

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: Herzman to Camp Freeman

Project Manager: Nancy Sandford

River/River Mile/Bank: Cedar River / RM 6.3 - 6.6 / Right Bank

Date: March 29, 2022

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.

Strategy and objectives for the Herzman to Camp Freeman project (Herzman Project) were developed as part of the Cedar River Capital Investment Strategy (CIS). The CIS planning process established flood risk reduction priorities throughout the Cedar River corridor by defining flood and erosion hazards, focusing on critical “worst-first” public safety risks, and proposing projects to address these risks. The Herzman Project was identified as a high priority project and near-term action in the CIS. Following flooding in February 2020, flood damages increased risks at the downstream end of the project, while risks at the upstream end were reduced. The project concept was modified to address increased scale and urgency of risk to Southeast Jones Road, and the project remains a high priority.

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 protect SE Jones Road and neighboring homes. Objectives towards achieving that goal include:

- Repair and upgrade the Camp Freeman and Buck’s Curve Revetments using flow deflectors and bank stabilization features to restore long-term protection for SE Jones Road and reduce future maintenance costs.
- Repair damages at the upstream end of the Herzman Levee, rebuilding to establish a stable bank and protect SE Jones Road and residential property.
- Remove the downstream portion of the Herzman Levee and replace it with a smaller setback levee that will maintain or improve flood protection for residential properties while reconnecting the floodplain and fostering natural habitat-forming processes.

The project is funded by the King County Flood Control District. Constraints on project implementation include:

- The need for easements from private landowners as well as coordination of right-of-way use with KC Roads and utilities.
- The need for multiple permits which may require lengthy review and approval processes.
- Limits on construction timing for all instream activities.

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.

A major flood in February 2020 led to an avulsion of the Cedar River immediately upstream from the project area. This has shifted flood and erosion risks in the project area, and the reach continues to evolve and adjust to the new mainstem channel alignment. Ongoing bank erosion has washed away a large portion of the lower bank area in the downstream end of the project area. Staff have observed a significant number of trees undermined by bank erosion or transported into the reach from upstream since the flood. Retention time varies, but high-water events typically alter these log features.

The Herzman project is being designed in coordination with several adjacent projects in the reach. The Cedar River Trail Site 2 Revetment (CRT2), located on the left bank in the project reach, was damaged by the 2020 flood. Repairs and improvements to CRT2, which provides critical protection for the trail, highway, and underground utilities, were started in 2020 and will continue through 2022. The Riverbend Levee Setback and Floodplain Restoration project is a large-scale habitat restoration project located on the left bank within and immediately upstream from the Herzman project and is scheduled for construction in 2022.

Chinook, coho and sockeye salmon, rainbow trout/steelhead, and coastal cutthroat trout utilize the Cedar River for spawning and rearing. Chinook salmon and steelhead are protected as threatened species under the Endangered Species Act.

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?

Properties adjacent to this right bank project are zoned for rural residential use with a density of one unit per 5-acre parcel (RA-5). There is also a homeowner's association community-owned parcel. There are seven homes behind and downstream from the Herzman levee. Across the river is the CRT2 revetment, directly behind which is the Cedar River Trail and then State Route 169/Maple Valley Highway.

The adjacent Riverbend project is on King County-owned natural area lands. The Cedar River itself is regularly used for recreational purposes. Floating the river in tubes or small rafts is a popular summer recreational activity.

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.

Four flow deflector structures consisting of large wood (logs), piles, and ballast rock are planned for construction along the toe of the rebuilt Camp Freeman and Buck's Curve Revetments. The deflectors will be spaced at approximately 100-foot intervals along the revetment. Each flow deflector will have a roughly rectangular shape measuring approximately 40-feet wide. Piles and ballast rock will support the structures and buried rock at the toe of each structure will provide scour protection. The deflectors will have nine layers of logs, with alternating layers angled upstream and parallel to flow. The top of the flow deflector structures will be roughly level at elevation 120 feet. Bumper logs will be placed at the leading edge of the deflectors at summer flow elevations.

In addition to the flow deflector structures, trees removed during construction will be placed in the recessed spaces between the flow deflector structures to enhance slow water edge habitat. River velocities in these spaces should be minimal due to the effect of the flow deflector structures and the increased roughness from the trees.

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 intended structural and hydraulic function of the flow deflectors is to shift high flow velocities away from the revetment and toward the center of the river channel. This will reduce the risk of erosion damage to the revetment and protect SE Jones Road. Areas between the large wood structures will accommodate alcoves for slower-moving water that provides habitat and flood refuge for aquatic species to mitigate the project's aquatic impacts.

The project is not intended to recruit or trap additional large wood. The flow patterns created by the deflectors should create conditions that encourage wood to pass through the main channel.

- 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.**

Following the 2020 flood, evolution of the river channel throughout this reach has been ongoing. Naturally fallen trees from the eroding banks, as well as upstream sources, have been observed lodging in the mainstem channel in the project reach, with a range of residence times. This reach may continue to recruit or accumulate natural large wood during flood events. However, the flow deflectors should not increase this likelihood, and may create conditions that encourage wood to pass through the main channel more easily.

- 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;**

Floating the Cedar River in tubes or small rafts has historically been a popular summer recreational activity in this area. However, since the February 2020 flood and subsequent channel evolution, the reach has contained a high level of naturally occurring wood that poses a significant risk for instream recreational users. As a result, recreational use is unknown, and may be inadvisable.

- b. Wood location, positioning, and anchoring techniques;**

The three upstream deflectors are buried in the bank, set back from the current summer low-flow water edge, but are likely to become exposed due to continued site evolution and erosion. Bumper logs that floaters can easily push off from, should they contact the structure, are being designed for the upstream face of the log deflectors at typical summer water surface elevations.

- c. Maximizing achievement of project goals and objectives while minimizing potential public safety risks;**

Public safety has been a design consideration from the beginning of project design. The current design strives to use wood to reduce erosion risks and improve habitat while minimizing potential public safety risks to recreational floaters.

- d. Use of established and recognized engineering, geological, and ecological expertise.**

The project team consists of licensed professional engineers and engineering geologists, and ecologists utilizing established and recognized design methods for these types of projects.

- 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?**

Herrera Environmental Consultants are providing the lead design engineer and Engineer of Record for the project. Reviews are being done by a team of licensed engineers, geologists, and geomorphologists that includes Tracy Winjum, P.E., Chris Brummer, P.E., L.E.G., Naod Sebhat, Judi Radloff, L.E.G. and Mark Beggs, P.E. All reviews and approvals of the 30% design 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)?

The project has been reviewed by Thomas Bannister and Kerry Bauman (Project Ecologists) to evaluate the design with regard to project goals, environmental regulations, and expected permit conditions. 30% design of the project has recently been completed and approved, final design is anticipated to be complete in the first quarter of 2023, and major construction will take place during the 2023 or 2024 fish window, from mid-July to mid-September. Public input will be solicited at appropriate stages in the design process, including at the 30% design stage via posting of this Project Design Checklist and the 30% design plans.



4/19/2022

Project Manager

Date

Chris Brummer

4/19/2022

Supervising Engineer, Project Supervisor or Unit Manager

Date