



PROJECT DOSSIER

DEIRA WATERFRONT DEVELOPMENT CAR PARK



PROJECT OVERVIEW

Project	Deira waterfront multi-storey car park, Contract AC1130870
Location	Deira, Dubai, UAE
Client	Investment Corporation of Dubai
Contractor	Al Futtaim Carillion L.L.C.
Consultants	AE-7 / Coffey
Duration	2014 - 2016

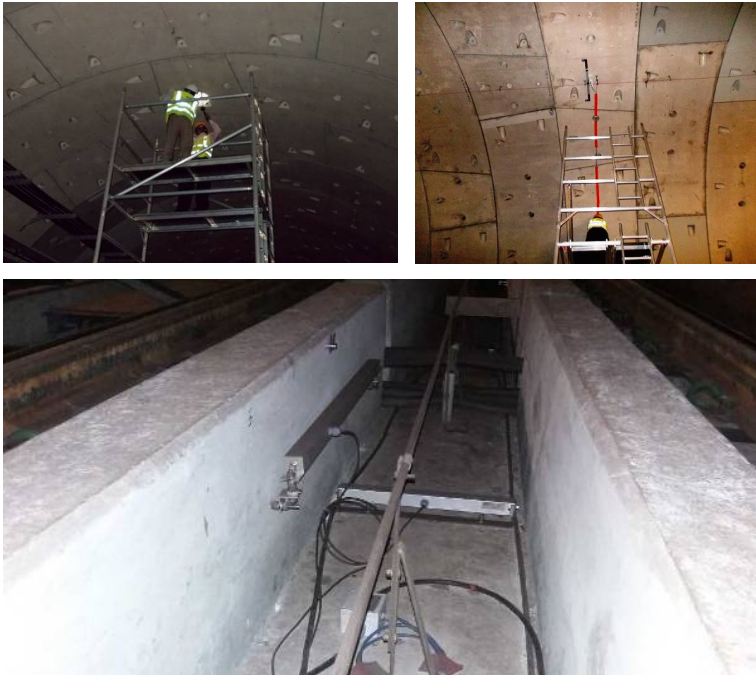
The Deira Waterfront Development is located in the northern portion of the existing Deira District across the street from the old Souq and fronting the famous Dubai Creek. The first stage of this development was to address imminent issues associated with parking. Multi-storey car park structure was thus built.

The car park area starts from the Dubai ports custom area and extends into two additional land parcels after the Hyatt Regency

Hotel plot. It accommodates over 600 vehicles and is easily accessible from the Gold Souk and the Deira Fish Market. The car park is equipped with state-of-the-art facilities which include parking management system with security and 24-hour CCTV monitoring services.

Dubai Metro Green Line tunnel was in close proximity to the multi-storey car park construction area. As the project involved heavy construction activities quite adjacent to the tunnel, monitoring became necessary for safety of the existing metro tunnel. Also the deep excavations for the multi-storey car park required extensive monitoring.

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



Monitoring solution

Geotechnical and geodetic instruments were used to monitor the effects on tunnel imposed by piling works and also applied loading from the structure. The monitoring work was divided into two sections:

1. Metro tunnel monitoring
2. Ground/sub-surface monitoring

Turnkey services

Encardio-rite was awarded the sub-contract for complete monitoring works of the project. Scope of works included:

- Supply and Installation of geotechnical and geodetic instruments
- Online monitoring of critical parameters and areas
- Manual monitoring of geotechnical instruments
- Surveying
- Daily & weekly reporting with evaluation & interpretations
- Pre-construction condition survey (dilapidation) of metro tunnel

Automatic as well as manual monitoring data was available **online** through our **web based data management system** to the Contractor, Client as well as the Consultant on their desktops in tabular as well as informative graphical formats, with predefined alarms.

Monitoring reports were submitted combined for automatic and manual data on weekly basis. Monitoring reports included interpretations of variations observed in instrument data with respect to the construction progress in the respective area.



INSTRUMENT USED

Existing metro tunnel monitoring

- **Crack Meter:** To monitor change in width of existing cracks & joints within the tunnel
- **Beam Sensor:** To monitor any movement of the track bed.
- **Tri-axial vibration sensor:** To monitor impact of piling operations on tunnel
- **Temperature sensor:** To monitor temperature variation during monitoring period, to correlate variations in data from other instruments
- **Prism target:** To monitor displacement in tunnel
- **Strain Gage:** To monitor stress in tunnel and also the change in-strain of tunnel lining (and therefore hoop compression and bending moments)

Excavation works and ground monitoring

- **Ground Settlement Point:** To monitor soil settlement and deformation of ground surface
- **Standpipe Piezometer:** To monitor water level/drawdown during construction
- **Inclinometer:** To monitor lateral movement and deflection of soil between construction area and tunnel.

Online monitoring was done for geotechnical sensors that were critical using advanced automatic dataloggers and data acquisition systems.