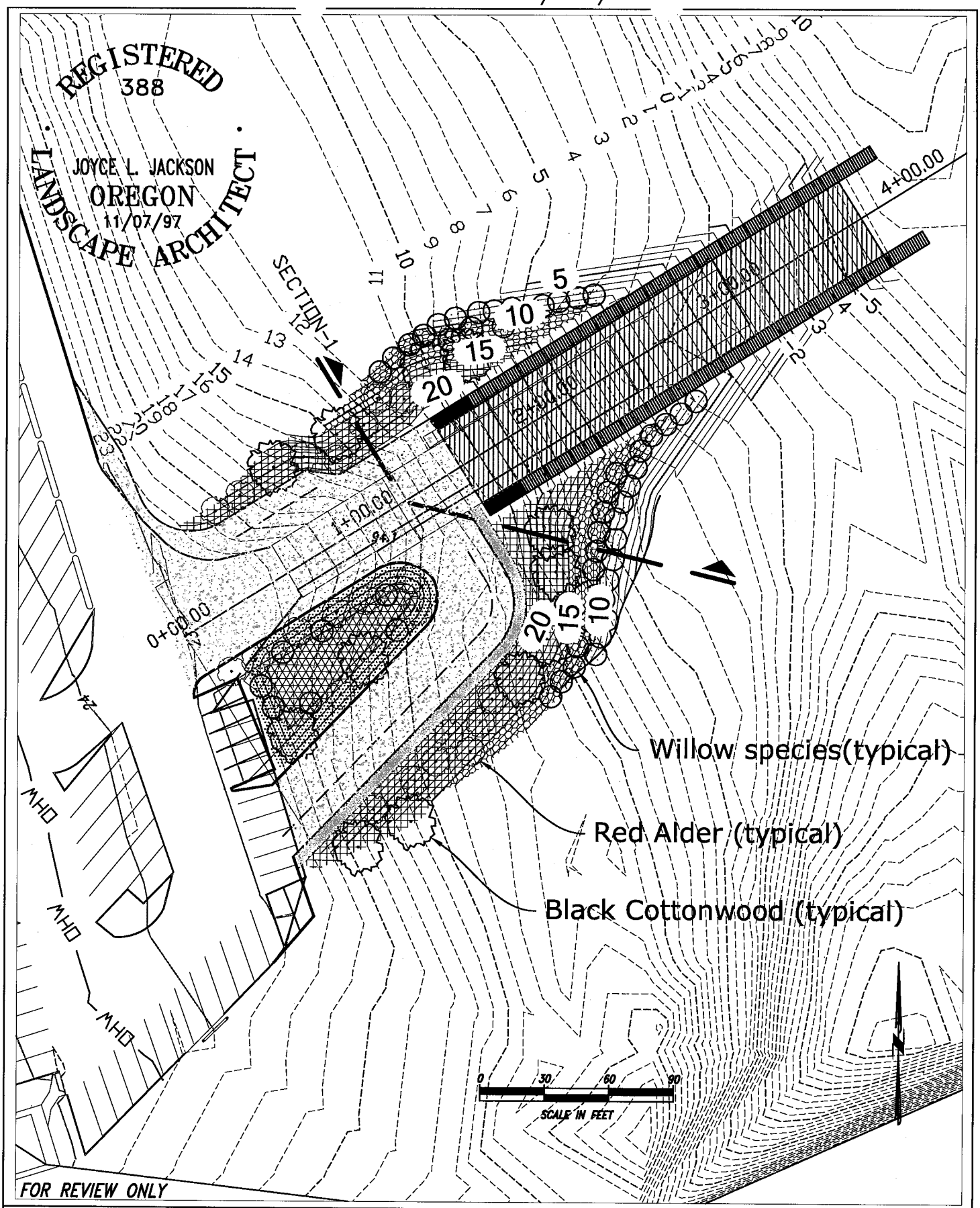


Flowing solutions Flowing Solutions 3305 SW 87th Avenue Portland, OR 97225 Phone (503) 297-6331 Fax (503) 297-6053	SHEET TITLE: DOCK DETAILS	DATE: 4/27/11
	PROJECT: CEDAR OAK PUBLIC LAUNCH RAMP NIXON AVE & ELMRAN DR WEST LINN, OR 97068	SCALE: NTS
	RIVER/MILE: WILLAMETTE, RM 23.2 — DATUM: NGVD	SHEET: 8/10

FIGURE 8

z:\cedaroakramp\fs-cedaroak-re-design.dwg

REVISED 4/27/2011



MAUL FOSTER ALONGI MAUL FOSTER ALONGI INC 2001 NW 19TH AVENUE SUITE 200 PORTLAND, OR 97209 TEL. 971 544-2139 FAX. 971 544-2140	SHEET TITLE: LANDSCAPE PLAN		DATE: 4/27/11
	PROJECT: CEDAR OAK PUBLIC LAUNCH RAMP NIXON AVE & ELMRAN DR WEST LINN, OR 97068		SCALE: 1"=60'
	RIVER/MILE: WILLAMETTE, RM 23.2	DATUM: NGVD	SHEET: 9/10

FIGURE 9

g:\0161.02 cedar oak\4-27-11\andy's\fs-cedaroak-re-design.dwg

Appendix B
Effective Hydraulic Model

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     ****************************
     SEPT 1971 VERSION UPDATED OCT 1973
*    F     CORRECTIONS 01,02,03,04,05,06
     P     ICATIONS 52,53,54,55,56
     *     ************************

T1  10 YEAR FLOOD
T2  BLW CLKMS R TO WILL FALLS
T3  WILLAMETTE R WEST LINN OR

J1  ICHECK    INQ     NINV    IDIR    STRT    METRIC  HVINS   Q       WSEL    FQ
          -1.     2.      0.      0.  0.0     0.0     -1.0    0.      30.810  0.0

J2  NPROF     IPLOT   PREVS   XSECV   XSECH   FN      ALLOC   IBW     CHNIM   ITRACE
        1.000   0.0     -1.000  0.0     0.0     0.0     0.0     0.0     0.0     0.0

J3      1.000   26.000  14.000  17.000  4.000   27.000  28.000  21.000  22.000  0.0
J3  VAR(I),I=1,10

            1.      26.     14.     17.     4.      27.     28.     21.     22.     0.0
NC      0.070   0.070   0.032   0.100   0.300   0.0     0.0     0.0     0.0     0.0
CT      5.000 251000.000 329000.000 375000.000 495000.000 435000.000 0.0     0.0     0.0     0.0

X1      22.350  27.000  410.000 800.000 0.0     0.0     0.0     0.0     0.0     0.0
GR      50.000  0.0     40.000  135.000 30.000  190.000 20.000  320.000 10.000  380.000
GR      3.000   410.000 -15.000 430.000 -20.000 450.000 -53.000 470.000 -59.000 500.000
GR      67.000  520.000 -75.000 550.000 -101.000 600.000 -103.000 630.000 -101.000 650.000
GR      94.000  680.000 -67.000 710.000 -55.000 740.000 -42.000 755.000 -31.000 770.000
GR      12.000  785.000 -7.000  800.000 10.000  820.000 20.000  850.000 30.000  900.000
GR      40.000  930.000 50.000  1190.000 0.0     0.0     0.0     0.0     0.0     0.0

X1      23.100  20.000  800.000 1880.000 3700.000 4200.000 4000.000 0.0     0.0     0.0
GR      50.000  0.0     43.500  215.000 40.000  475.000 20.000  530.000 10.000  800.000
GR      2.000   900.000 -8.000  950.000 -11.000 1000.000 -9.000  1050.000 -10.000 1300.000
GR      17.000  1400.000 -26.000 1500.000 -19.000 1600.000 -14.000 1700.000 -10.000 1800.000
GR      10.000  1880.000 20.000  1945.000 30.000  2000.000 40.000  2045.000 50.000  2200.000

X1      23.790  25.000  300.000 950.000 3300.000 3500.000 3400.000 0.0     0.0     0.0
GR      50.000  0.0     40.000  35.000  30.000  80.000  20.000  140.000 10.000  260.000
GR      4.000   300.000 -9.000  350.000 -21.000 400.000 -23.000 500.000 -34.000 560.000
GR      40.000  600.000 -47.000 630.000 -52.000 700.000 -46.000 770.000 -40.000 800.000
GR      30.000  850.000 -18.000 880.000 -9.000  900.000 -6.000  950.000 4.000   1000.000
GR      10.000  1010.000 20.000  1035.000 40.000  1060.000 48.000  1115.000 48.000  1220.000
NC      0.070   0.060   0.032   0.100   0.300   0.0     0.0     0.0     0.0     0.0

X1      24.060  23.000  260.000 1360.000 1500.000 1300.000 1400.000 0.0     0.0     0.0
GR      50.000  0.0     20.000  30.000  10.000  70.000  10.000  260.000 4.000   300.000
GR      13.000  330.000 -25.000 390.000 -11.000 500.000 -3.000  600.000 -8.000  700.000
GR      0.0     800.000 0.0     900.000 8.000   970.000 10.000  1120.000 12.000  1150.000
GR      12.000  1200.000 14.000  1240.000 18.000  1270.000 18.000  1315.000 16.000  1360.000
GR      10.000  1580.000 40.000  1640.000 47.000  1790.000 0.0     0.0     0.0     0.0
NC      0.060   0.060   0.038   0.100   0.300   0.0     0.0     0.0     0.0     0.0

X1      24.500  25.000  400.000 1350.000 2500.000 1900.000 2200.000 0.0     0.0     0.0
GR      50.000  0.0     40.000  40.000  30.000  75.000  20.000  270.000 12.000  310.000
GR      8.000   350.000 -8.000  400.000 -6.000  500.000 0.0     560.000 2.000   600.000
GR      7.000   700.000 -7.000  800.000 -5.000  900.000 -3.000  1000.000 -2.000  1100.000
GR      3.000   1200.000 -2.000  1300.000 3.000   1350.000 10.000  1400.000 20.000  1430.000
GR      30.000  1480.000 40.000  1570.000 40.000  1750.000 38.000  1900.000 36.000  2030.000
NC      0.060   0.060   0.040   0.100   0.300   0.0     0.0     0.0     0.0     0.0

X1      24.900  23.000  550.000 1250.000 1900.000 2100.000 2000.000 0.0     0.0     0.0
```

NC	0.060	0.060	0.040	0.100	0.300	0.0	0.0	0.0	0.0	0.0
X1	24.900	23.000	550.000	1250.000	1900.000	2100.000	2000.000	0.0	0.0	0.0
C	50.000	0.0	10.000	110.000	5.000	1 10	0.0	200.000	0.0	270.000
C	5.000	300.000	10.000	310.000	20.000	3 10	30.000	550.000	20.000	650.000
GR	10.000	730.000	5.000	750.000	-4.000	800.000	-6.000	900.000	-6.000	1000.000
GR	7.000	1100.000	-9.000	1200.000	5.000	1250.000	10.000	1300.000	20.000	1365.000
GP	30.000	1420.000	30.000	1600.000	40.000	1820.000	0.0	0.0	0.0	0.0
NC	0.060	0.060	0.036	0.100	0.300	0.0	0.0	0.0	0.0	0.0
CT	5.000	219000.000	295000.000	341000.000	469000.000	403000.000	0.0	0.0	0.0	0.0
X1	25.320	17.000	210.000	985.000	1650.000	2250.000	2000.000	0.0	0.0	0.0
GR	50.000	0.0	30.000	15.000	20.000	75.000	10.000	210.000	-7.000	240.000
GR	14.000	300.000	-16.000	400.000	-8.000	500.000	-2.000	600.000	0.0	700.000
GR	5.000	780.000	10.000	800.000	20.000	840.000	30.000	985.000	38.000	1010.000
GR	38.000	1200.000	50.000	1400.000	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.060	0.060	0.030	0.100	0.300	0.0	0.0	0.0	0.0	0.0
X1	25.730	15.000	600.000	1365.000	1600.000	2450.000	2000.000	0.0	0.0	0.0
GR	60.000	0.0	42.000	80.000	30.000	270.000	20.000	360.000	10.000	380.000
GR	0.0	400.000	-5.000	500.000	-6.000	600.000	-7.000	800.000	-11.000	900.000
GP	11.000	1100.000	-8.000	1300.000	10.000	1365.000	50.000	1430.000	49.000	1600.000
NC	0.070	0.050	0.020	0.300	0.600	0.0	0.0	0.0	0.0	0.0
X1	25.980	12.000	100.000	500.000	1100.000	1200.000	1150.000	0.0	0.0	0.0
GR	50.000	0.0	10.000	50.000	-20.000	80.000	-28.000	100.000	-27.000	150.000
GR	23.000	250.000	-22.000	400.000	-11.000	450.000	-5.000	500.000	10.000	550.000
GR	30.000	620.000	50.000	650.000	0.0	0.0	0.0	0.0	0.0	0.0
X1	26.080	23.000	130.000	480.000	650.000	750.000	700.000	0.0	0.0	0.0
GR	42.000	0.0	40.000	60.000	30.000	70.000	20.000	90.000	10.000	100.000
GR	4.100	110.000	-1.600	130.000	-16.100	160.000	-33.600	180.000	-48.700	200.000
GR	57.100	230.000	-66.800	260.000	-67.300	280.000	-65.100	310.000	-61.600	340.000
GR	58.100	370.000	-55.600	400.000	-12.600	420.000	-4.000	450.000	4.400	460.000
GR	25.600	470.000	50.000	480.000	50.000	530.000	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.028	0.300	0.600	0.0	0.0	0.0	0.0	0.0
X1	26.420	22.000	0.0	460.000	2200.000	2200.000	2200.000	0.0	0.0	0.0
GR	5.900	0.0	5.700	20.000	5.600	40.000	-2.200	55.000	-13.800	75.000
GR	36.300	95.000	-26.300	115.000	-42.200	140.000	-50.200	160.000	-31.600	235.000
GR	27.600	255.000	-26.100	275.000	-23.600	300.000	-21.300	315.000	-19.100	345.000
GR	17.100	355.000	-9.100	380.000	0.700	400.000	1.400	420.000	1.000	440.000
GR	30.000	460.000	40.000	700.000	0.0	0.0	0.0	0.0	0.0	0.0
EJ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

NUMBER LENGTH ROADWAY LOG CHORD GROUND ELEV

SEPT 1977 VERSION UPDATED OCT 1978
ERROR CORRECTIONS 01,02,03,04,05,06
MODIFICATIONS 52,53,54,55,56
***** **********

T1 50 YEAR FLOOD
T2 BLW CLKMS R TO WILL FALLS
T3 WILLAMETTE R WEST LINN OR

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	-1.	3.	C.	C.	C.0	0.0	-1.0	0.	27.510	C.C

J2	NPROF	IPLOT	PREVS	XSECV	XSECH	FN	ALLOC	IBW	CHNIM	ITRACE
	2.000	C.0	-1.CCC	0.0	0.0	0.0	0.0	0.0	0.0	C.C

CCEV= 0.100 CEHV= 0.300

NUMBER LENGTH ROADWAY LOW CHORD GROUND (GLS)

```
ERRCR CORRECTIONS 01,02,03,C4,05,06
MCDIFICATICNS 52,53,54,55,56
****      ******************

T1  100 YEAR FLOOD
T2  BLW CLKMS R TO WILL FALLS
T3  WILLAMETTE R WEST LINN OR

J1   ICHECK     INQ       NINV      IDIR      STRT      METRIC     HVINS      Q        WSEL       FQ
        -1.        4.        0.        C.   0.0          0.0       -1.0        0.     40.520      C.0

J2   NPROF     IPLOT     PREVS     XSECV     XSECH      FN        ALLDC      IBW       CHNIM      ITRACE
      3.000      0.0     -1.CCC      C.0       0.0       0.0        0.0       0.0        0.0        C.C

CCHV=   0.100 CEHV=   0.300
```

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****    ********************
SEPT    1 VERSION UPCATED OCT 1973
ERRC.  ..RRECTIONS 01,02,03,C4,C5,06
MCDIFICATICNS 52,53,54,55,56
****************************

T1  500 YEAR FLOOD
T2  BLW CLKMS R TO WILL FALLS
T3  WILLAMETTE R WEST LINN OR
J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    C        WSEL     FQ
      -1.       5.       C.       C.  0.0           0.0     -1.0       0.     47.36C     C.C
J2  NPROF     IPLOT    PREVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE
      4.000     0.0     -1.CCC     C.0      0.0      0.0      0.0      0.0      C.C      C.C
```

SUM PRINTOUT FOR MULTIPLE PROFILES

AMETTE R WEST LINN OR

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	VCH	CCF	K*XNCH	TOPWID	STENCL	STENCR
10	22.35	0.0	410.00	800.00	-103.00251000.00	30.81	10YR 8.59242707.69		32.00	682.00	0.0	0.0
50	22.35	0.0	410.00	800.00	-103.00329000.00	37.51	50YR 10.13310696.75		32.00	743.71	0.0	0.0
100	22.35	0.0	410.00	800.00	-103.00375000.00	40.52	100 11.02349907.94		32.00	787.55	0.0	0.0
500	22.35	0.0	410.00	800.00	-103.00495000.00	47.36	500 13.06447274.00		32.00	1062.59	0.0	0.0
1964	22.35	0.0	410.00	800.00	-103.00435000.00	44.62	11.99398522.50		32.00	952.41	0.0	0.0
							(1964 FLOOD					
	23.10	4000.00	800.00	1880.00	-26.00251000.00	32.19	5.65241949.50		32.00	1513.34	0.0	0.0
	23.10	4000.00	800.00	1880.00	-26.00329000.00	39.28	6.18312411.44		32.00	1564.81	0.0	0.0
	23.10	4000.00	800.00	1880.00	-26.00375000.00	42.56	6.54353702.81		32.00	1799.49	0.0	0.0
	23.10	4000.00	800.00	1880.00	-26.00495000.00	50.04	7.37458067.25		32.00	2200.00	0.0	0.0
	23.10	4000.00	800.00	1880.00	-26.00435000.00	46.94	6.91405982.56		32.00	2051.28	0.0	0.0
	23.79	3400.00	300.00	950.00	-52.00251000.00	32.46	6.87239039.56		32.00	974.97	0.0	0.0
	23.79	3400.00	300.00	950.00	-52.00329000.00	39.50	7.84308311.19		32.00	1021.67	0.0	0.0
	23.79	3400.00	300.00	950.00	-52.00375000.00	42.74	8.42348918.69		32.00	1053.45	0.0	0.0
	23.79	3400.00	300.00	950.00	-52.00495000.00	50.14	9.79453136.56		32.00	1220.00	0.0	0.0
	23.79	3400.00	300.00	950.00	-52.00435000.00	47.07	9.06400967.88		32.00	1058.40	0.0	0.0
	24.06	1400.00	260.00	1360.00	-25.00251000.00	32.79	6.59226560.31		32.00	1608.38	0.0	0.0
	24.06	1400.00	260.00	1360.00	-25.00329000.00	39.99	6.90292014.19		32.00	1629.96	0.0	0.0
	24.06	1400.00	260.00	1360.00	-25.00375000.00	43.32	7.19330612.81		32.00	1704.56	0.0	0.0
	24.06	1400.00	260.00	1360.00	-25.00495000.00	50.97	7.91429986.38		32.00	1790.00	0.0	0.0
	24.06	1400.00	260.00	1360.00	-25.00435000.00	47.77	7.48380231.25		32.00	1787.77	0.0	0.0
	24.50	2200.00	400.00	1350.00	-8.00251000.00	33.27	6.92229321.25		38.00	1445.83	0.0	0.0
	24.50	2200.00	400.00	1350.00	-8.00329000.00	40.37	7.35292983.31		38.00	1991.46	0.0	0.0
	24.50	2200.00	400.00	1350.00	-8.00375000.00	43.70	7.63328474.94		38.00	2004.82	0.0	0.0
	24.50	2200.00	400.00	1350.00	-8.00495000.00	51.34	8.28416492.75		38.00	2030.00	0.0	0.0
	24.50	2200.00	400.00	1350.00	-8.00435000.00	48.13	7.88372207.38		38.00	2022.51	0.0	0.0
	24.90	2000.00	550.00	1250.00	-9.00251000.00	33.84	8.84186226.81		40.00	1640.10	0.0	0.0
	24.90	2000.00	550.00	1250.00	-9.00329000.00	40.87	8.96232861.94		40.00	1794.90	0.0	0.0
	24.90	2000.00	550.00	1250.00	-9.00375000.00	44.19	9.17259535.25		40.00	1804.01	0.0	0.0
	24.90	2000.00	550.00	1250.00	-9.00495000.00	51.80	9.73327338.69		40.00	1820.00	0.0	0.0
	24.90	2000.00	550.00	1250.00	-9.00435000.00	48.58	9.34292974.81		40.00	1816.09	0.0	0.0
	25.32	2000.00	210.00	985.00	-16.00219000.00	34.81	8.61207176.81		36.00	988.65	0.0	0.0
	25.32	2000.00	210.00	985.00	-16.00295000.00	41.54	9.38274373.44		36.00	1252.64	0.0	0.0
	25.32	2000.00	210.00	985.00	-16.00341000.00	44.75	9.88313713.75		36.00	1308.57	0.0	0.0
	25.32	2000.00	210.00	985.00	-16.00469000.00	52.14	11.20419641.31		36.00	1400.00	0.0	0.0
	25.32	2000.00	210.00	985.00	-16.00403000.00	49.01	10.41365038.69		36.00	1382.73	0.0	0.0
	25.73	2000.00	600.00	1365.00	-11.00219000.00	35.84	6.42187884.06		30.00	1229.39	0.0	0.0
	25.73	2000.00	600.00	1365.00	-11.00295000.00	42.59	7.28250703.50		30.00	1340.60	0.0	0.0
	25.73	2000.00	600.00	1365.00	-11.00341000.00	45.85	7.81288106.50		30.00	1360.24	0.0	0.0
	25.73	2000.00	600.00	1365.00	-11.00469000.00	53.36	9.15390164.50		30.00	1630.47	0.0	0.0
	25.73	2000.00	600.00	1365.00	-11.00403000.00	50.12	8.41337805.00		30.00	1616.10	0.0	0.0

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	VCH	CCF	K*XNCH	TOPWID	STENCL	STENCR

SE NO	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND / DISCHARGE (CFS)	CWSEL	VCH / CCH	K*XNCH	TOPWID	STENCL	STENCR
25.98	1150.00	100.00	500.00	-28.00219000.00	35.55	.47194410.63	28.00	610.27	0.0	0.0
25.98	1150.00	100.00	500.00	-28.00295000.00	42.15	1?.24259339.38	28.00	628.41	0.0	0.0
25.98	1150.00	100.00	500.00	-28.00341000.00	45.29	14.32298457.00	28.00	637.06	0.0	0.0
25.98	1150.00	100.00	500.00	-28.00469000.00	52.48	17.14406492.63	28.00	650.00	0.0	0.0
25.98	1150.00	100.00	500.00	-28.00403000.00	49.43	15.59350755.31	28.00	648.43	0.0	0.0
26.08	700.00	130.00	480.00	-67.30219000.00	36.00	10.61213678.81	28.00	387.93	0.0	0.0
26.08	700.00	130.00	480.00	-67.30295000.00	42.45	12.85285892.69	28.00	461.23	0.0	0.0
26.08	700.00	130.00	480.00	-67.30341000.00	45.59	14.13329084.88	28.00	465.75	0.0	0.0
26.08	700.00	130.00	480.00	-67.30469000.00	52.76	17.40447697.00	28.00	524.97	0.0	0.0
26.08	700.00	130.00	480.00	-67.30403000.00	49.71	15.66386603.06	28.00	471.68	0.0	0.0
26.42	2200.00	0.0	460.00	-50.20219000.00	37.19	9.60218607.75	28.00	632.65	0.0	0.0
26.42	2200.00	0.0	460.00	-50.20295000.00	44.21	11.24292183.69	28.00	700.00	0.0	0.0
26.42	2200.00	0.0	460.00	-50.20341000.00	47.72	12.17335964.88	28.00	700.00	0.0	0.0
26.42	2200.00	0.0	460.00	-50.20469000.00	56.00	14.52456192.56	28.00	700.00	0.0	0.0
26.42	2200.00	0.0	460.00	-50.20403000.00	52.32	13.26394223.88	28.00	700.00	0.0	0.0

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSFLK	TOPWID	T.W. DIFF	LENGTH
22.350	251000.000	30.810	0.0	0.0	0.0	681.998	0.0	0.0
22.350	329000.000	37.510	6.700	0.0	0.0	743.707	-61.708	0.0
22.350	375000.000	40.520	3.010	0.0	0.0	787.549	-105.551	0.0
22.350	495000.000	47.360	6.840	0.0	0.0	1062.586	-380.588	0.0
22.350	435000.000	44.620	-2.740	0.0	0.0	952.411	-270.412	0.0
23.100	251000.000	32.185	0.0	1.375	0.0	1513.343	0.0	4000.000
23.100	329000.000	39.284	7.099	1.774	0.0	1564.811	-51.468	4000.000
23.100	375000.000	42.556	3.272	2.036	0.0	1799.486	-286.143	4000.000
23.100	495000.000	50.044	7.488	2.684	0.0	2200.000	-686.657	4000.000
23.100	435000.000	46.938	-3.105	2.319	0.0	2051.280	-537.937	4000.000
23.790	251000.000	32.460	0.0	0.275	0.0	974.968	0.0	3400.000
23.790	329000.000	39.497	7.038	0.213	0.0	1021.665	-46.697	3400.000
23.790	375000.000	42.742	3.245	0.186	0.0	1053.454	-78.486	3400.000
23.790	495000.000	50.145	7.403	0.101	0.0	1220.000	-245.032	3400.000
23.790	435000.000	47.074	-3.071	0.136	0.0	1098.395	-123.427	3400.000
24.060	251000.000	32.793	0.0	0.334	0.0	1608.380	0.0	1400.000
24.060	329000.000	39.987	7.194	0.490	0.0	1629.961	-21.581	1400.000
24.060	375000.000	43.324	3.337	0.582	0.0	1704.555	-96.175	1400.000
24.060	495000.000	50.966	7.642	0.821	0.0	1790.001	-181.621	1400.000
24.060	435000.000	47.766	-3.200	0.692	0.0	1787.766	-179.386	1400.000
24.500	251000.000	33.267	0.0	0.473	0.0	1445.832	0.0	2200.000
24.500	329000.000	40.370	7.104	0.384	0.0	1991.459	-545.627	2200.000
24.500	375000.000	43.699	3.328	0.375	0.0	2004.819	-558.987	2200.000
24.500	495000.000	51.342	7.644	0.376	0.0	2030.003	-584.171	2200.000
24.500	435000.000	48.126	-3.216	0.361	0.0	2022.508	-576.676	2200.000
24.900	251000.000	33.842	0.0	0.576	0.0	1640.101	0.0	2000.000
24.900	329000.000	40.874	7.031	0.503	0.0	1794.903	-154.802	2000.000
24.900	375000.000	44.186	3.312	0.487	0.0	1804.012	-163.912	2000.000
24.900	495000.000	51.797	7.611	0.455	0.0	1820.002	-179.902	2000.000
24.900	435000.000	48.579	-3.218	0.453	0.0	1816.094	-175.993	2000.000
25.320	219000.000	34.813	0.0	0.970	0.0	988.649	0.0	2000.000
25.320	295000.000	41.539	6.726	0.665	0.0	1252.637	-263.989	2000.000
25.320	341000.000	44.751	3.212	0.565	0.0	1308.572	-319.923	2000.000
25.320	469000.000	52.142	7.392	0.345	0.0	1400.000	-411.352	2000.000
25.320	403000.000	49.008	-3.134	0.429	0.0	1382.728	-394.079	2000.000
25.730	219000.000	35.836	0.0	1.023	0.0	1229.387	0.0	2000.000
25.730	295000.000	42.593	6.757	1.054	0.0	1340.597	-111.210	2000.000
25.730	341000.000	45.846	3.253	1.095	0.0	1360.341	-130.954	2000.000
25.730	469000.000	53.355	7.510	1.213	0.0	1630.469	-401.082	2000.000
25.730	403000.000	50.122	-3.233	1.114	0.0	1616.099	-386.712	2000.000

NOTE! U/S OF RM 24.90 ECCF WERE STRAIGHT LINED TO WILL. FALLS LOWER GAGE

Willamette Falls Lower Gage: R.M. 26.2

10 yr = 34.0
50 yr = 42.0
100 yr = 45.5
500 yr = 55.0

Straight line between RM 24.9 and gage @ RM 26.2

A B C D E F

25.320	403000.000	49.008	-3.134	0.42[illegible]				
5.730	219000.000	35.836	0.0	1.023	0.0	1229.387	0.0	2000.000
5.730	295000.000	42.593	6.757	1.054		1340.597	-111.210	2000.000
25.730	341000.000	45.846	3.253	1.095		1360.341	-130.954	2000.000
25.730	469000.000	53.355	7.510	1.213	0.0	1630.469	-401.082	2000.000
25.730	403000.000	50.122	-3.233	1.114	0.0	1616.099	-386.712	2000.000
25.980	219000.000	35.553	0.0	-0.283	0.0	610.271	0.0	1150.000
25.980	295000.000	42.147	6.594	-0.446	0.0	628.405	-18.134	1150.000
25.980	341000.000	45.294	3.147	-0.552	0.0	637.059	-26.788	1150.000
25.980	469000.000	52.481	7.187	-0.874	0.0	650.000	-39.729	1150.000
25.980	403000.000	49.428	-3.053	-0.695	0.0	648.427	-38.156	1150.000
26.080	219000.000	35.598	0.0	0.445	0.0	387.934	0.0	700.000
26.080	295000.000	42.451	6.852	0.304	0.0	461.228	-73.294	700.000
26.080	341000.000	45.593	3.142	0.299	0.0	465.753	-77.819	700.000
26.080	469000.000	52.761	7.168	0.280	0.0	524.972	-137.039	700.000
26.080	403000.000	49.707	-3.054	0.279	0.0	471.678	-83.744	700.000
26.420	219000.000	37.194	0.0	1.195	0.0	632.649	0.0	2200.000
26.420	295000.000	44.207	7.014	1.757	0.0	700.001	-67.352	2200.000
26.420	341000.000	47.721	3.514	2.128	0.0	700.001	-67.352	2200.000
26.420	469000.000	55.999	8.278	3.238	0.0	700.003	-67.354	2200.000
26.420	403000.000	52.322	-3.677	2.615	0.0	700.002	-67.353	2200.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	0.0	0.0	551.170	0.0
2	0.0	0.0	616.680	65.510
3	0.0	0.0	647.420	96.250
4	0.0	0.0	725.642	174.472
5	0.0	0.0	697.675	146.504

SEPT 1971 VERSION UPDATED OCT 1973
ERROR CORRECTIONS C1,02,C3,C4,C5,06
MODIFICATIONS 52,53,54,55,56
****

410021 - 19800215
M-R

T1 ~~FLOODWAY~~ NATURAL
T2 BLW CLKMS R TO WILL FALLS WILLAMETTE RIVER
T3 ~~FLOODWAY~~ NATURAL

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	FVINS	Q	WSEL	FQ
	-1.	2.	C.	C.	C.0	0.0	-1.0	0.	40.520	C.C

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLOC	IBW	CHNIM	ITRACE
	1.000	C.0	-1.CCC	C.C	0.0	0.0	0.0	0.0	0.0	C.C

J3										
	1.CCC	26.CCC	14.CCC	17.CCC	4.CCC	27.CCC	28.CCC	21.CCC	22.CCC	C.C

J3 VAR(I),I=1,10

	1.	26.	14.	17.	4.	27.	28.	21.	22.	C.C		
NC	0.070	C.07C	C.C32	C.1CC	0.300	0.0	0.0	C.C	C.C	C.C	C.C	
CT	2.000	375CCC.CCC	375CCC.CCC	C.0	0.0	0.0	0.0	C.C	C.C	C.C	C.C	
ET	0.0	C.0	4.1CC	260.CCC	865.CCC	0.0	0.0	C.C	C.C	C.C	C.C	
X1	22.350	27.CCC	41C.CCC	8CC.CCC	0.0	0.0	0.0	C.C	C.C	C.C	C.C	
GR	50.CCC	C.0	4C.CCC	135.CCC	30.CCC	190.CCC	20.CCC	32C.CCC	1C.CCC	38C.CCC	C.C	
GR	3.CCC	41C.CCC	-15.CCC	43C.CCC	-20.CCC	45C.CCC	-53.CCC	47C.CCC	-59.CCC	5CC.CCC	C.C	
GR	67.CCC	52C.CCC	-75.CCC	55C.CCC	-101.CCC	6CC.CCC	-103.CCC	63C.CCC	-101.CCC	65C.CCC	C.C	
GR	94.CCC	68C.CCC	-67.CCC	71C.CCC	-55.CCC	74C.CCC	-42.CCC	75C.CCC	-31.CCC	77C.CCC	C.C	
GR	12.CCC	78C.CCC	-7.CCC	8CC.CCC	10.CCC	82C.CCC	2C.CCC	85C.CCC	3C.CCC	9CC.CCC	C.C	
GR	4C.CCC	93C.CCC	5C.CCC	1190.CCC	0.0	0.0	0.0	C.C	C.C	C.C	C.C	
ET	0.0	C.0	4.1CC	51C.CCC	1950.CCC	0.0	0.0	C.C	C.C	C.C	C.C	
X1	23.100	2C.CCC	8CC.CCC	1880.CCC	3700.CCC	4200.CCC	4000.CCC	C.C	C.C	C.C	C.C	
GR	50.CCC	C.0	43.5CC	215.CCC	40.CCC	475.CCC	2C.CCC	53C.CCC	1C.CCC	8CC.CCC	C.C	
GR	2.CCC	9CC.CCC	-8.CCC	95C.CCC	-11.CCC	1CCC.CCC	-9.CCC	105C.CCC	-1C.CCC	13CC.CCC	C.C	
GR	17.CCC	14CC.CCC	-26.CCC	15CC.CCC	-19.CCC	16CC.CCC	-14.CCC	17CC.CCC	-1C.CCC	18CC.CCC	C.C	
GR	10.CCC	188C.CCC	2C.CCC	1945.CCC	30.CCC	2CCC.CCC	4C.CCC	2045.CCC	5C.CCC	22CC.CCC	C.C	
ET	0.0	C.0	4.1CC	28C.CCC	1090.CCC	0.0	0.0	C.C	C.C	C.C	C.C	
X1	23.790	25.CCC	3CC.CCC	95C.CCC	3300.CCC	3500.CCC	3400.CCC	C.C	C.C	C.C	C.C	
GR	50.CCC	C.0	4C.CCC	35.CCC	30.CCC	8C.CCC	2C.CCC	14C.CCC	1C.CCC	26C.CCC	C.C	
GR	4.CCC	3CC.CCC	-9.CCC	35C.CCC	-21.CCC	4CC.CCC	-23.CCC	5CC.CCC	-34.CCC	56C.CCC	C.C	
GR	4C.CCC	6CC.CCC	-47.CCC	63C.CCC	-52.CCC	7CC.CCC	-46.CCC	77C.CCC	-4C.CCC	8CC.CCC	C.C	
GR	3C.CCC	85C.CCC	-18.CCC	88C.CCC	-9.CCC	9CC.CCC	-6.CCC	95C.CCC	4.CCC	1CCC.CCC	C.C	
GR	10.CCC	1C1C.CCC	2C.CCC	1035.CCC	4C.CCC	1C6C.CCC	48.CCC	1115.CCC	4C.CCC	122C.CCC	C.C	
NC	0.07C	C.C6C	C.C32	C.1CC	0.3CC	0.0	C.C	C.C	C.C	C.C	C.C	
ET	0.0	C.0	4.1CC	5C.CCC	1420.CCC	0.0	0.0	C.C	C.C	C.C	C.C	
X1	24.060	23.CCC	26C.CCC	136C.CCC	1500.CCC	1300.CCC	1400.CCC	C.C	C.C	C.C	C.C	
GR	5C.CCC	C.0	2C.CCC	3C.CCC	10.CCC	7C.CCC	1C.CCC	26C.CCC	4.CCC	3CC.CCC	C.C	
GR	13.CCC	33C.CCC	-25.CCC	39C.CCC	-11.CCC	5CC.CCC	-3.CCC	6CC.CCC	-8.CCC	7CC.CCC	C.C	
GR	0.0	8CC.CCC	C.C	9CC.CCC	8.CCC	97C.CCC	1C.CCC	112C.CCC	12.CCC	115C.CCC	C.C	
GR	12.CCC	12CC.CCC	14.CCC	124C.CCC	18.CCC	127C.CCC	18.CCC	131S.CCC	16.CCC	136C.CCC	C.C	
GR	1C.CCC	15BC.CCC	4C.CCC	164C.CCC	47.CCC	179C.CCC	0.C	C.C	C.C	C.C	C.C	
NC	0.06C	C.C6C	C.C38	C.1CC	0.3CC	0.0	0.0	C.C	C.C	C.C	C.C	
ET	0.0	C.0	4.1CC	21C.CCC	1440.CCC	0.C	0.0	C.C	C.C	C.C	C.C	
X1	24.500	25.CCC	4CC.CCC	135C.CCC	2500.CCC	1900.CCC	2200.CCC	C.C	C.C	C.C	C.C	
GR	5C.CCC	C.0	4C.CCC	4C.CCC	30.CCC	75.CCC	2C.CCC	27C.CCC	12.CCC	31C.CCC	C.C	
GR	8.CCC	35C.CCC	-8.CCC	4CC.CCC	-6.CCC	5CC.CCC	0.0	56C.CCC	2.CCC	6CC.CCC	C.C	
GR	7.CCC	7CC.CCC	-7.CCC	8CC.CCC	-5.CCC	9CC.CCC	-3.CCC	1CCC.CCC	-2.CCC	11CC.CCC	C.C	

[illegible]	10.000	158C.CCC	4C.CCC	164C.CCC	47.000	179[illegible].0	0.0	C.C	16.CCC	136C.CCC
NC	0.060	C.C6C	C.C3E	C.1CC	0.300	0.0	C.C	C.C	C.C	C.C
ET	0.0	C.0	4.1CC	21C.CCC	1440.000	0.0	C.C	C.C	C.C	C.C
X1	24.500	25.CCC	4CC.CCC	135C.CCC	2500.000	1900.000	2200.CCC	C.C	C.C	C.C
GR	5C.CCC	C.0	4C.CCC	4C.CCC	30.000	75.000	20.000	27C.CCC	12.CCC	31C.CCC
GR	8.CCC	35C.CCC	-8.CCC	4CC.CCC	-6.000	500.000	0.0	56C.CCC	2.CCC	6CC.CCC
GR	7.CCC	7CC.CCC	-7.CCC	8CC.CCC	-5.000	900.000	-3.CCC	1CCC.CCC	-2.CCC	11CC.CCC
GR	3.000	12CC.CCC	-2.CCC	13CC.CCC	3.000	1350.000	10.CCC	14CC.CCC	2C.CCC	143C.CCC
GR	30.CCC	148C.CCC	4C.CCC	157C.CCC	40.000	1750.000	38.CCC	19CC.CCC	36.CCC	2C3C.CCC
NC	0.060	C.C6C	C.C4C	C.1CC	0.300	0.0	C.C	C.C	C.C	C.C
ET	0.0	C.C	4.1CC	4C.CCC	1375.000	0.0	0.0	C.C	C.C	C.C
X1	24.9CC	23.CCC	55C.CCC	125C.CCC	1900.000	2100.000	2000.CCC	C.C	C.C	C.C
GR	5C.CCC	C.0	1C.CCC	11C.CCC	5.000	120.000	0.C	2CC.CCC	C.C	27C.CCC
GR	5.000	3CC.CCC	1C.CCC	31C.CCC	20.000	365.000	30.CCC	55C.CCC	2C.CCC	65C.CCC
GR	10.CCC	73C.CCC	5.CCC	75C.CCC	-4.000	800.000	-6.CCC	9CC.CCC	-6.CCC	1CCC.CCC
GR	7.000	11CC.CCC	-9.CCC	12CC.CCC	5.000	1250.000	10.CCC	13CC.CCC	2C.CCC	1365.CCC
GR	30.CCC	142C.CCC	3C.CCC	16CC.CCC	40.000	1820.000	0.0	C.C	C.C	C.C
NC	0.06C	C.C6C	C.C3E	C.1CC	0.300	0.0	0.C	C.C	C.C	C.C
ET	2.CCC	341CCC.CCC	341CCC.CCC	0.0	0.0	0.0	0.0	C.C	C.C	C.C
	0.0	C.0	4.1CC	7C.CCC	930.000	0.0	0.0	C.C	C.C	C.C
X1	25.32C	17.CCC	21C.CCC	985.CCC	1650.000	2250.000	2000.CCC	C.C	C.C	C.C
GR	5C.CCC	C.0	3C.CCC	15.CCC	20.000	75.000	1C.CCC	21C.CCC	-7.CCC	24C.CCC
GR	14.000	3CC.CCC	-16.CCC	4C3.CCC	-8.000	500.000	-2.CCC	6CC.CCC	C.C	7CC.CCC
GR	5.CCC	78C.CCC	1C.CCC	8CC.CCC	20.000	84C.CCC	30.CCC	98[illegible].CCC	38.CCC	1C1C.CCC
GR	38.CCC	12CC.CCC	5C.CCC	14CC.CCC	0.0	0.0	0.C	C.C	C.C	C.C
NC	0.060	C.C6C	C.C3C	C.1CC	0.300	0.0	0.C	C.C	C.C	C.C
ET	0.0	C.0	4.1CC	23C.CCC	1420.000	0.0	0.0	C.C	C.C	C.C
X1	25.73C	15.CCC	6CC.CCC	1365.CCC	1600.000	2450.000	2000.CCC	C.C	C.C	C.C
GR	6C.CCC	C.0	42.CCC	8C.CCC	30.000	270.CCC	20.CCC	36C.CCC	1C.CCC	38C.CCC
GR	0.0	4CC.CCC	-5.CCC	5CC.CCC	-6.CCC	6CC.CCC	-7.CCC	8CC.CCC	-11.CCC	9CC.CCC
GR	11.CCC	11CC.CCC	-8.CCC	13CC.CCC	10.CCC	1365.CCC	5C.CCC	143C.CCC	4[illegible].CCC	166C.CCC
NC	0.07C	C.C5C	C.C2E	C.3CC	0.600	0.0	0.C	C.C	C.C	C.C
ET	0.0	C.0	4.1CC	4C.CCC	630.000	0.0	0.0	C.C	C.C	C.C
X1	25.98C	12.CCC	1CC.CCC	5CC.CCC	1100.000	1200.000	1150.CCC	C.C	C.C	C.C
GR	5C.CCC	C.0	1C.CCC	5C.CCC	-20.000	8C.CCC	-28.CCC	1CC.CCC	-27.CCC	15C.CCC
GR	23.CCC	25C.CCC	-22.CCC	4CC.CCC	-11.CCC	45C.CCC	-5.CCC	5CC.CCC	1C.CCC	55C.CCC
GR	3C.CCC	62C.CCC	5C.CCC	65C.CCC	0.0	0.0	0.C	C.C	C.C	C.C
ET	0.0	C.0	4.1CC	14C.CCC	480.000	0.0	0.0	C.C	C.C	C.C
X1	26.C8C	23.CCC	13C.CCC	48C.CCC	650.000	75C.CCC	7CC.CCC	C.C	C.C	C.C
GR	42.CCC	C.0	4C.CCC	6C.CCC	3C.CCC	7C.CCC	2C.CCC	9C.CCC	1C.CCC	1CC.CCC
GR	4.1CC	11C.CCC	-1.6CC	13C.CCC	-16.1CC	16C.CCC	-33.6CC	18C.CCC	-46.7CC	2CC.CCC
GR	57.1CC	23C.CCC	-66.8CC	26C.CCC	-67.3CC	28C.CCC	-65.1CC	31C.CCC	-61.6CC	34C.CCC
GR	58.1CC	37C.CCC	-55.6CC	4CC.CCC	-12.6CC	42C.CCC	-4.CCC	45C.CCC	4.4CC	46C.CCC
GR	25.CCC	47C.CCC	5C.CCC	48C.CCC	5C.CCC	53C.CCC	0.0	C.C	C.C	C.C
NC	0.1CC	C.1CC	C.C2E	C.3CC	0.6CC	0.0	0.0	C.C	C.C	C.C
ET	0.0	C.0	4.1CC	0.0	6CC.CCC	0.0	0.0	C.C	C.C	C.C
X1	26.42C	22.CCC	C.C	46C.CCC	2200.000	2200.CCC	2200.CCC	C.C	C.C	C.C
GR	5.9CC	C.0	5.7CC	2C.CCC	5.6CC	4C.CCC	-2.2CC	55.CCC	-13.8CC	75.CCC
GR	36.3CC	95.CCC	-26.3CC	115.CCC	-42.2CC	14C.CCC	-5C.2CC	16C.CCC	-31.6CC	23[illegible].CCC
GR	27.6CC	255.CCC	-26.1CC	275.CCC	-23.6CC	3CC.CCC	-21.3CC	315.CCC	-19.1CC	345.CCC
GR	17.1CC	355.CCC	-9.1CC	38C.CCC	0.7CC	4C3.CCC	1.4CC	42C.CCC	1.CCC	44C.CCC
GR	3C.CCC	46C.CCC	4C.CCC	7CC.CCC	0.0	0.0	0.0	C.C	C.C	C.C
EJ	0.0	C.0	C.C	0.0	0.0	0.0	0.C	C.C	C.C	C.C

SUMMARY PRINTOUT FOR MULTIPLE PROFILES

FLOODWAY

SECTION NUMBER	CHANNEL LENGTH	~~MIN EL OF ROADWAY~~ CH. LT. STA.	~~MAX EL OF LOW CHORD~~ CH. RT. STA.	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	VCH	CCH	K*XNCH	TOPWID	STENCL (FLOODWAY LT)	STENCR (FLOODWAY RT)
22.35	C.0	410.00	800.00	-103.00375000.00	40.52	11.02849907.94	32.00	787.55	C.C	C.0		
22.35	0.0	410.00	800.00	-103.00375000.00	41.22	11.03353101.31	32.00	577.51	260.00	665.00		
23.10	4000.00	800.00	1680.00	-26.00375000.00	42.56	6.54353702.81	32.00	1799.49	C.C	C.0		
23.10	4000.00	800.00	1680.00	-26.00375000.00	43.27	6.48355069.19	32.00	1440.00	510.00	1950.00		
23.79	3400.00	300.00	950.00	-52.00375000.00	42.74	9.42348918.69	32.00	1053.45	C.C	C.C		
23.79	3400.00	300.00	950.00	-52.00375000.00	43.38	8.63361322.31	32.00	803.27	280.00	1050.00		
24.06	1400.00	260.00	1360.00	-25.00375000.00	43.32	7.19330612.81	32.00	1704.56	C.C	C.0		
24.06	1400.00	260.00	1360.00	-25.00375000.00	43.97	7.47348723.63	32.00	1370.00	50.00	1420.00		
24.50	2200.00	400.00	1350.00	-8.00375000.00	43.70	7.63328474.94	28.00	2004.82	C.C	C.0		
24.50	2200.00	400.00	1350.00	-8.00375000.00	44.39	7.76338921.25	28.00	1230.00	210.00	1440.00		
24.90	2000.00	550.00	1250.00	-9.00375000.00	44.19	9.17259535.25	40.00	1804.01	C.C	C.C		
24.90	2000.00	550.00	1250.00	-9.00375000.00	44.86	9.37269731.94	40.00	1335.00	40.00	1375.00		
25.32	2000.00	210.00	985.00	-16.00341000.00	44.75	9.88313713.75	36.00	1208.57	C.C	C.C		
25.32	2000.00	210.00	985.00	-16.00341000.00	45.42	10.22320021.00	36.00	880.00	70.00	930.00		
25.73	2000.00	600.00	1365.00	-11.00341000.00	45.85	7.81288106.50	30.00	1360.34	C.C	C.0		
25.73	2000.00	600.00	1365.00	-11.00341000.00	46.66	7.70299082.56	30.00	1150.00	230.00	1420.00		
25.98	1150.00	100.00	500.00	-28.00341000.00	45.29	14.32299457.00	28.00	627.06	C.C	C.0		
25.98	1150.00	100.00	500.00	-28.00341000.00	46.12	14.12298881.56	28.00	590.00	40.00	630.00		
26.08	700.00	130.00	480.00	-67.30341000.00	45.59	14.13329084.88	28.00	465.75	C.C	C.0		
26.08	700.00	130.00	480.00	-67.30341000.00	46.29	14.49340999.94	28.00	336.76	130.00	480.00		
26.42	2200.00	C.C	460.00	-50.20341000.00	47.72	12.17335964.88	28.00	700.00	C.C	C.C		
26.42	2200.00	C.C	460.00	-50.20341000.00	48.72	12.15340999.94	28.00	460.04	C.C	460.00		

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH C	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
22.350	375000.000	40.520	C.0	0.0	0.0	787.549	C.C	C.C
22.350	375000.000	41.220	0.700	0.0	0.0	577.506	210.043	C.C
23.100	375000.000	42.556	C.0	2.036	0.0	1799.486	C.C	4000.000
23.100	375000.000	43.270	0.714	2.050	0.0	1439.999	359.487	4000.000
23.790	375000.000	42.742	0.0	0.186	0.0	1053.454	C.C	3400.000
23.790	375000.000	43.385	0.642	0.115	0.0	803.270	250.184	3400.000
24.060	375000.000	43.324	C.0	0.582	0.0	1704.555	C.C	1400.000
24.060	375000.000	43.973	0.649	0.588	0.0	1369.999	334.556	1400.000
24.500	375000.000	43.699	C.0	0.375	0.0	2004.819	C.C	2200.000
24.500	375000.000	44.390	0.691	0.417	0.0	1229.999	774.820	2200.000
24.900	375000.000	44.186 WSMT.	C.0	0.487	0.0	1804.012	C.C	2000.000
24.900	375000.000	44.862 K FLOODWAY	(0.676)	0.472	0.0	1334.999	469.013	2000.000
25.320	341000.000	44.751	C.0	0.565	0.0	1308.572	C.C	2000.000
25.320	341000.000	45.419	0.668	0.557	0.0	859.999	448.573	2000.000
25.730	341000.000	45.846	C.0	1.095	0.0	1360.341	C.C	2000.000
25.730	341000.000	46.663	0.817	1.244	0.0	1150.000	210.341	2000.000

24.900	375000.000	44.186	0.0	0.487	0.0	1804.012	C.C	2000.000
24.900	375000.000	44.862	0.676	0.472	0.0	1334.999	469.013	2000.000
25.320	341000.000	44.751	0.0	0.565	0.0	1308.572	C.C	2000.000
25.320	341000.000	45.419	0.668	0.557	0.0	859.999	448.573	2000.000
25.730	341000.000	45.846	0.0	1.095	0.0	1360.341	C.C	2000.000
25.730	341000.000	46.663	0.817	1.244	0.0	1189.999	170.342	2000.000
25.980	341000.000	45.294	0.0	-0.552	0.0	637.055	C.C	1150.000
25.980	341000.000	46.120	0.827	-0.542	0.0	589.999	47.000	1150.000
26.080	341000.000	45.593	0.0	0.299	0.0	465.753	C.C	700.000
26.080	341000.000	46.285	0.692	0.165	0.0	336.761	128.992	700.000
26.420	341000.000	47.721	0.0	2.128	0.0	700.001	C.C	2200.000
26.420	341000.000	48.720	0.999	2.435	0.0	460.045	239.957	2200.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	0.0	C.C	647.420	0.0
2	1.000	600.000	482.766	-164.654

565
- 200
365

Appendix C
No-Rise Certification

Federal Emergency Management Agency

Region X
130-228th Street SW
Bothell, WA 98021-9796

ENGINEERING "NO-RISE" CERTIFICATION

This is to certify that I am a duly qualified engineer licensed to practice in the State of Oregon .

It is to further certify that the attached technical data supports the fact that proposed Modifications to the Cedar Oak Boat Launch will not impact the 100-year flood elevations, floodway elevations and floodway widths on the Willamette River at published sections in the Flood Insurance Study for Clackamas County, Oregon, dated June 17, 2008 and will not impact the 100-year flood elevations, floodway elevations, and floodway widths at unpublished cross-sections in the vicinity of the proposed development.

(Name of Development)
(Name of Stream)
(Name of Community)

This certification is attached to a technical report that describes the hydraulic analysis that was completed to ensure a "No-Rise" design for the project. "Cedar Oak Boat Launch No-Rise Analysis and Certification" by WSE, January 22, 2015.

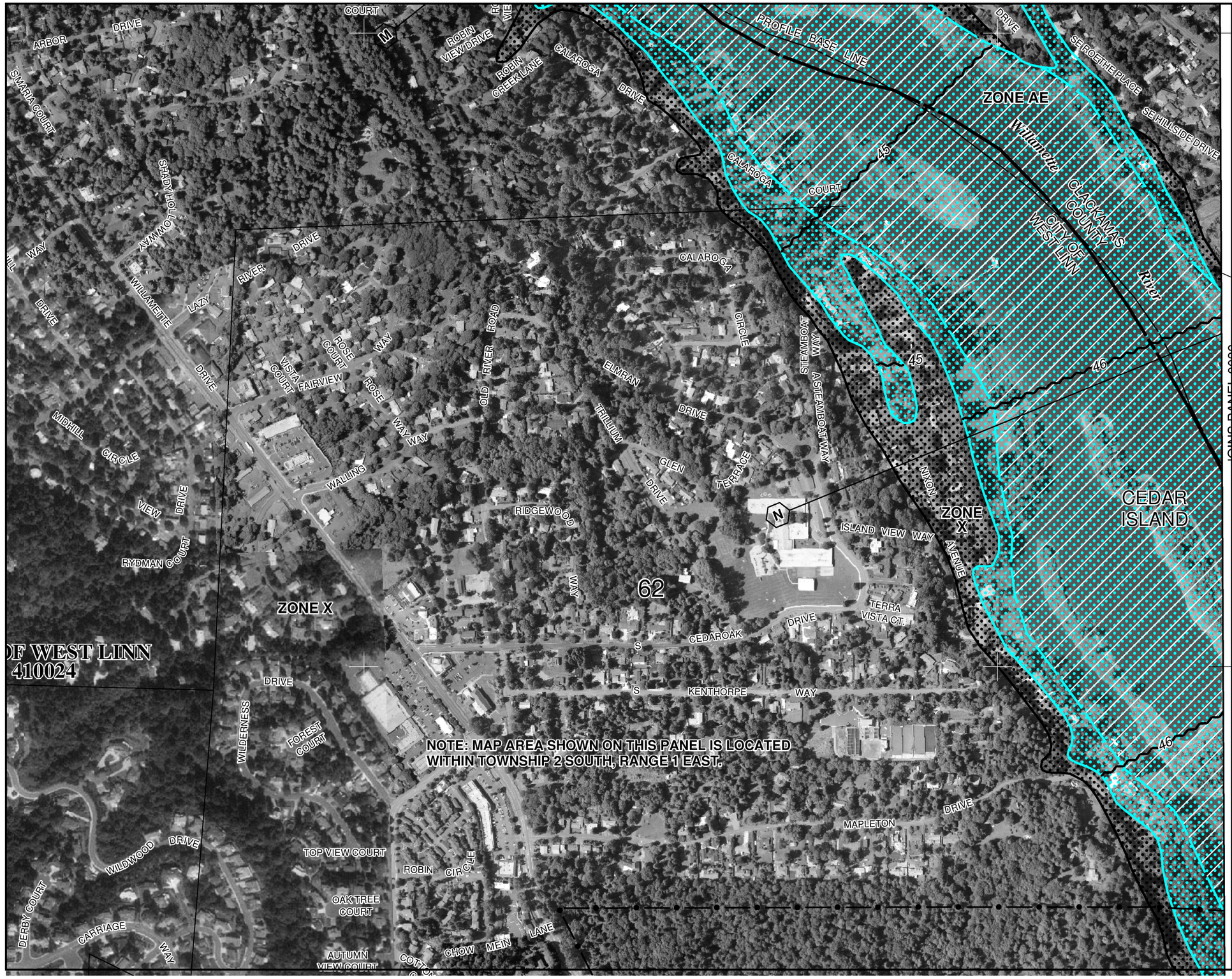
January 22, 2015

REGISTERED PROFESSIONAL ENGINEER 16358 OREGON 1-19-93 JEFFREY PAUL JOHNSON

President

Watershed Science & Engineering
110Prefontaine Pl. S., Suite 508
Seattle, WA 98104

Appendix D
Firmette



he Flood Insurance Study report for this jurisdiction.

nce is available in this community, contact your insurance d Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

0 150 300 METERS

PANEL 0019D

FIRM
FLOOD INSURANCE RATE MAP
CLACKAMAS COUNTY, OREGON
AND INCORPORATED AREAS

PANEL 19 OF 1175
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLACKAMAS COUNTY	415588	0019	D
LAKE OSWEGO, CITY OF	410018	0019	D
WEST LINN, CITY OF	410024	0019	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
41005C0019D

EFFECTIVE DATE
JUNE 17, 2008

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Appendix E
Floodway Data Tables

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
						FEET (NAVD)		
WILLAMETTE RIVER								
A	91,661	964/460[2]	58,628	6.4	34.7	34.7	35.4	0.7
B	94,161	985/390[2]	63,554	5.9	35.3	35.3	36.0	0.7
C	96,691	815/220[2]	51,043	7.3	35.6	35.6	36.3	0.7
D	98,381	1,325/500[2]	85,767	4.4	36.3	36.3	37.0	0.7
E	100,861	1,519/1,020[2&3]	63,590	5.9	36.4	36.4	37.0	0.6
F	104,979	955	52,697	7.1	36.7	36.7	37.4	0.7
G	105,719	778	47,756	7.9	36.7	36.7	37.4	0.7
H	106,469	1,005	62,300	6.0	37.4	37.4	38.1	0.7
I	110,312	895	43,115	8.7	37.6	37.6	38.1	0.5
J	111,912	550	44,879	8.4	38.1	38.1	38.9	0.8
K	113,540	520	31,029	12.1	39.3	39.3	40.0	0.7
L	115,130	820	54,496	6.9	42.7	42.7	43.4	0.7
M	118,034	578	37,630	10.0	44.0	44.0	44.7	0.7
N	122,034	1,440	64,809	5.8	46.1	46.1	46.8	0.7
O	125,434	800	46,296	8.1	46.2	46.2	46.9	0.7
P	126,834	1,370	55,501	6.8	46.8	46.8	47.5	0.7
Q	129,034	1,230	52,785	7.1	47.2	47.2	47.9	0.7
R	131,034	1,335	48,241	7.8	47.7	47.7	48.4	0.7
S	143,020	888	42,725	8.0	74.5	74.5	74.7	0.2
T	145,970	1,040	47,541	7.2	74.9	74.9	75.1	0.2
U	149,170	1,050	51,473	6.6	75.2	75.2	75.3	0.1
V	165,070	665	31,973	10.3	84.3	84.3	85.3	1.0
W	168,300	1,450	66,319	4.9	86.4	86.4	87.3	0.9
X	170,950	1,057	47,397	6.9	86.6	86.6	87.5	0.9
Y	174,825	1,100	52,109	6.3	87.5	87.5	88.4	0.9
Z	176,685	705	37,988	8.6	87.5	87.5	88.4	0.9

[1] Stream distance in feet above mouth

[2] Width/width within study area

[3] Values calculated from original model prior redelineation

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLACKAMAS COUNTY, OR

AND INCORPORATED AREAS

FLOODWAY DATA

WILLAMETTE RIVER

ATTACHMENT D

SITE PHOTOGRAPHS

ATTACHMENT D: SITE PHOTOGRAPHS
Cedaroak Boat Ramp

Photograph 1: Signage for boat trailer parking

Photograph 2: Signage for park hours

ATTACHMENT D: SITE PHOTOGRAPHS
Cedaroak Boat Ramp

Photograph 3: Existing parking lot

Photograph 4: Signage for trailer parking

ATTACHMENT D: SITE PHOTOGRAPHS
Cedaroak Boat Ramp

Photograph 5: Trailer parking stalls

Photograph 6: ADA parking stalls and recycling container in background

ATTACHMENT D: SITE PHOTOGRAPHS
Cedaroak Boat Ramp

Photograph 7: Existing boat docks and ramp

Photograph 8: Existing boat docks and ramp

ATTACHMENT D: SITE PHOTOGRAPHS
Cedaroak Boat Ramp

Photograph 9: Existing boat dock

Photograph 10: Existing ramp and deteriorated walkway to ramp

ATTACHMENT D: SITE PHOTOGRAPHS
Cedaroak Boat Ramp

Photograph 11: Signage for park identification at park entry