FUGRO LOADTEST

Dubai Creek Tower

A joint venture from Emaar Properties and Dubai Holding, Dubai Creek Harbour will be both a financially viable and ecologically responsible city built with future generations in mind. Offering the best infrastructure, it is a place where people will live, work and play, a community where families can achieve their aspirations for generations to come.

Dubai Creek Harbour project sits abreast of Ras Al Khor Wildlife Sanctuary, home to over 67 species of water birds, protected under the UNESCO Ramsar Convention. As Dubai Creek Harbour develops, this sanctuary will remain sacrosanct, with a new visitor centre bringing a message of sustainable biodiversity to new generations.

At the heart of the 6 sq km Dubai Creek Harbour is Dubai Creek Tower, which will include a 360 viewing deck 'The Pinnacle Room', and a VIP observation deck with landscaping meant to recreate the "splendour of the Hanging Gardens of Babylon."

The vast slender structure is a feat of engineering genius. Described as both a piece of art, and as using the most advanced mathematics, engineering and physics known to man, it is expected to be one of the most significant structures ever created.

Dubai Creek Tower will also feature fully glazed rotating balconies that extend outward, rotating outside the skin of the tower for visitors and the structural core and tension cables will be gently and dynamically illuminated.

PROJECT DETAILS

Project: Dubai Creek Tower

Location: Dubai, United Arab Emirates

Foundation Design and Construction: Soletanche Bachy

Geotechnical Consultant: Aurecon

Developer: Emaar Properties PJSC

PROJECT

Following one of the most comprehensive geotechnical investigations undertaken in the region, actual in-situ performance of the proposed foundations was desired to optimise the final design of the core and the cable anchorage foundation design.

For this, Fugro carried out three multilevel bi-directional O-cell® tests in the centre core of the foundations in parallel with the geotechnical investigations. Nominal dimensions for the section of the barrettes were 2800 mm x 1200 mm and of 50 m, 80 m and 90 m depth.

In addition, three fully instrumented conventional tension and lateral tests were proposed to simulate the pile behaviour from the pull out effect of the tension cables.

Installation of reinforcement with O-cell arrangement

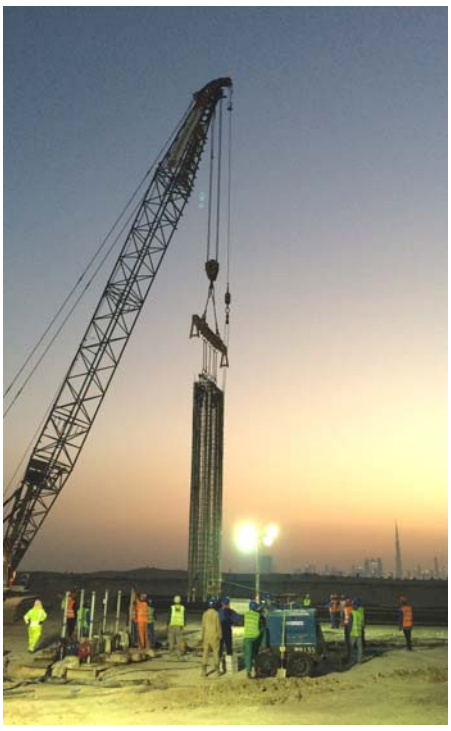
SUMMARY

By using the bi-directional O-cell technique, Fugro mobilised a total reaction of 320 MN, 360 MN and 363 MN using two levels of 3 x 890 mm O-cells in each of the tests, breaking the previous World Record for the highest test load in a single foundation element (which was 323 MN in a test pile in rock). The ultimate capacity of the barrettes was higher than the maximum test load applied.

Sister bar vibrating wire strain gauges were installed along the test barrettes and piles allowing a profile of mobilised unit skin friction at various levels. Fiber Optic distributed strain and temperature sensors helped to determine the distribution of load throughout the foundation length.

The test results provided detailed geotechnical information for use in the foundation design. Many ultra-high capacity piles and barrettes are being designed today as a direct result of Fugro Loadtest's ability to verify their capacity.

Artist impression of the tower.



Lifting of the reinforcement.

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