



Case Details

The Central Market in Abu Dhabi was a huge construction project which was completed in 2011. It consists of three towers, the Residential Tower, the Commercial Tower and the Hotel Tower. The tallest is the Residential Tower which stands 381 metres tall with 88 floors. It was imperative that certain parameters identifying the structural integrity would be monitored and logged during construction. The diaphragm walls also required monitoring during the construction period to ensure the safety of the people and equipment on-site.

Key Requirements

- Vibrating Wire sensor compatibility
- Expandability for large number of sensors
- Logging capability
- Alarm capability



The Central Market construction site is a hive of activity. In this picture, two of the three buildings are being built on the 45 hectare site.

DataTaker DT80G

- 1 A cost effective data logger expandable to 100 channels
- 2 Supporting vibrating wire and other Geotechnical sensors
- 3 Compatible with all major brands – Slope indicator, RST Instruments, Geokon, Soil Instruments, RocTest, AGI.
- 4 Built-in web and FTP server allows for remote access to logged data, configuration and diagnostics
- 5 Rugged design and construction provides reliable operation in the extreme s of the geotechnical environment and applications
- 6 Designed and manufactured in Australia



DataTaker Solution

Equipment

- DataTaker DT80G Geo-loggers
- DataTaker Channel Expansion Modules (CEM)

Sensors

Vibrating wire sensors, including:

- Inclinometers
- Embedment strain gauges
- Spot-weldable strain gauges

Implementation Notes

Stainstall in the Middle East was commissioned to provide the instrumentation for the Central Market construction. They chose to use vibrating wire sensors because of their accuracy, durability and stability. DataTaker DT80G “GeoLoggers” were used for logging because of their capability of measuring vibrating wire sensors and ability to read from up to 100 of these sensors through the use of DataTaker channel expansion modules.

During the initial construction period, the integrity of the diaphragm walls were monitored using vibrating wire inclinometers/tilt meters. These sensors were sampled and the measurements logged to the internal memory of the DT80G. In parallel, the logger was connected to a PC in the site-office where real-time data was displayed to a safety officer. If structural conditions of the diaphragm walls were to become unsafe for users (as detected by thresholds configured in the logger), visual and audible alarms would also be triggered.

As the buildings were erected other vibrating wire sensors were used. Embedment strain gauges took measurements of concrete creep, shrinkage & elastic shortening within columns and core walls whereas spot weldable strain gauges took measurements of rebar stress and load transfer from concrete. Loggers were placed throughout the building at different levels to take the measurements and transmit the results to a central PC in the basement for display and automatic reporting.