

March 25, 2014

TO: Project File
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SUBJECT: Project Closeout Summary for Columbia River Bridges & Approaches Design Build Procurement – Structures

Executive Summary

This memorandum provides the status of the work for the development of the Columbia River Bridges & Approaches Design Build Procurement, specifically addressing the following technical focus areas:

- Permanent Structures
 - Columbia River Bridges and I-5 Highway Approach Bridges
 - All Other Highway, LRT, and SUP Bridges
 - Retaining Walls and Sound Walls
 - Traffic Structures (for Signs, Signals, Illumination, ITS)
 - Tolling Structures
- Temporary Structures
- Existing Structures

This memo overviews the status of the work, outstanding work and next steps, an overview of project history, key decisions, and information on key documents and references. This memorandum, assembled at the time of project closeout, is intended to provide adequate information to allow project start-up within a year’s time-frame.

Status of Work

The work includes the development of the technical performance requirements, bridge design criteria, and select concept plans for the structures included in the Columbia River Bridges and Approaches Package.

The following deliverables were completed at the approximate level of completeness as identified in Table 1, at the time of project closeout.

TABLE 1.
 CRBA DB Procurement Deliverables Status Summary
Status of Deliverables for the CRBA Design Build Procurement Development

TASK	DELIVERABLE	APPROX. PERCENT COMPLETE	STATUS OF WORK
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4.3	Draft technical Performance Requirements - provision DB 141	75%	Work in progress. Waiting for client review. Continued clean up of DB 141 for formatting, language, terminology, acronyms, interdisciplinary coordination, project interfaces, and other outstanding issues. See "Draft RFP action items list".
13.1	Bridge Concept Plans	50%	Work in progress. Waiting for client review. Continued revision required to reflect "proof of concept", interdisciplinary coordination, and project interfaces.
13.2	Draft Structural Design Criteria for the Columbia River Crossing DB Project	80%	Work in progress, but generally complete. Waiting for final client comments. Conversion from tabular format to written design criteria and coordination with DB 141 required. See Excel table summary of actions to resolve inter-state differences in BDDM vs. BDM.
15.1	Updated bid quantities for the CRBA	0%	Work not started. Deleted by WOC 4 Amendment No. 1

Table Notes:

1. Table status as of March 14, 2014.
2. [Insert more notes as needed.]

Known Issues

The following is a summary of the known issues that were not resolved at the time of closeout:

- Forward compatibility with future WA North project needs to be evaluated by the CRBA design team, specifically addressing:
 - Bridge 5N-CST: Incorporating requirements for CRBA DB team submittals (30% design, FAA clearance documentation, structural interaction with I-5 mainline, etc.)
 - Retaining walls through the pinch point between the Post Hospital and Regal Cinemas/Riverwest development
 - Location of NB and SB collector-distributor ramps and associated retaining walls in relation to layout of CRBA infrastructure
- Future construction of the Locally Preferred Alternative on Hayden Island (as represented in the FEIS) would require reconstruction of some facilities, potentially including some structures. See Key Decisions below.
- Moved two bridges from the Marine Drive Package to the CRBA Package – 5S-MLK(A-5S) and MDE-5N(HI-5N):
 - Only rough evaluations of structure depth and vertical clearances have been performed.
 - Due to orientation of crossing alignments, integral straddle piers may need to be required in order to limit structure depths.
 - Sight distance and clear zone requirements have not been fully evaluated. Bridge layout modifications, alignment changes, and/or design exceptions may be required.
 - Concept plans for these bridges have not been developed.
- Cost estimates for many landside bridges (non-mainline) based on limited quantity calculations or assumed square foot costs. Estimates believed to be reasonably conservative.

- Unclear how to incorporate construction specifications, standard plans/drawings/ details, etc. for elements from “other” agencies incorporated into the project.
 - Can other-agency standard drawings (that are stamped by an EOR for that agency) be referenced directly for use in the ODOT project if the design manuals, construction specifications, and approval processes don’t follow the other agency requirements?
- Staging plans not synchronized with the current project schedule, potentially affecting scope of CRBA elements
- Coast Guard Bridge Permit condition requires construction of the bridges to be complete within 5 years of issuance of the permit. In the pre-permit review comments from CRC, it was requested that this be 10 years, but the change wasn’t incorporated into the permit conditions.

Outstanding Work

The following is a summary of outstanding work and next steps at the time of closeout that was not started, but necessary for the development of the DB Procurement final RFP for the CRBA Package:

- Discipline QC reviews, interdisciplinary coordination/reviews, and Agency reviews of concept plans
- Unresolved interface issues. See “CRBA Interface Work Status Memo” for detailed interface issues and action items.
- Unresolved comments for the structural performance requirements. See “Draft RFP Action Items List” regarding Section 141.11.
 - Inspection and maintenance requirements not fully developed.
 - Requirements for fencing, barriers, and rails on bridges need more work and coordination with other sections. Barrier test level requirements not yet specified.
 - Toll gantry requirements not included in structures section yet.
 - Confirm corrosion protection adequately covered in design criteria. Agency required stainless steel reinforcement in top deck of CRB’s. Need to confirm if stainless steel reinforcement is required in other decks (e.g., mainline approaches).
 - Wall coping/moment slab requirements incomplete. Wall batter requirements need confirmation.
 - Need to coordinate RFP requirements with Final Structural Design Criteria
 - Service life requirements in current draft need vetting
 - Noise wall geospatial reporting requirements need clarity and potentially belong in another section
 - Noise wall layout needs confirmation and coordination with WA North retaining wall/noise wall layout
 - Use of ODOT traffic structures in WA needs to be vetted
 - Compare WSDOT and ODOT steel fit-up requirements and provide additional requirements in RFP as necessary.
 - Stray current and other transit-specific requirements need more coordination.

- Confirm expansion devices for duct banks and other utilities crossing CRB expansion joints are accommodated
 - Need to develop requirements for provisions to accommodate future painting in lower deck transit cells.
 - Bridge removal and salvage requirements. Address Bridge Marketing Plan requirements.
 - Determine agency requirements for CRBA based on recommendations from Homeland Security. Determine approach to incorporation of sensitive requirements related to Homeland Security.
- Conformance of the concept plans to the performance requirements to ensure there are no direct conflicts
- Agency comments on Draft Structural Design Criteria not received or incorporated. Final Structural Design Criteria not developed. See “Draft Structural Design Criteria Action Items List”. Specific comments of note are:
 - Need to fully resolve design seismic event return periods to use for mainline approaches, both for structural and geotechnical design.
 - Confirm clearances are adequately provided for highway, SUP, and LRT. Confirm if heavy rail and aviation clearances required in design criteria or if they are provided in the RFP. Confirm draft fire engine clearance and load requirements for SUP with COP Fire and COV Fire.
 - Specific load rating technical requirements for WA bridges following WSDOT procedures should be included in the Structural Design Criteria.
 - Need to confirm that the requirements for structural redundancy are achievable. The design criteria requires that the DB produce an analysis and provide calculations that show that all bridge components, including secondary component (e.g. deck, studs, diaphragms, barriers, etc.) meet the Strength I Limit State with the loss of one tension member.
- Incorporation of requirements related to pre-construction survey of structures (likely in a general section of RFP), and instrumentation of existing I-5 bridges over the Columbia River
- Incorporation of environmental commitments related to structures

Milestones & Key Decisions Related to Disciplines

Key project milestones include:

- USCG Bridge Permit issued with conditions September 27, 2013.

Key project decisions include:

- As part of an initial capital cost reduction, the Hayden Island Interchange was reconfigured from the Split SPU shown in the FEIS to a diamond-type interchange similar to the existing.
- Columbia River Bridge type announced by Governors Gregoire & Kitzhaber: deck truss bridge, April 25, 2011

- Use of shafts for permanent Columbia River Bridge foundations, and use of vibratory installation with proofing for temporary pile installation. See Biological Opinion.
- Updated navigation channel locations. See Section 408 permit documentation.

Project Records

Records of the work conducted under this task can be found at:

- Bridge Concept Plans at G:\CRC\CRC Workpaper Files_Closeout Incomplete Deliverables\B31835 WOC 4\Task 13.1
- Draft I-5 Columbia River Bridges & Approaches Structural Design Criteria at G:\CRC\CRC Workpaper Files_Closeout Incomplete Deliverables\B31835 WOC 4\Task 13.2
- CRBA BDDM and BDM Comparison Table at G:\CRC\CRC Workpaper Files_Closeout Ref By Discipline\Structures\Design Criteria
- Draft memo for fire engine requirements at G:\CRC\CRC Workpaper Files_Closeout Ref By Discipline\Structures\SUP Draft fire engine requirements

Standards & Versions

Standards used for the work are listed in the Design-Build General Provisions DB 141.