FUGRO

AZIRIELI CENTRE, TEL AVIV, ISRAEL

Fugro specialists performed O-cell testing to determine the full geotechnical behaviour of a test pile. The method proved well-suited to the site and results enabled the client to optimise the foundation design.

PROJECT DETAILS

Project: Azirieli Centre
Location: Tel Aviv, Israel
Consultant: Blank Lehrer

BACKGROUND

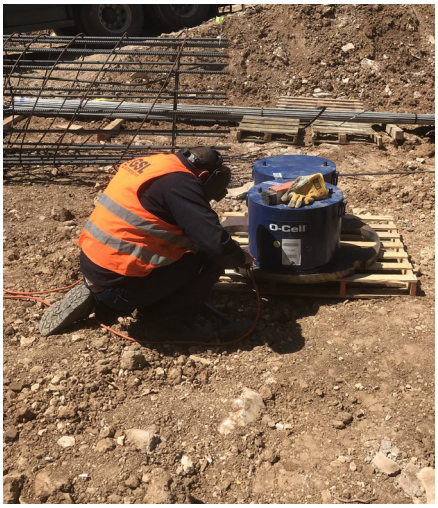
When completed, the Yediot Achronot Project Tower will be the tallest building in Israel. With 100 floors, the 400 metre skyscraper will include a hotel, offices and public areas.

PROJECT SUMMARY

In order to verify and improve the design of the tower foundations, a preliminary test pile was required by client GSL (Geo-Solutions Ltd). The location to be tested was in an area next to three existing towers of the Azirieli Centre. Ground conditions comprised soft clays and sands overlying sandstone over calcareous bedrock. The test pile was located deep inside an excavation, so providing a conventional reaction system or a dead weight Kentledge loading system to perform the test were considered impractical.

The Osterberg (O-cell) method of bi-directional loading was chosen as the ideal static loading test, using the pile itself to provide the reaction for the test within the pile shaft. One of the unique features of bi-directional testing is that the load can be applied directly to the zone within the rock so this may be evaluated directly without the need to load the overburden soils.

The 1300 mm diameter bored test pile was constructed with a single level test assembly comprising two 540 mm O-cells,



Assembly of the O-cell assembly

allowing a potential 40 MN gross loading to be applied directly into the calcareous rock underlying the sandstone.

The pile was bored to 50 m and concreted from the toe to 14.4 m below ground level. As a safety measure, the open bore was backfilled with sand. The section through the soft strata was lined with a temporary casing.

Strain gauges were placed at nine levels within the concreted lower 35.6 m of the pile shaft in order to assess load distribution mobilised during the test within both the sandstone and underlying calcareous bedrock.

TEST RESULTS

The test revealed the upwards behaviour of the skin friction above the O cell assembly, and the downward skin friction and end bearing characteristics below the O cell under loading.

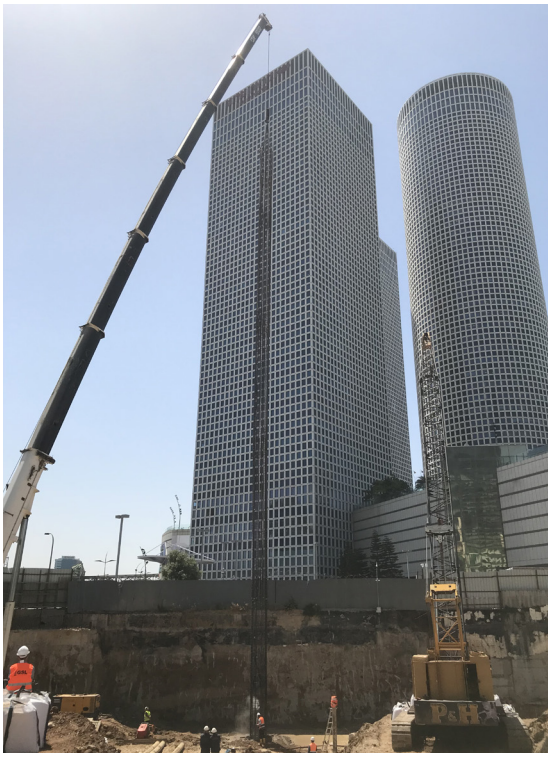
Fugro used Cemsolve® pile load movement analysis to determine the total ultimate pile skin friction capacity and ultimate end bearing load and stiffness. Further analysis using the Cemset® programme enabled prediction of pile head load / settlement.

Testingunder way with reference beam system to determine pile head movements.

CONCLUSIONS

The O-cell test was able to safely mobilise the underlying rock, revealing the full geotechnical behaviour of the pile. The results were critical for the tower foundation designers.

Concreting using conventional tremie techniques.



Pile reinforcement installation with O-cell assembly.

Fugro
E: loadtest@fugro.com
www.fugro.com