LOADTEST
O-Cell® Technology in Moscow City, Russian Federation

RMJMs Twisting Wedding Palace.

The City of Capitals (photo Bradmoscu)

Naberezhnaya Tower

Federation Towers

The Moscow International Business Center

The Moskva-City (also known as the Moscow International Business Center) Project is a $12 billion development close to the heart of Moscow. This new international business centre will consist of offices, hotels, retail and residential development. It will be the first of its kind in Eastern Europe and will offer the most up to date transport and telecommunications network.

These large high-rise projects have required foundations into the Suvorov Limestone through the Voskrensky clay. Since the behaviour of the Limestone is relatively unknown, pile tests have been recommended to verify the foundation designs. Bi-directional testing using O-cells was employed to verify rock socket behaviour. Tests were performed on piles of diameters between 900 mm and 1500 mm, located on several separate plots, mobilising total capacities in excess of 60 MN.

Plots 2-3 required testing for the foundations of the City Palace, formerly known as the Wedding Tower, designed by RMJM as “a wedding chapel in the sky”. This 46 storey twisting skyscraper will incorporate a top floor ball room with stunning views over Red Square.

Plot 4, Imperia Tower is a multipurpose 2 building complex located on plot 4 of the Moscow International Business Center, the mixed-use Building A and the water park entertainment complex in Building B. Office space, apartments, a 280 room hotel and a water park will make up the project and will be a focus of entertainment for MIBC with a shopping mall, restaurants and cafés.

Plot 9, the first project for Loadtest in Russia, was the twin, 53 and 63 floor towers, The City of Capitals consisting of Moscow Tower and St.-Petersburg Tower

Plot 10, the Naberezhnaya Tower C, a 250m high, a 56 storey tower block.

Plot 11, also incorporating the transport link which will be the transfer point between different subway lines and light rail lines and other public systems. There will also be offices, hotels, a clinic, and parking.

Plot 13, The Federation Tower complex consists of three towers, Tower A at 93 floors, Tower B at 62 floors and Tower C, Spire at a maximum height of 506m.

Moscow International Business City At Night *Source: Wikipedia.com*

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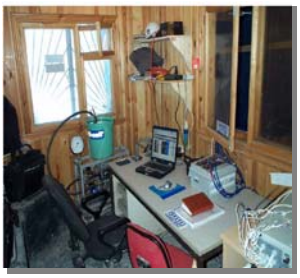
Installation of the reinforcing cage with O-cells



Testing monitored and controlled from inside a heated cabin

Testing in progress protected from the elements

Load testing programs

Load testing has been performed, on each of the projects previously mentioned, with two bi-directional tests using O-cell technology on each site. Unique to bi-directional O-cell testing, the applied load could immediately be directed onto the end bearing portion of the pile. By using the skin friction as a reaction, there is no need for a reaction beam at the surface with expensive anchor piles. If the tests were carried out by top down testing it would have been necessary to devise complex sleeving arrangements to reduce the friction above the rock socket.

Pile Tests

Despite testing at times in snow and freezing weather conditions, all the testing programs at the Moscow International Business Centre were successful. The effective mobilised capacity in each of the test piles was carried out to the desired maximum loading, and upon request, taken to higher loads; in the case of plot 13, the piles were tested to twice the required capacity. Total mobilised capacities for each plot were dependant upon size of structure and foundation design with a maximum of over 60 MN achieved on Plot 13.

The two 1500 mm piles tested at Plots 2-3 were tested to loads exceeding 40 MN. The main concern on this particular site was the settlement expected at the working load. Analysis of the test results enabled the confirmation of acceptable settlements, allowing the construction to proceed with confidence in the foundation design.

Moscow City Business Centre *Source: Wikipedia.com*