

The new Upper Perry Bridge, near La Grande, Ore., spans the Grande Ronde River and carries Interstate 84 traffic through a 1,000-foot radius curve. The original design for the bridge was envisioned as twin cast-in-place concrete box girder structures, tied together at the supports and with a deck closure pour.

However, after successfully bidding the job, the contractor, Holm II, Inc., decided that it would be difficult to complete all of the work, including casting all of the concrete required for the 8-cell box girder and the closure pour, in the contract time allowed. Faced with penalties if any poor weather or unforeseen events delayed the casting sequence, they began thinking of alternatives that better fit the project schedule even before the contract was awarded.

As construction began, the contractor immediately had the support of the owner's project manager for a value engineering proposal. In the end, both agreed that a steel structure was better suited for the project.

Through the value engineering process, the contractor proposed a curved, steel-plate I-girder bridge. A consulting engineer, steel fabricator, and steel detailer were brought into the discussion to help evaluate the costs of the preliminary design. The result was more of a design-build environment, with conference calls soliciting everyone's input. Even at a time of rapid price increases, the steel alternative was the structure of choice due to the relative ease and efficiency of construction.

During preliminary design, the engineer suggested independent structures that could be made different lengths to better accommodate the terrain at one end of the bridges. Additionally, the engineer suggested single, hammer-head piers instead of a two-column bent, utilizing the foundations already cast in solid rock. Due to the lower seismic mass of structural steel, the single-column substructures were sufficient for the controlling lateral load. Independent structures also eliminated the need to schedule the closure pour before a permanent traffic barrier was placed on top of the deck.

Once erection began, the contractor, who also served as the erector, worked 18-hour days in overlapping shifts to place 475 tons of steel in four days. The deck was cast five days after erection began, and the rails two weeks after the deck. The Interstate was opened for the winter as scheduled.

The design of the second bridge was completed on the heels of the first. The westbound bridge was also completed on time, with a little less stress, and the interstate was permanently opened to two lanes of traffic each way in time to meet the project deadline. In the minds of all involved, the original concrete plan would have never been completed on time. This would have created traffic delays and impacts to the traveling public, both in terms of safety and mobility. In addition, the amount of falsework required to cast the concrete for the box girder bridge would have resulted in more impact to the sensitive river environment.

MSC

Owner

Oregon Department of Transportation, Salem

Designer

OBEC Consulting Engineers, Eugene, Ore.

Fabricator

Fought & Company, Inc., Tigard, Ore. (AISC Member)

Detailer

Tensor Engineering Co., Indian Harbour Beach, Fla.

General Contractor

Holm II, Inc., Stayton, Ore.

Upper Perry Bridge

Interstate 84 near La Grande, Ore.

