

TILIKUM CROSSING BRIDGE - Portland, OR



Overall Bridge View

PROJECT INFORMATION

Year of Completion: 2015

Construction Cost: \$119M (bridge only)

Client: Kiewit Infrastructure West Co. and T. Y. Lin International

Owner: Tri-Met

The Tilikum Crossing Bridge is Portland's latest addition to the Willamette River crossings. The 1,720-ft long cable-stayed bridge (780-ft main span) is intended to serve light-rail trains, pedestrians, cyclists, and Portland's Streetcar extension to SE Portland and Milwaukie.

The bridge is located in a seismic zone and is required to meet a two-level seismic performance criteria as stipulated in the AASHTO LRFD Seismic Criteria. Both pier caps and supporting drilled shafts were designed for soil-structure interaction, including non-linear behavior.

BSCE was retained by the Design-Build team of Kiewit / T.Y.Lin International to develop & produce both the preliminary pre-bid & detailed post-bid structural engineering design for the main span's two major in-water foundations. As part of the pre-bid work, BSCE proposed a method of significantly reducing the pile cap mass and thereby reducing the seismic demands of the foundation, which allowed a 25% reduction in the number of drilled shafts.

The final foundation design involved the use of six 10-ft drilled shafts for each tower, each of which penetrated at least 120-ft into the river bed, attached to an oval-shaped cap approximately 55-ft wide, by 95-ft long, and 18-ft high. The original design involved a 96-ft diameter circular cap with eight shafts.

Special attention was required during the planning and execution phases of construction of the in-water piers to minimize the environmental impacts and effects on river traffic and users. The in-water construction of the foundations was constrained to a four month window during the summer of 2011 to protect local fish.

SERVICES PERFORMED

- ◆ Specialty structural and geotechnical foundation engineering
- ◆ Full foundation structural design
- ◆ Seismic analysis and design
- ◆ Soil-structure interaction and non-linear structural behavior analysis
- ◆ Detailed structural design of in-water pile caps, and drilled shaft foundations



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