GRL + PDI

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Information gathered by the engineers of
Goble Rausche Likins and Associates, Inc. and *Pile Dynamics, Inc.*

It is that time of the year again ....

We thank our clients and readers for another good year of working together and we hope that 1999, the end of the millennium will bring you peace, success and confidence in the future.

THE PILE INSTALLATION RECORDER

by George Piscsalko

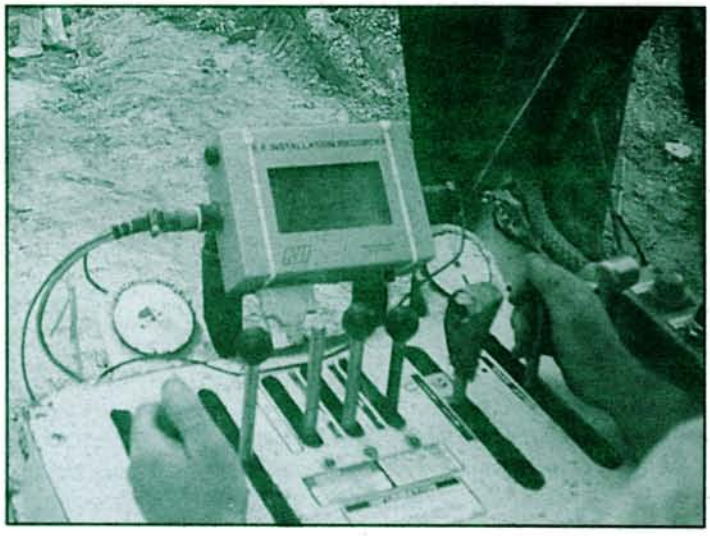
The Pile Installation Recorder (PIR) has been developed both for driven piles (PIR-D) and augercast piles (PIR-A). When placed in the crane cabin, the PIR's display unit (photograph) provides the operator with crucial information to aid in optimal pile installation during pile driving, or drilling and grout placement.

The PIR-D for driven piles records the number of blows and pile penetration with an accuracy exceeding that of an inspector counting blows. For diesel hammers, the ram stroke is also calculated and displayed. Optional measurements include impact velocity and pile inclination in two planes.

For augercast piles, the PIR-A records depth and pumped grout volume simultaneously. The grout volume pumped per unit depth is graphically displayed during installation to meet minimum grout ratios. If a problem is noted by the operator, the pile can then be re-drilled and re-grouted while the grout is still fluid. The PIR-A also monitors grout line pressure and volume per pump stroke, displaying the actual and target withdrawal rates as a guide to the operator for maintaining a minimum grout ratio without wasted grout. The PIR-A gives the engineer or owner greater confidence in the final product which in turn helps the augercast contractors gain better acceptance for their product.

Examples of the PIR-A applications include:

- Prof. Mike O'Neill from the University of Houston conducted a demonstration for the Texas Department of Transportation. Nine shafts were installed by Berkel Co. at three test sites were monitored. These 18" piles varied in length from 30 ft to 50 ft. The PIR-A was operated by engineers from PDI. It was quickly demonstrated to the site supervisor that the PIR-A was far more accurate in determining auger position than the inspector's estimate. For the final seven piles, the site supervisor relied solely on the PIR-A's auger position for final depth determination.
- Grout Systems, Inc. used the PIR at the Alliant Health Systems Project in Louisville, KY where more than 500 piles were installed. These 18" diameter piles were 50 ft long. The 150-ton piles were statically load tested to 450 tons. The PIR-A was operated and monitored by Law Engineering.
- At the famous Central Artery site in Boston, MA, contractor Richard Goettle, Inc. used the PIR-A to monitor more than 200 augercast piles of 14" diameter and 50 ft length. Printed PIR-A records were the basis for pile acceptance by the city inspector.



- At the new Paul Brown stadium in Cincinnati, OH, Richard Goettle, Inc. is currently installing more than 6000 piles of 16" diameter and 70 ft average length . This PIR-A has been customized to give the crane operator an audible tone with each pump stroke. The crane operator stated that this feature has made the job of maintaining the proper auger extraction rate much easier.
- The Ohio Department of Transportation specified the use of PIR-D at the Fort Washington Way project near Cincinnati, Ohio. Three PIR-D systems are monitoring the installation of several thousand piles. The project includes the installation of 20 bridges and numerous retaining walls along I-71, the major North-South freeway in Ohio. The contractors, C.J. Mahan and S.E. Johnson, are driving 14" diameter steel pipe piles and H piles to depths ranging from 45 ft to 80 ft. Additional pile driving rigs will be employed, each one equipped with a PIR-D.

  Within a few minutes of initial installation, the crane operators were comfortable with the operation of the PIR-D. A single inspector can now travel around the vast construction site and check the printed PIR-D records for pile acceptance.

READERS AND CLIENTS WRITE

(WE'D LIKE TO HEAR FROM YOU. SEND US YOUR COMMENTS AND QUESTIONS FOR INCLUSION IN THIS SECTION):

From Finland, Hannu Jokiniemi, with the Tampere University of Technology, ends his e-mail with the following P.S.: *"We are very satisfied with the PAK and CAPWAP. I wonder why we didn't purchase them earlier."*

From Orlando, FL, Timothy Wattleworth and George Mayforth, with Parsons Brinckerhoff, write: *"We would like to thank you for the diligence which you have shown in the performance of PIT analysis for the drilled shafts which we are constructing at the Fuller Warren Bridge... Your timely response allowed us to (have this group of shafts available for a footing pour) with no reservations"*

1999 CALENDAR OF EVENTS with GRL-PDI Participation

January 18-19:	ASCE Course on Deep Foundations: Design, Construction and Quality Control - New Orleans. Mohamad Hussein, GRL Florida, will be one of the lecturers. Call 800-548-2723.
February 19-20:	Pile Driving Contractors Association (PDCA) annual meeting, San Diego. Call Pam at 314-275-7453.
February 21-24:	2nd Int. Conf. on Engineering of Calcareous Sediments, Bahrain. Call 973-727100.
February 25-26:	Pile Symposium 1999, IGB-TUBS, Braunschweig, Germany. Call 49-531-391-2732.
March 3-4:	Seminar and Workshop on Dynamic Testing and Wave Equation Analysis of Piles using GRLWEAP, Orlando, FL. (See enclosure)
March 5-6:	PDA User's Day, Orlando, FL. Call 216-831-6131.
Spring, Fall:	Additional ASCE courses in New York and Seattle. (See January 18-19)

SUCCESSFUL PDA TESTS IN INDIA

Mr. Ravikiran Vaidya recently established Geo Dynamics in Baroda, India (fax: 91-265-356205) and already tested 1200 mm drilled shafts using a new Pile Driving Analyzer (PDA) obtained through Geokon India (fax: 915-2222-4185). Comparison with static tests confirmed good agreement with the PDA results. Mr. Vaidya has gained his experience with PDI's PDA and Pile Integrity Tester™ (PIT) systems while working for AL Technologies in Singapore.

GRLWEAP NEWS

We are in good company: Our GRLWEAP for Windows release date has slipped a little bit. Extensive program checking and modifications for conveniences, help file preparations and example rewrites, all of these things have taken a little longer than anticipated. We are now anticipating first shipments of the program in December 1998.

GETTING THE WORD OUT

Dr. G.G. Goble and *G. Likins* traveled to Asia in October. In cooperation with Earth Products China, they presented lectures to various engineering groups in Hong Kong and China covering wave equation analysis and dynamic pile testing. In cooperation with Richard Yu of Soil Dynamics Malaysia, a PDA Users Days event was also held in Kuala Lumpur on October 2 and 3.

MS. GINA BEIM JOINS PDI

Ms. Gina Beim received a degree of Masters of Science in Engineering from Case Institute of Technology in Cleveland, OH in 1987. Shortly after, she became a partner in PDI Engenharia in Brazil. *Ms. Beim* intends to use her broad technical background to further strengthen PDI's first class client support.

Y2K - NOT A PROBLEM!

For all of you who have been staying up at night thinking about what may happen to your computer on January 1, 2000: Cross us off your list of worries. All GRL and PDI products have been extensively tested. We have not identified any problems. Check our Web Page for constant updates on this Hot Issue.

CALL FOR PAPERS

The **Stresswave 2000** conference will be held in the Hotel Maksoud in Sao Paulo, Brazil, September 11 to 13, 2000. This conference is held every 4 years and is the most important one for our specialty practice. Abstracts are due in June, 1999. We urge our readers to participate both by submitting a paper and attending. For further information, please contact PDI representative Jorge Beim, PDI Engenharia, Rio de Janeiro, phone: 55-21-434-1692, fax: 55-21-434-2939.

GRL

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