



PROJECT BRIEF

# World Trade Center Monitoring

## PROJECT PROFILE

**CLIENT:**  
Port Authority of NY & NJ

**LOCATION:**  
New York City, NY

**VALUE:**

- Real-time monitoring enabled continuous tunnel and wall deformation detection during construction

**SERVICES PROVIDED:**

- Geotechnical and structural instrumentation monitoring
- Data management and real-time effect of construction activities on the tunnel

“Provided geotechnical and structural instrumentation that focused on the integrity and stability of the subway box and uninterrupted operation of the train during the underpinning and undermining activities.”



## GEOTECHNICAL AND STRUCTURAL INSTRUMENTATION AND MONITORING

Geocomp provided geotechnical and structural instrumentation that focused on the integrity and stability of the subway box and uninterrupted operation of the train during the underpinning and undermining activities. The monitoring system implemented included:

- Automated Motorized Total Stations (AMTS) and reflective prismatic targets on top of the subway box and an existing slurry wall to continuously monitor tunnel and wall deformations during construction
- Horizontal inclinometers on the subway roof and in the subway track to monitor settlement
- Strings of horizontal beam sensors mounted on the subway walls to monitor the settlement
- Seismographs installed inside the tunnels to record vibrations caused by construction activities
- Observation wells on both sides along the subway box to measure groundwater levels during dewatering
- Liquid level gages installed in the subway track to measure potential heave during the jet grouting
- Web-based data processing, reporting and alarm system to provide performance measurements



## BACKGROUND

The World Trade Center (WTC) Transportation Hub Project in New York City will form an underground connection between the World Financial Center and the Metropolitan Transportation Authority's Fulton Street Transit Center. Through it, pedestrians will have access to Hudson River ferry terminals, PATH trains, 14 subway lines, and rail link to JFK International Airport. Construction began with the underpinning of New York City Transit's No. 1 Train subway box that runs through the center of the site in a north-south direction. The project involved the installation of over 450 mini-piles and jet grout cutoff walls to support the subway box while excavations are conducted below the subway box.