

North Shore Connector Underpinning S.R. 65 Bridge Piers

Client:

Port Authority of Allegheny
County

Location:

Pittsburgh/North Shore, PA

Services Provided:

- Installation of:
 - 17 strain gages and 54 tilt meters on selected bent structures to monitor deflections during excavation
 - automated total stations and reflective prisms used to measure displacements during the load transfer of the under-pinning elements
- Data aggregation, reduction and display using *iSiteCentral*[™]

Value Provided:

- Successful load transfer to new highway structure with deformation and settlement limits
- Affirmation that abutting structures were unaffected by construction

Background & Project Challenges

The North Shore Connector project extended the Port Authority of Allegheny County's Light Rail Transit system 1.2 miles from the Gateway Subway Station located in downtown Pittsburgh to the North Shore. While remaining

underground in twin-bored tunnels along the North Shore, the alignment would transition to an elevated alignment before terminating near the West End Bridge.

The project supported the effort to revitalize downtown Pittsburgh and the North Shore's residential areas, business districts, educational institutions, and entertainment developments. The Connector enabled the Port Authority to construct extensions of the transit system to other destinations within Allegheny County.

With many historical buildings and elevated highway bents located along the alignment of the project, care needed to be taken to assess that they were not affected by construction activities. Designers implemented a geotechnical and structural monitoring program consisting of traditional survey instrumentation along with modern state-of-the-art instruments.

The challenge was to manage the load transfer of active approaches through a real-time monitoring program.



Geocomp Role & Accomplishments

Geocomp deployed its *iSite*[™] datalogging system along with the *iSiteCentral*[™] web-based data management program to deliver data to the engineer on a real-time basis 24/7.

Over two weekends in March 2008, the existing supports under the SR 65 North and South approaches to Ft. Duquesne Bridge were cut away, allowing the load transfer of the highway structures above to new foundation elements. The old foundations had to be removed to make room for the new light rail tunnels.

Geocomp engineers and technicians were on-site for 24-hour shifts monitoring the piers while the load was transferred using a complex post-tensioning process. Any movement greater than 6 mm triggered an alarm and work would immediately be halted. The measured movements were less than 3 mm, and the work proceeded without incident.