

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 Elliott Bridge Reach Off-Channel Habitat And Floodplain Reconnection Project Manager Jon Hansen

River/River Mile/Bank RM 5.2 – 5.6, both banks Date January, 2015

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.

Existing planning documents that specifically define management goals and strategies for the Cedar River include:

- Lower Cedar River Basin and Nonpoint Pollution Action Plan (King County Watershed Management Committee, 1997);
- Lake Washington/Cedar/Sammamish Watershed (WRIA 8) Near-Term Action Agenda for Salmon Habitat Conservation (Lake Washington/Cedar/Sammamish {WRIA 8} Forum, 2002);
- Final Lake Washington/Cedar/Sammamish Watershed (WRIA 8) Chinook Salmon Conservation Plan (Lake Washington/Cedar/Sammamish {WRIA 8} Forum, 2005);
- 2006 King County Flood Hazard Management Plan (King County Department of Natural Resources and Parks, 2006—updated in 2013.)

Both the Lower Cedar River Basin and Nonpoint Pollution Action Plan and the King County Flood Hazard Management Plan identified the need to remove houses that experienced frequent flooding from downstream of the Elliott Bridge (then located in the middle of the present project area) and restore up to 16 acres of flood storage and habitat in this area. The houses identified and several others have already been removed and this project helps to restore flood storage and habitat in the area, consistent with the objectives identified in that plan.

The Lake Washington/Cedar/Sammamish Watershed (WRIA 8) Near-Term Action Agenda identifies loss of channel complexity and connectivity as a factor contributing to decline of Chinook salmon in the system and calls for reconnection/restoration of off-channel habitat, removal of bank-hardening structures from the floodplain, and identification of opportunities to safely increase large woody debris within the system.

The Final Lake Washington/Cedar/Sammamish Watershed (WRIA 8) Chinook Salmon Conservation Plan identifies protection and restoration of riparian vegetation as a source of large woody debris to the river and direct addition of woody debris to create pools and riffles as technical priorities on its Tier 1 Action Start-List.

In general, all of the planning documents addressing the Cedar River corridor and the Elliott Bridge Reach specifically identify the need to remove flood-prone structures from the floodplain and, where possible, remove structures that restrict the migration and complexity of the river channel. These actions allow natural habitat-forming-processes, including recruitment of woody debris to the mainstem channel, to improve conditions for fish.

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 project will create wetland and aquatic habitat and restore floodplain functions within the Elliott Bridge Reach (EBR) of the Cedar River to satisfy mitigation obligations transferred from WSDOT to King County through the federally authorized In-Lieu Fee Mitigation Program (aka MRP). Specific goals and objectives of the project include:

- A. Create wetland, off-channel, in-channel and floodplain habitats that satisfy mitigation obligations transferred to King County from the WSDOT SR 520 project.
- B. Address potential impacts to recreational safety.
- C. Maintain current level of flood hazard protection to adjacent properties.
- D. Implement a project that is compatible with future reach wide habitat and flood hazard reduction projects.

Several of these objectives involve placing large wood in the floodplain, backwater and directly in the channel of the Cedar River. Most of these large wood pieces are far from the low-flow channel and are unlikely to be encountered by recreational users. However, one requirement of the mitigation obligation is the construction of a wood structure that creates a scour pool and cover for adult salmon in the mainstem channel of the Cedar River. Such habitats are increasingly rare in the Cedar River due to its confinement by levees, lack of natural large wood and loss of riparian sources of large wood.

The requirement that the structure form a scour pool means that the structure needs to interact with relatively high-energy currents and precludes locating the structure on the inside of a bend or other sheltered area of the river where it would be less likely to be encountered by recreational river users. The requirement that the structure provide instream cover for fish means that it needs to intrude into the active low-flow channel for fish to be able to use it. Behavioral patterns of adult salmon in the Cedar River indicate that the scour pool and cover will be of most benefit if it is located in a reach of the river heavily used for spawning. All of these factors were considered in siting the scour structure, which will be located along the right (north) bank of the river near the end of an existing levee and revetment (Orting Hill levee). A rock diversion structure will be constructed upstream of the scour structure to deflect river users around the scour structure.

Mitigation obligations also require the placement of 51 logs within a backwater channel to be constructed off the left (south) bank of the river. These logs will be anchored by burying them in the bank of the backwater channel. These logs are very unlikely to be encountered by recreational river users.

Five more logs, likely in the form of full-sized coniferous trees, will be placed on the right (north) bank in an area where "aquatic margin habitat" will be enhanced as a requirement of the mitigation plan. These logs will be shoreward of the low flow channel with their tips facing riverward and slightly downstream. The location is on the inside of a bend in the river and they are unlikely to present a hazard to recreational river users.

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.

Existing and Historical Conditions

The Elliott Bridge Reach is so named for the bridge that used to cross over the Cedar River around the middle of the present project site. The old Elliott Bridge was removed and replaced by the new 154th Place SE Bridge which is located about 1,000 feet upstream and at the upstream boundary of the present project site. The abutments and elevated approaches to the former bridge are still present in the floodplain on either bank and enforce a constriction in the channel here.

Both sides of the river were, until recently, occupied by residential structures which were protected by levees and revetments. The Orting Hill Levee presently runs along the right (north) bank from the new 154th Street Bridge downstream to the abutment of the old Elliott Bridge. This levee/revetment restricts channel migration and, to a limited degree, prevents flooding of the properties landward. However, these properties still experience relatively frequent flooding and so were purchased by King County as part of its Flood-Prone Property Buyout program over the last several years. All of the residential structures in this area have since been removed.

Another levee, known as the Elliott Bridge Levee, begins on the left (south) bank about 1,000 feet downstream of the 154th Pl. SE Bridge and forces the river to turn slightly to the north. Formerly, this levee constrained the river as it approached the old and now-removed Elliott Bridge and it ends after about 500 feet at the remaining concrete abutment and fill prism that was the southern approach to the old bridge. A corresponding fill prism exists across the river on the right bank. The left (south) bank is unprotected and relatively natural downstream of these old bridge approaches and abutments.

The Punnett Briggs Revement armors the right (north) bank beginning about 400 feet downstream of the old bridge approaches and protects several residential structures landward. Between the old bridge approaches and this revetment are two remaining residential structures with relatively low, unprotected banks.

The historical presence of bridges over the river in this location (including a predecessor of the Elliott Bridge that was located near the upstream end of the Punnett Briggs Revement) and the use of levees and revetments to restrict channel migration in their vicinity has caused the river channel to become narrower and simpler through this reach. Historical sources going back to the original Government Land Office maps of the late 1800's show that the channel used to migrate frequently across its floodplain, especially to the south of its present location. The narrower and deeper channel that has resulted also has steeper, often rock-protected banks, all of which have decreased the frequency with which trees mobilized by the river stick and persist in this reach of the river. During the planning phases of this project, virtually no large wood was present in the channel in this reach of the river.

Fish Use and Ecological Attributes

The Cedar River is used by coho, sockeye and ESA-listed Chinook salmon, coastal cutthroat, rainbow and ESA-listed steelhead trout, and other species. The greater Elliott Bridge Reach (extending upstream and downstream from the project area) contains heavily-used salmon spawning grounds (just downstream of the 154th Pl. SE bridge), previous side/backwater channel restoration projects (downstream of the project site), and log jams resulting from landslides (downstream of the project site).

In addition to the levees and revetments described above, there are numerous residential structures located immediately on the river channel banks upstream of the 154th Pl. SE Bridge and more levees and revetments both upstream and downstream of the project site. The project site is just outside the city limits of Renton, Washington and the entire lower and middle Cedar River have been subject to residential, commercial and infrastructure development for well over 100 years. The resulting river is constrained and constricted for most of its length and lacking in off-channel habitats that are critical for rearing of several species of juvenile salmonids.

Development of the Cedar River valley and floodplain has also affected riparian vegetation and function. Few stands of mature conifer trees remain on the river banks and consequently comparatively few such trees are recruited and mobilized by the river during floods and storms. Degradation of riparian vegetation communities, along with residential, commercial and infrastructure development and restriction of channel migration have resulted in a mainstem channel that is simplified and lacks the hydraulic diversity that would be present in a channel allowed to migrate naturally.

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?

Although most of the land adjacent to the river within the project area is owned by King County as a result of previous flood buyout programs, there are several remaining privately-owned parcels fronting the river on either bank within the general project area. Precautions have been incorporated into the design of the project to prevent additional flooding or channel migration risk to these properties. Ron Regis Park, owned and operated by the City of Renton, is located immediately downstream of the project area. The river front of Ron Regis Park is mostly natural and provides good habitat. Heavily used portions of the park, such as ball fields, are located well away from the river. The Cedar River Trail, constructed on an abandoned railroad grade, runs parallel to the river along State Route 169 and is also well away from the river in this section.

Many recreational floaters use the Cedar River, primarily but not exclusively in the summer months. Studies of recreational use of the Cedar River were conducted by King County in 2010 and again in 2013. These studies showed that recreational use of the Elliott Bridge Reach to be among the highest of the whole river. Cameras set up to characterize river use in the reach extending from the 154th Pl. SE Bridge downstream through Ron Regis Park during the summer recorded 1,541 individual users in 653 different groups. Of the 1,368 vessels in those groups,

almost 80% were inner tubes and only 13.5% had paddles or oars to assist with navigation. Less than 16% wore life vests or other personal floatation devices (*Synthesis of 2013 River Recreation Studies*, Herrera Environmental Consultants, 2014).

The recreational user study cited above makes it abundantly clear that many users who are potentially unaware of river safety hazards or best practices and who lack the basic equipment required to safely navigate a river use this reach of the Cedar River. Furthermore, landslide activities just downstream of the proposed project site have deposited numerous trees and logs in the river channel that could pose hazards to recreational users. The project design team has taken great caution to minimize any additional hazard to river users resulting from implementation of this project.

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 majority of the large wood to be installed as part of this project will be placed far from the mainstem river channel and is very unlikely to be encountered by recreational river users. However, a "Scour Structure" will be constructed on the right (north) bank of the river about 150 feet downstream of the 154th Pl. SE Bridge. As described above in the answer to Question 2, this structure must be located where it will interact with current of significant energy in order to produce the required function (a scour pool within the main channel). The structure will consist of 14 logs with rootwads, most of which will be oriented parallel to the channel with rootwads facing upstream. The logs will be stacked three abreast and three high with several oriented perpendicular to the rest and connecting the structure to the adjacent river bank. This complex of logs will be anchored in place using 9 timber pilings driven or drilled into the river bed. The structure will be secured to the adjacent rock levee face to reduce the potential for flows going between the structure and the river bank. The entire structure will protrude into the low-flow channel about 15 feet from the toe of the right bank.

The potential hazard that such a structure on its own would present to recreational river users is well recognized by the project design team. To reduce this hazard, a rock deflector structure will be placed upstream of the log complex to deflect river users around the complex. The deflector structure, to be constructed of large and small boulders and cobbles, will extend to an elevation sufficient to deflect river users at flows up to 1,200 cubic feet per second (c.f.s.), well above flow levels at which most recreationists use the river.

The 1,200 c.f.s. level was selected by analyzing patterns of river use by recreational boaters, river flows and air temperature, and by conferring with river rescue experts with King County Sheriff Marine Unit and representatives of the recreational boating community. While highly-skilled kayakers may float the river at almost any flow level, the vast majority of recreational users float only during the late spring and summer when air temperatures are relatively warm (higher than 69 degrees). The King County Sheriff reports that most river rescues and accidents occur during the spring, when air temperature rises, but water temperatures are lower and flows are higher. To be conservative, the design team examined 20 years of air temperature and water flow discharge data for May and June and found that flows rarely (10% of days) exceeded 1200 c.f.s. on days when the air temperature exceeded 69 degrees. Data from King County's study of recreational use of the river also shows that river users using inner tubes or air mattresses very rarely use the river until later in the season, typically the end of June or July, when flow levels are typically much lower. The 1200 c.f.s. level is also consistent with flow levels recommended for boating by American Whitewater, an organization that typically caters to more skilled paddlers. They recommend floating the Cedar River at flows between 400 c.f.s. and 1200 c.f.s. (<http://www.americanwhitewater.org/content/River/detail/id/2078/>).

The design of the scour structure was developed and refined using modelling techniques that enabled the designers to increase the ability of the structure to scour a pool while reducing its intrusion into the river. Modelling shows that scour can be increased by building the structure higher, rather than wider. By doing so, the structure interacts with high-energy flows that accompany high river flows which produce significant scour, while reducing interaction with low-energy flows present when most recreational users are in the river.

In addition to the scour structure, five large trees will be placed along the river margin on the right bank between 600 and 800 feet downstream of the 154th Pl. Bridge. This location is on the inside of a bend in the river where recreational users propelled by the river current will be unlikely to encounter them. These trees will be just outside

of the low-flow channel and oriented with their tips pointed toward the river and angled slightly downstream. The trees will begin to interact with river flows at around 300-400 c.f.s.

Approximately 51 pieces of large wood will be placed in the backwater channel to be constructed on the left (south) bank. These logs and trees are intended to provide complexity and cover for fish using the backwater channel. Most of these pieces will be buried in the bank of the backwater channel for most of their lengths with the root ball end protruding outward into the backwater channel. Eight large trees will be buried so that their trunks span the bottom of the backwater channel with their tops and root balls buried in opposing banks. The backwater channel will be fed by groundwater and will have very slow currents during any but overbanking flood flows. Recreational river users are very unlikely to encounter any of the large wood in the backwater channel due to its inaccessibility to the mainstem river.

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 scour structure is intended to cause formation of a scour pool in the main channel of the river and to provide cover for adult salmon. Adult salmon use cover habitat such as deep pools or wood complexes that are near spawning areas for rest and safety while preparing to spawn. These types of habitat are increasingly rare in the Cedar River, especially in proximity to prime spawning areas, such as those located just downstream of the 154th Pl. SE Bridge.

Construction of the scour pool fulfills a specific requirement of the mitigation for the SR 520 Bridge Replacement. The agreement which transfers the responsibility for these mitigation requirements to King County states that the County will, "(p)rovide an engineered log jam (or similar structure) to form a scour pool(s) suitable for adult salmon holding habitat. Wood should be exposed to the normal range of flows and withstand 100-year flow conditions." The requirement that the structure form a scour pool necessarily entails that the structure interact with currents of sufficient energy to create that scour. For this reason, the structure cannot be located on the inside of a river bend or other more quiescent site where boaters drifting on the current are less likely to encounter it.

The scour structure may recruit additional woody debris. This may enhance the ecological functions provided by the structure, but could also pose risks to recreational river users. King County, in coordination with relevant regulatory agencies, will assess and, if necessary, manage recruited wood to maintain safe passage through the project reach for river users.

The five large trees to be placed on the river margin of the constructed wetland are intended to provide cover and complexity to the low-angle, frequently inundated bank area on the inside of the river bend. These areas are used by juvenile salmon, including ESA-listed Chinook, during their rearing stages in the river. These trees and the constructed wetland as a whole may recruit additional wood that floats in the river, especially during floods when these areas are inundated and will form a quiescent backwater. Wood floating in the river may collect here as flood flows retreat. This would be a relatively safe place for wood to collect as recreational users are unlikely to encounter it.

Approximately 51 pieces of large wood will be placed in the backwater channel on the left bank. These logs and trees are intended to provide complexity and cover for fish using the backwater channel. Their placement is also a specific requirement of the agreement which transfers the responsibility for mitigation requirements to King County. Neither the backwater channel nor the wood structures placed in it are likely to recruit additional large wood due to their isolation from the mainstem 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.

The project is not designed to encourage the recruitment or accumulation of large wood, but both are possible. The scour structure to be constructed on the right bank may accumulate large wood on its upstream-facing edge. Wood that racks on the scour structure will be monitored and moved or removed, in cooperation with regulatory agencies, if it is deemed to pose an unacceptable hazard to recreational users.

Large wood may also accumulate on the edge of or within the wetland area to be constructed on the right bank. This low-lying area will be frequently inundated and wood that floats into the wetland during high water may be left there. Wood that accumulates in the wetland is unlikely to present a hazard to recreational river users as this area is on the inside of a river bend and is dry during most flows when recreational boaters use the river. However, wood that accumulates in the wetland will also be monitored and may be moved if it presents an unacceptable safety hazard.

None of the project elements are designed to encourage or allow bank erosion or channel migration that might recruit large wood to the river.

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;

Many recreational floaters use the Cedar River, primarily but not exclusively in the summer months. Studies of recreational use of the Cedar River were conducted by King County in 2010 and again in 2013. These studies showed that recreational use of the Elliott Bridge Reach to be among the highest of the whole river. Cameras set up to record river use in the reach extending from the 154th Pl. SE Bridge downstream through Ron Regis Park during the summer recorded 1,541 individual users in 653 different groups. Of the 1,368 vessels in those groups, almost 80% were inner tubes and only 13.5% had paddles or oars to assist with navigation. Less than 16% wore life vests or other personal floatation devices (*Synthesis of 2013 River Recreation Studies*, Herrera Environmental Consultants, 2014).

The recreational user study cited above makes it abundantly clear that many users who are potentially unaware of river safety hazards or best practices and who lack the basic equipment required to navigate a river safely use this reach of the Cedar River. The project design team has taken great caution to ensure that these users aren't further endangered by implementation of the project.

b. Wood location, positioning, and anchoring techniques;

Most large wood (greater than 8" in diameter and 15' in length) placed as part of this project will be anchored by either burying a sufficient portion of the wood securely into the earth or, in the case of the right bank scour structure, by securing it to wooden pilings driven into the river bed. With the exception of the right bank scour structure, all large wood placed will be in areas unlikely to be encountered by recreational river users (inside of river bends, in the floodplain or in the backwater channel isolated from the mainstem channel). Wood placed in the wetland closest to the mainstem channel will be oriented with their tips pointed toward the channel and angled downstream to minimize their potential for hazard. These pieces will be anchored by securing them to large boulders of sufficient mass to ballast the wood and keep it from being mobilized.

As described above, the right bank scour structure must interact with high energy currents in order to perform its objective of creating a scour pool in the mainstem channel. This precludes locating the structure in more isolated areas where it would be less likely to be encountered by river users.

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

Many of the project goals and objectives can be achieved without placing large wood in areas where it will be encountered by recreational river users. Wood placed in the backwater channel or in the right bank wetland are very unlikely to be encountered by river users because these areas are physically isolated from the mainstem channel.

The specific objective of the right bank scour structure is to create a deep scour pool with nearby cover for adult salmon to use while preparing to spawn. These objectives cannot be achieved without placing the structure in a location where it will interact with high-energy flows and in an area near to known salmon spawning beds. The very flows that will interact with the scour structure to scour the river bed may also carry recreational river users. The design team considered many locations before deciding on the present site just downstream of the 154th Pl. SE Bridge. This location was chosen for several reasons that decrease the hazard it may present:

- The location is adjacent to a rock levee/revetment that is unlikely to ever be removed; therefore there is little chance of the river migrating around the structure and changing its location relative to the river channel;
- The location has a long sight-line, enabling river users to see it from far upstream and navigate away from it;
- While the flows at the proposed structure location are sufficient to create scour, they are still spread out sufficiently across the channel that river users will not be forced into the structure.

Modelling has shown that a structure that extends vertically higher rather than horizontally into the channel can produce as much or more scour than one that extends further out into the channel. This enables the structure to achieve its objective of causing a deep scour pool within the main river channel without obstructing a significant portion of the channel, which would pose a greater hazard to river users.

The rock deflector structure upstream of the scour structure is designed to deflect river users away from the scour structure, itself. Its location is sufficiently close to the structure to prevent river users from being carried around it and into the scour structure, but far enough upstream to prevent it from being undermined by the scour pool caused by the scour structure.

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

The team that has designed the Elliott Bridge Reach Off-Channel Habitat And Floodplain Reconnection Project includes three Licensed Professional Civil Engineers and a Licensed Engineering Geologist, as well as two professional ecologists, all with many years of experience designing projects in and around rivers and streams. Extensive analysis has been applied to each element of this project design to ensure project success in both achieving ecological goals and minimizing any hazard to the public.

9. Has the project been reviewed and approved by a Licensed Professional Civil Engineer? Please list other licensed technical staff that 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?

The Engineer of Record is William Mansfield, P.E. Two additional Licensed Professional Engineers worked on the design of the project, and a third from King County's River and Floodplain Management Section provided design review throughout the design process. A Licensed Engineering Geologist also worked extensively on the project design. Licensed Professional Land Surveyors provided base maps of existing topography and land features. A Licensed Engineering Geologist provided analysis of well borings to characterize subsurface conditions. Numerous consultants that contributed to the project design also possess professional licenses and certifications.

Final seals and approvals will not be granted until the Final Design Plans 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 Manager of the Elliott Bridge Reach project is a King County Professional Ecologist and is the Reviewing Ecologist for this project. Two additional King County Professional Ecologists worked extensively on the design and permitting of this project. The Reviewing Ecologist has reviewed the current plan set. Final design approval will not occur until the Final Design Plans have been completed.

30% Design was completed during October, 2014. Final design is scheduled to be completed in March of 2015. Construction will begin in summer, 2015. Formal public review and comment will be solicited in January, 2015.

The design team has already engaged members of the recreational boating community to discuss specific design parameters. These individuals have provided numerous suggestions for increasing the safety of the proposed

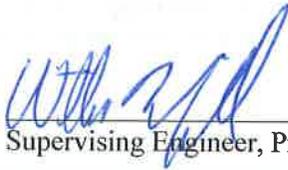
structures, many of which have been incorporated into the designs. They have been very helpful in identifying flow levels at which recreational users are likely to be in the river and specific orientations of log structures that decrease their potential hazard.



Project Manager

1-5-15

Date



Supervising Engineer, Project Supervisor or Unit Manager

1-5-15

Date

II. Pre-Construction Information (70% or 100% design with permits) *These questions relate to the designed and permitted project. Information should include input resulting from permit review process, SEPA, boater safety meetings and any other stakeholders.*

11. Have any answers provided in Section I at the Preliminary Design Phase changed in the interim? If so, provide the new answers and the rationale for the change.

No. The answers provided in Section 1 above are all still an accurate reflection of site conditions and the project design. The one notable change relates to the schedule for the proposed work. Although the majority of the project will be constructed in 2015, the project is now being phased to delay construction of the scour structure located in the mainstem of the Cedar River until 2016. The decision to phase construction was based on meetings and verbal feedback on the plans received from recreational safety advocates and resource/regulatory agencies. The additional time is intended to provide an opportunity to work through final details of this feature with stakeholders and to ensure input and concerns are fully considered.

12. What regulatory review or permits are required for the project (e.g. HPA, Clearing and Grading permit, COE permits)? List any conditions or requirements included in the permit approvals relevant to placement of large wood in the project.

The project required local, state and federal permits including:

- King County - Clearing and Grading, Shoreline Exemption, Flood Hazard Certification, Special Use Permit from KC Dept. of Transportation
- State - Hydraulic Project Approval (HPA), NPDES Permit, Section 401 Water Quality Certification and Aquatic Use Authorization
- Federal - Section 404 Nationwide Permit 27, Endangered Species Act Concurrence, Section 106 National Historic Preservation Act Compliance

Relevant Permit Conditions – King County is obligated through mitigation plans and agreements to incorporate large wood and a mainstem scour structure into the project. Although these requirements were originally conveyed through federal and state permits, they are summarized in the text of the HPA permit (attached). HPA conditions 13 and 14 require wood placement within the created habitat areas and specify that all placed wood must extend a minimum of 1/3 into the low flow channel.

13. What specific actions or project elements were employed to address public safety in the final, permit-approved design?

Public safety has been a primary consideration in the design of the project from the beginning. Great care has been taken to evaluate potential hazards and to adjust the design to achieve the intended function while minimizing potential risk and hazard. The most prominent feature includes a rock deflector intended to deflect recreational users away from the scour structure at recreational flow levels. Wood placement elsewhere has also been sited and oriented to minimize potential hazards.

14. Describe how the project team solicited public input on the preliminary design. Describe the input received from the public and how, if appropriate, the project team has responded to this input.

Members of the project team have proactively sought input on the project from the public, regulatory agencies and recreational safety advocates. In addition to posting plans and project information on the project website, attending public meetings and sending direct mailings out to residents, the team has held specific meetings with key stakeholders to obtain feedback. Representatives from the team have met on-site with members of the River Safety Council to review plans and discuss safety concerns, as well as project obligations. A similar meeting was held with staff from regulatory and resources agencies. Input received was largely focused on the right bank scour structure

which is of keen interest to all parties. Input on the project has been used to revise the design in numerous ways, including the inclusion of additional safety elements (rock deflector) and revised placement of wood (location and orientation) within the project limits.

The project team will continue to work with the public on the design of the right bank scour structure that is slated for construction in 2016.

15. Describe any additional design modifications or mitigating actions that were or will be taken in response to the public comments.

Project design has been modified in response to the input received from the public including the configuration of a rock deflector upstream of the planned right bank scour structure, reorientation of large wood placed on the right bank and strategically placing another wood cluster at the mouth of the backwater channel and along the left bank. Design of all of the features considered flow levels, river position, sight distance and other factors to maximize achievement of project goals and objectives while minimizing potential hazards to the public.

16. Will further educational or informational materials be made available to the public to heighten awareness of the project (e.g., public meeting, press release, informational website, or temporary or permanent signage posted in the vicinity of the project)? If so, explain.

Yes. Information related to the project will continue to be distributed through the project website, public meetings, direct mailings and press releases as appropriate. A press release will be made in advance of construction this summer, with updates as necessary to track progress. Following construction, signs will be placed upstream to alert users to the changed river conditions. The project will continued to be monitored and results shared with the public via the County websites and updates at the annual Cedar River meeting and/or Cedar River Council meetings. If hazards develop, a press release will be published and the County river hazard webpage will be updated to advise users and appropriate signage will be placed upstream.

17. If the project is expected to influence the recruitment, mobility or accumulation of natural wood, has a Public Safety Management Plan been completed?

Yes. A plan for addressing potential hazards that may evolve has been developed for the site.



Project Manager

5/5/2015

Date



Supervising Engineer, Project Supervisor or Unit Manager

5/5/2015

Date