

SR-520 FLOATING BRIDGE - SEATTLE, WA

1200-Ton Capacity Pontoon Lift Barge

To replace the aging SR-520 Evergreen Point Bridge between Seattle and Bellevue, the Washington DOT commissioned a new floating bridge to run parallel to the existing one. When completed, the new bridge will be the longest floating bridge in the world at 7,710-ft long and will improve capacity on the old bridge.

The construction schedule dictated the use of multiple casting facilities for the construction of the concrete pontoons. The bulk of the pontoons were constructed at the Aberdeen basin. A second graving dock casting facility was selected in Tacoma to construct 44 of the supplemental stability pontoons.

PROJECT INFORMATION

Year of Completion: 2016

Construction Cost: \$4.65B (full project with approaches)

Client: Kiewit-General-Manson JV

Project Sponsor: Washington DOT

However, there were two challenges in the use of the Tacoma site. First, the graving dock at Tacoma was too shallow for the supplemental pontoons. The typical high tide at Tacoma only produces a water depth of 12-ft, but the supplemental pontoons that were to be



Pontoon Lift Barge in Service

cast in the basin would had a draft of about 15-ft. The second challenge resulted from a combination of construction schedule and the narrow width of the graving dock. The schedule needed the pontoons to be constructed in pairs, and the width of the dry-dock only allowed for supplemental buoyancy between the 2 constructed pontoons, not on both sides of each pontoon. To solve this problem, BSCE provided the design of a unique, 1,200-ton capacity "T-Pontoon" that fit between a pair of pontoons for the float-out of the supplemental pontoons from the graving dock in Tacoma.

The weight of the supplemental pontoons varied from 2,500 to 2,800-tons

each. The T-Pontoon was floated in between each pair of supplemental pontoons and was connected by steel framing to the centerline of the supplemental pontoons. This configuration provided 1,200-tons of additional buoyancy, reducing the total draft of the pontoons to 11-ft for float out at a typical high tide.

SERVICES PERFORMED

- ◆ Analysis & Design of 1200-Ton Capacity Lift Pontoon
- ◆ Barge Stability & Buoyancy Analysis of Lift Pontoon
- ◆ Construction Engineering

In addition to the added buoyancy provided by the "T-Pontoon" some pontoons required watertight temporary framing in the center moonpool to provide the required lift. Once the basin was flooded and the three connected pontoons were freely floating, they could be towed to deeper water. To finish the float-out operation, the T-Pontoon was flooded to eliminate the buoyancy, and the supplemental pontoons disconnected.



Pontoon Lift Barge Prior to Launch



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