Project:	**C9727 - I-405, Brickyard to SR 527 Improvement Project**
Document Name:	**BY-CRE-01827_009727_SUB_17.02_Package 8 Final Fish Passages - Juanita Creek**
Submittal Date:	**1/28/2025**
Due Date:	**2/11/2025** **COB**
Reviewer:	**Jason Pang (JP), City of Kirkland (COK), Gabe Ng (G. Ng), Chris Vondrasek (CV), Sam Michels-Boyce (SMB), Darrell Sofield (DS)**
Document Lead:	

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1	EFP5-13 & 14	JP		Per GDM 15-4, 4 foot level benches are required in front of retaining walls. Please adjust contours at the wingwalls to provide required bench if not provided.						
2	I-405 MP 21.94 Juanita Creek Fish Passage Project – Flood Risk Assessment. Throughout document	COK-KJ		Based on how the detention facility was represented in the model (by a lower peak flow value modeled under steady state for existing conditions), additional textual clarifications should be included throughout the FRA for the potential effect this has for any results comparisons upstream of the crossing. The attenuated peak flow utilized for existing conditions was based on flow released by the detention facility, so it does not accurately reflect water surface changes throughout the upstream reach.						
3	I-405 MP 21.94 Juanita Creek Fish Passage Project – Flood Risk Assessment. Throughout document	COK-KJ		The City of Kirkland (2022) reference was not produced by NHC and is not a City document either. The reference should be updated to reflect the actual author of the memo.						
4	I-405 MP 21.94 Juanita Creek Fish Passage Project – Flood Risk Assessment page 2	COK - KJ		As part of the FRA, the template must consider and analyze compliance with Kirkland Code, including Chapter 90.70 Stream Modification of the Kirkland Zoning Code. Section 5, Decisional Criteria, of this chapter includes providing information to demonstrate no adverse impacts on drainage, stormwater detention capabilities and base flood storage volume and function, will not increase velocity upstream or downstream, will not increase sediment load upstream or downstream, and will not result in unstable geologic and soil conditions and close conditions or create an erosion hazard or contribute to scour actions. The City would anticipate this would include a downstream analysis will extend to at least the NE 141st Street culvert, survey information will be updated such that there is a reasonable channel bottom that can then be used to evaluate risk of overtopping (in the current model there is an abrupt break between survey data and LIDAR data downstream of the culvert).						
5	I-405 MP 21.94 Juanita Creek Fish Passage Project – Flood Risk Assessment pages 15 and 17	COK - KJ		Page 15 notes that there will be a 1.15 ft rise in the 1% AEP water surface elevation at Station 1+42, and shows this rise in Figure 9. In addition, larger rises than this, upward of 1.4 - 1.6 feet occur within the domain of the hydraulic model further downstream. Neither of these are currently addressed within the FRA. The FRA contradicts the information provided and states the project does not cause an average rise over 1 foot in the summary on page 17. These areas should be mentioned and addressed within the FRA.						
6	I-405 MP 21.94 Juanita Creek Fish Passage Project – Flood Risk Assessment page 17	COK-JJG		The rise in downstream water surface elevations is likely to cause increased bank erosion and channel instability. Provide analysis of this situation - where will the eroded sediment settle, and what will be the impacts on flooding and habitat?						
7	EFP5-01, EFP5-04 (but see next comment re language), EFP5-07	COK-JJG		These sheets note that the instream pond control structure is to be abandoned/removed. Update callout to state removed, the structure should not be abandoned.						
8	EFP5-03	COK - KJ		There is a private storm drainage line within COK limits on the west side of the freeway that enters from Bothell, goes through private property, and discharges near the existing culvert to be removed/abandoned downstream of the I-405 culvert crossing. Will this storm drainage line be maintained with the project and regrading in this area?						
9	EFP5-04	COK-JJG		This sheet states " abandon/remove inline detention facility" . Language on this sheet should be consistent with other sheets that state that "existing instream pond control structure to be abandoned/removed". All sheets should callout the control structure being removed.						
10	EFP5-07	COK-KJ		Deformable grade control references detail 2 on sheet EFP5-16. There is no detail for deformable grade control on this page. Reference should be updated.						
11	EFP5-12	COK-KJ		Deformable grade control appears to referencing the wrong note (says "see note 13"). This should be updated to note 12.						
12	EFP5-00 through EFP5-29	COK-JJG		There still does not appear to be mention of an access road, use of the existing access road, or any other means of physically getting to the project on the upstream side of I-405.						
13	I-405 MP 21.94 Juanita Creek Draft Final Hydraulic Design Report November 2024, page 5	COK-JJG		WSDOT is not responsible for the inlet to the control structure and the 48" pipe on the upstream side of I-405. Therefore they would have no record of maintenance at this location. Kirkland has provided maintenance records for this location. - note sediment/debris and maintenance issues as contained in those documents.						
14	I-405 MP 21.94 Juanita Creek Draft Final Hydraulic Design Report November 2024, page 22	COK-JJG		The statement "The majority of fine sediment that does migrate from upstream will be transported as wash load and deposit near the mouth of Juanita Creek at Lake Washington" needs further investigation and explanation. The City is concerned as sediment deposition in Juanita Creek near Lake Washington (in Juanita Beach Park) is already an on-going concern. Additional sediment deposition will aggravate existing concerns with a recently-created off-channel wetland. Consider removing fine sediment within proposed flooded area to reduce delivery of this fine material to the lower reaches of Juanita Creek.						
15	I-405 MP 21.94 Juanita Creek Draft Final Hydraulic Design Report November 2024, page 22	COK-JJG		The statement " As described in Section 7.2, Juanita Creek may be at risk for long-term degradation under proposed conditions..." needs further evaluation. It seems inconsistent that the project area is not likely to degrade, but the overall channel is set to degrade. And how does this interact with the deformable grade control that is shown on sheet EFP5-12?						

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16	EFP5-12	COK-JJG		Note 13, which appears to be related to the deformable grade control, appears to mislabeled - looks like this should be Note 12.						
17	I-405 MP 21.94 Juanita Creek Draft Final Hydraulic Design Report November 2024	COK-KJ		The City of Kirkland (2022) reference was not produced by NHC and is not a City document either. The reference should be updated to reflect the actual author of the memo.						
18	I-405 MP 21.94 Juanita Creek Draft Final Hydraulic Design Report November 2024, page 27	COK-JJG		The language "A lateral separation from the existing structure was deemed necessary in the event that the City of Kirkland could not decommission the inline detention facility during construction due to their municipal stormwater treatment commitments." needs to be removed. It is not appropriate for WSDOT to speculate as to Kirkland's stormwater treatment commitments, and WSDOT will be solely responsible for any alteration of this facility.						
19	I-405 MP 21.94 Juanita Creek Draft Final Hydraulic Design Report November 2024, page 30	COK-JJG		4.2.3.1 needs to be updated to reflect City of Kirkland maintenance records regarding the inlet to the control structure, which is also the inlet to the 48" culvert. There have been significant issues with buildup of wood and other debris, with sedimentation, and with beaver activity in and near the inlet.						
20	I-405 MP 21.94 Juanita Creek Draft Final Hydraulic Design Report November 2024, Chapter 6 and 7	COK-JJG		Flows downstream of I-405 will increase significantly. What is currently estimated to be the 100-year flow (41 cfs) will now become approximately the 2-year flow (40 cfs).The flood and scour impacts of this change need to be more thoroughly evaluated to prevent safety and habitat concerns.						
21	I-405 MP 21.94 Juanita Creek Draft Final Hydraulic Design Report November 2024, Chapter 7	COK		•Despite the proposed design restoring sediment transport potential through the crossing, the system is likely supply limited based on the barriers upstream of the project site. Higher peak flows through the crossing will increase erosion of the channel bed and banks downstream, where there is already suspected channel incision occurring. Further, under proposed conditions, the stream will likely erode some of the constructed streambed sediment and transport it to downstream depositional areas, such as downstream crossings. Additional analysis should be performed for how the downstream channel will respond to the new hydraulic and sediment transport conditions from the proposed crossing, including whether sediment could aggrade at the culvert crossing NE 141st Street.						
22	I-405 MP 21.94 Juanita Creek Draft Final Hydraulic Design Report November 2024, page 73	COK-KJ		We are concerned that increased flows will impact channel and bank stability in the area immediately downstream of the new culvert. There are 51 structures within 100 feet of the stream centerline between I-405 and 111th Ave NE, primarily private residences.13 of these residences are within 50 feet of the stream centerline. Given the potential safety issue, WSDOT should conduct a geomorphic evaluation of existing conditions and the expected impacts of the project on bank stability. For example, from the 2012 geomorphic study provided by the City, 215, 216, and 214 referenced in the image below are identified as slightly unstable (215), completely unstable (216) and moderately unstable (214) (page 13 of Appendix B).						
23	I-405 MP 21.94 Juanita Creek Draft Final Hydraulic Design Report November 2024	COK-KJ		Throughout the document (example on page 65), while the SRH2D model does not include the existing instream pond, when referring to why there are higher velocities and shear stresses, it should note within the text that this is not only caused by existing culverts, but is also caused by the removal of the existing instream pond. This element creates a different situation than most undersized culverts and should be noted throughout the document.						

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24	I-405 MP 21.94 Juanita Creek Draft Final Hydraulic Design Report November 2024, page 69	COK-KJ		When comparing the Q100 average velocities from existing to proposed, velocities are ~3 ft/s faster in the main channel and the right bank. This will likely cause more erosion along the channel and banks downstream of the project. At station -5+00, the figure appears to show the velocity is in the 4 - 5 ft/s range, as well as WSE rise of 1 - 2 feet. With this increase and the banks of the stream so close to properties, this increase could cause significant issues for downstream property owners. How will this be addressed by the project?						
25	9	G.Ng		Please show all other barrier/culverts. Please include all culverts in Vic. Map.						
26	9	G.Ng		Please show where the inline detention facility is on the map as it's referenced later on in this section and preceding sections without understanding where it's exactly located.						
27	19	G.Ng		Please show where the inline detention facility is on the map as it's referenced through this section and preceding sections without understanding where it's exactly located.						
28	22	G.Ng		proposed gradient is 3.3% and greater; this should not be called a reference reach.						
29	22	G.Ng		Not similar. crossing is twice the gradient in reference reach.						
30	22	G.Ng		assume these are BF depths? Please clarify.						
31	25	G.Ng		this is incorrect; it is Confined.						
32	25	G.Ng		What/how was FPW determined? Please describe & document so it could be replicated if necessary.						
33	25	G.Ng		How is this slope ratio calculated? I've calculated 2.1 or 1.4 depending on how far you go upstream.						
34	26	G.Ng		This is great! Glad you were able to take a few grab samples and run a sieve analysis. These samples should be documented through WSDOT GHPA 2020-9-8+01 for APP ID 21036 protocol which outlines permitting steps to take stream samples below the OHWM.						
35	27	G.Ng		Please include that this restores natural stream processes.						
36	27	G.Ng		This should be able to be seen in the watershed profile.						
37	28	G.Ng		This is not a watershed profile. This is a project reach profile. While this is good to have. Please add a watershed profile.						
38	28	G.Ng		There is no slope in the profile shown below at 3% or greater; Why are we designing a stream at this steep of a slope? It doesn't match the reference reach or any other areas adjacent to the crossing.						
39	28	G.Ng		You need to explain what the FPW and/or valley width of this confined stream as that is your outer limits for Channel Migration.						
40	28	G.Ng		What happens once it reaches the inline detention facility? Does the migration potential increase? What's the historic path and what is the expected risk? What types of soils?						
41	28	G.Ng		While anthropogenic features can control and limit channel migration they are not a basis for assessing low or limited migration. Heavy vegetation, like mature trees would be signs of lateral/banks stability as well as steep banks with coarser gravels/boulders if they are present. Bolstering this section will better support the retaining wall designs.						
42	28	G.Ng		assume this is about where the inline detention facility is located; notice a sediment storage of material upstream of this 1.6%; with a prevailing gradient of 2.4% through project reach. This appears to be the natural equilibrium slope, so why are we designing something more drastic?						
43	29	G.Ng		clarify what Pre & Post is in reference to. Existing and proposed? With or without regional detention?						
44	29	G.Ng		This needs to be referenced in appendices.						
45	29	G.Ng		As the EOR you should acknowledge the legitimacy of this data. It appears you're using this data without any validation or comparison to other models.						
46	30	G.Ng		This is incorrect. FUR less than 3 indicates a confined channel where a culvert is better suited.						
47	30	G.Ng		This should be a design reach not a reference reach. A reference reach by definition is: A stable segment of stream with consistent slope, geometry, planform, and sediment load that represents, to the best available knowledge, the background condition of the project reach. You're designing a project reach with step pools @ 4.3% and channel crossing of 3.3%. Reference reach was 1.7%.						
48	30	G.Ng		remove references to PHD.						

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49	30	G.Ng		Please provide the data, sinuosity and/or wavelength to understand what you are saying here. You can't reference the PHD.						
50	30	G.Ng		This morphology doesn't match the reference reach or any reach in the system and is also not supported in Sec. 2.30-B Table.						
51	30	G.Ng		these appear to be 20' long in the designs. At 6% these would appear to function as a cascade. What is the basis of this riffle design? Reference reach? Research paper?						
52	32	G.Ng		The removal of these two crossings would be beneficial to denote in chapter 1.						
53	32	G.Ng		Please describe how existing channel is providing high flow fish habitat?						
54	32	G.Ng		10:1 benches are not indicative of a less than 3% gradient slope. Consider flatter floodplains for better high flow refugia and flood relief.						
55	33	G.Ng		This information would be good to include in the Channel Migration section.						
56	34	G.Ng		Please provide this supporting information.						
57	34	G.Ng		Please provide supporting documentation. The existing & proposed profile show a flatter gradient upstream of the crossing. Confirm what station or how far upstream is the tie-in location.						
58	34	G.Ng		slope ratio of proposed over proposed is not necessary.						
59	35	G.Ng		FUR calculation needs to be shown in previous sections.						
60	36	G.Ng		please remove reference to PHD.						
61	36	G.Ng		I wouldn't classify it as steep at 1.6 - 2.4%. Consider updating language.						
62	36	G.Ng		Please describe not just the storage sediment, but the upstream supply? Limited or not. How will the upper basin contribute to sediment over life of the structure?						
63	37	G.Ng		6% stable riffle sounds like a cascade.						
64	37	G.Ng		How is WDFW permitting these log weirs? Confirm that this would not be permitted as a fish-way. Typically log weirs would be permitted this way and would require serviceability and maintenance for the design life. If so, this would also require an easement on the property for this future maintenance.						
65	38	G.Ng		remove all references to PHD. This FHD document supersedes that document and is the final basis of design endorsed and reviewed by the EOR.						
66	38	G.Ng		appreciate the reference to PHD and how sediment sizes has changed from that document, but it is not needed as the FHD supersedes PHD.						
67	38	G.Ng		This would constitute grade control and wouldn't follow stream simulation methodology.						
68	39	G.Ng		This material gradation will have subsurface flow issues as the sands and gravel ratios are not high enough to fill the interstitial spaces. From experience you will need 30% streambed sediment/fines.						
69	39	G.Ng		Mobile woody material or LWM? Inconsistent throughout the FHD. Stable Key piece LWM will require scour countermeasures.						
70	40	G.Ng		If LWM is entirely placed above the 100yr WSE, then per F&B it can't be counted towards the targets.						
71	40	G.Ng		What flows is this high flow channel being engaged? Please clarify.						
72	40	G.Ng		Be cautious that all these 46 mobile pieces of wood don't mobilize all at one event. Without reviewing each of your wood calculations it might be good to describe that better here.						
73	41	G.Ng		Why step pools in this design? There isn't any documented in the existing system.						
74	41	G.Ng		This FHD supersedes the PHD, there shouldn't be a reference to the PHD as a document.						
75	41	G.Ng		Are you confident that this less than 0.8 feet will be maintained in perpetuity?						
76	41	G.Ng		Section 2.30 Table states a riffle-pool morphology. These step pool designs will prohibit the channel from naturally regrading as table 2.30 also denotes.						
77	41	G.Ng		Consider current MB guidance for sizing. These should be sized up for better long-term stability.						
78	43	G.Ng		what's the function of these?						
79	43	G.Ng		What's the low flow path?						
80	44	G.Ng		what's the design life of these? What's expectations where coir deteriorates?						
81	65	G.Ng		This discrepancy needs to be explained and justified to why it's acceptable.						
82	76	G.Ng		how is proposed higher than existing at upstream? Is proposed flow greater than existing?						
83	76	G.Ng		My understanding is the detention facility is between Station 7+00 and 10+00. How can inflow from above that be greater? also where do you get the additional flow from? I understand that it's attenuating the flows but how is it adding flow?						
84	76	G.Ng		Who is completing these ongoing investigations?						
85	78	G.Ng		How far down does this increase in WSE continue?						
86	78	G.Ng		Need to overlay GIS layer that includes known structures to understand the risk.						
87	83	G.Ng		This will need to be updated with updates to any streambed material adjustments.						
88	89	G.Ng		Based on the design of log weirs with Type 2 boulders, this is not allowed to degrade/regrade over time.						
89	FRA 497	G.Ng		This is incorrect. Previous table shows a 1.15 foot rise at Sta. 1+42; please clarify.						
90	EFP5-03	G.Ng		what's the intention of this grading finger; would it be easier to not have this and provide floodplain and room for the channel to adjust? Otherwise, It appears to be subject to bend scour and may be more effort trying to maintain and establish it.						
91	General	G.Ng		See PDF for additional context.						
92	I405_Brickyad FP-Final-DP8-Juanita-FHD	CV	Section 2.4	Consider adding the Statewide Integrated Fish Distribution (SWIFD) spatial data to the reviewed and cited data sources for this section.						
93	I405_Brickyad FP-Final-DP8-Juanita-FHD	CV	Section 2.4	"The WDFW online SalmonScape application documents sockeye salmon... " Please revise for accuracy. The WDFW data does not "document" potential presence. It documents presence, where the fish have been documented, and it describes reaches where modeling shows the stream gradients will not or should not limit the fish. It does not "presume" anything as far as fish presence.						

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94	I405_Brickyad FP-Final-DP8-Juanita-FHD	CV	Section 2.4	"Sockeye, Chinook, and steelhead are presumed present based on a lack of gradient barrier" This "presumed present" statement isn't quite the right interpretation of the data sources. A modeled lack of gradient barriers between the reaches downstream where the species have been documented and the project crossing is true. These 3 species have been documented downstream in lower Juanita Creek (in Salmonscape and SWIFD). Please rewrite to something like: "Sockeye, Chinook, and steelhead have been documented in lower reaches downstream in Juanita Creek. Existing models find no gradient barriers in the stream profile that might limit species. However 0% passable and other partly passable fish passage barriers exist between these downstream reaches and the Culvert 998602 project crossing. These species might be potentially present in the project reach in the future if passage has been restored through all of the downstream barriers."						
95	I405_Brickyad FP-Final-DP8-Juanita-FHD	CV	Section 2.4	"....potentially present in Juanita Creek based on suitable habitat" The WDFW Fish Passage map tool (or the SWIFD spatial data) show all of these species documented as present in the downstream reaches of Juanita Creek, at various distances between Lake Washington and the project crossing. These spatial data sources do not show anything "based on suitable habitat". An accurate statement will describe where each species have been documented and the distance the documented presence ends downstream from the project crossing. If you are citing a habitat assessment that explicitly connects species to suitable habitat, please cite it.						
96	I405_Brickyad FP-Final-DP8-Juanita-FHD	CV	Section 2.4	"There are no available data confirming steelhead or sockeye presence in Juanita Creek, but presence is assumed based on the availability of suitable habitat" Both Salmonscape and the SWIFD spatial data show documented sockeye presence (upstream in Juanita Creek to culvert 932403) and documented winter steelhead presence (upstream to a bit further, to 108th Ave.NE). Again, there's no description of suitable habitat in these data sources. If citing habitat descriptions in one of the King County sources, please add a citation. But Salmonscape and SWIFD contradict the "no available data confirming steelhead or sockeye presence…" part of the sentence.						
97	I405_Brickyad FP-Final-DP8-Juanita-FHD	CV	ction 2.4, Table	Please change all references from "presumed" to "modeled", as the "no gradient barrier" designation (in Salmonscape or in the SWIFD data) is modeled based on the stream profile gradient. Please consider adding a note under the table clarifying what we mean by 'modeled' here.						
98	I405_Brickyad FP-Final-DP8-Juanita-FHD	CV	ction 2.4, Table	Please change "not warranted" to "none" in this column. "Not warranted" is a description of a USFWS or NMFS agency legal decision after an official agency review of a petition to list a species under the ESA. These species (in Puget Sound) have not been reviewed this way.						
99	I405_Brickyad FP-Final-DP8-Juanita-FHD	CV	Section 2.6.2	Suggest moving or reiterating this description of aquatic fish habitat conditions and quality in Section 2.6.3						
100	I405_Brickyad FP-Final-DP8-Juanita-FHD	CV	Section 2.6.3	Here, and further down in the section, please describe the substrates with more detail (sand, silt, clay, organics, mucky and so it was hard to walk in, whatever you experienced). In the next paragraph, pool riffle habitat has been described. This stream reach might be expected to have more complexity in the substrate, even possibly areas of spawning gravel. The WDFW habitat survey describes "sand/gravel". The hydraulic field reports mentions gravel and cobbles. Please describe these conditions and their locations, and where and why they changed. Did you encounter any large wood in the channel that helped force the pool riffle character? What did you encounter?						
101	I405_Brickyad FP-Final-DP8-Juanita-FHD	CV	Section 2.6.3	In Section 2.7.1, the channel description of the upstream reach includes, "The gravels found in this reach are consistent with the materials found in the adjacent stream banks and are likely representative of the sediments routinely transported by the channel." Please add details here describing how these "consistent" gravels might relate to spawning gravels and habitat. As noted in other 2.6.3 comments, add detail on the pools and the behavior of any LWM to form them, and/or to sort the gravels in ways fish would find beneficial.						
102	I405_Brickyad FP-Final-DP8-Juanita-FHD	CV	Section 2.6.3	"Downstream, the creek flows through a vegetated area... " Suggested edit for clarity: Assuming this "downstream" is downstream of the Culvert 998602 crossing, it should be clearly stated. Quantifying the extent of the downstream extent you are describing will be helpful. Same with the WDFW habitat survey (in the next sentence), what distance from the crossing are we describing? Does it extend beyond the Culvert 932991 and that 0% passable barrier?						
103	I405_Brickyad FP-Final-DP8-Juanita-FHD	CV	Section 2.6.3	"A WDFW habitat survey detected juvenile salmonids... " This statement would seem to indicate a certain amount or quality of rearing habitat that would be worth describing. Additionally, the statement "According to residents, …." requires a citation, either a "private conversation on "X" date and location" kind or an "in this published report" kind. Please add it here, and in the references.						
104	I405_Brickyad FP-Final-DP8-Juanita-FHD	CV	Section 2.6.3	"Channel complexity, floodplain connectivity, and riparian condition and function are heavily degraded due to bank armoring" Suggest providing a distance downstream that this "no habitat" and "heavily degraded" condition persist.						
105	I405_Brickyad FP-Final-DP8-Juanita-FHD	CV	Section 2.6.3	Last paragraph: Please add a summary statement about how this impaired water quality impacts the quality of the fish habitat. Also, please specify if this 303(d) listing applies to all of Juanita Creek, or just the upstream project reach near I-405?						

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106	I405_Brickyad FP-Final-DP8-Juanita-FHD	CV	Section 2.6.4	Section 2.6.4 is light on detail. Please describe the vegetation in more detail, such as conifer or deciduous, species, maturity or seral stage of the trees? Native shrubs or mostly Himalayan blackberry. Reed canary grass or other wetland or groundcover species. Other channel forming features described? Potential for beaver activity? Both photo figures illustrate a more complex riparian corridor than the text hints at. With a narrow corridor downstream, what's the canopy cover and stream shade? Is it better upstream?						
107	I405_Brickyad FP-Final-DP8-Juanita-FHD	CV	Section 2.6.4	Section 2.6.3 describes the 303(d) listing. Does the riparian condition contribute to or help ameliorate these problems?						
108	FHD PDF pg 11	SMB		4th paragraph references Appendix J, but that appendix is blank. Include Level A assessment, or just reference WDFW report						
109	FHD PDF pg 12 (Table 2-1)	SMB		Suggest deleting rows with 0% basin coverage						
110	FHD PDF pg 25 (Section 2.7.2.1)	SMB		Last line of 2.7.2.1 erroneously says a FUR of 2.11 is "unconfined." Please change to "confined"						
111	FHD PDF pg 27	SMB		Typo in first paragraph. Change "exiting" to "existing" in 3rd line						
112	FHD PDF pg 29	SMB		Please include more discussion explaining the difference between Pre and Post scenarios hydrology scenarios. Is this pre- and post- human development? Pre- and post- project conditions?						
113	FHD PDF pg 29	SMB		It's unclear exactly what the existing detention facility is and how it functions. Is it realistic that it will continuously detain flows in the 100yr + scenario, never letting more than 41cfs reach the I-405 culvert?						
114	FHD PDF pg 31 (Figure 4-1)	SMB		There is an unlabeled, horizontal line just above the top of the right bank that partially spans the channel. What is this line? 2-yr flow?						
115	FHD PDF pg 34 (Table 4-1)	SMB		Is it accurate to state that both the proposed structure grade and the proposed upstream gradient are the same (3%)? Based on the profile in App D, the upstream reach looks much steeper						
116	FHD PDF pg 35	SMB		4th bullet - For consistency, the Section 4.2.4 says the length is 253 feet. Please resolve						
117	FHD PDF pg 38	SMB		Please clarify what the first sentence after Table 4-4 means.						
118	FHD PDF pg 38	SMB		We should have better justification for why a stable bed is necessary. What is the sediment supply from upstream, and why can't we assume mobilized sediment will be replenished? If this proposed streambed mixture has not been reviewed/approved by the comanagers, I'm concerned the comanagers will push back on this design claiming an overly coarse, roughened channel.						
119	FHD PDF pg 38	SMB		Text states that "the upper one foot of bankfull channel will consist of WSDOT streambed sediment." I don't see that detail on any of the sections in App D						
120	FHD PDF pg 38	SMB		It's not clear to me from the calcs or the narrative what portions of the proposed sediment gradation are stable at the 100yr design flows.						
121	FHD PDF pg 39 (Figure 4-5)	SMB		Figure caption says "conceptual." At FHD, this shouldn't be a conceptual layout						
122	FHD PDF pg 41	SMB		Typical WSDOT modeling approach is to only include "rigid" features into the mesh surface, and to simplify deformable features into a typical cross-section/gradient. Including the steps is appropriate, but including riffle features implies they are rigid. Additionally, sizing that material based on the localized steep run slope of the riffle almost ensures they will be immobile.						
123	FHD PDF pg 41	SMB		Consider following current WSDOT guidance for meander bar "teardrop" shape and sizing of head/tail material to help ensure more successful performance						
124	FHD PDF pg 41 (4.3.2.5)	SMB		Typo 3rd line of Section 4.3.2.5. "Junita"						
125	FHD PDF pg 44	SMB		Text states that pool sediment is mobile at the 100-yr flow. How does pool sediment perform at lower flows? 2yr?						
126	FHD PDF pg 48	SMB		5th line is missing a close parenthesis						
127	FHD PDF pg 48	SMB		Sediment given in mm. Suggest giving these dimensions in inches as well for consistency of units throughout report						
128	FHD PDF pg 57	SMB		Why is Manning's roughness of the side channel steps (0.29) so much higher than steps in main channel?						
129	FHD PDF pg 79	SMB		Last paragraph states that we have insufficient geotech data. We should have final geotech data before this report is finalized. Is there more data to be collected?						
130	FHD PDF pg 82	SMB		The first paragraph states that the proposed riffle material will stop headcut migration, but earlier in the report (4.3.2.4) state the riffles are meant to be deformable. These seem to be contradictory design goals						
131	FHD PDF pg 82	SMB		2nd to last paragraph says that a project benefit is restoring natural sediment transport. However, by armoring the bed, we're not restoring natural sediment transport to occur.						
132	FHD PDF pg 84	SMB		"Thus, the less conservative Julien 2002 equation will also be evaluated" is repeated twice in the 1st paragraph. Delete one.						
133	FHD PDF pg 84	SMB		3rd paragraph, last sentence says "projected 500 100-year flow". Which is it? Please fix						
134	FHD PDF pg 86	SMB		Please expand the justification for assuming the channel bends won't migrate to the walls, thereby including bend scour in the total scour computation. You could lean on the meander bars helping to hold channel alignment. Or, bend scour COULD be included in total scour depth, even though it ultimately it won't increase the minimum 3ft requirement.						
135	FHD PDF pg 95 (App A)	SMB		Please identify the project location on these FEMA maps						
136	FHD PDF pg 97 (App B)	SMB		The report mentions at least 1 other site visit. Are there other field reports to include?						
137	FHD PDF pg 123 (App D, EFP5-10)	SMB		What is the purpose of including these 2 existing cross section details? Needed for construction?						

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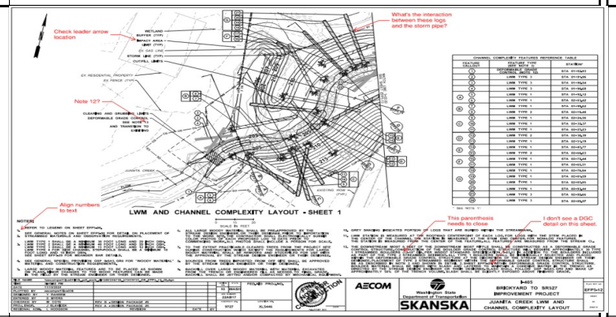
138	FHD PDF pg 125 (App D, EFP5-12)	SMB								
139	FHD PDF pg 126 (App D, EFP5-13)	SMB		Slash material upstream of meander bars is very hard to see and could easily be missed by contractor						
140	FHD PDF pg 126 (App D, EFP5-13)	SMB		Typ: Lots of existing linework overlapping proposed crossing and grading, which makes sheet very busy. WSDOT typically does not include existing features within proposed streamwork						
141	FHD PDF pg 128 (App D, EFP5-15)	SMB		Type 2 & 3 boulders are called out on the side channel steps for ballast, but they are shown below the logs. Will step logs be attached to boulders, or how does that interaction work?						
142	FHD PDF pg 129 (App D, EFP5-16)	SMB		General comment about LWM details - I'm concerned that the comanagers will push back on the layout of LWM. Most pieces of wood are perched will above the thalweg and won't interact with typical "average" flow events						
143	FHD PDF pg 132 (App D, EFP5-19)	SMB		Suggest showing the storm line on the left detail in relation to the horizontal wood members						
144	FHD PDF pg 136 (App D, EFP5-23)	SMB		The WSEs shown on the Mobile Wood Detail differ a lot from those shown on EFP5-08, where the 10-yr hits the structure wall at the same location as the streambed. Can we resolve for consistency?						
145	FHD PDF pg 137 (App D, EFP5-24)	SMB		Log-to-Log Fastener Detail: It's not clear in the plans what log structures this connection applies to						
146	FHD PDF pg 138 (App D, EFP5-25)	SMB		LWM Step-Pool Control Table - multiple typos "SECURLY"						
147	FHD PDF pg 142 (App D, EFP5-29)	SMB		Note 6 states that there are different sediment gradations for the head and tail of the bars, but the plans/details don't indicate where these different mixes go within each bar						
148	FHD PDF pg 142 (App D, EFP5-29)	SMB		Meander Bar plan detail - It could cause confusion that the flow direction on the detail (left to right) is opposite of the overall plan sheet (EFP5-13/14; right to left), which might lead the contractor to put slash on wrong side of bars						
149	FHD 2.3	DS		No geotechnical borings or geotechnical memo was consulted, nor was the DNR Geo Portal (https://geologyportal.dnr.wa.gov/) referenced, which would have helped review historical subsurface geotechnical reports. As such, it appears (but it is hard to determine for sure) that channel regrading will get into the underlying soils described as glaciolacustrine clay (Hon West, 1990)						
150	FHD 4.1.1	DS		The Proposed channel has a 1:10 slope landward of the top bank, where the slope in the reference reach was considerably less. The result is that the proposed channel is more confined (the FUR is lower) than the reference reach.						
151	FHD 2.6.2	DS		There is no discussion /investigation of the existing detention facility, High Woodland Regional Detention Pond. Presumably, there is documentation on its construction, if sediment transport is affected, and an intended function that could be used to describe better the channel changes that occurred before and after its construction.						
152	FHD 4.3.2	DS		Section 4.3.2 shows conceptual level plans, and no structure types (which differs from Appendix D)						
153	FHD 7.2	DS		I am not familiar with the alternative methods they used for LTD but it appears to use coarse sediment in the roughened riffles to amour the channel. I am concerned that the most downstream proposed riffle will become a barrier.						
154	Scour Checklist	Gabe		Please see additional comments in Excel Spreadsheet: ScourReviewChecklist_JuanitaCr_Kjensen						
155	Model Checklist	Gave		Please see additional comments in Excel Spreadsheets: SRH-2D-Model-Audit-Checklist_WSDOT_Juanita_Creek_MP_21.94						
156	Model Checklist	SMB		Please see additional comments in Excel Spreadsheets: JuanitaCrk_FHD_SRH2DModelReview_2D_ModelQC						
157	FHD 4.3.1 pg 31	ATS		The average slope of the crossing should be used to size bed material. Using an oversteepened riffle slope has substantially oversized the proposed bed material.						
158	FHD 4.3.1 pg 32	ATS		Initial pebble counts were taken above the influence of the detention facility. The statement regarding backwatering influencing the sediment size does not hold for the pebble count locations. This substantial oversizing of material does not allow for natural stream processes to occur through the crossing.						

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159	FHD 4.3.1 pg 32	ATS		Meander bars having the same sediment gradation as the riffles does not seem to meet the intention of the meander bar. The meander bar is meant to be a larger gradation to maintain the sinuosity within the channel. If the main channel and meander bar sediment are the same, it does not provide any diversity of sediment to maintain the meander within the channel.						
160	FHD 4.3.1 pg 32	ATS		In preventing LTD, this does not allow for natural stream function through the crossing as required by the terms of the injunction.						
161	FHD 4.3.1 pg 33, table 4.6	ATS		This sediment grade mix appears to invite subsurface flow.						
162	FHD 4.3.2.5 pg 35	ATS		The PHD attached to the RFP documents had the steepest proposed slope at 5.9%, not sure where the steeper slopes come from.						
163	FHD 4.3.2.5 pg 35	ATS		These step pools as designed do not allow for natural stream function.						
164	FHD 4.3.2.5 pg 37, figure 4-6	ATS		This is over engineered for this system. These should be steps that are allowed to deform over time, allowing for natural stream function to occur						
165	Plans Sht EFP5-07	ATS		I don't understand the reason for the points along the profile being numbered (01-74). These are not explained on this sheet.						
166	Plans Sht EFP5-08	ATS		Table 2 - this sediment gradation is too large. Refer to previous comments in the FHD. This sediment will not encourage natural stream function through the crossing, as required by the terms of the injunction.						
167	Plans Sht EFP5-10	ATS		What is the reason for including these sections as a part of this plan set						
168	Plans Sht EFP5-12	ATS		This plan view is very busy, really hard to read.						
169	Plans Sht EFP5-12	ATS		General comment about LWM layout - rootwads need to be more engaged in the low flow channel.						
170	Plans Sht EFP5-12	ATS		Note 12 - This does not read like a deformable grade control. This sounds like a series of boulders that could likely become a barrier to fish passage… Plus, there is no detail showing this 'deformable grade control'. The intention of this grade control is to deform over time to allow natural stream functions to occur. This, as designed, appears to not allow natural stream function to occur.						
171	Plans Sht EFP5-15	ATS		The step pool designed are over engineered, and a drastic change to what was shown in the preliminary plans. These steps look as though they would be considered a fishway by WDFW, thus not meeting the terms of the injunction.						
172	Plans Sht EFP5-16	ATS		Structure A - rootwads are not engaged in the low flow channel, thus not creating any instream diversity.						
173	Plans Sht EFP5-16	ATS		Structure B - rootwads are not engaged in the low flow channel, thus not creating any instream diversity.						
174	Plans Sht EFP5-17	ATS		Structure D - rootwads are not engaged in the low flow channel, thus not creating any instream diversity.						
175	Plans Sht EFP5-18	ATS		Structure E - rootwads are not engaged in the low flow channel, thus not creating any instream diversity.						
176	Plans Sht EFP5-25=28	ATS		This step pool design is over engineered, and will not provide natural stream function in this system. Deformable steps will provide the stream to function naturally over time, which is required per the terms of the injunction. Additionally, this is a substantial change from what was shown in the preliminary plans, and requires more discussion as to how we have gotten to this overly engineered design. Steps designed and constructed in this manner have, historically, become passage barriers, thus negating the ability for the stream to function naturally.						
177	Plans Sht EFP5-29	ATS		No deformable grade control detail is provided. As noted on previous sheets, the description of this deformable grade control does not meet the intention of how a deformable grade control should perform, which should deform over time, and allow the stream to function naturally over time.						
178	Section 2.1 page 4 last paragra	DJS		This is the only mention of the beaver dam in section 2. It is visible in Historical LiDAR and there is evidence of older dams that may have influenced sediment transport or sediment size downstream which is helpful to understand in sections 2.7 and 7.2. A) Please elaborated. B) was it present in Dec 2023, if not what changed?						
179	Section 2.1 page 4 last paragra	DJS		"Beaver Dam Removal. This seems out of place, recommend moving to section 4?						
180	Section 2.1 High woodlands reg	DJS		There is no discussion /investigation of the existing detention facility, High Woodland Regional Detention Pond. Presumably, there is documentation on its construction, if sediment transport is affected, and an intended function that could be used to describe better the channel changes that occurred before and after its construction which should be discussed in section 2.7						
181	Section 2.2 Table 2-1			The text based summarized landcover doesn't equal the values in table 2-1. Did you update table after revising the watershed? Please revise						
182	Section 2.3	DJS		the final FHD needs to have results from a GeoTechnical report incorporated into the analysis and results. In this draft NO geotechnical borings or geotechnical memo were consulted , nor was the DNR Geo Portal (https://geologyportal.dnr.wa.gov/) referenced, which would have helped review historical subsurface geotechnical reports. As such, it appears (but it is hard to determine for sure) that channel regrading will get into the underlying soils described as glaciolacustrine clay (Hon West, 1990). hopefully, the Geotechnical report will clear this up.						
183	Section 2.6.1	DJS		FYI: WSDOT recommends you use Site Visits #, to include each time a survey or field crew collects data (see training). WSDOT requires field hydraulics memos for site visits pictures and observations in those can/should be referenced in the FHD. The Dec 3, 2023 field visit, please include the field memo. It is unclear if the site conditions changed between 2019 and 2023, and how, please add this to section 2.6 and 2.7 if relevant.						

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184	Figure 2-9	DJS		Nice this figure has existing stationing. Could you refer to these stations throughout section 2 please?						
185	Section 2.6.1 Data collection	DJS		What was surveyed and when is not clear, please revise.						
186	Section 2.6.2 or 2.7.2 Downstre	DJS		The description of the channel conditions (channel width, sediments, banks, gradient, etc.) downstream is missing; it is not present in section 2.7.2. Without observations of the downstream conditions, we can not check your conclusions about design tie-ins, channel armoring, and long-term degradation. Please add.						
187	Section 2.7.3 you mention 2 gra	DJS		A) What were they used for? B) Where is the lab analysis? C) Given you report, the eroded bank sediments are finer than the sediment size distribution upstream (includes no gravel) does this suggests you may have a different geomorphic reach downstream?. D) Please comment on why there are no sediment observations downstream.						
188	Page 21 text and Figure 2-16	DJS		text indicates lidar and survey is showing an elevation from lake Washington. That is not shown in the figure. Please clarify and call out parks and confluences, and culverts mentioned in later text. The profile in section 7.2 shows gradient breaks and decrease in gradient downstream. Please discuss how these may impact channel migration (or channel stability) Please reconcile the difference in reported gradient in section 2.7.4 and 7.2						
189	Page 21 text and Figure 2-16	DJS		Note you mention a transition zone in section 2.7.4, page 21. I agree, have you considered thinking about these 3 geomorphic reaches based on topography and surface geology I would recommend placing them as such in figure 2-16 1) the downstream reach station -450 to 270. 2) Flow and sediment transport impacted = 270 to 800, and 3) what you have as your reference reach = station 800 to 1900.						
190	Figure 2-16	DJS		Can you explain what is happening at station 300 ? If you obtain the gradient of the reaches described above. The gradients downstream are different then above. please consider.						
191	Section 2.7.5 Channel migration	DJS		Section 7.1 suggests anthropogenic changes; reading this section, those changes are unclear. In this section, 1) there is no discussion of historical analysis and what you found. 2) there is nothing mentioned of observations upstream. Can you rule out that the channel was rerouted or modified for development and would make existing channels more prone to channel instability? Please review historical topo maps and aerial photos (see section 7.1 for sources) and elaborate.						
192	Section 4.3.2	DJS		Section 4.3.2 shows conceptual level plans, and no structure types (which differs from Appendix D.)						
193	Final Scour Analysis in general	DJS		a) Without a geotechnical report you should NOT consider this section to be Final. b) FYI, Completed in 2/2024, WSDOT implemented a revision of the Scour Section of the FHD template and created a set of training videos. These revisions do make it more clear what WSDOT expects to see in the FHDs. I encourage you to use the figure templates and methods.						
194	Section 7.1	DJS		You are missing available historic mapping and aerial photos. See USGS historical topos and King County GIS. Note: In King County in 2022, put all their historical photos online. this includes georeferenced aerial photos from the 1930. Please interpret these channel changes/ponds in the reference reach and downstream (consider putting this info in section 2)						
195	Section 7.1	DJS		From what I understand, HEC-20 Rapid assessment is not meant to be used in this manner. Unless you cite some peer-reviewed study that shows that Fractional scoring and comparing vertical /lateral ratings has value, please don't use these conclusions.						
196	Section 7.1 last paragraph	DJS		a) Could you make your conclusion clear and complete based on the info you have, 2) Pleased the term "NOT low" is used. Based on what I read, it seems like this should be your summary. "Based on the available geologic and geomorphic understanding described in section 2, the risk of lateral migration is NOT low. The existing sediments/soils in the bed and banks are considered erodible. Beavers/beavers dams are present in the watershed. It is possible that the channel could shift or change. We were not able to determine the amount the channel has changed historically." if this is not correct, please revise						
197	7.2 general about methods	DJS		WSDOT suggests you use A) HEC-18 equations 6-16 and 6-18 and B) that you show your math so it can be checked. Pemberton and Lara are outdated. Please revise.						
198	7.2	DJS		Regarding sediment size in equilibrium slope equation: A key variable to the equilibrium slope and armoring equations (both methods) is an accurate sediment gradation of the underlying bed sediments. In section 2 you don't have any observations of the bed sediment or underlying soils (they are likely different) downstream of the crossing and you should not assume the sediments will be the same in the reach (upstream) where the pebble counts are located. Please conduct field work to take samples and revise.						
199	7.2	DJS		Regarding sediment size in the armoring equation: A key variable to the equilibrium slope and armoring equations (both methods) is an accurate sediment gradation of the bed where you expect it to armor. In section 2 you don't have any observations of the bed sediment or underlying soils (they are likely different) downstream of the crossing and you should not assume the sediments will be the same in the reach (upstream) where the pebble counts are located. Please conduct fieldwork to take samples and revise.						
200	7.2 page 76	DJS		Regarding 1.47 feet scour depth. We suspect you should revise your methods to HEC-18 and evaluate bed /soil sediment downstream (likely finer); the potential channel incision would be greater than 3 ft, which could unravel the proposed riffle. Please consider a different design.						
201	7.2 page 76	DJS		"we would respond by creating a ramp" and a deformable grade control would be installed downstream end of the proposed treatment" these are contradictory and unclear if these are in your design or something else.						
202	7.2 page 76	DJS		Your approach doesn't follow HEC-18, and it needs to follow the WSDOT manual, not only the HEC manuals.						