



DID YOU KNOW:  
GRL ENGINEERS TURNED 30  
YEARS OLD IN 2006?



## Assuring Quality Under Challenging Circumstances

by Gina Beim, PE

The deep foundations industry frequently faces the need to test foundation elements in challenging locations. Developments in electronic testing tools have enabled the industry to tackle these situations. For example, in projects where static testing was difficult or impossible to perform, such as on foundations over water, high strain dynamic testing became a routine solution for performing load tests. In restricted or hard to get to locations that once complicated any type of testing, high strain dynamic testing may now be done remotely. On job sites where power availability would once hamper pile integrity testing (this test once required a relatively large vibrator connected to a large power source), the current pulse echo method test has been performed for some time with a portable, battery operated device using a small hand-held hammer.

Cross-hole Sonic Logging (CSL) now joins the testing methods that can be performed in challenging situations, thanks to the advent of the Cross Hole Analyzer model CHAMP. The recently introduced portable, light-weight CHAMP is battery operated and has allowed engineers to perform CSL on job sites where such a test would otherwise be difficult. Three such project examples will illustrate where the CHAMP has facilitated CSL testing.

A cable-stayed bridge supported by drilled shafts is currently under construction over the Potengi River that separates the cities of Natal and Redinha in northeastern Brazil. CSL was specified to assure the quality of the shafts. The first part of the testing program consisted of performing CSL on 12 drilled shafts that were 2 m (6.6 ft) in diameter and about 53 m (174 ft) in length. PDI Engenharia, who performed the tests, initially used the CHA-QX but later switched to the CHAMP and reported that traveling to the site and testing the shaft with the smaller instrument was much easier. The battery lasted all day and no additional power source was required.



CSL testing with CHAMP in Brazil



Drilled Shafts, bridge over Potengi River

The California office of GRL Engineers was retained to perform cross-hole sonic logging in Baja, Mexico. Anytime testing is required in locations that require airline transportation, recently imposed more stringent airline restrictions on baggage weight present a potential cost increase. GRL was able to avoid excess baggage fees and transfer the transportation cost savings to its client by offering the CSL service with a much lighter piece of equipment that does not exceed airline baggage weight limits.

Certainly the most challenging of the projects was the Blennerhassett Island Bridge over the Ohio River (side note for American history students: this island was made infamous by Aaron Burr). This bridge is supported by 10.7 m (35 ft) long 2.3 m (7.5 ft) diameter drilled shafts that were drilled from a barge and included access tubes for CSL testing. In the river piers, the top of the concrete was 9 m (30 ft) below water level, at the river bottom, and steel shells rose 12 m (40 ft) above the concrete to provide access for construction and testing. Six access tubes were installed in each of the shafts. The only way to perform the CSL test was from a 1 m by 1 m (3 ft by 3 ft) basket that was lowered into the shafts. Engineers from the GRL Ohio office carried the CHAMP as they rode in the basket. They welcomed the low weight of the instrument and the fact that it had sufficient battery life for the entire test.



Blennerhassett Island Bridge, mid river shaft

CSL is frequently required by US Departments of Transportation for situations of shafts installed with slurry, and is recommended in manuals issued by the Deep Foundations Institute, ADSC and the FHWA. CSL testing procedures are standardized by ASTM D6760-02.

# Event Highlights 2006

please visit [www.pile.com/events](http://www.pile.com/events) for a complete listing

**May 24, Ljubljana, Slovenia: Seminar on Foundation Testing and Analysis, by Pile Dynamics Europe. For additional information and to register visit [www.pile.com/events/docs/Seminar\\_slovenia06.pdf](http://www.pile.com/events/docs/Seminar_slovenia06.pdf)**

**May 25, Ljubljana, Slovenia: PDA and CAPWAP Workshop, by PDI and Pile Dynamics Europe. Register at [www.pile.com/events/docs/Seminar\\_slovenia06.pdf](http://www.pile.com/events/docs/Seminar_slovenia06.pdf)**

**May 26, Ljubljana, Slovenia: Workshop on Wave Equation Analysis (GRLWEAP), by PDI and Pile Dynamics Europe. Register at [www.pile.com/events/docs/Seminar\\_slovenia06.pdf](http://www.pile.com/events/docs/Seminar_slovenia06.pdf)**

**May 31-June 2, Amsterdam, The Netherlands: The 10th Int'l Conf. on Piling and Deep Foundations, by DFI and EFFC. [www.pilinganddeepfoundations.com](http://www.pilinganddeepfoundations.com)**

**June 16, Bellevue, WA: Driven Pile Specialty Seminar by DFI. <http://www.dfi.org/conferencedetail.asp?id=77>**

**June 28-30, Logan, UT: Driven Pile Foundation Design with GRLWEAP, by Utah State University and Prof. Joe Caliendo ([joe@cc.usu.edu](mailto:joe@cc.usu.edu)). Other instructors are Dr. George Goble and Pat Hannigan, GRL Illinois**

**Aug 3-5, Asheville, NC: ADSC Summer Meeting. [www.adsc-iafd.com/i4a/pages/index.cfm?pageid=3298](http://www.adsc-iafd.com/i4a/pages/index.cfm?pageid=3298)**

**Aug 14-18, St. Louis, MO: 2006 NDE Conf. on Civil Engineering, by American Society for Nondestructive Testing [www.asnt.org/events/events.htm](http://www.asnt.org/events/events.htm)**

**Aug 27, Curitiba, Brazil: Seminar on Foundation Testing and Analysis, by COBRAMSEG and PDI (in Portuguese)**

**Aug 27-31, Curitiba, Brazil: XIII Brazilian Congress of Soil Mechanics and Geotechnical Engineering (COBRAMSEG), [www.cobramseg2006.com.br](http://www.cobramseg2006.com.br)**

**Sept 12-13, Minneapolis, MN, PDA and CAPWAP Workshop, by PDCA. Instructor Dr Julian Seidel. Foundation QA certification exam held in association with this Workshop. Contact: [info@piledrivers.org](mailto:info@piledrivers.org)**

**Sept 14-15, Minneapolis, MN, Design and Installation of Cost Efficient Piles by Pile Driving Contractors Association [www.piledrivers.org](http://www.piledrivers.org)**

**Oct 4-6, Washington, DC: 31st Annual DFI Conference on Deep Foundations. [www.dfi.org/conferencedetail.asp?id=66](http://www.dfi.org/conferencedetail.asp?id=66)**



**New hires:** Greg Glitto, P.E., has joined GRL Engineers. Greg has 15 years experience in dynamic pile testing and will be a welcome support for the Chicago office.

**A new home for the California office of GRL Engineers.** The GRL California office has moved to 516 Crane Blvd, Los Angeles, CA 91355. Camilo Alvarez's new office numbers are 323-441-0965 for phone and 323-441-0975 for fax.

## PDCA Project of the Year Awarded

The Pile Driving Contractors Association (PDCA) presented the River Chamber Demolition, Charleroi Locks and Dam with the 2005 PDCA Project of the Year Award in the category greater than US\$1 million. The Charleroi dams are located on the Monongahela River in Pittsburgh, Pennsylvania. The Project Owner is the U.S. Army Corps of Engineers and the Contractor was Joseph B. Fay Company. The project involved the construction of a stable wall for the future expansion of Charleroi Locks which will allow the passage of larger barges. The piles had to be driven under water with care to avoid existing underwater concrete structures. In addition, pile placement was critical for the next project phase, when battered anchors are to be installed between the piles of this phase. Michael Morgano, GRL Ohio, provided pile driving monitoring throughout the entire pile installation process and, on behalf of the other team members, accepted the award for this project.



PDA on Charleroi Locks and Dam project

## Comment on "Dynamic APPLE Load Testing Over Water"

**GEOMEC, a PDA user from Brazil, commented on the load test over water using GRL's APPLE described on our last newsletter. GEOMEC noted that it had previously performed high strain dynamic tests on drilled shafts over water with its own 20 ton hammer (see photo). GEOMEC used its PDA to verify capacities of 2145 tons on this 1.6 m (5.3 ft) diameter, 45 m (148 ft) long drilled shaft over 25 m (82 ft) deep water. PDI is always happy to receive reports of such successful uses of its testing equipment.**



Dynamic Load Testing on drilled shaft over water, Brazil

## GRL Engineers now provides vibration monitoring services

GRL is now offering vibration monitoring services with InstanTel's Minimate Plus. Vibration monitoring may be performed in conjunction with pile driving monitoring or APPLE dynamic load testing, or as a stand alone service. Camilo Alvarez, GRL California, recently monitored pile driving vibration effects at the Hayward Water Pollution Control Plant to ease concerns about vibration levels near critical structures, such as trickling filters and residential buildings. Camilo also monitored the driving of 21 m (70 ft) long piles with the Pile Driving Analyzer<sup>®</sup>.

## CAPWAP<sup>®</sup> 2006 release

CAPWAP 2006, being released shortly, includes many new features such as extensive customization of reports, including graph labels in languages other than English, improved static simulation analysis, easier data input, expanded automatic search capabilities, and an interactive tutorial. CAPWAP is considered an integral part of state of the practice of dynamic testing.

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