



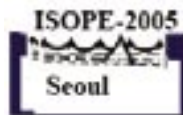
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"Providing confidence in foundations through load testing around the world"

SPRING 2005 • LOADTEST

UPCOMING CONFERENCES

- **Austrian Geotechnical Conference**
 Vienna Terzaghi Lecture
 February 21-22, 2005
- **Baltic Geotechnics X Conference**
 Riga, Latvia
 May 11-13, 2005
- **The 15th International Offshore and Polar Engineering Conference & Exhibition**
 Seoul, Korea
 June 19-24, 2005



MAJOR STRUCTURES USING THE O-CELL® TEST

- **New World Record Load Test (18,000 tons 163 MN) – Pomeroy Mason Bridge, Ohio River**
- **Hangzhou Bay Bridge – Shanghai, China**
- **Mandalay Bay Casino – Las Vegas, Nevada**
- **One Raffles Quay – Singapore**
- **Venetian Casino – Las Vegas, Nevada**
- **Po River Bridge – Milan, Italy**
- **Su Tong Bridge – China**

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TELLTALES

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World Record Test!

On August 27, 2003 a new world record for deep foundation testing of 18,400 tons (163 MN) was set by Loadtest, Inc. in Meigs County, West Virginia on the Pomeroy-Mason, Ohio River Bridge project, exceeding Loadtest's 2001 world record by 1,400 tons.

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SETTING RECORDS GLOBALLY

AUGERCAST (CFA) – O-CELL® SUCCESS

Loadtest, Inc. of Gainesville, FL and HJ Foundation, Inc. of Miami, FL have successfully tested two Augercast, or CFA piles, using Osterberg Cell's on what are believed to be the largest Augercast piles constructed in North America. With the market for condominiums and office high-rises literally taking off in many parts of the United States; Florida is no exception. In the land of Mickey, beaches and hurricanes, the skylines of Miami, Tampa and Jacksonville are changing rapidly due to the number of new skyscrapers under construction or in development. In the Miami area alone, currently there are more than 50 projects for multi-storey high rises in excess of 20 stories.

The need to expedite these projects is paramount, and Loadtest, Inc. was contracted by HJ Foundation, Inc., a leading Augercast contractor, to test some world-class foundations on two separate projects. Both projects require Augercast piles to exceed 100 ft. (30m) in depth and carry loads in excess of 800 tons. (See project profiles.) The geography of the test areas is typical for Florida, comprised primarily of sand underlain by dense layered sandstone.

A crane-mounted hydraulic drill advanced the > 100ft.(30m) piles and grout was then placed as usual. The rebar cages with the O-cells affixed were then lowered into the grouted holes. The O-cell and cage assembly slipped smoothly through the



125 ft. (38m) of cage ready to place in grout

grout with minimal resistance. These are the first O-cells installed and used in Augercast piles.

The shafts were 24 in. (610mm) and 30 in. (760mm) in diameter and the O-cells were placed at 70 ft. (21m) and 100 ft (30m) respectively within the cage assemblies prior to grout placement. Both cages were able to reach tip elevation without incident and the O-cells were placed precisely at their predetermined elevation.

Testing began after the grout reached 28-day strength. Both piles proved to be robust and ultimate design capacities were exceeded on both projects. Mr. William Ryan and Mr. Jon Sinnreich of Loadtest, Inc. were on hand to conduct both tests. Total loads applied exceeded 4300 kips (19 MN) and 2600 kips (12MN) respectively.



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AUGERCAST (CFA)

MIAMI, FLORIDA



AUGERCAST (CFA) PROFILE

- Test Location: Miami
- Test Date: September 2004
- Contractor: HJ Foundation, Inc.
- Engineers: Langan Engineering
- Pile diameter: 30 in. (760mm)
- Pile Length: 125 ft. (38m)
- O-Cell configuration: 1 x 16 in. (410mm)

MAX EQUIV. LOAD/MOVEMENTS

- 4300 kips (19MN)
- +0.14 in. (3.6mm) up _
- -0.18 in. (4.6mm) down _

MOSCOW, RUSSIA

A design for the foundations of this impressive project required a piled raft foundation solution. One of the key questions regarding the design was the ultimate end bearing capacity in the limestone.

A top down test was considered which would require sleeving to full depth or *alternatively* a bi-directional test in which a sacrificial jack (O-cell) is cast at the pile toe.

Two O-cell tests were performed on 36 in. (900mm) diameter piles, 62 ft. (19m) and 65 ft. (20m) long, through the Voskrensky clay layer and installed approximately 13-16 ft. (4-5 m) into the Suvorov limestone. Each test mobilized an end bearing capacity of 4700 kips (21 MN).

PROJECT

This site, currently referred to as Moscow City, Lot 9, is uniquely located within the heart of the Russian capital and is one of 20 plots surrounding a new train terminal (not yet completed) with a direct link to the Airport.

The load test was carried out mobilizing approximately 0.12 in. (3mm) of upward movement and approximately 1.9 in. (48mm) and 1.1 in. (27mm) of downward movement in each of the piles. The results indicate it was likely the full end bearing stiffness was not immediately engaged.

The desired maximum end bearing loading was specified as 3600 kips (16 MN). The effective mobilized total capacity in each of the test piles was 9450 kips (42 MN) approx. 4720 kips (21 MN) in each direction.



Current progress on plots 9 & 10 and the O-cell cage being lifted ready for installation

MOSCOW PROJECT PROFILE

- Geotechnical Engineers: Ove Arup & Partners International Limited
- Foundation Contractors: Kasktas Piling & Drilling Contracting Co. Inc.
- Client: Capital Group
- Project Manager: Bovis Lend Lease International Ltd.

GERMANY

The Zeil, Frankfurt am Main was the site of the first Osterberg cell test in Germany. In April 2004 the largest, static load pile test on German soil was performed using Osterberg cells, in the heart of Frankfurt.

Six O-cells were installed on two separate levels to allow the behavior of three elements of the pile in the rock socket to be evaluated independently. The bi-directional load testing was aimed at confirming the foundation design, before demolition of some of the surrounding older structures. The testing was performed on 1.68 m (66 in) diameter test piles approximately 47m (155 ft) long, installed 12m (39 ft) into the Frankfurt limestone.

This large site is uniquely located within the heart of the Frankfurt city centre, on the main shopping street, "Zeil". This street is amongst those of the highest pedestrian traffic in Germany.

The load test was carried out in two stages as is necessary with a multilevel O-cell arrangement:

- In the first stage the upper 5m (16 ft) of rock socket was loaded to 24MN (5400 kips)
- In the second stage a lower 5m (16 ft) section was loaded against the bottom 2.5m (8 ft) of the pile.
- The effective mobilized capacity was 78MN (17,535 kips).



Bi-directional test in progress. Steel beam is used as reference frame for top of pile movement measurements.

GERMAN PROJECT PROFILE

- **Geotechnical engineers:** Ingenieursozietät – Prof. Dr. Ing Katzenbach, GmbH: Dr. Matthias Vogler.
- **Foundation Contractors:** Bilfinger Berger AG, Bauer Spezialtiefbau GmbH, and Hochtief Construction AG.
- **Developer:** MAB joint venture with BPF.
- **Architect:** KSP Engel und Zimmerman Architekten; Fuksas Associati S.r.l.
- **Local LOADTEST office in Germany:** Scanrock GmbH: Carlos Fischer

UAE – ABU DHABI & DUBAI

In 2004, LOADTEST performed the first Osterberg cell (O-cell) bi-directional load test in the UAE. Although many static load tests have been performed in the region in the range of 40MN (9000 kips), the O-cell is capable of far greater loads. On three projects in the UAE LOADTEST recently mobilized loads from 60MN (13,500 kips) to 90MN (20240 kips).

With designers pushing the "envelope" on many new structures which require even larger bearing capacities; the Osterberg cell technology is ideally suited to test large capacity foundation elements and assist in removing the "factor of uncertainty" associated with large foundation design.

Several world class projects in the UAE area are utilizing O-cell technology and the booming market for office towers and bridges in the region can only benefit by using this test method.



First O-cells being installed in UAE

UAE PROJECT PROFILE

- Designers:** High-Point Rendel
- General contractor:** Archirodon
- Foundation Contractor:** Bauer