

Client:

Massachusetts Port Authority

Location:

Boston, MA

Services Provided:

- Liquid level settlement system design
- Installation and management
- Real-time data to detect and compensate for settlement

Value Provided:

- Real-time data allowed for informed decision making, reducing delays
- Supported maximum required compaction without unnecessary delays

Background & Project Challenges

The Massachusetts Port Authority (Massport) operates Boston's Logan International Airport. In the last decade, Massport and its airline partners have invested more than \$4.4 billion to build a new runway, roadways, and terminals.

The construction of Taxiway M was commissioned in 2008 as one of several projects to help with safety at the airport after a series of incursions occurred. The taxiway was being built to decrease the number of runways that planes must cross and to reduce ground delays.

Logan airport is built on filled land in Boston Harbor. Runways and taxiways are approximately 15 feet above sea level. Ground water levels in the filled soil are affected by the daily tidal fluctuation. Construction of Taxiway M required the contractor to excavate approximately 4 to 5 feet of the filled material to a depth where the underlying soil was saturated. Subsequent to construction of one section of the taxiway, settlement was observed which required reworking the constructed area. To avoid this condition in future construction, the contractor turned to Geocomp to devise a method and system to monitor potential settlement as construction progressed.



Geocomp Role & Accomplishments

Geocomp's challenge was to design a Liquid Level Settlement System to measure the differential settlement between two points. A liquid reservoir is located at a stable reference point outside of the construction area and is connected by liquid-filled tubing to a pressure transducer sensor located at the point where settlement is to be measured, measuring the elevation difference between the reservoir and the sensor. The system was comprised of three vibrating wire liquid level settlement sensors, installed at the bottom of the excavation, and perpendicular to the taxiway centerline.

As backfilling and compaction took place, the sensors measured the changes in pressure. The sensor data was recorded automatically by a Geocomp data logger and transmitted in real-time to Geocomp's web-based monitoring system, *iSiteCentral*TM. The contractor was able to view the settlement data in real-time as backfilling and compacting operations progressed.