



Midspan framing showing the double edge girders with the anchors tucked between them to provide the navigation clearance in the middle of the bridge. Rendering: T.Y. Lin International.

and recess the anchorage between the split edge girders. This design produced a somewhat complicated forming system, but it allowed meeting the clearance requirements without significantly increasing the concrete volume and weight.

Means and Methods

One of the more critical elements for reducing the cost of construction is to efficiently move material through the construction site and out to the construction fronts. The construction of work bridges required for the two main towers allowed workers and materials to efficiently reach the construction fronts. There was a large preassembly yard on the Portland,

Ore., side of the bridge where the reinforcing steel cages were preassembled prior to being lifted into place by the tower cranes at each pylon.

This efficient use of the site was one of the ways construction costs were reduced. Preassembly of the tower reinforcement along with aligning the cable saddles in the preassembly yard allowed for efficient assembly of the structure. The preassembled sections were then moved to the towers over the work bridges.

The overhead traveler system used to cast the segments was chosen because it was comparatively

lightweight. This was necessary to avoid overstressing the deck. However, due to the shallow edge girder section, it was not possible to cast a full 32 ft between cable anchors. The segments were cast 16 ft long, and temporary cables were used to support the bridge as the permanent cables were installed.

Summary

The bridge is essentially complete, and the systems necessary to operate the LRT are being installed. The new LRT line will open to riders on schedule in 2015 due to the collaborative efforts of the owner and the design-build team. Portland, Ore., a city of many bridges, has a unique, new transit and pedestrian crossing of the Willamette River, which will serve the public for many years to come. **A**

Norman Smit is a senior associate and David Goodyear is senior vice president with T.Y. Lin International in Olympia, Wash. Aaron Beier is a project engineer with Kiewit Infrastructure West Co. in Vancouver, Wash.

For additional photographs or information on this or other projects, visit www.aspirebridge.org and open Current Issue.

AESTHETICS COMMENTARY

by Frederick Gottemoeller



Portland, like Pittsburgh, Chicago, and several other major cities, is fortunate to have a whole array of major bridges lined up along its most important waterways. They shape everyone's image of the city. The bridges are of many types and sizes, each reflecting its purpose, ownership, and period of completion. Placement of a new bridge in the midst of such an array is always a challenge. Will the new bridge hold its own in the cityscape? Will it adequately reflect the aspirations and skills of its era? And, in a city center especially, will its details stand up to the scrutiny of the thousands of people who will see it close-up every day? It appears that the new Tilikum Crossing will do all of those things.

This cable-stayed bridge, a first for Portland, inserts a clearly twenty-first century form into the mix of existing trusses and arches. The form itself is large enough and geometrically distinct enough to stand out in the cityscape. The designers have taken the form a step farther, making it visually unique among cable-stayed bridges by such refinements as the tapered pentagonal tower legs and visually simplified floor system. They had no need to seek novelty in untried structural systems. The elegance of the design will make it a strong visual anchor for the future redevelopment of the adjoining areas upstream from downtown. The generous side paths make for a natural combination of bus/light-rail transit riders, bicyclists, and pedestrians on a single structure. One hopes that we will soon see similar arrangements in other cities.

Finally, the quality of the details will make the structure an interesting bridge to be around. The oval pedestals for the tower press into service an attractive geometric shape that responds to the flow of the river. The floor system simplifies the underside appearance for boaters and riverwalk users by integrating the cable anchorages within the paired edge girders. And the aesthetic lighting will bring the bridge to life at night. Portland has a fitting new landmark to add to its array of bridges.