

Project Dossier



PROJECT DOSSIER

PLOT-13 DEIRA WATERFRONT DEVELOPMENT

PROJECT OVERVIEW

Deira Waterfront Development encompasses an expansion of the urban fabric to the existing Deira community. It is one of the most important development projects and involves construction of a number of new plazas, mixed use buildings and green open spaces. The project aims to develop the seafront which will be unique and beautiful.

Phase 1 of the project includes development of almost 30 plots along the waterfront, each plot having its own development and design. Plot-13 is located in the northern portion of Dubai in the Deira District. The proposed Mixed Used Development at Plot 13 includes a maximum two level basement (approximately 10 m deep excavation) and is situated between the Al Shindagha tunnel and Dubai Metro Green Line tunnel.

The nearest edge of the shoring works was at 10 m from the Dubai Metro Green Line tunnel and the south-eastern edge was located at a distance of 15 m from the existing Al Shindagha Road tunnel.

As the project involved heavy construction activities quite adjacent to tunnels, monitoring became necessary for safety of the two existing tunnels.

Project	Plot-13 Deira Waterfront Development
Location	Dubai, UAE
Client	Deira Waterfront Development L.L.C/ Investment Corporation of Dubai
Contractor	Dutch Foundation & Concrete Processing Company
Consultants	Coffey, COWI, Parsons
Duration	36 month from May 2016



Monitoring solution

The purpose of the instrumentation and monitoring was to systematically identify significant design risks caused by the construction upon existing tunnels. To ensure that the project proceeds safely it was also important to monitor response of ground, groundwater and viaduct foundations during construction period.

Turnkey services

Encardio-rite scope of works included:

- Supply and Installation of geotechnical and geodetic instruments
- Online monitoring of critical parameters and areas
- Manual monitoring of geotechnical instruments
- Automatic as well as manual Surveying
- Daily & weekly reporting with evaluation & interpretations
- Pre-construction condition monitoring of both the tunnels



INSTRUMENT USED

Excavation works and ground monitoring

- **Inclinometer:** To monitor lateral movement and deflection of soil between construction area and tunnel
- **In-place inclinometer:** To monitor lateral movement and deformation of earth works and shoring wall
- **Standpipe Piezometer:** To monitor water level/drawdown during construction
- **Ground Settlement Point:** To monitor soil settlement and deformation of ground surface
- **Anchor load cell:** To monitor force in ground anchor

Existing metro and road tunnels and rail track monitoring

- **Strain Gage:** To monitor stress in tunnel and also the change in-strain of tunnel lining (and therefore hoop compression and bending moments)
- **Tape extensometer:** In Shindagha tunnel to monitor convergence
- **Borehole extensometer:** Automatic, to monitor deformation
- **Magnetic extensometer:** To monitor sub-surface settlement
- **Beam Sensor/Tiltmeter:** To monitor differential movement & tilting in tunnel, change in diameter under unbalanced loading
- **Beam Sensor:** To monitor any movement of the track bed.

- **Tri-axial vibration sensor:** To monitor impact of piling operations on tunnel
- **Prism target:** To monitor displacement in tunnel
- **Crack Meter:** To monitor change in width of existing cracks & joints within the tunnel

Installation of sensors in the existing metro tunnel was very critical, as running metro trains allowed only 2 hours (midnight) for installation works.

Online monitoring was done for geotechnical sensors that were critical using advanced automatic dataloggers and data acquisition systems. Automatic total stations with complex control boxes were used for online monitoring of geodetic points.

Monitored data was available online through our web based data management system to the Contractor, Client as well as the Consultant on their desktops. Monitoring reports were also submitted combined for geotechnical and geodetic monitoring data on daily and weekly basis. Monitoring reports included interpretations of variations observed in instrument data with respect to the construction progress in the respective area.



TUNNELS



HYDROELECTRIC



CONSTRUCTION



STRUCTURAL



METRO & RAIL



BRIDGES



MINING