

Monitoring of Sakonnet River Bridge

Client:

Rhode Island Department
of Transportation

Location:

Portsmouth, RI

Services:

- Installation of automated instrumentation
- Real-time monitoring during construction of new bridge

Value:

- Real-time monitoring allowed for surveillance of structural integrity of the existing bridge during construction
- Real-time data reported minimal impacts of construction on bridge structure and showed safe traffic flow

Background & Project Challenges

Faced with a deteriorating Sakonnet River Bridge that did not meet current highway design standards for shoulder width and structural capacity and required replacement, the Rhode Island Department of Transportation chose to construct a new 2,265-ft-long, 4-lane bridge parallel to the existing structure. The construction of the new bridge posed significant concerns to the foundation of the existing bridge and to abutments – all of which had to be closely monitored. The challenge to install a comprehensive real-time monitoring system while maintaining traffic flow during construction, supporting project schedules, protecting public safety, and protecting existing structures.



Geocomp Role & Accomplishments

Geocomp provided extensive automated instrumentation to monitor the existing Sakonnet River Bridge during the foundation installation of 5-ft diameter piles for the adjacent new bridge. As part of the overall monitoring program, Geocomp provided robotic total stations tied to GPS reference stations to measure settlement and lateral movements of the existing bridge foundations.

Automated vibration monitoring on the piers enabled evaluation of the dynamic impacts of the foundation piling work on the existing bridge foundations. In addition, automated surveying and vibration monitoring on abutment buildings/properties provided for construction control and disturbance mitigation for local residences and businesses.

The instrumentation program included nearly 400 vibrating wire and resistance strain gages installed on steel columns, girders and beams on the existing structure that had been identified as the most critical for the bridge's performance and safety. Three hundred of these sensors were monitored at 50 samples per second using a web-based monitoring system to monitor in real-time the effects of the new construction on the existing bridge to minimize the risk of disturbance and maintain safe bridge operations.

The data obtained by Geocomp was used to evaluate both dynamic and long-term changes in loads for the key bridge members. Geocomp's used its *iSiteCentral*TM web-based data collection and reporting system which enabled the project team to evaluate and interpret the data consistently across the different monitoring systems.