

Project dossier



PROJECT DOSSIER

Seymour Street Office Renovation Project, USA

PROJECT OVERVIEW

An over 100 year old, 2 story masonry building was renovated and expanded for additional office space. Part of the modification consisted of constructing an elevator pit for a new elevator in limited interior space of the existing building footprint. Excavation for the elevator pit occurred adjacent to a brick and concrete block exterior wall and existing beam footings supporting second floor framing.

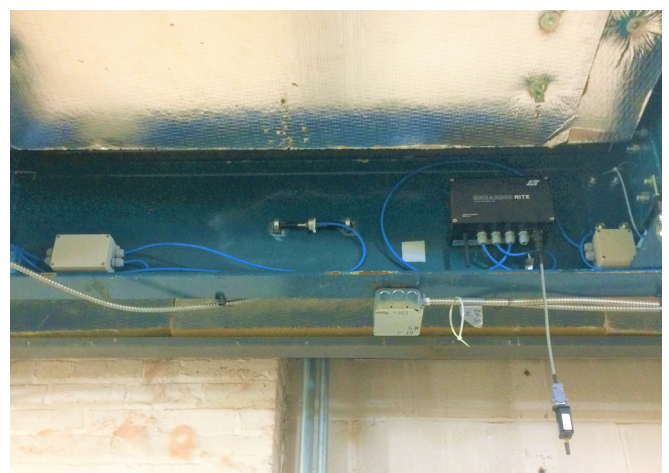
WHY MONITORING?

Monitoring was required to detect settlement of existing support column footings and movement of the existing perimeter wall during underpinning excavation of existing masonry wall and excavation of the elevator pit.

MONITORING SOLUTION

Rite Geosystems Inc., USA was entrusted to provide automated instrumentation for the project with real time monitoring results. The type of instrumentation installed at this site included MEMs tiltmeters and vibrating wire strain gauges. In addition to automated instrumentation, settlement pins were installed for survey monitoring of the wall and beam footings. The sensors were all read by remote, real time dataloggers transmitting to the cloud.

Project	Seymour Street Office Modification and Expansion Project
Location	Pittsburgh, PA, USA
Owner	Duquesne Light Company
Client	Rycon Construction Inc
Duration	2022; 3 months



Strain gages installed on W-beam with datalogger



SCOPE OF WORKS

Rite-Geosystems scope of works included:

- Supply and installation of instrumentation
- Datalogger commissioning and configuration
- Automatic monitoring at desired frequency
- Setting up an online web-based data management system (WDMS) with instant alerts via SMS/emails

INSTRUMENTS USED

- Wireless tilt meters (3 no.)

Model ESDL-30MT wireless tilt meters were used for monitoring tilt of the structure. These were evenly spaced across the upper portion of the brick perimeter wall. ESDL-30MT has in-built datalogger that sent recorded data directly to the cloud server via cellular network.

- Digital tilt meter & beam sensor (1 no. each)

Additional digital tilt sensor and beam sensor were used on the structure wall to monitor tilt at different levels. Model EAN-93M tilt meter was installed at center while model EAN-93M-B beam sensor was installed to the lower portion of the perimeter wall. These sensors were connected to model ESDL-30MT wireless tilt meter. The in-built datalogger in ESDL-30MT collected and transmitted data from these digital tilt sensors also.

- Strain gage (4 no.)

Model EDS-20V-AW arc weldable strain gage were evenly spaced across the second story W-beam, located parallel at the top of the perimeter wall. The data was collected by model ESDL-30 datalogger that transmitted the data wirelessly to central server via cellular network.



Tilt meter and beam sensor connected to wireless tilt meter with in-built datalogger

- Settlement marker (9 no.)

Model EBS-16 building settlement monitoring pins were fixed to the column footings located adjacent to the perimeter wall, 2 no. per column. Five monitoring pins were evenly spaced across the middle of perimeter wall. data was collected from these settlement points for on-demand spot monitoring by surveying.

The data was available in near real time over our web based data management software, with instant alerts via SMS and emails.

RESULTS

Online data management successfully provided the contractor with the data needed to perform construction activities while monitoring structural movements within required threshold tolerances.



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