Thank you for your support in 2010. May 2011 bring peace to the world and health, happiness and prosperity to you and your family.

Pile Dynamics, Inc.

GRL engineers, inc.

INTEGRITY IS JUST THE BEGINNING

Frank Rausche, PhD and Gina Beim

Deep foundation professionals frequently agonize about the structural integrity of their product. After all, a very expensive project may be rendered unserviceable, and the safety of people compromised, if the building or superstructure is supported by an inadequate pile, shaft or barrette. Case in point, the Ocean Tower on South Padre Island in Texas, which started out as an ambitious luxury condominium and after sinking almost 40 cm ended up as the largest building ever imploded.

Major voids or honeycombs, concrete contaminated by water or slurry, insufficient concrete strength due to inappropriate mix design or admixtures are just a few reasons why, according to some reviews, 20% of cast-in-situ foundations have anomalies, flaws or defects. It is therefore not surprising that codes in various countries such as the UK, Australia, United Arab Emirates and China require integrity testing, while many others (various US States, Argentina and others) recommend it.

When QA/QC project plans require foundation integrity testing, the most appropriate method has to be specified. Most frequently, the choice is made between either the Pulse Echo Method (PEM) or the Cross Hole Sonic Logging Method (CSL). They are incorporated in Pile Dynamics' instruments PIT and CHAMP, respectively. As a rule of thumb, CHAMP testing is more applicable to pile diameters greater than 600 mm (24"), but should also be considered when the pile length to diameter ratio exceeds 30 (where PEM records may become complex depending on construction methods and soil properties). Since CSL testing requires installation of access tubes, foundation elements that could have been tested by CSL, had they been prepared for it, end up instead being tested with the more limited PEM (pulse echo method limitations are discussed in Rausche et al, 2004 and other references, consult www.pile.com/reference).

CHAMP results, particularly when combined with tomography, yield an impressive view of the pile integrity in terms of concrete wave speed (a measure of concrete quality). The method is versatile enough to provide clear results in slurry wall panels. For example, the late PDPSA engineer Antonio Mendez tested curved panels in Mexico City, lining sewer access shafts of up to 20 m diameter and 45 m depth. They required concrete evaluation between access tubes of more than 4 m distance. Very clear and easily interpreted results were obtained. On the other hand, the CSL method cannot check the concrete quality outside of the reinforcement cage.

PIT records generally can only provide information about one and only one major variation in shaft size or concrete quality. However, particularly where the important upper pile portion is concerned, these limited results can be of great value to the foundation professional.

The actual field testing is only the beginning. A sometimes simple, sometimes very demanding data interpretation follows which should classify the test records (Likins et al, 2007). Typical categories are "acceptable" or indicative of an "anomaly", "flaw" or "defect". Record interpretation should always be made within the context

PDI's Dr. Liqun Liang tests an ACIP Pile with PIT-X2 (2 velocity test) in Cleveland, OH

of the specific job site - taking into account soil borings and, in the case of augered cast in place (ACIP) or continuos flight auger (CFA) piles, also the installation records from automated monitoring equipment such as PDI's Pile Installation Recorder (PIR).

A record indicative of a defect requires the decision to accept, reject or repair the foundation, enlist a peer reviewer or call for additional testing. GRL Engineers has been involved in situations where, after CSL of large diameter shafts pointed to defects, access holes were drilled into the foundation, the foundation was cleaned out and high pressure grouting was then performed, followed by additional CSL testing to attest to the effectiveness of the repair. In another case, after a PEM indicated a defect, a high strain dynamic load test was performed, which not only provided information about the structural integrity, but also the geotechnical performance of the shaft.

There is absolutely no point in calling for integrity testing in the project specification, if the specification does not also establish a clear procedure for correcting perceived defects. If all parties involved agree on such a specification before the job is executed, then there will be no painful, construction delays, and at bid time the contractor will be able to provide a better estimate of potential cost.

Integrity testing is just the beginning of delivering a project with, well, integrity. And integrity methods as they exist today are, in the view of Pile Dynamics, in just the beginning stages of progress. PDI is currently developing new methods that hold the promise to overcome some of the limitations of current ones, to provide more information and to speed up both testing and the decision making. Stay tuned.

Rausche, F., et al, January, 2004. Economy, Benefits and Limitations of NDT for Augered-Cast-in-Place-Piles. Proceedings from the Michael Wayne O'Neill Auger Cast-in-Place Pile Sessions: Recent Experiences & Advancements in the U.S. and Abroad on the Use of Auger Cast-in-Places Piles, 83rd Annual Transportation Research Board Meeting: Washington. (CD-ROM)

Likins, G. E., et al, February, 2007. Defect Analysis for CSL Testing. Geotechnical Special Publication No. 158 Contemporary Issues in Deep Foundations; Proceedings from Geo-Denver 2007 New Peaks in Geotechnics: Denver, CO. (CD-ROM)

Winter – Spring 2011 Calendar of Events – See more at www.pile.com/events

- **January 24, Noon to 1:00 pm Eastern Time: ASCE Webinar on NDT Methods for the Integrity Assessment of Deep Foundation: Principles, Capabilities, and Limitations. Garland Likins will present. https://secure.asce.org/ASCEWebsite/WEBINAR/LISTWEBINAR.aspx**

- January 31-February 2, Madison, Wisconsin: University of Wisconsin's 36th National Course of Foundation Engineering and Design. **Pat Hannigan will present.** http://epd.engr.wisc.edu/webL700

- February 1-5, New Orleans, LA: ADSC 2011 Annual Meeting. www.adsc-iafd.com. **Visit the PDI/GRL table and watch PDI's product presentation on Friday the 4th.**

- February 1, Mannheim, Germany: Low Strain Integrity Testing (Impact Echo) Workshop (in German). **Presented by PDI's representative GSP.** For more information contact Dr.-Ing. Oswald Klingmüller at ok@gsp-mannheim.de

- February 2, Mannheim, Germany: Dynamic Load Testing Workshop (in German). **Presented by PDI's representative GSP.** For more information contact Dr.-Ing. Oswald Klingmüller at ok@gsp-mannheim.de

- **February 1, 2, 8 and 9, 9:00 am Eastern Time: PDI offers a GRLWEAP Webinar presented by Frank Rausche. Four, 1.5 to 2 hour long sessions. For more information contact Bill Herman at askpdi@pile.com**

- **February 16-17, New Orleans, LA: PDI and PDCA offer a PDA and CAPWAP Workshop. Garland Likins and Brent Robinson will present. For more information contact Gina Beim at gina@pile.com. Dynamic Measurement and Analysis Proficiency Test will be offered.**

- **February 17, New Orleans, LA: PDI and PDCA offer a half day GRLWEAP Workshop. Brent Robinson will present. For more information contact Gina Beim at gina@pile.com**

- **February 18, New Orleans, LA: PDI and PDCA offer a Workshop on Integrity Testing and QA/QC of Cast in Place Piles. Garland Likins and Brent Robinson will present. For more information contact Gina Beim at gina@pile.com**

- February 17-18, Braunschweig, Germany: Pfahlsymposium 2011 (in German). Presented by Institut für Grundbau und Bodenmechanik der TU Braunschweig. **Frank Rausche will present.** www.igb-tubs.de/

- March 13-16, Dallas, TX: Geo-Frontiers 2011 Sponsored by the Geo-Institute of ASCE and others. **Visit the PDI/GRL exhibit booth.** www.geofrontiers11.com

- March 17, Dallas, TX: DFI Seminar "Helical Foundations & Tiebacks". **Jorge Beim will present.** www.dfi.org

- March 17-18, Boston, MA: ASCE Seminar "Deep Foundations: Design, Construction and Quality Control". **Mohamad Hussein will present.** https://secure.asce.org/ASCEWebsite/Webinar/ListSeminar.aspx?CatCode=CED-GEOT&catName=Geotechnical#5

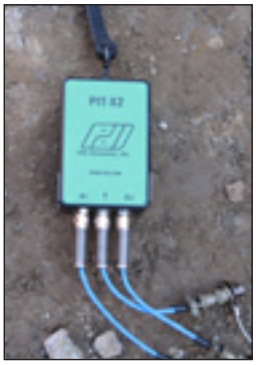
- March 30-April 1, Hershey, PA: ASCE Central PA 25th Annual Geotechnical Conference. **Visit the PDI exhibit booth.** www.central-pa-asce-geotech.org

GRLWEAP 2010 AND GRLWEAP OFFSHORE WAVE

Our last newsletter whetted everyone's appetite for GRLWEAP 2010, which was then in final beta testing phase. The wait is now over, the software has been officially released. Current users of the Wave Equation Analysis of Pile Driving who upgrade to the 2010 version will enjoy its friendlier interface with Office programs, simplified input for driveability and battered pile analyses, and the increased number of geotechnical analysis options.

GRLWEAP now has an option designed specifically for the Offshore industry – GRLWEAP Offshore Wave. GRLWEAP Offshore Wave makes it possible to model complex pipe pile sections and hammer locations at any point along the pile, performs static bending analysis for inclined pile driving, and outputs fatigue analysis tables.

PIT-X2: INTEGRITY TESTING WITH TWO ACCELERATION CHANNELS



The smaller and wireless Pile Integrity Tester, PIT-X, was an instant success when it was released about a year ago. However, those that wanted to perform the low strain test using two accelerometers (to test piles under existing structures, to determine wave speed and evaluate unknown foundation length or to better analyze the records of relatively large piles), had to use the larger PIT-FV. That is no longer the case! The PIT-X2 looks exactly like the PIT-X, and acquires data from two accelerometers coupled to a wireless transmitter. A model that will work with an instrumented hammer is in the works.

DYNAMIC MEASUREMENT AND ANALYSIS PROFICIENCY TEST

PDI, in cooperation with the Pile Driving Contractors Association, has developed a Dynamic Measurement and Analysis Proficiency Test. This proficiency test will be offered for the first time in the USA in New Orleans this coming February (it was offered in Spain, Indonesia and Korea this past Fall). The test, which covers the theory of high strain dynamic testing, PDA data interpretation, application and quality, and CAPWAP analysis, is designed to be completed in 90 minutes or less, with minimal calculations required. PDI and PDCA plan to offer workshops to prepare for the test on a regular basis. The Foundation QA High Strain Dynamic Testing Examination is still available and may be taken at any Regis location. The workshops offered by PDI and PDCA will provide adequate preparation for either the FQA exam or the PDI/PDCA test. Pile Dynamics' main interest is to encourage PDA testers to become experts in their field, something that can be demonstrated by passing with a high ranking either the FQA exam or the new PDI/PDCA test.

PDI WELCOMES NEW INTERNATIONAL REPRESENTATIVE

PDI has added a new representative in the past few months: Nasiruddin Ahmed with Shamsun International represents PDI in Bangladesh.

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DID YOU **KNOW?**

Driven monopiles for offshore wind turbines reach 6m in diameter?

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THERMAL INTEGRITY PROFILER

Gray Mullins, FGE, Garland Likins, PDI and George Piscsalko, PDI

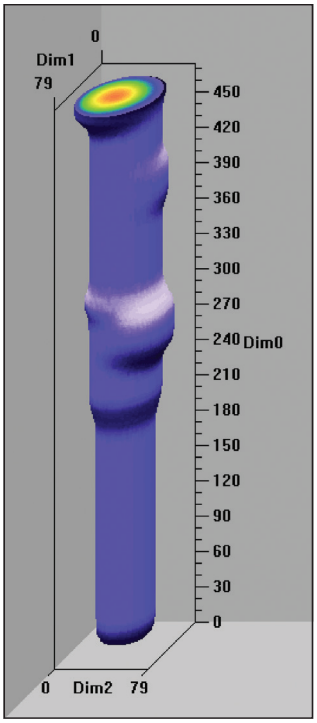
The integrity of drilled shafts (bored piles) is of vital importance. Low strain integrity testing (also called PIT and Pulse Echo), Cross Hole Sonic Logging (CSL) and Gamma-Gamma logging (GGL) are known integrity assessment methods, and each has its unique advantages. Each of these methods also has limits in evaluating the quality of the foundation: CSL assessments are restricted to the area inside the reinforcing cage, GGL assesses only the area within a few inches of access tube, and PIT results may be limited by shaft length and difficult data interpretation below major non-uniformities.

The Thermal Testing Method has been developed in response to these challenges. It uses the heat generated by the curing cement to assess the quality of cast-in-place concrete foundations such as drilled shafts, augered cast-in-place (ACIP) or continuous flight auger (CFA) piles. The Thermal Integrity Profiler (TIP) incorporates the Thermal Testing Method to evaluate concrete quality over the entire cross-section and shaft length.

TIP measures temperature either by an *Infrared Probe*[i] containing 4 orthogonal sensors and inserted into access tubes, or by *Thermal Wires*[ii] that have uniformly spaced sensors and are tied to the rebar cage. The recommended number of tubes or thermal wires is the same as for CSL or GGL applications. A single thermal wire is attached to a center rebar to test smaller diameter ACIP or CFA piles.

With the Probe Method, temperature data are collected typically 24 to 48 hours after concrete casting. With the Thermal Wire Method data are automatically (and, if possible, remotely) sampled at user defined intervals (e.g. 15 minutes), thereby continuously monitoring the concrete curing process. Thermal Testing by either method provides concrete quality data at a very early time, allowing construction to progress more quickly, because engineers no longer need to wait for the concrete to fully cure to assess shaft integrity.

In general, a shortage of competent concrete is registered by relatively cool regions (necks, inclusions or poor concrete); extra concrete (over-pour bulging into soft soil strata) is registered by relatively warm regions. The average temperature at any depth is proportional to the shaft diameter.



3D rendering of shaft generated by Thermal Modeling

Thermal testing by probe method, coutesy FGE

Temperature measurements at the cage, obtained by either the Probe or Thermal Wire method, may also be used to evaluate concrete cover and cage alignment. The measured temperatures have an almost linear relationship to the concrete cover: if the cage is closer to one side of the excavation (less cover) its temperature is lower than average while sections closer to the shaft center will exhibit higher than average temperatures.

Field measurements alone already highlight significant foundation problems, since a plot of the average temperature versus depth is an approximate image of the shaft geometry. This level of review may reveal cage alignment irregularities, casing or rock socket location, and locations of over-pour bulges or necking. Further refinement of concrete cover location is possible by measuring the gradient between 2 thermal sensors offset over a known, radial distance. Thermal Modeling is the highest level of analysis, estimating temperatures of the entire shaft based on the surrounding soil type, climatic history and specific heat generation for a particular concrete mix. Simulated temperatures are matched to field measurements, generating a probable concrete shape, a 3-D rendering of the as-built shaft, 2-D slices of the shaft cross section at any depths of interest and vertical slices through any radial orientation.

The Thermal Testing Method was developed at the University of South Florida under the direction of the first author, who also directed its practical implementation by Foundation & Geotechnical Engineering (FGE) of Plant City, FL. Further research and development is a joint effort of FGE and Pile Dynamics, Inc.

This article is partially based on Mullins, G., "Thermal Integrity Profiling of Drilled Shafts", DFI Journal Vol. 4, No.2, December 2010, available at www.pile.com/references.

i Mullins, A. G. and Kranc, S. C., (2004), "Method for Testing the Integrity of Concrete Shafts," US Patent 6,783,273

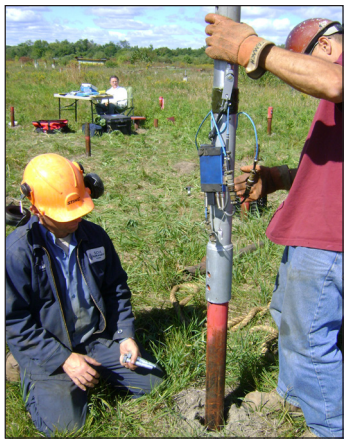
ii Cotton, D., Ference, M., Piscsalko, G., and Rausche, F., (2010) "Pile Sensing Device and Method of Making and Using the Same" Patent Pending

Upcoming 2011 Events – for a complete listing visit www.pile.com/events

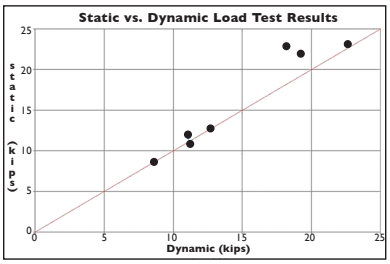
- May 19-21, Sacramento, CA: Frank Rausche will present at the ADSC West Coast Chapter Annual Meeting. Info: www.adsc-iafd.com/RegionalChapters/WestCoast.aspx
- June 22-26, Orlando, FL: Mohamad Hussein will present at the ASHE National Conference. Info: www.ashe2011.org
- July 27-30, Charleston, SC: ADSC Summer Meeting 2011. Info: www.adsc-iafd.com
- August 20-24, Louisville, KY: Visit the PDI exhibit booth at the 70th Annual Meeting of the Southeastern Association of State Highway and Transportation Officials. info: www.sashto.org/SASHTO2011
- September 29-30, Washington DC Metro Area : Mohamad Hussein will teach the ASCE seminar Deep Foundations: Design, Construction and Quality Control. Info: https://secure.asce.org/ASCEWebsite/Webinar/ListSeminar.aspx?CatCode=CED-GEOT
- October 2-6, Toronto, Canada: Visit the PDI exhibit booth at the XIV PanAmerican Conference on Soil Mechanics and Geotechnical Engineering and 64th Canadian Geotechnical Conference. Sponsored by ISSMGE, the International Society of Soil Mechanics and Geotechnical Engineering. Info: www.panam-cgc2011.ca
- October 18-21, Boston, MA: Visit the PDI exhibit booth at the DFI 36th Annual Conference on Deep Foundations. Info: www.dfi.org
- November 3, Orlando FL: PDCA presents Design and Installation of Cost Effective Piles (DICEP)

DYNAMIC TESTING ON HELICAL PILES

PDI's Jorge Beim partnered with Severino Carlos Luna from Geotechnical Consultants, Inc. to evaluate the performance of Dynamic Load Tests on Helical Piles. Helical piles of less than 8 cm in diameter were installed in the National Geotechnical Experimental Site of the University of Massachusetts – Amherst Campus, and Dynamic and Static tests were conducted on 7 of them. Good agreement between static and dynamic test results was achieved (see below). The dynamic test setup on such a small diameter pile required some ingenuity, and was similar to the setup used for calibration of SPT hammers using a PDA. Test details, correlations and recommendations were presented at the DFI Helical Piles Seminar in March.



Wireless sensors on helical piles transmit force and velocity data to PDA (on background) photo courtesy of Geotechnical Consultants Inc.



PIR VIEWER FOR THE PILE INSTALLATION RECORDER

There is a new accessory for the PIR, PDI's Automated Monitoring Equipment for Augered Cast-in-Place and CFA piles. The PIR Viewer is a hand-held wireless device that allows an inspector or piling foreman to view what the main unit of the PIR is displaying (the main unit is installed in the crane cabin). The progress of the drilling and grouting operation is seen in real time on both the main unit and on the PIR Viewer. In addition to receiving data, the PIR Viewer allows the inspector to enter the observed grout return, which is then recorded in the PIR along with the entire installation record.

SOLD OUT EVENTS PAVE THE WAY TO MORE EDUCATIONAL ACTIVITIES IN THE SECOND HALF OF 2011

Last February a PDI / PDCA seminar and workshop in New Orleans sold out, as did a presentation on Dynamic Foundation Testing that Jorge Beim made in São Paulo, Brazil. The GRLWEAP Webinar given by Frank Rausche topped at more than 100 attendees!

During the second half of 2011 Pile Dynamics is planning to hold Deep Foundation Testing and Analysis seminars and/or workshops in locations around the world, including at its beautiful new headquarters in Cleveland, Ohio, USA.

The PDI / PDCA Dynamic Measurement and Analysis Proficiency Test will be offered at the workshops.

We will keep you informed of dates and locations via the Events page of our website (www.pile.com/events) and by email. Make sure to update us on your contact information, including email address, so you don't miss out...and register early, as we could sell out again.

REMEMBER TO RETURN THE CARD THAT CAME WITH THIS NEWSLETTER!

NEW REPRESENTATIVES, NEW TERRITORIES

We welcome Geotech Engineering as Pile Dynamics representative in Indonesia, EMP Piletec Pty Ltd as a representative for Australia and New Zealand, and AGRI as our new representative for Japan.

Long time representative GSP had its territory expanded, and now represents PDI in Germany, Austria, Switzerland, The Netherlands, Belgium, and Luxemburg.

PDI CUSTOMERS HAVE THEIR SAY

Parakrama Jayasinghe, Geotech Testing Services (Pvt) Ltd., Sri Lanka: "I am pleased to confirm that it *(the Cross Hole Analyzer)* has given us yeoman service *(exceptionally good service)* over the past seven years or so and we certainly acknowledge with gratitude the ready support you have given us at all times."

Mike Kightley, Director, MKM Technical Services Ltd, United Kingdom: "The service was excellent. Teamviewer allowed me to talk to the PDI experts (...) I was able to re-commence working on urgent GRLWEAP and CAPWAP® analyses within hours of the problem arising. PDI's support was spot on and allowed me to meet my deadlines (...) Excellent support from PDI who has served me well for 32 years."

Phillip Kapronczai, P.Eng. DFI Edmonton, AB, Canada: "I just wanted to let you know that I have been using the radios *(PDA wireless sensors)* with the remote option *(SiteLink®)* and it's working great! I am really happy with this technology. The site we are working on is about 300kms away from my office and we are having to complete one to 3 tests every 4 or 5 days, which would mean a lot of driving for me…and time is very precious right now. I trained one of my operators to install the equipment properly and things are working really well. I just completed one test this morning and it took me all of 20 minutes or even less to get it done. Anyways, just thought I would thank you again for making my work life a little more manageable."

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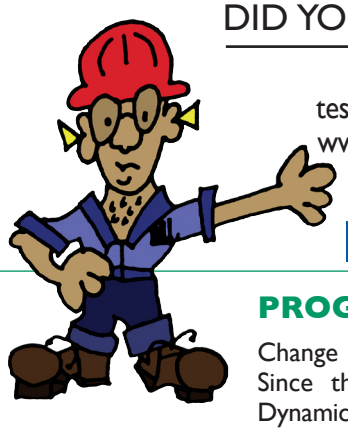

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Newly updated sample testing specs are available at www.pile.com/specifications

Pile Dynamics, Inc.

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PROGRESS

Change is good, and change is inevitable. Since their inception in the 1970s, Pile Dynamics, Inc. (PDI) and GRL Engineers, Inc. (GRL) have had the good fortune of working with some of the best and brightest minds in the deep foundations industry. We have been privileged to have, within our ranks, researchers and engineers with a passion for advancing the State-of-the-Art in construction and geotechnical engineering.

Eventually, the time comes for this next generation of experienced engineers to take on some of the top leadership roles. Over this past summer, Patrick Hannigan, P.E. and Mohamad Hussein, P.E., have ascended into the highest management positions at GRL Engineers. Both are highly respected professional engineers and well-known in the deep foundations testing circles, have spent decades in the firms, and ultimately represent a seamless transition of authority and ability.

Patrick Hannigan is now President of GRL Engineers. He has for the past two decades developed and directed the Illinois Branch Office of GRL, a function he will retain. While heading the Illinois Branch he has managed GRL's activities on major projects in the region, including the Marquette Interchange in Milwaukee, Wisconsin, the Soldier Field reconstruction in Chicago, IL, and the new I-69 corridor in southeast Indiana. He has also been the principal author of the 1998 and 2006 versions of the US Federal Highway Administration's Manual on the Design and Construction of Driven Pile Foundations, a document that has found wide acceptance among designers, testers and contractors. Pat is the lead instructor for the National Highway Institute courses associated with the manual and has been a frequent speaker at Pile Driving Contractors Association (PDCA) and American Society of Civil Engineers (ASCE) events.

Mohamad Hussein has been appointed Chairman of the Board of GRL Engineers, Inc.. He is a well-recognized leader in the deep foundations world, especially in the Southeast US, where in the 1980s he launched the Florida Branch Office of GRL, an office he continues to lead. Mohamad has been involved in numerous major projects like the I-10 Escambia Bay Bridge, Orlando International Airport, I-4 and East-West Expressway Interchange, and many other award winning projects. He is an accomplished author with more than 75 publications, having co-edited several books, among them the Geotechnical Chapter in the Civil Engineering Handbook, seven ASCE Special Geotechnical Publications, and the proceedings of the 5th International Conference on the Application of Stresswave Theory to Piles. Mohamad is a frequent lecturer, and has organized several professional conferences, most recently the 2009 ASCE/ADSC/PDCA International Foundation Congress. He was the Chairman of ASCE's Deep Foundations Committee from 2002 to 2009.

The rise of Pat Hannigan and Mohamad Hussein implies that someone has relinquished these roles. Frank Rausche, PhD, P.E., one of the original researchers of the Case Project on dynamic pile testing, has transferred his executive responsibilities to his two capable colleagues. Frank Rausche was also Chairman of the Pile Dynamics Board of Directors, and that position transitions to Mohamad Hussein, while Garland Likins, P.E. remains president of Pile Dynamics. The Central and Colorado branches of GRL are now headed by, respectively, Brent Robinson, P.E. and Camilo Alvarez, P.E., both highly accomplished GRL engineers.

After more than forty years developing and implementing dynamic pile testing methods, including the Case Method, CAPWAP® and GRLWEAP, and helping grow GRL and Pile Dynamics, Frank will now concentrate on his favorite role of research and development. He will remain a principal of Pile Dynamics, and his long-time business partner Garland Likins looks forward to continuing to enjoy Frank's creative input. Frank mused that the staff and management of PDI and GRL, being such a highly educated, talented, motivated and dedicated group of people, will continue to build on past successes and move the companies ahead with innovation and quality products.

And so, while there is change, the dedicated group of people that makes up GRL will continue to provide outstanding testing and consulting services, while the motivated PDI staff will continue to build quality equipment and write powerful software. Both firms will continue to further develop methods and technologies and, most importantly, provide the same unwavering support to their clients – for years to come.

From left: Pat Hannigan, Frank Rausche, Garland Likins and Mohamad Hussein

2011 Calendar of Events Highlights – for a complete list and event details, visit www.pile.com/events

SEPTEMBER

25-28: **Stop by the PDI exhibit, booth #5,** at the Western Bridge Engineers Seminar in Phoenix, Arizona to see the latest deep foundation testing systems.

OCTOBER

2-6: **Visit PDI at booth 11** at the XIV Pan-American Conference on Soil Mechanics and Geotechnical Engineering and 64th Canadian Geotechnical Conference in Toronto, Canada to see the latest deep foundation testing systems.

4-7 **Meet PDI Italian representative** DRC at the SAIE Exhibition in Bologna, Italy.

10-11 Attend a PDA and CAPWAP Workshop and take the Pile Dynamics and PDCA Dynamic Measurement and Analysis Proficiency Test at the Pile Dynamics headquarters in Cleveland, Ohio. Frank Rausche, Garland Likins, Brent Robinson and Jorge Beim will lecture. For more information and registration form: www.pile.com/events/docs/cleveland1011.pdf

18-21: **Learn from George Piscsalko** at the short course *Importance of Testing and Inspection for Deep Foundations* on the 18th, and **see the latest deep foundation testing systems** at PDI's booth 303 at the DFI 36th Annual Conference on Deep Foundations in Boston, Massachusetts.

27-28: **Learn from Mohamad Hussein** at the ASCE seminar Deep Foundations: Design, Construction and Quality Control in Orlando, Florida.

NOVEMBER

3-4: **Listen to Camilo Alvarez's** presentation at the Simposio Internacional sobre Cimentaciones Profundas in Mexico City, where you can also **visit the booth of PDI representative** PDPSA.

8-9: **Learn** from PDI German Representative Dr.-Ing. Oswald Klingmüller at the Low Strain Integrity Testing (Impact Echo) Workshop and Dynamic Load Testing Workshop (both in German) in Mannheim, Germany.

JANUARY 5, 2012:

Learn from Garland Likins by attending the ASCE Webinar "Installation, Verification and Applications of Driven Piles."

REPRESENTATIVES NEWS

Pile Dynamics welcomes **Geofive Co., Ltd** as a new representative in Japan and **DECL** as a new representative in Taiwan. PDI has worldwide representatives, find them at www.pile.com/pdi/agents.

On a much sadder note, we announce the passing of **Mr. Oscar Fusconi**. Oscar was the founder of CARMIX do Brasil, a PDI representative since 2005. We express our sympathy to his entire family. Oscar's son Francesco Fusconi was groomed by his father to take the helm of CARMIX do Brasil, and the firm continues to represent PDI in Brasil under his leadership.

Pile Dynamics, Inc also regrets to report the passing of **Mr. Quincy Nguyen**, who had been a friend of the company for almost a decade and whose company Nguyen Cao Company Limited of Vietnam was one of PDI's representatives in Vietnam. Deepest condolences to Quincy's family. Pile Dynamics continues to be represented in Vietnam by its representative Inotech.

WELCOME NEW GRL ENGINEERS

GRL continues to expand to better serve its clients. **Dale Paxton** joined the Florida office, bringing over 12 years of experience in deep foundations testing. **Tom Hyatt**, who had been with GRL as a co-op student since January 2010, has graduated with a BS in Civil Engineering and is now part of the Central Office.

PDA PROFICIENCY TEST WEBSITE

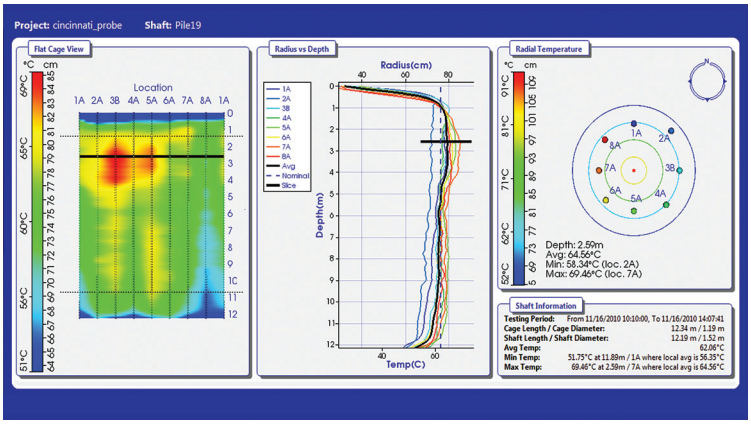
The PDI - PDCA Dynamic Measurement and Analysis Proficiency Test now has a website. Visit www.PDAProficiencyTest.com to learn about the test and to find a link to the PDCA magazine article "The Need for Quality Testing" and a list of professionals who have already received a test certificate. More professionals will take the test at the PDA workshop on October 10 and 11 (see calendar of events for more details).

NEW LOOK FOR THE E-SAXIMETER

The time-tested, dear-to-many-pile-driving-inspectors E-Saximeter has changed colors! The new brown keyboard is easier to use with separate alphanumeric keys for entering information. The E-Saximeter calculates the stroke for single-acting diesel hammers, measures the hammer operating rate in blows per minute and helps the piling inspector create a pile driving log that can later be downloaded. Optional accessories compute hammer kinetic energy and measure penetration depth.

THERMAL INTEGRITY PROFILER

Our last newsletter described the Thermal Testing Method, which uses the heat generated by curing cement to assess the quality of drilled shafts and other cast in place concrete foundations. The Thermal Integrity Profiler (TIP), with its associated TIP Reporter software (shown on Figure), is now available for sale. Two major benefits of TIP testing are the ability to test soon after casting, and evaluation of concrete cover.



THANK YOU READERS

Our last newsletter asked that our readers confirm and update their contact information. We were delighted to receive, along with the requested information, several unsolicited notes of praise. Thank you to all of you that took the time to recognize our efforts by telling us that you "enjoy" or even "love" the fact that our "interesting" and "valuable" newsletters "always include very useful and informative content", are "brimming with new information and developments'" and "help (readers) keep abreast of current research/technology". You urged us to "keep up the great work" – and we will!

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