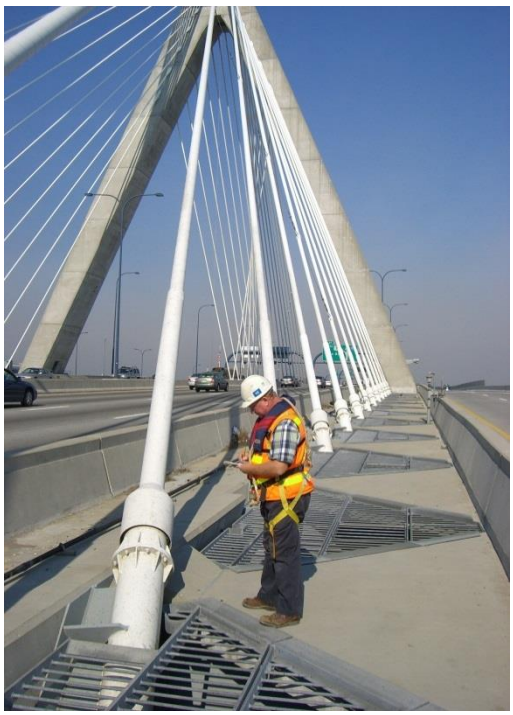
PROJECT PROFILE

Zakim Memorial Bridge

Safety Inspection of Cable Stay Bridge | Boston, MA



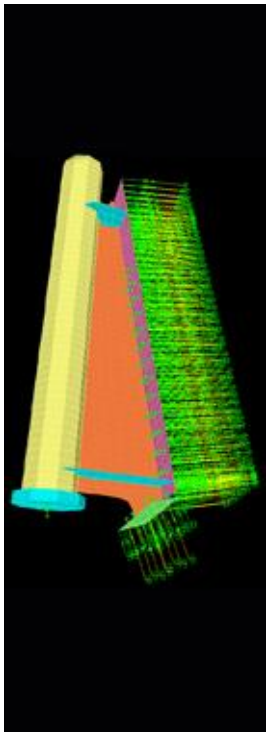
CLIENT

The Commonwealth of Massachusetts

BACKGROUND

The Leonard P. Zakim Memorial Bridge is the iconic, signature structure of Boston's Big Dig project. The bridge with its graceful lines and 270-foot towers form the widest cable-stayed bridge in the world and the first "hybrid" cable-stayed bridge in the United States, using both steel and concrete in its frame. Swiss bridge designer Christian Menn conceived the bridge, with its inverted Y-shaped towers, to reflect the shape of the Bunker Hill Monument in neighboring Charlestown.

Following the fatal ceiling collapse of the Big Dig's I-90 connector tunnels and the subsequent discoveries of systemic problems, Governor Mitt Romney ordered, via Executive Order 474, a "stem to stern" safety review of the entire Metropolitan Highway System. This included a detailed safety inspection of the Zakim Memorial Bridge.



SOLUTION

The "stem to stern" safety audit included a detailed review of all structural, electrical, mechanical and life safety systems associated with the Big Dig, including all bridges, tunnels, roadways, buildings, signs, and luminaries. Specific to the Zakim Bridge, the project included detailed visual inspection of bridge cable stays, anchorages, and post-tensioning ducts that comprise the deck structure.

WJE engineers provided the expertise and experience to complete an objective and thorough evaluation of any deficiencies in the design or construction of Big Dig structures within the 90-day project delivery schedule. In addition to documenting deficiencies, finite element modeling of welding heat analysis on bent anchorage plates validated the causation of observed defects, and a safety analysis was conducted on anchorage plates under combined live and dead loadings. The engineers then recommended priority for action, from immediate removal and replacement to continued service with monitoring.

WJE ENGINEERS ARCHITECTS MATERIALS SCIENTISTS