

East Side Access Tunneling & Excavation Projects

Client:

Metropolitan Transit
Authority (MTA)

Location:

New York City, NY

Service Provided:

- Instrumentation to monitor tilt, strain and liquid levels

Value Provided:

- Automated instrumentation provide alerts to unacceptable movement during construction

Background & Project Challenges

The East Side Access (ESA) project in New York City will connect the Long Island Rail Road'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, dramatically shorten travel time for Long Island and eastern Queens commuters traveling to the East Side of Manhattan, provide a new commuter rail station in Sunnyside Queens.

Prior to starting construction, geotechnical instruments are being installed above ground and in the subway tunnels to measure any movement, settlement, tilt, strain and induced vibrations from tunneling, excavation and construction activities.

Instruments include automated motorized total stations (AMTS) with reflective prismatic targets, manual survey points, inclinometers, extensometers, observation wells, tilt meters, seismographs, dynamic strain gages, and liquid level settlement systems (LLSS). Many of the instruments are designed to be read remotely and automatically.

Tunnel boring machine (TBM) equipment has been delivered and a TBM assembly chamber has been constructed. Following the construction of the TBM in the assembly chamber, tunnels will be bored via four TBM drives from the existing tunnel under 63rd Street and Second Avenue to the south end of the GCT tail tracks. The work also includes excavation of cross passages between the tunnels and a central instrument room.

An open-cut structure is being created and then decked over to serve as the TBM launch area for the Queens tunnels prior to its permanent use as an interlocking and an emergency exit/ventilation facility. The shaft that was completed in November 2003 is being expanded via tunneling under Northern Boulevard (requiring underpinning of the Brooklyn-Manhattan Transit "BMT" structure) into LIRR's existing rail yard.



Geocomp Role & Accomplishments

Geocomp managed the geotechnical instrumentation data on the following ESA contracts:

- Manhattan Approach Tunnels (CM009)
- Queens Open-Cut Excavation (CQ028)