

PROJECT DOSSIER

DUBAI WATER CANAL-Pkg 3



PROJECT OVERVIEW

Project	Dubai Water Canal Infrastructure Package-3 Canal and Coastal Works
Location	Dubai, UAE
Client	Roads & Transport Authority
Contractor	Belhasa Six Construct L.L.C
Consultants	Parsons Overseas Limited
Duration	24 Weeks in year 2016

The Dubai Water Canal & Coastal Works is a 3 km long project starting from Business Bay into the Persian Gulf through Safa Park and Jumeirah. The width of the project works range from 80 - 120 m. It's construction goes 6 m deep and the bridges are built 8 m high. The project includes construction of bridges, property developments, retail facilities and of an artificial peninsula at Jumeirah Park.

Package 3 is one of the three contracts in which the project has been split. It includes excavation of the water canal, construction of canal walls, associated utilities and infrastructure, construction of four marine transit stations, as well as the bulk filling, soil improvement and marine works to build the artificial peninsula.

Roads and Transport Authority (RTA) decided to build bridges over the canal for Sheikh Zayed Road, Al Wasl Road and Jumeirah Road. The Sheikh Zayed road bridge had 8 lanes in each direction and 3 lanes in each direction on Al Wasl Road and Jumeirah Road. The crossings are 8.5 m above the water to allow boats to pass underneath.

The project involved heavy construction activities which required monitoring for the safety of neighboring structures including existing elevated Red Line of Dubai Metro.



Monitoring solution

The monitoring works involved instrumentation at different locations to record every aspect of safety with respect to the Metro Piers near construction works. Instrumentation was done on and near Pier RPN-410, RPN-411, RPN-412 and RPN-413 of the Red Line - Dubai Metro.

Our advanced dataloggers, automatic total stations with complex control box along with web based data management system provided online data on client's desk.

Turnkey services

Encardio-rite got the sub-contract for the 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 building condition monitoring

- **Tri-axial vibration sensors:** To monitor vibrations during excavation works

- **Dataloggers:** to collect data automatically from sensors, with telemetry option to transfer data to server

As drilling was not allowed by the RTA on piers of Red Line Dubai Metro (elevated tracks), tilt meters were fixed on the piers with epoxy.

Online monitoring was done for tilt meters and ground water level monitoring, as both these parameters were critical for the project. Monitoring reports were submitted combined for geotechnical and geodetic monitoring 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

Excavation works and ground monitoring

- **Inclinometer:** These were installed in ground between excavation works and metro line to measure lateral movement due to construction activity near Red Line Metro Pier RPN-410 and RPN-41
- **Borehole extensometers:** Three-point vibrating wire type MPBX were installed to measure change in vertical settlement at 3.5 m, 7.5 m and 10 m near Red Line Metro Pier RPN-410 and RPN-413
- **Standpipe piezometer:** Standpipes were installed to measure change in water level with time near Red Line Metro Pier RPN-410 and RPN-413.
- **Automatic water level monitoring system:** These were installed to monitor water level with time near Red Line Metro between Pier RPN-410 & RPN-411 and Pier RPN-411 & RPN-412

Piers and rail track monitoring

- **Tilt sensors:** Tilt meters were installed on each pier RPN 410, 411, 412 and RPN 413 to measure tilt towards construction activity
- **Prism target:** Prism targets were installed for measurement of deformation during construction and also for monitoring of displacement of bridge between Pier RPN-410 and RPN-413 and at Metro Rail Track. These were also installed on track for both Rashidiya and Jebel Ali Bound between Pier RPN-410 and RPN-413
- **Building settlement point:** Building settlement points were installed at Pier RPN-410, 411, 412 and RPN-413 of Red Line Metro to monitor settlement due to construction activities