PROJECT DOSSIER

AL SHINDAGHA-SANA JUNCTION CORRIDOR

PROJECT OVEREVIEW

Project	R-1013/1 Improvement of Al Shindagha Corridor-Sana Junction Project
Location	Sana Junction, Dubai, UAE
Client	Roads & Transport Authority (RTA)
Contractor	Wade Adams Contracting L.L.C
Consultants	Parsons Overseas Limited
Duration	April 2017 till date

The Al Shindagha Corridor plays a vital role in connecting and transporting people and commerce along the coastline of Dubai. First phase of Al Shindagha Corridor comprises the improvement of Sana Junction which is located at the crossing between Sheikh Rashid Road and Sheikh Khalifa bin Zayed Street. 99999The project consists of a new bridge connecting Bur Dubai to Deira that will serve as a gateway to Dubai. The project is Dubai's largest new road and bridge project and is located in the heart of Dubai.

To mitigate the foreseen increase of congestion at Sana junction, RTA decided for grade separated interchange at Sana Junction. It comprises of two parallel underpasses along Shiekh Rashid Road and two parallel bridges with approach ramps along Sheikh Khalifa bin Zayed Street.

The underpass is in the close vicinity of Dubai Metro Red Line pier RPN 194 (at ~ 30 m distance) and therefore is classified as a Restricted Activity within the Railway Protection Zone 1 for Viaduct or Bridge Type A. It became important that during the construction period, monitoring of the response of ground, groundwater and existing pier piles was carried out to ensure safety and durability of the existing metro infrastructure.

Monitoring solution

Looking at the criticality of safety monitoring of existing running metro, automatic online monitoring was decided. Both subsurface and surface geotechnical and geodetic instruments were installed with automatic dataloggers to monitor effects of construction of the underpass and bridges on the existing Dubai Metro Red Line structures.

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 sensors & geodetic points (surveying) of critical parameters and areas
- Manual monitoring and manual surveying
- Daily & weekly reporting with evaluation & interpretations
- Pre-construction (dilapidation) condition survey of metro piers and viaduct.

INSTRUMENT USED

Pier & rail track monitoring

- **Tilt sensors:** To monitor lateral movement of piers RPN 193, 194 & 195
- **Temperature gage:** To assess the influence of temperature induced changes on pier pile monitoring points
- **Tri-axial vibration sensors:** to confirm impact of excavation for underpass construction
- **Prism target:** to monitor movement of pier top level at piers RPN 189, 190, 193, 194 & 195 and at rail tracks
- **Transverse beam sensors:** To measure lateral displacements across adjacent rails
- **Longitudinal beam sensors:** To measure differential settlements along rail

Excavation works and ground monitoring

- **In-place inclinometer :** To assess deflection secant wall
- **Anchor load cell:** To measure the anchor forces at Secant wall
- **Standpipe piezometer:** To monitor variation of level of ground water table during construction
- **Surface settlement point:** To access the settlement of pier foundations and ground

In all almost 19 numbers of automatic dataloggers (as given below) were used for automatic monitoring of geotechnical sensors installed at track, pier & ground:

- 14 no. of model ESDL-30 SDI-12 interface automatic dataloggers
- 3 no. of model EDAS-10 data acquisition systems
- 2 no. of model ESCL-10VTR3A-BX VW automatic dataloggers

Solar panels were used for the power supply to the dataloggers.

Prism targets installed on track & piers were monitored using automatic total station at 6 hours monitoring frequency. Online data was available on client's desk in tabular as well as graphical formats. Sophisticated software was used to display geotechnical as well as geodetic data on single platform.

Monitoring reports were submitted combined for automatic and manual 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.

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