

Project dossier



PROJECT DOSSIER

Address Jumeirah Gate, UAE

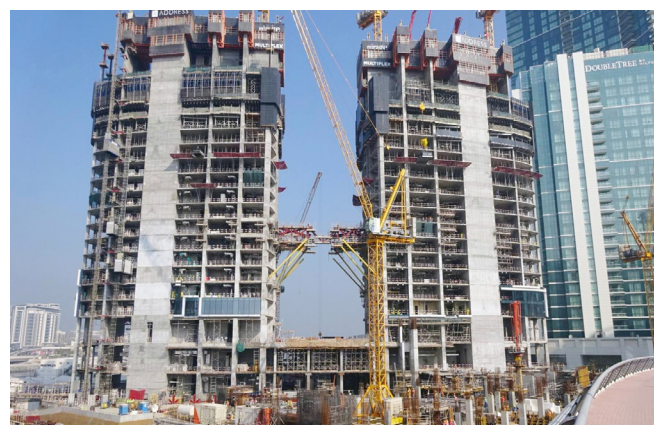
PROJECT OVERVIEW

The Address Jumeirah Gate is a mixed development project located within the Jumeirah Beach Residence area of Dubai. It features two symmetrical towers constructed on a shared podium structure, with additional connectivity via a low level link bridge at Levels 8 to 13 and a high level link bridge at level 63 to Roof. The towers comprise of hotel and serviced apartments B3+B2+B1+G+77+Roof levels.

In a high rise building, permanent absolute movements and differential movements of structural elements occur and are an important consideration for design and construction. At the Address Jumeirah Gate Project, movements that occur during construction and in the long-term needed to be adequately predicted and accounted for in order to avoid potential damage. Also, in the case of the link bridge construction, it was important to consider and adequately account for the expected building movements to avoid misalignment issues during the lifting and installation process.

This required installation of monitoring instrumentation at the structure, to provide a range of vertical and horizontal movement data. The movements were expected due to wind and gravity loads at key locations in the building. The monitoring data was required at different stages - including during construction and also for the long-term.

Project	Address Jumeirah Gate Project
Location	Dubai, UAE
Client	Alaseed Investments
Contractor	Multiplex Constructions L.L.C
Consultants	WSP
Duration	2018- 2020





MONITORING SOLUTION

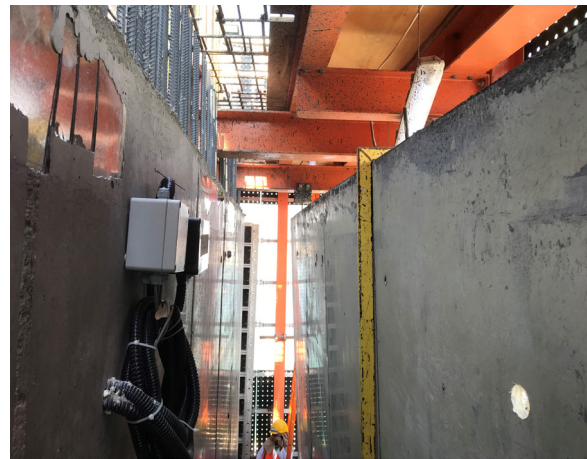
The instrumentation plan aimed to provide settlement, deflection and deformation data for the verification of predicted structural movements. Typically, monitoring instrumentation on Towers A & B was required for following:

- Safety of construction
- Design verification
- Construction control

TURNKEY SERVICES

In order to monitor the lateral and vertical movements of the structures during the construction of the two towers of Address Jumeirah Gate Project, Encardio-rite Geosystems LLC, UAE distributed its workflow as follows:

- Establishment of geodetic networks around and within the construction influence zone; maintenance, and measurements of survey network including levelling.
- Supply, installation, monitoring and reporting of geotechnical and geodetic instrumentation
- Manual and automatic monitoring
- Setting up an online web-based data management system (WDMS) and maintenance during the contract period
- Daily & weekly reporting with evaluation & interpretation.



INSTRUMENT USED

Embedment strain gauges	To measure strain in structure elements. Installed across the floor plate of each towers at regular intervals through tower elevations and key structural features.
Prism targets	To measure deformation during building construction. Also to monitor displacement of structures.
Bi-axial tilt meter	To monitor inclination and vertical rotation in structures.
Precision inclination sensors	To measure inclination and direction of movement.
Building settlement points	To measure vertical settlement.
Dataloggers	To collect data automatically from installed geotechnical sensors that were critical. The data was collected at required frequency and was sent wirelessly to central server.
Robotic total stations	To collect survey data automatically at required intervals. The collected data was sent wirelessly to central server.
Trimble digital level machine	To collect settlement data manually.

Automatic as well as manual monitoring was carried out for the project. Online monitoring was done for geotechnical sensors that were critical using advanced automatic dataloggers. Both manual as well as automatic collected data was available online through our web based data management system to the Contractor, Client as well as the Consultant, with predefined alarms.

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



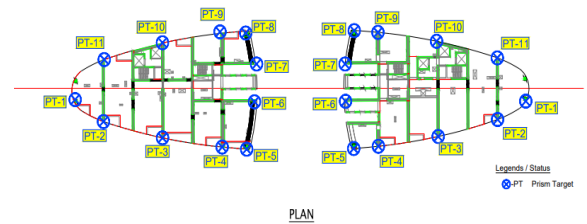
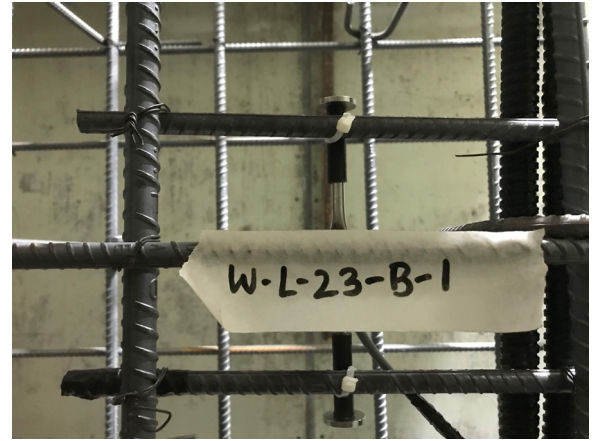
ACHIEVEMENT & RESULTS

Installation and monitoring of the above-mentioned instruments were executed successfully by experienced and proficient I&M team of Encardio-rite.

Management and control of building movements during construction at the Address Jumeirah Gate (using survey and monitoring techniques), not only ensured construction to the specified tolerances and fits but also the incorporation of allowances into constructions methods and fabrications. Further, preliminary data on anticipated movements during construction as well as on final levels after long-term settlement was provided (after the occurrence of creep and shrink-age).

Establishing survey control stations around the building ensured to setting out and monitoring of the structure. Monitoring points were established at various floors up the building with a minimum of eight monitoring points on each of the tower floors and foundation raft. These monitoring points had horizontal and vertical movements recordings, which was carried out every two weeks and at addition of every ten floors.

Building movement and monitoring reports (which included movements, stresses, stages of construction, weather record, etc) were provided without any delay or failure, hence enabling in taking all necessary actions in time.



Typical arrangement for strain gauge location (Level 22 to Level 23)



TUNNELS



HYDROELECTRIC



CONSTRUCTION



STRUCTURAL



METRO & RAIL



BRIDGES



MINING