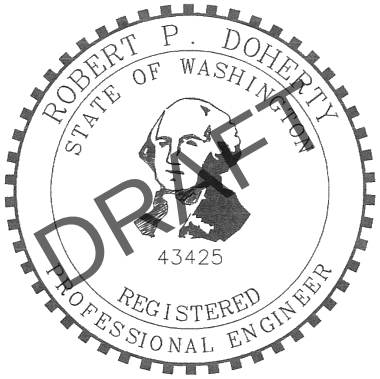
Memorandum



To:	Steve Clark, Jeff Hamlin
From:	Bob Doherty
Copies:	Lori McFarland, Jeff Gray
Date:	May 26, 2022
Subject:	Kimball Creek Bridges Assessment
Project No.:	20700

The City of Snoqualmie (City) requested Otak to assess the status of previously prepared design, permitting and funding documents for two Kimball Creek bridges and determine requirements for updating the project to be ready for construction. In addition to this assessment, options for repair of the existing bridges and for replacement with culvert structures are evaluated.

The following sections are included in this memo:

1. **Bridge Replacement Option** – Evaluate existing replacement documents against requirements to be "shovel ready".
   a. General Design
   b. Plans
   c. Specifications
   d. Construction Cost Estimate
   e. Schedule
   f. National Bridge Inventory (NBI)
   g. Funding Options
2. **Culvert Replacement Option** – Evaluate options for replacing existing bridges with large culverts for comparison against bridge replacement and bridge repair options.
   a. Culvert Options
   b. Culvert Cost Estimate
3. **Bridge Repair Option** – Evaluate bridge repair concepts for comparison against bridge and culvert replacement options
   a. Existing Conditions
   b. Repair Costs
4. **Permitting** – Evaluate existing bridge replacement permitting documents and compare to options for bridge repair and culvert replacement options.
5. **Recommendations** – Based on the above assessment, recommend project options.

1. Bridge Replacement Option

Otak has evaluated the documents previously developed by others between 2012 and 2016 with the intent of summarizing the work needed to finalize the project for construction. In general, it appears that there is a significant amount of effort needed to update the documents to be ready for construction. We have summarized our findings in the following sections:

- General Design
- Plans
- Specifications
- Construction Cost Estimate
- Schedule
- National Bridge Inventor
- Funding Options

Permitting issues are discussed separately in Section 4.

General Design

In general, the design should be checked to determine if it complies with current design requirements. This will be required to obtain permits and federal funding.

- **WDFW Guidelines.** Due to the timing of the work by Perteet (2012 to 2014), the project design was mostly performed under a version of the Washington State Department of Fish and Wildlife (WDFW) design guidelines that is now outdated. To be permitted today, the design must comply with the WDFW 2013 Water Crossing Design Guidelines (2013 WCDG).
- **Basis of Design.** The design memoranda from 2012 and 2014 does not provide backup data for key information typically needed to prepare a Basis of Design Memorandum used to obtain permits. These items should be obtained from Perteet and/or produced under a new engineering contract.
  - Bankfull measurements. Bankfull widths appear to have been previously verified with WDFW, however, backup calculations and support information for bankfull widths is not available. It is anticipated that this information will be needed to obtain approval today.
  - Pebble counts
  - Hydrology and hydraulic modeling
  - Scour calculations
  - Structure characteristics relative to the stream characteristics. A channel section should be proposed to handle the bankfull flow within a low flow section and to contain a 100-year storm event such that the stream does not come into contact with the crossing structure. The structure also should provide adequate freeboard above the 100-year storm event. The guidance for freeboard is typically three feet but can be reduced under certain circumstances. However, from a brief review of this project, it may be difficult to justify a reduction.
  - Streambed geomorphology. Assess whether imported streambed sediments or gravels are needed and make recommendations on scour protection.
- **Bridge Design.** Verify bridge design against more-recent standards and update as needed. Bridge design codes have changed in the years since the design was performed. Showing that the design meets current standards is anticipated to be required to receive federal funding. Design code requirements are listed in the Code of Federal Regulations, CFR 625.4(d)

(https://www.ecfr.gov/current/title-23/chapter-I/subchapter-G/part-625/section-625.4). Per this code, AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017 are required. However FHWA also allows the most-recent bridge design code, AASHTO LRFD Bridge Design Specifications, 9th Edition, 2020 (https://www.fhwa.dot.gov/bridge/structures/04112022.pdf).

It is possible that the existing structure design meets the 2013 WCDG but if it does not, and variances cannot be justified with the permit agencies, the structures will need to be re-designed in their entirety. Based on our assessment, the standard that seems most likely to trigger a complete re-design is the freeboard requirement. If sufficient freeboard cannot be provided, the roadway may need to be raised which may trigger a number of other follow-on issues, such as wetland impacts and/or increased costs for bridge, wing walls and retaining walls. In this case, we anticipate the following steps to update the design:

1. Update the Basis of Design Memorandum using current standards. Collect bankfull width measurements in the field and summarize in a memorandum to support the stream crossing design. Additional environmental documentation will need to be updated to support permitting as described in Section 4 Permitting of this memorandum.
2. Confirm that the design meets the City's goals. The 2014 design report stated that the project intended to provide sidewalks and bike lanes on both sides of the roadway, but the design only provided for the sidewalks. Having a clearly defined project scope is essential if the project obtains outside funding.
3. Re-engagement of the community or other forms of stakeholder review may be needed. One topic to address will be suitable detour route(s). The 2014 plans contained a detour route using 384th Avenue SE/River Street/Railroad Avenue while the preliminary design report showed a detour route had been approved along W North Bend Way/394th Avenue SE.

During our assessment, we identified a few design elements that should be reviewed and updated, even if the existing design complies with current standards for permitting and funding purposes:

- **Basemap.** Conduct a site visit to verify that basemap features are unchanged.
- **Roadway design.** Check design against current roadway design standards.
- **Clear zone.** Identify and document correct clear zone distance.
- **Guardrail design.** Guardrail layout appears to be nonstandard and should be reviewed. If this requires substantial design changes, check grading, wetland impacts versus retaining walls, and Area of Potential Effects.
- **Stormwater management.** Check thresholds in current stormwater manual (2016) to determine if any stormwater management is required for the project.
- **Paving limits.** Check current pavement condition.
- **Dewatering.** Review proposed dewatering methods. This may need to be reviewed by a geotechnical consultant.
- **Scour protection.** Review the scour protection design. The existing bridges are experiencing scour issues and the current design includes reclamation of existing rocks for scour protection. The rock size and adequacy of these rocks for scour protection is not clear.
- **Channel Section.** Review the proposed typical channel section and identify streambed sediments or gravels, if needed.
- **Utilities.** Utility coordination should be re-activated. The existing plans identify underground facilities belonging to Century Link (now Lumen), that require relocation. More detail regarding the relocation is needed in the contract provisions to place an appropriate amount of responsibility on

the contractor, thus reducing risk for the City. Other utilities should also be contacted to verify their absence in the project vicinity and/or lack of project impacts, as well as updating contact information.

Plans

The condition of the plans appear to be fairly complete structurally and appear to be around 90% complete for the civil drawings. A thorough quality review should be conducted with additional details filled in. Small corrections and detailed design alterations are not noted herein. Based on the status of design noted in the General Design section above, we recommend reviewing the following plan sheets and updating as needed:

- **Cover Sheet.** Update cover sheet for project numbers and funding information.
- **DT1, Sheet 4.** Check the detour route as noted in the previous section.
- **SP1-SP2, Sheets 5-6.** Verify the dewatering method and revise if needed.
- **TS1, Sheet 7.** Revise stream bypass method if needed.
- **PP1-PP2, Sheets 9-10.** Provide hydraulic analysis, show 100-year water surface elevation and revise profile as needed to achieve freeboard requirements.
- **PV1-PV2, Sheets 11-12.**
  - Revise guardrail design. Angles and taper rates appear to be non-standard and should be reviewed and revised as needed. This may affect grading for stream channel, embankment slopes and retaining walls.
  - Verify retaining wall layout. Walls appear to be at odd angles to the bridge and may be too close to the bridge wing walls. Check for conflict with wall reinforcement and bridge abutments.
  - Verify wall type. Wall type shown in the plans is different than the wall types described in the special provisions.
- **RP1-RP2, Sheets 15-16.**
  - Both of the existing bridges exhibit scour issues. Add scour protection details if needed. Scour protection at the South Bridge appear to be particularly minimal and should be verified.
  - Add details to restoration drawings. Add seeding, planting, and/or large woody debris if needed.
- **Bridge Plans.** Update plans as needed to be consistent with current WSDOT Standard Specifications for Road, Bridge, and Municipal Construction; AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017, or 9th Edition, 2020; and current WSDOT Bridge Design Manual. Update Construction and Design notes on sheet B1 for both the South Bridge and the North Bridge.

AutoCAD version should be updated for all files. Complications are not anticipated, but this may take some time depending on how the files were put together. CAD files in older formats may be accepted by the City, but may be more difficult to update for as-built plans and future repairs. Licensing may also be an issue for older versions of CAD.

Specifications

Specifications were reviewed and should be updated to be consistent with design and plan updates noted above. Below are specific items note in our assessment:

- **General:**
  - If federally funded (anticipated), obtain current PS&E checklist from Local Programs and use it to review project manual and plans

- If not federally funded (not anticipated), the Special Provisions should be de-federalized, e.g. delete DBE, federal wage rate General Special Provisions (GSPs), etc.
- Update to current version of WSDOT Standard Specifications
- Update Table of Contents
- Remove amendments (no longer applicable to current WSDOT Standard Specifications)
- Review advertisement for compliance with Title VI language if federally funded.
- Instructions to Bidders should list which forms are to be included in the bid package
- Update front end forms to comply with current laws, e.g. RCW 39.04
- Subcontractor list must be included to identify structural steel and/or reinforcing steel subcontractor
- Update Special Provisions Table of Contents
- Update GSPs to current versions
- Update description of work in Special Provisions and Advertisement to include all types of work so that subcontractors and suppliers are alerted to review this project for bid.
- Include permits in Appendices and Table of Contents.
- Further development/updating of special provisions is required for stream work to address streambed sediment/gravel, streambed restoration/grading, and temporary stream bypass requirements. Verify that bid items are well-defined and quantifiable to a Bidder.
- Complete Appendices

- **Division 1:**
  - Further development of Division 1 Special Provisions is required to address permits, utility coordination/relocation, working days, detour time limits, temporary pedestrian access route (check requirement if federally funded), and long lead items.
- **Division 3:**
  - Special provisions are not necessary.
- **Division 5:**
  - Update special provisions.
- **Division 6:**
  - Further development of special provisions is required for retaining wall to include acceptable material types and verify pay limits are clearly defined.
  - Verify wall type. Wall type shown in the plans is different than the wall types described in the special provisions.

Construction Cost Estimate

The reviewed construction cost estimate is dated 3/11/2016. Unit costs should be updated for current bid climate. Below shows the cost estimate total updated to include:

- Increase for inflation. Assumes 6% per year for six years (2016 to 2022 dollars).
- 10% contingency
- 5% design engineering to update the design documents
- 10% construction management
- 10% City administration

		South Bridge	North Bridge	Total
Construction Cost (2016)		$ 817,525.00	$ 881,444.00	$ 1,698,969.00
Utility Relocation (Est)		$ 25,000.00	$ 25,000.00	$ 50,000.00
Subtotal		$ 842,525.00	$ 906,444.00	$ 1,748,969.00
Inflation (2022)	42%	$ 352,612.82	$ 379,364.14	$ 731,976.95
Subtotal Construction		$ 1,195,137.82	$ 1,285,808.14	$ 2,480,945.95
Contingency	10%	$ 119,513.78	$ 128,580.81	$ 248,094.60
Total Construction		**$ 1,314,651.60**	**$ 1,414,388.95**	**$ 2,729,040.55**
Design Engineering	5%	$ 65,732.58	$ 70,719.45	$ 136,452.03
Construction Management	10%	$ 131,465.16	$ 141,438.90	$ 272,904.05
City Administration	10%	$ 131,465.16	$ 141,438.90	$ 272,904.05
Total Project		**$ 1,643,314.50**	**$ 1,767,986.19**	**$ 3,411,300.69**
Rounded	$ 1,000.00	**$ 1,644,000.00**	**$ 1,768,000.00**	**$ 3,412,000.00**

These costs are used to compare to the Culvert Option and Repair Option in Section 2 and Section 3 of this memo, respectively.

Schedule

Based on the design and permitting assessment, we anticipate the following schedule to prepare the project for construction. The durations shown below assume that the original design engineers are available to complete the design.

- If basis of design is good, approximately 15-18 months. This assumes about 2-3 months for design and 13 months for permits.
- If basis of design needs to be updated, approximately 17-19 months. This assumes about 4-6 months for design and 13 months for permits.

Applications for permits can be submitted within about one month after completing the design. Updating critical areas and bankfull measurements, and coordination with WDFW and the Tulalip and Snoqualmie Tribes can occur during design completion. Once submitted, the critical path for permit approval is through the Army Corp of Engineers, which is expected to take about one year.

National Bridge Inventory (NBI) and National Highway System (NHS)

The City currently inspecting bridges and reporting bridges as small-span (less than 20 feet) to WSDOT. For reporting purposes structures greater than 20 feet span are considered a bridge. For the City's purposes there is no difference between the proposed girder-type bridge and a culvert with a span greater than 20' (see Section 2 below). Because the City is currently inspecting and reporting the existing bridges, there should be no change in effort for the new larger bridges (greater than 20 feet), whether the new structure is a bridge or culvert. Bridges on a public road reported to the WSDOT inventory will be tracked on the NBI. As such, these bridges are subject to the NBIS which requires regular inspection.

These bridges should be eligible for off-system funding since they are not located on the National Highway System (NHS). NHS routes can be found at:
https://www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/washington/index.cfm

Funding options

Based on conversations with the City, it is anticipated that federal funds will be needed for construction of these bridges. Federal bridge bunding programs are summarized at the link: https://www.fhwa.dot.gov/bridge/bripro.cfm. A guidebook is available for cities that has information about new funding available from the Bipartisan Infrastructure Law and can be downloaded from the link https://www.whitehouse.gov/wp-content/uploads/2022/01/BUILDING-A-BETTER-AMERICA_FINAL.pdf

Based on our review, it appears that Bridge Formula Program (BFP) funding is the most likely avenue for the City. Information for BFP funding can be found by clicking on the Bridge Formula Program link in address above or at the link https://www.fhwa.dot.gov/bridge/bfp/20220114.cfm. Under this program, funding is available for new bridges, bridge replacement, and bridge rehabilitation; and FHWA encourages states to distribute about 50% of funds to off-system bridges.

2. Culvert Option

As requested by the City, Otak has prepared a concept-level culvert option for comparison to bridge replacement and bridge repair options. Figures 1-3 show several options for culverts with the span capability needed for this project. We assumed that the clear span of the culvert should match the clear span of the bridge option. Spans over 20 feet long are considered bridges, whether they are 4-sided (box culvert) or 3-sided. From a permitting perspective, three-sided culverts and bridges are preferred, so 4-sided options were not considered. In short, we found that the cost of the culvert option is slightly higher than the cost of the bridge option and may not be change worth pursuing.

Key details for the culvert option and a summary of costs are provided below.

Culvert Design Details

Key design details for determining culvert layout and type:

- Span: 23’-4” clear span to match bridge layout
- Options: Aluminum, Steel Plate, Concrete Box/Arch
- Foundations: All options can accommodate recommended pile foundations. Due to span and weight, it is assumed that the same foundation type will be needed.
- Design: Large culverts are typically “contractor-designed”. There are several fabricators to choose from and it is often preferred for the contractor to choose the lowest cost option that fits the project criteria. The City’s consultant engineer typically designs the foundation. It is typically required to specify three approved fabricators for Fed Aid projects. Preferred fabricators can be specified directly if only local funds are used.
- 2’ min. bury
- 3’ min. freeboard
- Top can be near surface and carry truck loads if needed

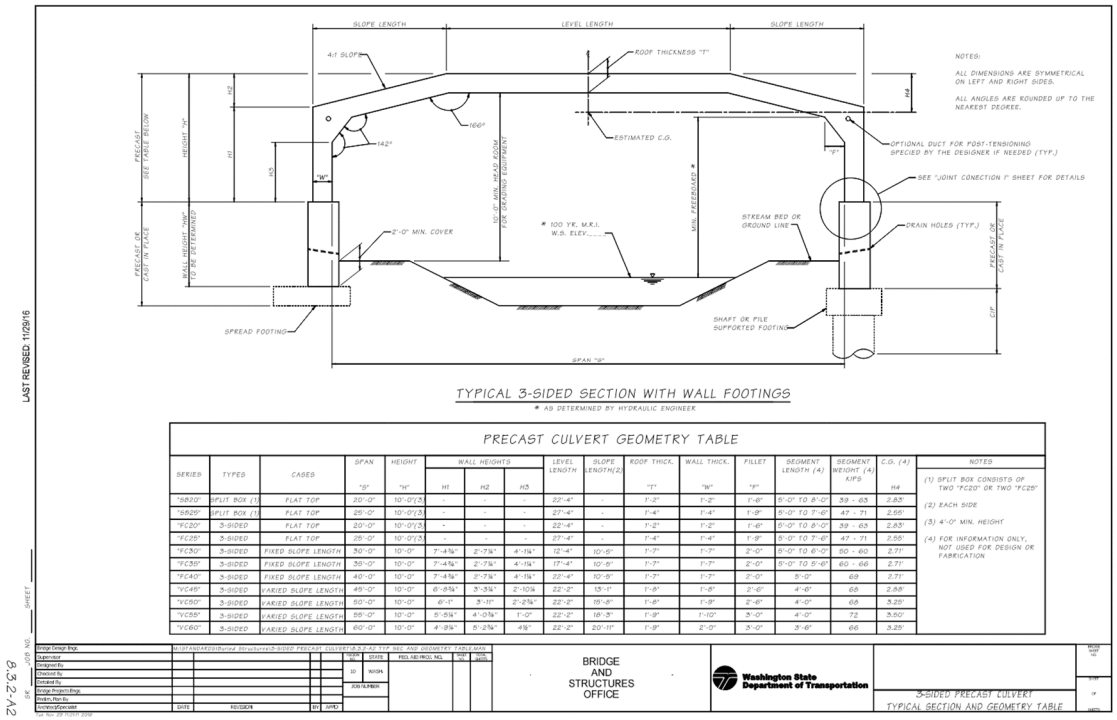


Figure 1 – WSDOT "Standard" Culverts

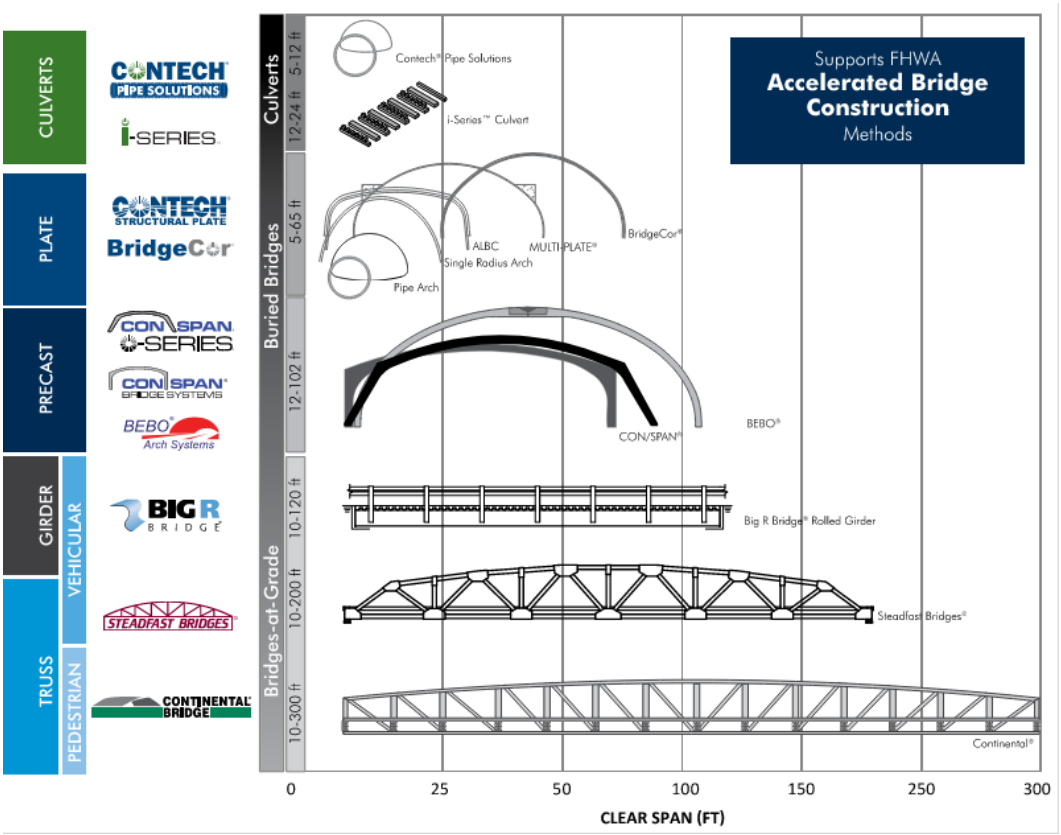
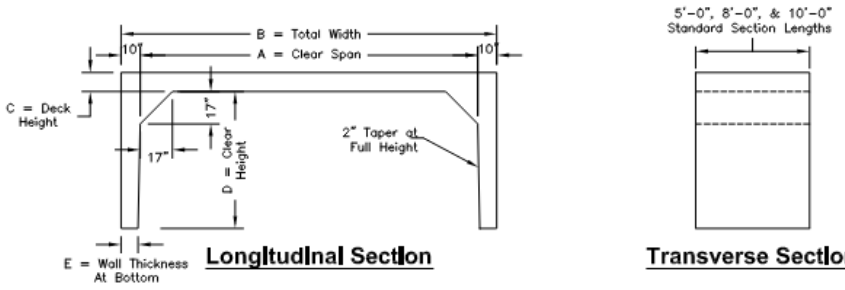


Figure 2 – Contech Culvert and Bridge Options



Sizing & Weights (Tons) for 5'-0" Section Length with 0° Skew

A	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
B	13.67	14.67	15.67	16.67	17.67	18.67	19.67	20.67	21.67	22.67	23.67	24.67	25.67	26.67	27.67	28.67	29.67	30.67	31.67	32.67	33.67	34.67	35.67	36.67
C	10	10	10	10	10	10	10	10	12	12	12	12	12	12	12	12	14	14	14	14	14	16	16	16
D=3'	6.9	7.2	7.5	7.8	8.1	8.4	8.8	9.1	10.7	11.1	11.5	11.9	12.2	12.6	13.0	13.4	15.6	16.0	16.5	16.9	17.3	19.9	20.4	20.9
D=4'	7.5	7.8	8.1	8.4	8.7	9.0	9.3	9.7	11.3	11.7	12.1	12.5	12.8	13.2	13.6	14.0	16.2	16.6	17.1	17.5	17.9	20.5	21.0	21.5
D=5'	8.1	8.4	8.7	9.0	9.3	9.6	9.9	10.2	11.9	12.3	12.7	13.0	13.4	13.8	14.2	14.5	16.8	17.2	17.6	18.1	18.5	21.1	21.6	22.1
D=6'	8.6	8.9	9.2	9.6	9.9	10.2	10.5	10.8	12.5	12.8	13.2	13.6	14.0	14.3	14.7	15.1	17.3	17.8	18.2	18.6	19.1	21.7	22.2	22.7
D=7'	9.2	9.5	9.8	10.1	10.4	10.7	11.0	11.4	13.0	13.4	13.8	14.2	14.5	14.9	15.3	15.7	17.9	18.3	18.8	19.2	19.6	22.2	22.7	23.2
D=8'	9.7	10.0	10.3	10.6	11.0	11.3	11.6	11.9	13.6	13.9	14.3	14.7	15.1	15.4	15.8	16.2	18.4	18.9	19.3	19.7	20.2	22.8	23.3	23.8
D=9'	10.2	10.5	10.9	11.2	11.5	11.8	12.1	12.4	14.1	14.5	14.8	15.2	15.6	16.0	16.3	16.7	18.9	19.4	19.8	20.3	20.7	23.3	23.8	24.3
D=10'	10.7	11.0	11.4	11.7	12.0	12.3	12.6	12.9	14.6	15.0	15.3	15.7	16.1	16.5	16.8	17.2	19.4	19.9	20.3	20.8	21.2	23.8	24.3	24.8

Figure 1 – Oldcastle Culvert Options

Culvert Cost Estimate

The following costs were developed for the culvert option:

		South Bridge	North Bridge	Total
Culvert Items (Items different than for bridge option)		$ 607,022.00	$ 635,508.00	$ 1,242,530.00
Other Items (Items similar to bridge option)		$ 466,452.00	$ 516,199.00	$ 982,651.00
Subtotal Construction		$ 1,073,474.00	$ 1,151,707.00	$ 2,225,181.00
Contingency	25%	$ 268,368.50	$ 287,926.75	$ 556,295.25
Total Construction		$ 1,341,842.50	$ 1,439,633.75	$ 2,781,476.25
Design Engineering	18%	$ 241,531.65	$ 259,134.08	$ 500,665.73
Construction Management	10%	$ 134,184.25	$ 143,963.38	$ 278,147.63
City Administration	10%	$ 134,184.25	$ 143,963.38	$ 278,147.63
Total Culvert Project		$ 1,851,742.65	$ 1,986,694.58	$ 3,838,437.23
Rounded		**$ 1,852,000.00**	**$ 1,987,000.00**	**$ 3,839,000.00**

Culvert costs exceed bridge replacement and bridge repair options. As such, proceeding with the culvert option is not recommended.

3. Repair Option

As requested by the City, Otak has prepared a concept-level repair option for comparison to bridge replacement and culvert options. The intent of these repairs is to extend the existing bridge life by

approximately 10-15 years while additional funding for replacement can be found. This options is summarized in the following sections:

- Existing Conditions
- Repair Costs

Existing Conditions

Inspection reports for inspections on 8/3/2021 were provided by the City and were reviewed and used to determine members that need to be repaired. Inspection reports note element-level conditions in the BMS Elements section. Condition states are summarized below.

- State 1 – Good condition, no repairs needed.
- State 2 – Previously repaired elements, no repairs needed.
- State 3 – Fair condition, repairs not needed, but may be warranted in the context of repairing the bridge before it degrades further.
- State 4 – Poor condition, repairs recommended

Portions of elements can be listed in different condition states. We are recommending repairs for portions of elements that are in Condition State 3 or 4. In some cases, we also recommend repairing portions of elements in Condition State 1 when a significant portion of that element is in Condition State 3 or 4. Notes about the repair of elements are listed in the line items for each element in the cost summary the Repair Costs section below.

Repair Costs

Summary of the repair costs are below. Following that is a more-detailed breakdown of the costs for each bridge. Repair costs are generally much less than the bridge replacement costs. Typically, repairs are warranted when the repair costs are less than about 50%-70% of the bridge replacement costs. If bridge replacement funding is not obtained in the near term, repairing the bridges is recommended.

Cost Summary

		South Bridge	North Bridge	Total
Subtotal Construction		$ 162,840.00	$ 196,440.00	$ 359,280.00
Contingency	25%	$ 40,710.00	$ 49,110.00	$ 89,820.00
Total Construction		**$ 203,550.00**	**$ 245,550.00**	**$ 449,100.00**
Design Engineering	25%	$ 50,887.50	$ 61,387.50	$ 112,275.00
Construction Management	10%	$ 20,355.00	$ 24,555.00	$ 44,910.00
City Administration	10%	$ 20,355.00	$ 24,555.00	$ 44,910.00
Total Repair Project		**$ 295,147.50**	**$ 356,047.50**	**$ 651,195.00**
Rounded		**$ 296,000.00**	**$ 357,000.00**	**$ 653,000.00**

Bridge No. 1413B South Fork Kimball Creek (South Bridge)

	Element	Unit	Qty	Unit Cost	Total	Notes
1	Bridge Deck	SF	0	$ -	$ -	Good condition (whole deck in Condition State 1)
2	Bridge Girders	LF	0	$ -	$ -	Good condition (all girders in Condition State 1)
3	Timber Abutment	LF	52	$ 1,000.00	$ 52,000.00	Fair condition, repair recommended (20 lf of 52 lf in Condition State 3). Assume full replacement of timber abutment and wingwall planks.
4	Timber Submerged Pile/Column	EA	2	$ 5,000.00	$ 10,000.00	Poor condition, repair recommended (1 pile in Condition State 3, 1 pile in Condition State 4)
5	Timber Pier Cap	LS	1	$ 2,000.00	$ 2,000.00	Good condition (entire length of each cap in Condition State 1). Assume minimal amount for cleaning to remove algae growth.
6	Metal Bridge Railing	LF	32	$ 500.00	$ 16,000.00	Fair condition, repair recommended (10 lf of 32 lf in Condition State 3). Recommend replacing full length, both sides. Unit cost includes removal and disposal of existing rail and installation of new.
7	Scour	EA	2	$ 25,000.00	$ 50,000.00	Fair condition, repair recommended (both abutments in Condition State 3)
8	Asphalt Concrete (AC) Overlay	TON	5	$ 300.00	$ 1,500.00	Fair condition, repair recommended (4 sf of 371 sf in Condition state 3). Pothohles forming in northbound lane. 8" AC depth is excessive. Recommend 6" grind with 2" overlay to remove excess dead load and repair AC surface. High unit cost for small quantity.
9	Remove Existing Asphalt Concrete (AC) Overlay	SY	42	$ 100.00	$ 4,200.00	See AC Overlay above.
	Subtotal				$ 135,700.00	
10	Mobilization, Site Prep, TESC, Survey and Traffic Control	LS	1	$ 27,140.00	$ 27,140.00	Estimate 20% Ffor additional items not covered in structural repair of members
	Subtotal Construction				**$ 162,840.00**	
	Contingency			25%	$ 40,710.00	Typically about 25% for concept-level estimate.
	Total Construction				**$ 203,550.00**	
	Design Engineering			25%	$ 50,887.50	Typically 15%-18% for design. Increased to 25% to include inspection and load rating.
	Construction Management			10%	$ 20,355.00	Typically about 10% for CM.
	City Administration			10%	$ 20,355.00	Adjust as needed to cover City costs.
	Total Repair Project				**$ 295,147.50**	
	Rounded				**$ 296,000.00**	

Bridge No. 1413C East Fork Kimball Creek (North Bridge)

	Element	Unit	Qty	Unit Cost	Total	Notes
1	Bridge Deck	SF	0	$ -	$ -	Good condition (whole deck in Condition State 1)
2	Bridge Girders	EA	5	$ 10,000.00	$ 50,000.00	Fair condition, repair recommended (12 lf of 86 lf in Condition State 3). Cracking noted in 5 of 6 girders, all near abutment 1.
3	Timber Abutment	LF	51	$ 1,000.00	$ 51,000.00	Fair condition, repair recommended (all of timber abutment in Condition State 3). Full replacement of timber abutment.
4	Timber Submerged Pile/Column	EA	1	$ 5,000.00	$ 5,000.00	Fair condition, repair recommended (1 pile in Condition State 3)
5	Timber Pier Cap	LS	1	$ 2,000.00	$ 2,000.00	Good condition (entire length of each cap in Condition State 1). Assume minimal amount for shimming to distribute girder bearing evenly on cap.
6	Metal Bridge Railing	LF	0	$ 500.00	$ 0.00	Good condition (entire length of rail in Condition State 1). Repair or replacement not needed unless condition changes.
7	Scour	EA	2	$ 25,000.00	$ 50,000.00	Fair condition, repair recommended (both abutments in Condition State 3)
8	Asphalt Concrete (AC) Overlay	TON	5	$ 300.00	$ 1,500.00	Good condition, repair not needed (entire surface in Condition state 3). However, 7.5" AC depth is excessive. Recommend 6" grind with 2" overlay to remove excess dead load. High unit cost for small quantity.
9	Remove Existing Asphalt Concrete (AC) Overlay	SY	42	$ 100.00	$ 4,200.00	See AC Overlay above.
	Subtotal				$ 163,700.00	
10	Mobilization, Site Prep, TESC, Survey and Traffic Control	LS	1	$ 32,740.00	$ 32,740.00	Estimate 20% for additional items not covered in structural repair of members
	Subtotal Construction				**$ 196,440.00**	
	Contingency			25%	$ 49,110.00	Typically about 25% for concept-level estimate.
	Total Construction				**$ 245,550.00**	
	Design Engineering			25%	$ 61,387.50	Typically 15%-18% for design. Increased to 25% to include inspection and load rating.
	Construction Management			10%	$ 24,555.00	Typically about 10% for CM.
	City Administration			10%	$ 24,555.00	Adjust as needed to cover City costs.
	Total Repair Project				**$ 356,047.50**	
	Rounded				**$ 357,000.00**	

4. Permitting

The previous project design and permitting package assumed a federal nexus through funding from the Federal Highway Administration (FHWA) and Washington Department of Transportation (WSDOT) Local Programs (LP). Distribution of the federal dollars required compliance with the National Environmental Policy Act (NEPA) and associated federal laws (e.g., Endangered Species Act, National Historic Preservation Act). A NEPA compliance documentation package was prepared but did not appear to have been approved by WSDOT. A Joint Aquatic Resource Project Application (JARPA) was also prepared for acquiring Section 404/401 permits from the United States Army Corps of Engineers (USACE), and a Hydraulic Project Approval (HPA) from WDFW.

Some of the previously completed documentation can be re-used during permitting for either the bridge repair or replacement, and other materials will need to be updated. New items for permitting have also been identified, including compliance documentation for floodplain hazard regulations [Snoqualmie Municipal Code (SMC) Chapters 15.12 and 19.12], and shoreline management regulations (SMC Chapter 19.08). It is assumed that the repair option would be funded by the City, and the bridge replacement option would require federal aid.

In general, all permit applications and environmental compliance documentation need to be updated to reflect the most current project design.

Items that need to be updated are listed below. The rationale is included in parentheses, and items listed by italics are required only for replacing the bridges using federal funds:

- Critical Areas Study (more than five years old, complete wetland ratings per new Ecology 2014 Rating System, and update classifications and buffer widths per current SMC 19.12)
- JARPA Form and Plan Sheets (application should be revised to reflect the preferred and updated design)
- *Categorical Exclusion Document and supporting studies, formerly called Environmental Classification Summary [ECS] (WSDOT utilizes new form based on 2022 guidance, and information in existing form needs to be verified for accuracy and updated if necessary)*

New items that need to be prepared for permitting with federal, state, and local agencies:

- Endangered Species Act compliance documentation (*Biological Assessment expected to be required by WSDOT for bridge replacements;* Biological Evaluation and FPRP III Notification Form for USACE for bridge repairs)
- Shoreline Permit Application (no application prepared previously, including No Net Loss statement for mitigating project impacts to the shoreline environment)
- Flood Hazard Regulations compliance documentation (not prepared previously, project is within mapped floodplain)

Items that likely do not need to be updated include:

- Cultural resources documentation provided that no changes are made to the Area of Potential Effects (No Effect Letter issued by DAHP dated June 12, 2014)

5. Recommendations

Based on Otak's assessment of the Kimball Creek bridges documents, and development of culvert and bridge repair options, we recommend one of the two options below, depending on availability of federal funding to bridge replacement:

- If federal funding for bridge replacement is not available in the near term, proceed with bridge repairs. The costs for this option appear to be significantly less than the bridge replacement and culvert options. Permitting applications for this option have not been developed and will need to be developed in conjunction with the repair details.
- If federal funding for bridge replacement is available, the following is recommended:
  - Update design documents as detailed in Section 1.
  - Coordinate with WDFW regarding potential sponsorship of a Fish Habitat Enhancement Project (FHEP) designation, which would eliminate the need for local permits except for Flood Hazard.
  - Prepare bankfull width memorandum and review for concurrence with WDFW and Tribes to prevent delays during USACE permitting.