

# O-cell<sup>®</sup> Technology in Continuous Flight Auger piles

LOADTEST has inserted and performed the deepest Osterberg cell (O-cell<sup>®</sup>) bi-directional load tests in CFA piles.

HJ Foundation, Inc. of Miami, FL. have successfully installed numerous CFA piles, complete with Osterberg Cell's<sup>®</sup> mounted in the cage for subsequent bi-directional load testing on what are believed to be the largest and deepest Augercast piles constructed.

With the market for Condominiums and Office high-rises literally taking off in many parts of the United States; Florida is no exception. 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 100 projects for multi-storey high-rise buildings in excess of 20 storeys.



*Test pile being constructed and O-cell assembly ready for installation*

Loadtest, was engaged by a HJ Foundation, Inc. – a leading Augercast contractor, to test some world-class foundations on separate projects in Miami, Florida. These projects required CFA piles to depths exceeding 30 m and for working loads of around 8000kN.

The ground conditions on these projects are typical for Florida, comprised primarily of a thin deposit of fill, sand or shore deposits, followed

by a soft oolitic limestone of the Miami Formation. Beneath this are layers of sand of varying density intermixed and interbedded with the soft sedimentary rock formations including limestones, sandstones, cemented sands and shells.

The O-cells and instrumentation were assembled into the reinforcing cages in preparation for insertion into the wet piles.



*CFA/O-cell Assembly Tip*

Crane-mounted hydraulic CFA drill rigs advanced the 30m+ and the piles were backfilled with a cementitious grout mix during auger extraction as usual. Some of the grout mixes also employed aggregate with typical strengths of 55 N/mm<sup>2</sup> and slumps of around 200 mm.

The full length reinforcing steel cages with the O-cells affixed were lowered into the grouted holes. The O-cell and cage assembly slipped smoothly through the grout with minimal resistance. These are the deepest O-cells installed and used in Augercast piles.

In 2006, Loadtest performed their first multilevel O-cell installation and test.



*Cage & O-cell ready for installation*

Cages were able to reach tip elevations without incident nor difficulty and the O-cells were placed precisely at their predetermined elevation.

Testing started after the grout reached the required 28-day strength. All of the piles have been proven to be robust and test loads exceeded ultimate design capacities on each of the projects.

Pile dia.[mm]	O-cell dia.[mm]	Pile Depth	Test Load
610	330	31m	12MN
760	405	38m	18MN
760	405	51m	12MN
760	540	37m	22MN



*Test in progress under the reference beam*

If the load tests had been performed by application of load at the pile head, stresses in excess of 40 N/mm<sup>2</sup> would have been required.

**LOADTEST: Providing Confidence in Foundations through Load Testing around the World.**

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