

# INSTREAM PROJECT DESIGN CHECKLIST

## *For Design and Construction of Flood and Erosion Protection Facilities and Habitat Restoration Projects that May Include Large Wood Placement or Natural Wood Recruitment*

Project Name: WLFL0 Timberlane Revetment 2020 Repair      Project Manager: Stella Torres

River/River Mile/Bank: South Fork Skykomish River Left Bank (River mile 18.5)      Date: July, 13, 2020

Check one or both:

Project includes placement of large wood elements

Project may influence the recruitment, mobility and accumulation of natural large wood.

**Note:** If the project is comprised of emergency work, then fill out and file this form within 30 days of completion of emergency work.

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

*(Provide general information at a conceptual level)*

1. Describe the overall river management context, strategy and objectives for the river reach. Refer to pertinent plans, policies or documents pertaining to flood hazards, salmon recovery, etc.

*Timberlane Village is a community of private residences located 1.5 miles east of the Town of Skykomish in unincorporated King County. Timberlane Village is bounded to the north, west and east by the South Fork Skykomish River, which is formed at the confluence of the Tye and Foss rivers, approximately ¾ of a mile upstream of the neighborhood. The steep and narrow South Fork Skykomish River valley generates deep, fast-flowing flood flows capable of severe bank erosion and flooding. Most recently, severe flooding occurred in 2006, 2009, and 2015. Several homes were acquired following the 2006 flood event and numerous homes continue to be at significant risk of erosion and flooding. River management approaches in this river reach are informed by several plans and related documents that provide context for flood hazard management and salmon recovery.*

- *Acquisition of at-risk homes was identified in and is consistent with the primary objectives of the adopted 2006 King County Flood Hazard Management Plan.*
- *In 2014, King County completed the Risk Assessment and Recommended Actions for Timberlane Village. This assessment identified significant flood and erosion risks in the neighborhood.*
- *In 2017, King County adopted the South Fork Skykomish River channel migration zone (CMZ) study and map. All properties along the river are mapped in the severe and moderate CMZ.*
- *The Snohomish River Basin Salmon Conservation Plan (2005) provides a snapshot of this mainstem reach on pages 11-28 and 11-29. The recovery focus is to restore watershed process by restoring forest and increasing floodplain connectivity and channel complexity.*

*Based on these studies and the known flood hazards and risks, King County's primary flood risk reduction strategy in Timberlane Village is to acquire properties at risk of flooding and erosion from willing sellers. King County will continue to monitor potential river bank erosion on King County owned property that may occur in the future and take appropriate action as needed to protect key infrastructure.*

2. Describe the goals and objectives of the project and its relative importance to the success of DNRP program goals and mandates. Identify funding source(s) and describe any applicable requirements or constraints.

*The goal of the project is to modify approximately 370 feet of a privately built revetment that King County acquired in 2009). The project is funded by the King County Flood Control District (KC FCD). Specific objectives of the project include:*

- *Identify and evaluate alternatives necessary to address the failing condition of this privately built revetment. Evaluation will include feasibility (construction, access/easement and permitting), environmental impacts/mitigation, schedule, environmental improvements, cost, and design life.*
- *Develop an alternative that will improve riparian or instream habitat in this reach of river to the degree practicable when compared with existing conditions.*

- *Develop an alternative that will be acceptable to permitting agencies, stakeholders, the Tulalip Tribes and the Snoqualmie Indian Tribe.*
  - *Develop an alternative that can be permitted with sufficient time for summer 2020 construction.*
  - *Recommend a repair alternative to RFMS Gate Committee and the KC FCD for selection.*
  - *Proceed with the selected alternative.*
  - *Conduct stakeholder coordination and public outreach throughout the project cycle as specified in the public outreach plan of the project management plan.*
  - *Implement/construct selected alternative in summer/fall 2020.*
3. Describe the existing (and historic, if relevant) site and reach conditions, including structural features, channel form, and the presence of naturally-deposited large wood. Describe known utilization by salmonids and any important or unique biological or ecological attributes.

*The 300-foot privately built revetment at River Mile (RM) 18.6 was acquired in 2009 and another 95-foot privately built revetment at RM 18.55 was acquired in 2017. It is unknown exactly when the revetments were constructed, but photographs show the revetments in place by the late 1990s. They were likely constructed by the previous property owners. County-owned parcels in the site area are primarily managed as natural open space. The 300-foot nearly vertical rock revetment has over steepened construction and exposure to significant hydraulic forces. The bank slope above the revetment is slumping along most of its length, with some unstable rock on the upstream end. Tension cracks are evident in discrete locations at the upstream portion. In 2016, approximately six large loose revetment rocks on the upstream portion were repositioned to reduce on-going erosion and risk of toppling. The South Fork Skykomish Channel Migration Zone (CMZ) Study and Map (King County 2017), adopted September 7, 2017, maps severe and moderate channel migration hazard areas within the area. Over 20 trees were cut in 2013 by an unknown party near private parcel adjacent to Parcel 8649400250. The presence of large wood is extremely limited due to numerous factors, including deforestation for timber harvesting and stream cleaning that occurred most extensively in the 1970s through early 1990s. Numerous salmonids use this reach of the river due to the trap and haul program utilized at nearby Sunset Falls. Species include the federally ESA-listed Chinook salmon, steelhead and bull trout.*

4. 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?

*The land immediately adjacent to the project area, both upstream and downstream, is a homeowner's association, Timberlane Village. Roads within Timberlane Village are private and maintained by the Homeowners Association (HOA) which limits access during seasons of high rain. Eight parcels were acquired between 2009 and 2017 for flood risk reduction and public safety using KC FCD funds. The Village is residential land use along with passive recreation by landowners and their guests including fishing from the river bank. According to the King County 2013 River Recreation Study, this reach experiences infrequent use by recreationists (Synthesis of 2013 River Recreation Study, prepared by Herrera Environmental Consultants for King County, 2014).*

5. If the project includes wood placement, 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.

*The repair does not include any large wood incorporated into the design, but will include placement of up to seven trees and four snags (standing dead trees) near the edge of river after their removal during construction. The repair will remove the unstable rock above the ordinary high water mark (OHWM) along the length of the revetment (approximately 395 linear feet). The upper bank above the OHWM will be regraded from a failing, vertical rock wall, to a shallower slope, and rebuilt with coir lifts consisting of soil, vegetation and willow plantings. The coir lifts will help with plant establishment by stabilizing the soil in the regraded river bank. Deep and fast flows are expected to reshape this bank with time, including both the coir lifts and the remaining rock below OHWM. Native plantings will be installed along the top of bank. The seven trees and four snags planned for removal during the project will be placed near the edge of the river and will likely be mobilized into the river during subsequent high flows.*

6. If the project includes wood placement, what is the intended structural, ecological or hydraulic 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 large wood that may be floating in the river?

*The wood placement near (but not a part of) the revetment repair site is intended to serve an ecological function as fish habitat. State of Washington's Integrated Streambank Protection Guidelines (2003) and WAC 220-660-130 require "No Net Loss" of aquatic habitat functions when conducting bank stabilization projects. Because removal of the existing trees from the top of bank is effectively removing a future source of large wood input to the aquatic habitat, placing the removed trees into the river and planting new ones for future input satisfy this requirement under the "no net loss" framework.*

7. Is the project likely to affect the recruitment, mobility or accumulation of natural large wood, e.g., by encouraging wood deposition on or near the site or promoting bank erosion that may cause tree toppling? Describe expected site evolution and its potential effects on natural wood dynamics.

*Because of the relatively small size of this wood to be placed, it is not expected to remain in place at the project site beyond the first major flood.*

8. Describe how public safety considerations have been incorporated into the preliminary project design. For placed wood, address each of the considerations:
- a. Type, frequency, and seasonality of recreational use: *According to the King County 2013 River Recreation Study, this reach experiences infrequent use by recreationists.*
  - b. Wood location, positioning, and anchoring techniques: *Wood will not be anchored. It will be placed on the bank just above OHWM, and will recruit semi-naturally during first high flows after construction. The exact location of the low flow channel potentially changes every year, therefore location will be determined on site during construction in late summer.*
  - c. Maximizing achievement of project goals and objectives while minimizing potential public safety risks: *The repair project goals do not include wood placement per se. It is a mitigative measure integral to the environmental permitting process. The wood that will be placed is not expected to change the background wood loading in the system.*
  - d. Use of established and recognized engineering, geological, and ecological expertise: *Large wood is known to function as salmonid habitat directly (hiding cover), and to influence habitat formation indirectly through hydraulic shadow effects on water velocity and sediment sorting.*
9. Has the project been reviewed and approved by a Licensed Professional Civil Engineer? Please list other licensed technical staff who have reviewed and provided input on the design (e.g., Licensed Geologist and Licensed Engineering Geologist). Specify the Engineer of Record for the design and any other Licensed Professionals who have sealed their portion of the design plans. Were all reviews and approvals completed?

*Yes. Jessy Hardy (Engineer in Training), Darian Kis-Young (Engineer in Training) and Mark Ruebel P.E. (Engineer of Record) designed the revetment repair and will oversee the wood placement. The project is currently at 30% design. All design reviews and approvals required to date have been completed.*

10. Has the project been reviewed and approved by a King County Professional Ecologist (e.g., person with an advanced degree in aquatic and/or biological sciences from an accredited university or equivalent level of experience) if ecological benefits are an intended project objective, to evaluate the consistency of the design with project goals, existing environmental policies and regulations, and expected or known permit conditions? Specify the Reviewing Ecologist for the project. Was this review and approval completed? What is the anticipated schedule for completing project milestones (30-40% design, final design, major construction/earthmoving) and for soliciting public input)?

*Tom Bloxton, Project Ecologist, approved of the levee repair design and placement of the wood. The project is currently at 30% design. The anticipated project construction date is September-October 2020.*

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Stella Torres 7/13/2020  
Project Manager Date

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Supervising Engineer, Project Supervisor or Unit Manager Date