Geocomp
Technologies to manage risk for infrastructure

Project Brief

Walt Whitman Bridge Structural Member Strain Gage Instrumentation and Monitoring

Client:
HAKS

Location:
Philadelphia, PA

Services or Products Provided:
Panel Point strain gauge instrumentation installation to monitor load paths near and through gusset plates connections

Development of software algorithms for triggered data collection providing preliminary assessment of data near instantaneously

Value Provided:

- Structural model validation to prioritize scheduling of gusset plate repairs
- Real-time data collection and evaluation of member stresses without disruption to traffic or load testing
- Results used to prioritize decisions for Asset Managment

Background & Project Challenges

Geocomp worked with HAKS under contract to the Delaware River Port Authority to extend the service life of the 57 year old suspension bridge over the Delaware River in Philadelphia.

Rusted gusset plates were discovered below the recently re-decked bridge structure during routine inspection. This prompted emergency repairs based on inspection and classification of the gusset plate deterioration. The repair schedule was built on classification importance from engineering calculations and verification through field instrumentation and data collection and evaluation.

Geocomp Role & Accomplishments

Geocomp's work included strain gage installation on select members surrounding gusset plates and monitoring peak strains under ambient traffic conditions over six months. The information was used to measure actual stress from live loads to compare with predicted stress in the members. Geocomp also provided:

- Installation of spot weldable strain gages and a temperature sensor at multiple gusset plate panel points. Each panel point had five framing structural elements instrumented and wired into a remotely positioned high-speed data acquisition system.
- Remote data logging systems that collected data near continuously at rates up to 250 Hz during the first week to establish threshold response values for subsequent data collection. Data was reduced to engineering units and made available through an FTP site.
- Remote loggers programmed to continuously collect data based on triggered response from pre-established thresholds determined in the first week of baseline data collection

In addition, Geocomp provided all instrumentation, installation, and system programming and operated and maintained the system for six months.