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LOADTEST • SUMMER 2002

June 3rd-5th:

DFI 9th International Conference on Piling and Deep Foundations, Nice, France

Jack Hayes presenting paper co-authored with Tony Simmonds of Geokon, Inc.: **“Interpreting Strain Gage Measurements from Load Tests in Bored Piles”**

July 24th-27th:

ADSC Summer Meeting, Monterey, CA

October 4th:

ASCE Colorado Regional 2002 Geotechnical Seminar, Denver, Colorado

Dr. Jorj Osterberg presenting **“Drilled Shaft Load Tests for T-REX Project”**

October 9th-11th:

DFI Annual Meeting, San Diego, CA

Dr. Jorj Osterberg presenting **“Load Testing of High Capacity Drilled Shafts”**

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HAWAII - ALOHA!

From Highways to beachfronts, Loadtest Inc. and our patented O-cell™ technology is providing engineers, designers and contractors an economical method of testing drilled shafts throughout the Hawaiian islands.

Recent analysis of the **Hana** highway bridges has concluded that replacement of a number of bridges is in order. Engineers on two of these replacement projects, **Uaoa Stream Bridge** and **Kaupakulua Stream Bridge**, have chosen O-cell™ technology to confirm their design values.

Mr. Jung Kim of **EHA** knew the O-cell™ test was the only choice for testing his **1072-kip** design load shaft. **Malcolm Drilling** constructed the shaft to a 48-inch diameter and to a depth of 80-feet. Mr. Kim was on site to observe as the O-cell™ applied a total load of **3752 kips** with a displacement of only 0.07 inches.

Engineers **Robin Lim** and **Gerald Sekii** of **Geolabs Hawaii** also turned to O-cell™ technology for their testing needs at the **Kaupakulua Stream Bridge**, a mere 2 miles away from Uaoa. Again the professionals from **Malcolm Drilling** were chosen to construct the 70-foot deep, 60-inch diameter test shaft for the west abutment. Staff Geologist **Nick Mitchell** observed as LTI applied a state record 10,658 equivalent top load to the test shaft, proving a unit side shear value of over **30 ksf** in the underlying basalt formation.

To the beach, and none better than **Waikiki Beach**, where **Jim Prentice** and the crew at **Hawaiian Dredging and Construction**

Company installed an 80-foot dedicated test shaft for a proposed low rise commercial building, literally a stones throw from the beach on **Kalakaua Ave.** **Robin Lim** and **Gerald Seki** from **Geolabs Hawaii** designed the test shaft to confirm design values for proposed 24-inch and 36-inch diameter production shafts. The test shaft proved a combined top load capacity in excess of 1400-kips, a load well beyond economic feasibility without O-cell technology. Value engineering provided cost savings for the client (using O-cell™ technology) as the shafts were shortened using data provided by the O-cell™ test.

Loadtest Inc. then headed to Windward Oahu, **Castle Medical Plaza** in Kailua. Drilling subcontractor **CMZ Hawaii** constructed a 38-inch diameter and 32-foot in length test shaft, and representatives of the general contractor **Dick Pacific, Inc.**, as well as **Glen Barut** of **Geolabs Hawaii** were on hand to observe the test. A 13-inch diameter O-cell™ was used to apply 438-kips in a combined side shear and end-bearing load. Thanks also go out to **Mr. Ed Minkel** of **CMZ of Hawaii, Inc.** and **Gary Moura** of **Dick Pacific Construction Co.** for their support on this project.



ENGLAND – T5 AND THE WHARF

Heathrow Airport, London was the site of the first O-cell™ test in the United Kingdom. Heathrow's **Terminal 5 Project** is scheduled for completion in 2007 and will increase passenger capacity by 30 million to 85 million per year.

Bachy Soletanche, Ltd. drilled two 1050mm diameter dedicated test piles to a depth of 47.99 and 43.84 meters respectively. O-cell™ assembly, instrumentation and installation were carried out under the direction of Loadtest, Inc. personnel **Mr. Robert Simpson** and **Denton Kort** with assistance from **Santiago Perazzo**. The test was conducted by **Jack Hayes** and **John Sinnreich** of Loadtest, Inc. and **Mr. David Newby**, Project Manager for **Bachy Soletanche Ltd.** and **Mr. Robert McDermott** of **Mott-McDonald** observed the installation and testing. The results of the 540-mm O-cell™ tests on these two piles resulted in end bearing values of 3.4 MN and 3.2 MN respectively.

Charrington's Wharf (Central London Wharf Project) in London was the second site for Osterberg Cell testing in the United Kingdom. The O-cell™ testing for **Stent Foundations Ltd.** (**John Spence**, Project Manager) was part of a value-engineering program. A 670 mm diameter O-cell™ was placed 0.65 meters above the tip of the 1100 mm diameter, 36.2 m deep test pile. The pile was loaded to a combined side shear and end bearing of more than 18.3 MN.

ITALY – PO RIVER PROJECT

Piacenza, Italy was the site for Osterberg Cell testing on the **Po River Bridge Project** for Grandi Lavori Fincosit, Spa. (Ing. Augusto Bâ). Two multi-level O-cell™ tests were performed on 2000 mm piles constructed by **Trevi spa.** (**Mr. Novellini**). The shafts were constructed wet using bentonite to depths of 52.3 and 57.7 meters. The equivalent top load values for shafts were 66.1 MN and 69.9 MN respectively. By placing the O-cell™ at strategic elevations in the shaft, Loadtest was able to assess shear characteristics in specific zones, as well as isolate end bearing and total side shear loads. These tests represented further evidence of the economic benefits of O-cell™ technology, as the owner, **Italferr** was able to save millions of lire using the Osterberg cell method versus conventional testing.

TRANSPORTATION EXPANSION PROJECT – T-REX IN DENVER

The **Transportation Expansion Project**, also known as **T-REX**, is a landmark collaborative effort between the **Colorado Department of Transportation (CDOT)** and **Regional Transportation District (RTD)** and is shaped by extensive public input from across the metro Denver area. This project is the next step in the evolution from an aging, outdated transportation system to a modern integrated network of highway and light rail options. It includes highway expansion and safety improvements, the addition of light rail along **I-25** and **I-225**; and reconstruction of interchanges and bridges; a new drainage system and improved pedestrian and bicycle access. Loadtest Inc. is pleased to be involved in this landmark project with **Southeast Corridor Constructors** and the **Anderson Drilling Co.**

Franklin Street/I-25 Overpass

Loadtest Inc.'s first O-cell™ on the T-Rex site was at the new Franklin Street overpass, spanning I-25. **Anderson Drilling** excavated the production test shaft, socketed in rock. The shaft was constructed with a **42-inch (1066-mm)** auger to a total length of **25.3 feet (7.70 meters)** from tip of shaft to the concrete cut-off elevation. The test shaft was successfully loaded to a combined side shear and end bearing of more than **5610 kips (25.0 MN)**.

I-25/I-215 Interchange

Anderson Drilling excavated this **42-inch (1070-mm)** diameter dedicated test shaft to a total length of **22.6 feet (6.89 meters)** to top of concrete. The test shaft was successfully loaded to a combined side shear and end bearing of **1086 kips (4.83 MN)**.

Countyline Rd. Test Shaft

Anderson Drilling excavated this **42-inch (1070-mm)** diameter dedicated test shaft a total length of **16.3 feet (4.95 meters)** to top of concrete. The test shaft was successfully loaded to a combined side shear and end bearing of **1348 kips (6.00 MN)**.

Broadway Viaduct

Anderson Drilling excavated this shaft to a total of **41.4 feet (12.62 meters)**. The shaft started out as a **60-inch O.D.** shaft with a temporary casing and then a **54-inch auger (1370-mm)** was used to excavate the **30 foot rock socket**. The O-cell™ was placed. The test shaft was successfully loaded to a combined side shear and end bearing of more than **14700 kips (65.9 MN)**.

Loadtest Inc. would like to thank **Mr. Jim Toole** and **Ben Carnazzo** of **Southeast Corridor Constructors**, and **Mike Waldren** of **Anderson Drilling**, and **XXXX** of the **CDOT**, for all their assistance and support.

TESTING THE COOPER RIVER BRIDGE

Upon completion in 2005, the **Cooper River Bridge** will be the longest suspension bridge on the east coast of the United States. Contractors will construct more than 400 drilled shafts to support the 2.5 mile bridge from Charleston to Mt. Pleasant spanning the Cooper River. The **South Carolina Department of Transportation** and **Parsons Brinckerhoff** utilized Osterberg Cell technology to confirm shaft design. Loadtest, Inc. has completed a total of 14 O-cell™ tests to date on this project.

The first 12 tests (five single level and seven multi-level) were performed for **Trevilcos Corporation** during the fall of 2000 on dedicated test shafts. The shaft diameters were 72-inches and 96-inches and depths from 100-ft to 150 ft. Loadtest, Inc. also performed CSL and Sonic Calipering for **Trevilcos** during this testing phase. Representatives of **Trevilcos**, **SM&E** and the **South Carolina Department of Transportation** observed the shaft construction and testing.

Loadtest returned to Charleston in February 2002 to test two 60-inch diameter production shafts for **Case Atlantic Co.** These multi-level O-cell™ tests yielded loads of combined side shear and end bearing load of **14,064 kips (63MN)** for the 222 ft. deep shaft and **13,295 kips (59MN)** for the 225-ft. deep shaft. Representatives of **Palmetto Bridge Constructors** and **Parsons Brinckerhoff** were present to observe the testing. **Mr. Michael Ahrens, P.E.** was the Project Manager for Loadtest, Inc.



FIRST TIME DOT'S – W. VIRGINIA & OREGON

Kanawha River – Kanawha County, W.V.

LOADTEST Inc. performed the first two O-Cell™ tests in the state of **West Virginia** for the **WVDOT** on a new bridge spanning the “**Great Kanawha**”. The Kanawha River, known as the “**Great Kanawha**”, is West Virginia’s largest inland waterway

National Engineering and Construction Co. constructed two 36-inch diameter shafts to 72-feet in length as part of the **I-64/Kanawha River Bridge**. **James Shook, Bob Pennington** of the **WVDOT**, **Brett Schneider** and **John Hargett** of **National Engineering & Construction Co.**, **John Nottingham** from **Triad Engineering**, **Tony Anders** of **Aherns & Associates**, as well as **Karl Hred** of **Hailey and Aldrich** were on site observing the O-cell™ process. Both shafts were tested using 34 inch O-cells™ which applied loads to a combined side shear and end-bearing load of **19,039 kips (84.7 MN)** for Test Shaft 1 and combined side shear and end-bearing load of **13,540 kips (60.2 MN)** for Test Shaft 2. Mssr.’s **Denton Kort, Shing Pang, Keith Fickling** and **Jack Hayes**, all of Loadtest Inc. conducted The O-Cell™ installation and testing procedures.

O-cell™ Debut in the Great Northwest

Loadtest, Inc. performed the first Osterberg Cell test in the State of Oregon in January 2002 at the I-205 Interchange site in Portland. This roadway improvement project will provide two east and westbound travel lanes with a dual left turn lane.

ADSC member **AGRA Foundations** of Everett, Washington (**Mr. Jim Ransom**, Project Manager) constructed the 84-inch diameter, 64.5-ft. deep production shaft. The shaft was excavated using a 7-ft. core barrel and digging bucket. Shaft instrumentation and assembly was carried out under the direction of **Mr. Denton Kort** of Loadtest, Inc. The 34-inch diameter O-cell™ was located 0.55 ft above the tip of shaft. Representatives of the **Oregon Department of Transportation** were present to observe.

Mr. Denton Kort and **Mr. Bill Ryan** of Loadtest, Inc. carried out the test resulting in an applied maximum bi-directional load of 23.0 MN, exceeding the required load.