



Hood River - White Salmon

BRIDGE REPLACEMENT PROJECT

State Route 35 Columbia River Crossing

Project Cost Estimate Update - Executive Summary



February 24, 2022

Executive Summary

PCE UPDATE PURPOSE

The Port of Hood River (Port) has requested an update of the engineer's preliminary project cost estimate (PCE) with associated construction schedule and scoping (assumptions) documentation for the proposed Hood River – White Salmon Replacement Bridge project (the project). The Port's goal is to qualify the project work elements, design and construction assumptions, construction schedule, identify risks and associated contingencies, address current year to construction escalation and market variability, and capture programmatic costs into one PCE that can be tracked and adjusted as the project progresses through design and construction.

PCE DELIVERABLES

The PCE update is separated into several documents. This executive summary document describes the purpose of each document developed as part of the PCE update and provides an outline and page count for quick reference about where to look for specific information regarding the update.

The supporting documents for the Preliminary Cost Estimate can be found at the following Port of Hood River bridge replacement Bi-State Working Group link, under the December 13, 2021 meeting materials:

<https://portofhoodriver.com/bridge/bridge-replacement-bi-state-working-group-bswg/>,

Project Cost Estimate Document

Pages 1 – 12

This document introduces the purpose and goals of the PCE update. It documents decisions made in collaboration with the Port and inputs that are included in the PCE after the base construction item costs. These items include mobilization, sales tax, design and post-design engineering costs, contingencies, escalation, and programmatic costs. The other deliverables are considered attachments to this document.

A few key points in this document worth highlighting include:

- Construction costs wrapped mobilization and sales tax (when applicable) into bid item unit prices in KMC Construction Consulting's (KMC) efforts to accurately place cost to specific work elements. Mobilization and sales tax should be broken out in future updates to the project cost estimate.
- The 6 percent Engineering and 2 percent Post-Design Services based on relative projects; need to define scope of services and delivery method for construction to finalize these percentages. These percentages are based on a design-bid-build delivery method.
- Contingency at 30 percent of construction costs include both design and construction and are based on specific key factors for this project and Class 4 level estimate, as defined by the Association for the Advancement of Cost Engineering and a link is provided to describe the levels of estimates. Key project factors impacting the contingency recommendation are included with percent impact potential of each to justify the 30 percent decision in this effort.

- The team, including representatives from the Port, selected a 4-percent escalation rate and understand that this will have to be closely monitored with adjustments to be considered yearly.
- Port programmatic costs include right-of-way (ROW), tolling, finance, governance, replacement bridge management contract (RBMC) resources, Port staff costs, BNSF Railroad, other mitigation, and Port insurance on the project. The Port worked with WSP to tie these Port input items with the assumptions associated with this current PCE update.

PCE Scope Assumptions

Pages 1 – 37

The PCE scoping document works with the PCE update to document the assumptions tied to the proposed Hood River – White Salmon Replacement Bridge replacement structure and demolition of the current bridge. This document has a table of contents to help the reader navigate to specific topics. It is important to note that these assumptions are based on “one way” that a contractor could reasonably perform the work. Future engineering will refined these assumptions as procurement documents and permits are established. The actual construction means-and-methods will be determined by the contractor awarded the work to meet the contract requirements. Outlining these assumptions provides the Port a tool to track and adjust project costs, schedule, and even project goals as the engineering is advanced through design. It also helps inform project scope, risks, and change management.

There are many assumptions in this document and possibilities that can be adjusted later in design, but some key considerations include:

- The document focused on project bid items that are expensive, challenging, or include a large quantity that have a large impact on the project cost. Smaller bid items were not documented, and the quantities and unit process are carried over from past cost estimate efforts.
- The scope assumes design-bid-build delivery is the delivery method the Port will use. This document allows for flexibility to adjust assumptions if the Port selects another delivery method.
- The assumed sequence of work, with critical milestones tied to the schedule update (discussed below), lays out how the work will be accomplished and the process to get materials and resources out to specific work items. A critical factor is work-window limits and how to manage tasks associated with those windows to limit the number of years required to construct the new bridge and remove the existing bridge.

The order of work is important in both design and construction. This document is intended as a tool in design, so the organization of the *categories* in this document follows:

- *Environmental Commitment Summary* and *Project Design Criteria* are included first. Each of these categories is fully developed in their own documents. What is include in the scoping assumptions document are inputs, that if change in the future, would affect, quantifies, unit costs, or assumptions in this document.
- *New Bridge Construction* will start with foundation work. The design process starts with the bridge configuration and geotechnical inputs, then develops details for the foundations and bridge superstructure. This document is outlined in this order with bridge aesthetics added at the end. The assumptions for aesthetics are very broad-brush at this point and need input

from several interested parties besides the Port. The bridge work includes the bridge abutments, but access to the river and approach work is include in the next two categories. Assumptions from either approach or the bridge can change independently without affecting the other unless roadway geometry is adjusted.

- *Oregon Approach* category includes assumptions associated with intersection improvements, impacts to the Port of Hood River Boat Launch and Port facilities, project phasing and construction access on the Oregon side of the river, and a discussion on tolling.
- *Washington Approach* category includes assumptions associated with the project approach to phasing and construction access over and across BNSF railroad line and ROW.
- *General Construction Staging and Access* is a broad topic and is included in other categories when related to specific work activities, such as shaft construction for foundations or segmental construction of the post-tensioned box superstructure, but is separated out specifically here for work activities that apply to multiple aspects of construction. This section covers construction staging access location around the project footprint, challenges with concrete batching and placement on a project of this size and over water, work trestle requirements and impacts, and marine support. Marine support can be a very costly component of the project and includes barges, tugboats, loading and unloading materials and equipment, and river-staging footprints that impact fishing rights, the navigable channel, and recreational segments the river.
- *Existing Bridge Removal* describes assumptions for removal of the existing bridge superstructure, containment, and removal of the bridge foundations, and addresses challenges for containing environmentally sensitive materials.

Project Cost Estimate Update

Pages 1 – 25

The PCE update includes an itemized breakdown of construction bid items (pages 1 – 3) with quantities and unit costs developed through KMC’s contractor style construction estimate (see KMC cost estimate discussion below for more details). KMC and WSP revisited key bid items quantities to verify against or update to the most current design and to be consistent with the construction assumptions outlined in this effort. Bid items not identified as high cost or with large quantities were carried over from previous engineering estimate development. Figure 1 shows the summary of the PCE update.

Escalation was derived from the KMC resource loaded schedule (discussed further in the schedule section below) and PCE escalation analysis (pages 4 – 7).

Programmatic costs provided by the Port and discussed in the PCE scoping document above are broken out on page 8.

PCE bid items carried over from pervious engineering cost estimate efforts for quantities and unit prices are tabulated on pages 9 and 10. Pages 11 – 25 include bid items identified as high cost or large quantity. These quantities were updated and verified with KMC to be consistent with the scoping assumptions.

PROJECT COST ESTIMATE - UPDATE					
SR-35 COLUMBIA RIVER CROSSING				Port of Hood River	
KEY NUMBER	BRIDGE NAME	BR #	DATE	ROADWAY DESIGNER	
	Hood River Bridge Replacement	--	2/15/2022	WSP/KMC	
ITEM NUMBER	ITEM DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL
SUBTOTAL, Construction Items					
	MOBILIZATION (Included in Bid Items)	LS	1	0%	\$0
SUBTOTAL, All Items					
	CONTINGENCIES (Design & Construction)	LS	1	30%	\$76,271,000
SUBTOTAL, All Items + Contingencies					
	SALES TAX, 7.5% - WA only (PCE assumes all materials purchased in WA)	LS	0.0	7.50%	\$0
	DESIGN ENGINEERING	LS	1	6%	\$19,831,000
	POST-DESIGN ENGINEERING (CSS)	LS	1	2%	\$6,611,000
TOTAL COST 2021\$					
	ESCALATION (To mid-year of construction - see escalation tab)	YR	7	4.0%	\$97,215,944
TOTAL COST Mid-year Construction					
	PROGRAMMATIC COSTS				\$44,343,178
PROJECT COSTS					
					\$498,506,330

Figure 1 – Project Cost Estimate Update Summary

PCE KMC Cost Estimate Update

Pages 1 – 29

WPS partnered with KMC to develop the contractor style construction estimate using InEight Software methodology for discrete high risk/high dollar activities, including labor, equipment, material, supplies, and specialty subconsultants. KMC developed their own construction access, marine support, and staging concept that was incorporated into the assumptions and PCE update.

KMC performed a Unit Price Analysis for costs and labor rates associated with the higher-cost or high-risk work elements. KMC then developed a PCE Summary to roll all costs, including contractor profit and overhead, into the engineering estimate bid items to produce updated unit costs for the associated quantities. This allowed the team to match the contractor style construction estimate with the engineering estimate and maintain an equivalent project costs.

The PCE Summary is detailed out in the first 2 pages of the document, followed by 4 pages (pages 3 – 6) of the work breakdown structure (WBS) for their contractor style construction estimate, and then 23 pages (pages 7 – 29) of details for each WBS item.

PCE Basis Project Document Review Report

Pages 1 – 6

The first three pages of the PCE basis project document review report describes KMC approach to the development of the contractor style construction estimate based on the review and iteration with WSP to develop the assumptions document, engineering estimate bid item quantities, and construction schedule. KMC describes the different rates applied, costs assumed, application of indirect factors, overhead, market contingencies and fees, and other inputs that were incorporated into the estimate. Detail of production and direct cost work is reflected in the WBS and KMC attached a labor register (pages 4 – 6) as backup.

PCE Cost Risk Register

Pages 1 – 3

The PCE cost risk register identifies items associated specifically to assumptions that impact cost and are described, assigned a probability of occurrence and magnitude of impact to cost, and placed in a cost risk matrix. A risk response is provided with a mentoring interval and any specific notes to add carination if needed. This tool will be advanced though design and possibly into construction, with items dropped off or added as the risk are marginalized or identified. A risk that covers both cost and schedule are included independently in each. There are risks

associated with every design element, project assumption, or work activity, but the ones included were agreed to by the WSP team and the Port based on the best knowledge today.

PCE Schedule Risk Register**Pages 1 – 3**

Similar to the cost risk register for the PCE update, the schedule risk register focuses on assumptions associated with schedule that creates project risk and warrants specific monitoring.

PCE Schedule Update**Pages 1 – 12**

WSP started the Primavera P6 schedule developed in early 2021 to support the environmental impact statement (EIS) process and reduce the construction duration to approximately six years. KMC worked with WSP to identify critical milestones to update the construction schedule. Collaboratively, the team iterated through schedule, cost, and assumptions to create a compatible schedule with the PCE update.

A memorandum is included in pages 1 – 4 to cover the assumptions for the effort, identifies the individual calendars used, critical milestones targeted, and a brief discussion of the KMC generated resource loaded schedule that helped inform the construction schedule and project escalation. Pages 5 – 11 are the detailed construction schedule and page 12 is the KMC resource loaded schedule.

Key components of the updated schedule include:

- Sequence of work and critical milestones to match current PCE assumptions built around the in-water work-window (IWWW) limitations set currently as October 1 – March 15 each year.
- Weather delays were incorporated into any work elements that could be shut down due to high winds. This was done by creating separate schedules that included one day per week that was identified as non-working for weather sensitive items.
- Notice to proceed (NTP) for construction has a target date of December 1, 2026, to meet the first October 1, 2027 IWWW. The Port identified the need to accelerate the design schedule, including funding, development of bridge replacement authority, RBMC, design, procurement method, EIS and permits, and other efforts to meet the NTP date set.
- This schedule shows the new bridge open to traffic in September 2030 and the demolition portion of the existing bridge completed with project restoration by January 2032. This maintains a construction schedule just over six years in total duration.

SCB:nb
February 24, 2022