

INSTREAM PROJECT CHECKLIST

*For Construction and Maintenance of Flood and Erosion
Protection Facilities and Habitat Restoration Projects
that may include large wood elements*

Project Name Fenster 2B Revetment Setback and Floodplain Rest. Project Manager Wm. Laird O'Rollins

River/River Mile/Bank 31 Date 5/7/14

I. Project Background and Preliminary Design (30-40 Percent) Information

(Provide general information at a conceptual level)

1. *Describe the goals and objectives of the project and its relative importance to the success of DNRP program goals and mandates. (Note: If the project is comprised of emergency work, then fill out and file this form within 30 days of completion of emergency work.)*

The Fenster 2B Revetment Setback and Floodplain Restoration Project was initiated by the City of Auburn, is on City of Auburn property and is within the city limits of Auburn. King County Water and Land Resources staff are providing design, permitting and construction management assistance for this project under a technical services agreement between Auburn and King County.

The goals and objectives of this project are to:

- Restore habitat forming processes and improve flood conveyance of the local reach by widening the channel cross-section;
- Slow floodwater velocities, thereby reducing erosion, and increasing flood refugia for juvenile salmonids;
- Restore quantity and quality of floodplain and riparian habitat within the reach;
- Minimize-risk to public safety and private property;
- Fulfill King County flood Control District criteria for recognition of the facility.

These goals and objectives are consistent with those of salmon recovery expressed in the *Green/Duwamish and Central Puget Sound Watershed Salmon Habitat Plan*. This project is located at the transition between the middle- and lower-Green River reaches and will extend the superior habitat characteristics of the middle-Green River for another 700 feet downstream.

2. *Describe the existing (and historic, if relevant) site and reach conditions, including structural features, channel form, and the presence of naturally-deposited large wood.*

The project site is located at the end and on the outside of a shallow bend in the river channel. However, the channel adjacent to the project site is fairly straight and mostly featureless. The first phase of the Fenster Levee Setback Project (const. in 2007) is located immediately upstream, and the Pautzke Levee Setback Project (constructed in 2009) is about ½ mile upstream.

The river bank is presently protected by a rock revetment constructed in the early 1960s. A maintenance road runs along the top of the revetment and effectively acts as a levee to contain floodwaters. The project site is comprised of several parcels owned by the City of Auburn that include about 5 acres of floodplain habitat. The area is forested, though not densely, with large black cottonwood and red alder trees, underlain by both native and non-native shrubs. Soils are primarily sand and were likely either naturally deposited or placed as fill shortly before revetment construction

in the early 1960's. 1936 aerial photos show the site to be occupied by a backwater pond that was obviously at a lower elevation than the present floodplain.

There is a naturally-recruited tree lodged in the channel near the opposite (right) bank approximately even with the upstream end of the project site, and another piece of wood adjacent to the revetment on the near bank at the upstream end of the project site.

Many pieces of wood were installed along the channel edge upstream of the present project site as part of the first phase of the Fenster Levee Setback Project in 2007. As the river bank retreated after removal of channel bank armor, the wood was left anchored within the channel. A separate 2014 project will relocate much of that wood.

3. *Describe what is known about adjacent land uses and the type, frequency, and seasonality of recreational uses in the project area. Are there nearby trail corridors, schools or parks? What is the source(s) of your information?*

Areas landward (west) and downstream (north) of the project site are occupied by medium-density single family residences. Land upstream (south and east) is the Auburn Narrows Natural Area. Land on the opposite bank is undeveloped floodplain forest owned by the Washington State DNR.

The project site itself is part of the City of Auburn's Fenster Nature Park. It is used for passive recreation by walkers, fishers, etc. The city/county boundary is located about 600 feet upstream (east) of the project area. The reach immediately upstream of that boundary is presently closed to boating by the King County Sherriff because of a very large log jam about ¼-mile upstream. The City of Auburn does not regulate or consider closures of the river to boating.

A study of recreational use of the river was conducted by Herrera Environmental Consultants over the summer of 2013. The study used cameras mounted in trees to record, characterize and count users floating on the river. Cameras were positioned at the upstream end of this project site and pointed both upstream and downstream. This study recorded 805 individuals in 651 different watercraft (including inner tubes) using the reach upstream of the project site, between June 28 and September 12, 2013. The cameras recorded 818 users in 650 watercraft using the reach downstream of the cameras, which includes the reach to be modified by the proposed project. It should be noted that there are no vehicle-accessible launch points in the reach between the project site and the large log jam blocking the river about ¼ mile upstream. All watercraft would need to be hand-carried to the river from the nearest roadway.

Few of the recreational floaters documented in the study referenced above appeared to be fishing, likely due to the season, but fishing does occur from the shoreline throughout this reach and may also occur from watercraft during the fall when adult salmon are returning.

4. *Describe the conceptual design of large wood elements of the project, including, if known at this stage in the design, the amount, size, location, orientation, elevation, anchoring techniques, and type of interaction with the river and stream at a range of flows.*

No wood will be placed within the present active channel of the Green River. However, large wood will be placed both on the surface of the floodplain and buried within the floodplain in areas where it may be recruited or excavated and exposed by channel migration after removal of the existing revetment.

Numerous (as many as 40) cottonwood trees will need to be removed to construct the buried setback revetment. These cottonwoods represent a significant volume of structure that should be available to the river and floodplain. We have committed to retaining this structure on the project site. Several of the trees will be buried in one of three trenches excavated in the floodplain between the existing channel and setback revetment. These trenches and trees will be oriented more or less perpendicular

to the existing channel alignment and will be about 15 feet deep. At least two cottonwood trees, as intact as possible, will be placed in each trench and then buried. Shorter (~25' long) conifer logs with rootwads and longer (~50') conifer logs without rootwads may also be buried in the trenches. Live cottonwood poles will be installed on 10' centers to a depth of 15 feet along both sides of each trench. The elevation of the buried wood structures (about El. 55' NAVD88) should place them just below the OHWM (at ~El. 57.5') and allow them to interact with medium- to high-flows, but not likely with low summer flows.

Trees that need to be culled for construction in excess of those placed in the trenches—likely numbering more than 30—will be placed on the floodplain surface with the rootwads facing landward where possible.

In addition to the buried log structures described above, twelve 30-foot-long conifer logs with rootwads will be incorporated into the buried setback revetment near its downstream end, where we expect the revetment to be exposed first. These logs will be either embedded into the revetment with their rootwads facing outward or will be pinned to the revetment by the embedded logs in a parallel orientation. One cottonwood tree will also be pinned to the face of the revetment by the embedded conifer logs. This wood would only interact with the active channel if exposed by channel migration. The logs will be placed between elevations 52' and 62' (NAVD88), which corresponds to the water surface range between about 1 foot below summer low-flow and flood stage. This log structure will be constructed and then buried in the floodplain. It will not be exposed to the river until the bank retreats to expose it.

5. *What is the intended function of the placed wood? What role does the placed wood have in meeting the project's goals and objectives? Is the project intended to recruit or trap additional woody debris that may be floating in the river?*

The buried wood floodplain structures are intended to roughen the river bank as it retreats after removal of the revetment. They will also recruit and trap other woody debris and provide complexity and variability to the retreating bank. These are important objectives that are consistent with the overall project goals. Trapping and recruiting wood either from on-site or from upstream will aid in slowing bank retreat, as well as in improving habitat values of the site.

Wood will also be buried and embedded into the buried setback revetment near its downstream end where it is likely to be exposed in the near term. The design team expects this portion of the revetment to experience the most direct attack from the river as the bank retreats. Logs will be embedded into the revetment for at least two thirds of their length or will be pinned to the revetment by the embedded logs. These logs will provide both added protection to the revetment and habitat benefits to this area where the rock revetment is most likely to be exposed.

6. *Describe how public safety considerations have been incorporated into the project design [see section 1.B.2 of Ordinance 16581] and include a description of how the six (6) key steps provided in Public Rule LUD 12-1, Appendix A. (Rule) Section V.2.A. i)-vi) have been addressed.*

The reach immediately upstream of the project site has been closed to recreational boating for some time by the King County Sherriff due to the presence of a very large log jam about 3/4 mile upstream of the project location. There are no vehicle-accessible launch points between that closure and the project site. However, informal recreation does occur in the river upstream of the project site and a study by Herrera Environmental Consultants of recreational use of this reach found significant boating activity past the project site.

The primary reason for implementing levee/revetment setback projects is to reintroduce natural habitat forming processes to the river channel, banks and floodplain. Trees will fall into the river and have the potential to create complex and hazardous jams as the channel shifts and changes shape, form and location over time. However, this reach of the Green River is of low gradient and slow velocities during any flows where people are likely to be recreating in the water. While the project

site is along the outside of a bend, that bend is relatively shallow and the pressure pushing boaters towards the outside bank is slight. The fastest current still runs in the middle of the channel and not along the bank, so river users should be able to stay away from any logs or log structures on the river bank. A portion of the existing revetment just upstream of the proposed project will be left in place. This portion of the bank will provide a "shadow" that will deflect much of the current away from the bank and the buried wood if it is exposed.

The bottom of the buried wood floodplain structures will be installed at an elevation of about El. 55' NAVD88. This is about 2 feet above typical summer flow levels. Summer flows (April through September) are typically at an elevation of about 53 to 54 feet (NAVD88). The bottoms of the structures should therefore slightly above the surface of the water and present little chance of entrapping boaters or swimmers.

Another potential hazard associated with channel migration is related to steep and instable slopes along the channel margin. Since the area is a public park, the potential exists for users to walk along the bank and either fall over or cause the lip of the bank to calve off. We plan to mitigate this hazard in several ways. First, many of the trees that need to be cut in order to construct the setback revetment will be placed on the floodplain near the river's edge. Their presence will make it more difficult for casual park users to approach the actual river bank. Plantings of native rose bushes will also be installed in these areas, further discouraging park users from approaching the bank. The buried wood floodplain structures described above, along with the trees placed on the floodplain, are also designed to interrupt the erosion process that would leave a dangerously vertical bank.

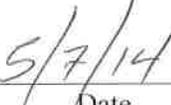
The proposed wood structures have been reviewed by both King County Engineers and Ecologists with appropriate expertise. They have also been reviewed by consulting geomorphologists and engineers from Herrera Environmental Consultants. The river bank within the project area will be monitored at least yearly by the City of Auburn to assess the potential hazard presented by any of the wood structures or by any naturally recruited trees or logs that are present on the site. If judged to be hazardous to recreational river users, the structures, trees or logs will be modified, moved or removed in order to mitigate the hazard in consultation with WDFW and other stakeholders.

7. *What is the anticipated schedule for completing project milestones (30-40% design, final design, major construction/earthmoving) and for soliciting public input?*

Preliminary design (between 30% and final design) was recently approved by the Salmon Recovery Funding Board Technical Review Committee. Final design is expected to be complete in June of 2014. Construction will begin in July, 2014.



Project Manager



Date



Supervising Engineer, Project Supervisor or Unit Manager



Date