

Harold Structures Monitoring East Side Access Project

Client:

Tutor Perini

Location:

Manhattan, NY

Service Provided:

Structural and geotechnical
instrumentation

Value Provided:

- Engineering design of support of excavation systems to support railroad tracks, buildings, bridge foundations, roadways, utilities and other existing structures
- Finite element solutions to prepare efficient designs based on displacement-based contract document criteria
- Utilized various high-precision instrumentation techniques to monitor the performance of pile load tests
- Helped to ensure the protection of both railroad and city-owned structures, thus keeping New Yorkers safe on their daily commutes

Background & Project Challenges

The East Side Access (ESA) Project in New York City will connect the Long Island Railroad's (LIRR) Main and Port Washington Lines in Queens to a new LIRR terminal beneath Grand Central Terminal (GCT) in Manhattan. The new connection will

increase the LIRR's capacity into Manhattan, relieve the overcrowded Penn Station, dramatically shorten travel time for Long Island and eastern Queens commuters traveling to the East Side of Manhattan, and much more. A major part of the Queens construction includes the "Harold Structures" Contracts. The purpose of these contracts is to

- reconfigure the existing Harold Interlocking and lead tracks to Amtrak's Sunnyside Yard;
- create more usable space for the railroad by widening the track structure;
- prepare for the arrival of the ESA tunnel boring machines; and
- add to LIRR's overall operating flexibility.

Construction components include retaining walls, bridges, a substation, and a vehicular access bridge along with all the associated foundations and utilities. This will aid in increasing the capacity of Harold Interlocking and making room for the new ESA tracks. Tutor Perini, the General Contractor for the work, selected Geocomp to furnish, install, maintain and monitor required structural and geotechnical instrumentation.

Geocomp Role & Accomplishments

The monitoring system implemented by Geocomp includes:

- Automated Motorized Total Stations (AMTS) which monitor reflective prismatic targets on bridge structures;
- inclinometers in soil, adjacent to critical subsurface structures;
- extensive network of track and ground monitoring points; and
- piezometers to monitor groundwater levels adjacent to underground excavations.

Geocomp has also utilized various high-precision instrumentation techniques to monitor the performance of pile load tests within this contract. With Harold Interlocking being the busiest railroad interlocking in the country, the instrumentation installed by Geocomp on this project has helped to ensure the protection of both railroad and city-owned structures, thus keeping New Yorkers safe on their daily commutes.

