2013 â?? I-5 / Skagit River Bridge Span 8 Replacement

Description

Meta Fields

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Project Summary :

In 2013, a steel through truss span of the I-5 Skagit River Bridge collapsed, as a result of a high-load impact to the sway frames. A temporary Acrow bridge was erected to reopen the roadway. The permanent span of precast prestressed deck-bulb tee girders was constructed adjacent to the temporary span. Within a single day of roadway closure, a horizontal skid track system was used to relocate the temporary span and install the permanent span.

Project Location :

Interstate 5 across the Skagit River between the cities of Mount Vernon and Burlington in northwestern Washington State

Mobility Impact Time : The interstate remained operational for 208 days with the temporary span in place, during the design and construction of the permanent span. Therefore, the expected time to construct the bridge conventionally would at least have required the 208 days.
Impact Category : Tier 1 (within 1 day)
Dimensions : The existing bridge was four steel through truss main spans (simple spans), eight concrete girder spans. The collapsed span was one of the steel through truss spans. The replacement span is eight W65DG lightweight prestressed concrete deck bulb tee girders with 1.5" concrete overlay, spaced at 7.25'. The replacement span was 60' wide and 163' long.
Average Daily Traffic At Time Of Construction : 71000
Traffic Management : After the span collapsed, the interstate traffic was detoured through city streets to a nearby bridge, crossing the river. The detour was 3 miles long. A temporary Acrow bridge was constructed as a temporary span while the permanent span was constructed adjacent to the Acrow bridge. The interstate was detoured for 27 days. The interstate was detoured for an additional day to slide the temporary bridge and slide the permanent span. Conventional construction would have required an additional 200+ days.
Existing Bridge Description : The existing bridge was four steel through truss main spans (each 160' simple spans), eight concrete girder spans (48' to 84'). The collapsed span was one of the steel through truss spans. The bridge carries two lanes in each direction.
Replacement Or New Bridge : The new permanent span was constructed adjacent to the temporary span (east side), on temporary steel pile supported bents. The permanent span consisted of eight W65DG prestressed deck bulb tee girders using lightweight concrete. The temporary span was slid off to the west, onto temporary steel pile supported bents. Using the same track alignment, the permanent span was slid into the permanent location, to the west.
Construction Method : The temporary and permanent spans were slid in one day using Teflon surface skid tracks and horizontal jacks. The skid distance for each move was approximately 75'.
Stakeholder Feedback : Lightweight girders can be used to limit weight replaced on existing foundations. Headed bars used for flange connection between adjacent deck bulb tees can cause interference if sufficient placement tolerance is not provided. Using full depth flange connection (instead of welded ties) provided a shear - flexure transfer joint, permitting the use of distribution factors that eliminated one line of girder.
High Performance Material : Lightweight concrete in prestressed girders.
Contacts : Bijan Khaleghi, P.E. State Bridge Design Engineer Washington State Department of Transportation khalegb@wsdot.wa.gov 360-705-7181 **Submitter:** Jed Bingle P.E. Accelerated and Innovative Bridge Construction (ABC) Specialist Washington State Department of Transportation binglej@wsdot.wa.gov 360-705-7222 **Designer:** Parsons Brinckerhoff Victor Ryzhikov, P.E. Ryzhikov@pbworld.com 813-520-4367 **Fab1:** Concrete Technologies Corporation Fabricated lightweight prestressed girders. (253) 383-3545 **Contractor:** Max J Kuney
Costs : Design-Build contract best value $6.9M.
Additional Information : Contract plans are available below. This was a design / build project; therefore, no specifications or estimates are available.

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