



W Seattle High Bridge Emergency Repairs

- **Location:** Seattle, Washington, USA
- **Start Date:** July 2020
- **Completion Date:** July 2022
- **Contract Value:** ~\$6,650,000 (USD)

Project Description: The West Seattle High-Rise bridge is a cantilevered segmental concrete bridge rising 42m above the Duwamish Waterway extending 410m across 3 spans. The bridge opened in 1984 serving as a link for 125,000 vehicles per day between West Seattle and Seattle, WA.

During a 2013 routine inspection, cracks averaging 0.25 mm wide were identified near post-tensioning (PT) system anchorage at 4 locations. In late 2018, specialists found that cracking had proliferated beyond the locations previously identified and a recommendation was made to install 32 additional crack monitors. Follow-up inspections in May and November of 2019 found that prior cracks did not appear to widen however significant additional cracking was evident including extensive diagonal cracking in the main span.

In February 2020, engineering studies revealed significant concerns regarding load capacity of the bridge in present condition. It was suggested that daily observations be conducted, and plans be developed to reduce traffic. On March 19, 2020 considering accelerating rates of cracking, a recommendation was made to close the bridge and to develop plans to inhibit collapse. On March 23, 2020 SDOT ordered an immediate closure to all traffic.

PULLMAN, in concert with STRUCTURAL TECHNOLOGIES were engaged in a design-assist capacity to restore load-carrying capacity to the bridge structure. Phase 1 repairs commenced late in 2020 requiring use of custom platforms to access the bridge's exterior. To stabilize the structure and to allow subsequent Phase 2 repairs commenced in 2021 and included epoxy injection at crack locations, installation of an external post-tensioning system within the concrete girders and the installation of carbon fiber reinforced polymer (CFRP) at select locations within the superstructure was undertaken.

The project was completed on-schedule to the highest level of safety and quality. The bridge fully reopened to the public on September 18th, 2022.



PROJECT HIGHLIGHTS

- **Owner:**
Seattle Department of Transportation
- **Specialty Repair Contractor:**
PULLMAN
- **Structural Consultant:**
WSP
- **Engineering and Design Support**
STRUCTURAL TECHNOLOGIES