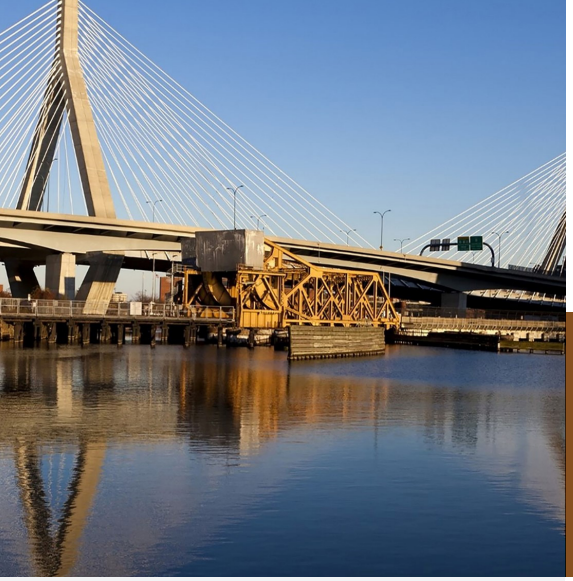

Geocomp
Trusted to help mitigate risk

PROJECT BRIEF

Central Artery Tunnel Zakim Bridge Monitoring

PROJECT PROFILE

CLIENT:
Massachusetts Department of Transportation (MassDOT)

LOCATION:
Boston, MA

VALUE:

- Monitoring system detected movement and initiated project alerts
- Automated data logging allowed for multiple daily readings in critical or restricted construction areas

SERVICES PROVIDED:

- Instrumentation and real-time monitoring of critical repairs

"Monitoring of the repair work included surveys on the bridge deck to measure deflection during jacking of the beam onto the underside of the bridge and load measurements at each jacked bar using load cells."

INSTALLATION OF GEOTECHNICAL INSTRUMENTS & DATA MANAGEMENT COLLECTION

Geocomp provided instrumentation to monitor the cracks while work continued tensioning the cable stays. LVDT sensors were installed and connected to 8-channel *i*Site® data loggers allowing monitoring to occur at regular intervals. Monitoring of the repair work included surveys on the bridge deck to measure deflection during jacking of the beam onto the underside of the bridge and load measurements at each jacked bar using load cells. The engineer for the reparation plan stipulated that loads after lock-off should not reduce by more than 5% of the lock-off load. The automated data acquisition system was in operation for 4 months during all key reparations steps. The *i*Site® system allowed for real-time load adjustment in the bar during tensioning.

BACKGROUND

The Central Artery/Tunnel Project in Boston, MA was one of the largest urban infrastructure projects in the U.S. The most identifiable feature of the project is the Leonard P. Zakim Bunker Hill Memorial Bridge – an asymmetric cable stay bridge completed in early 2001. Prior to joining the bridge to the tunnels, a series of cracks were noticed in the concrete bridge deck. The cracks appeared in a critical area of the bridge and inferred the possible presence of excessive tensile stresses in the concrete. The team performed non-destructive sonic testing that indicated the presence of voids in the concrete near the observed cracks. Repairs required that the concrete decking above the voids be removed and rebar re-spaced, with the concrete deck replaced using a temporary beam which forced upward against the bridge wings. The load in the bridge 'wings' was transferred to the beam and bars, reducing or removing the tensile stresses potentially carried in the deck area to be worked on. Eight threaded bars were fixed into the center area by jacking them tightly against the upper surface of the bridge deck at the center and locked off.