

Fore River Bridge Utility Tunnel Monitoring

Client:

Parsons Corporation

Location:

Weymouth and Quincy, MA

Service Provided:

Instrumentation,
monitoring, and data
management system

Value Provided:

- Real-time data to evaluate construction effects on underground utility tunnel
- Integration of existing NOAA tidal gage data to correlate with flow meter data
- Active Risk Management™ during construction activities in the vicinity of vital high voltage and fuel utility lines

Background & Project Challenges

The Fore River Bridge project requires a program capable of monitoring potential settlement and vibration of a sensitive underground utility tunnel during construction of the new bridge above. The tunnel carries a water main and a high voltage power service between the cities of Weymouth and Quincy, and is submerged under the Fore River in the vicinity of where the poles for the new bridge were being driven.



Geocomp Role & Accomplishments

Geocomp is providing risk monitoring services for the underground utility tunnel during construction. The instruments installed include:

- (1) flow meter
- (8) seismographs
- (20) crack meters
- (40) tilt beams

The instruments were placed within the zones of influence of pile driving. The tilt beams were placed in continuous strings that extend beyond the zones of influence, allowing for points of fixity to be established and a tunnel profile to be generated. An ultrasonic flow meter was installed to monitor the performance of the existing sump pump allowing early warning of potential flooding of the tunnel during high tides and/or potential pump malfunction. Crackmeters were installed to monitor crack development within the zones of influence, while the seismographs were evenly spaced within the zones of influence to monitor vibration during pile driving operations. The data acquisition system was fully automated, providing real-time monitoring data to the engineers and general contractor to allow timely response upon critical constructions activities in the vicinity of the tunnel.

Geocomp also provided:

- development of a customized monitoring report available for download from *iSiteCentral*™ web-based data reporting service;
- data presentation on *iSiteCentral*™;
- redundant data storage on our secure servers;
- sensor threshold alarms/SMS text messages; and
- site maintenance visits.