

DID YOU KNOW?

The CASE METHOD just turned 40!



iCAP™ - A new wave for dynamic testing

Garland Likins and Frank Rausche

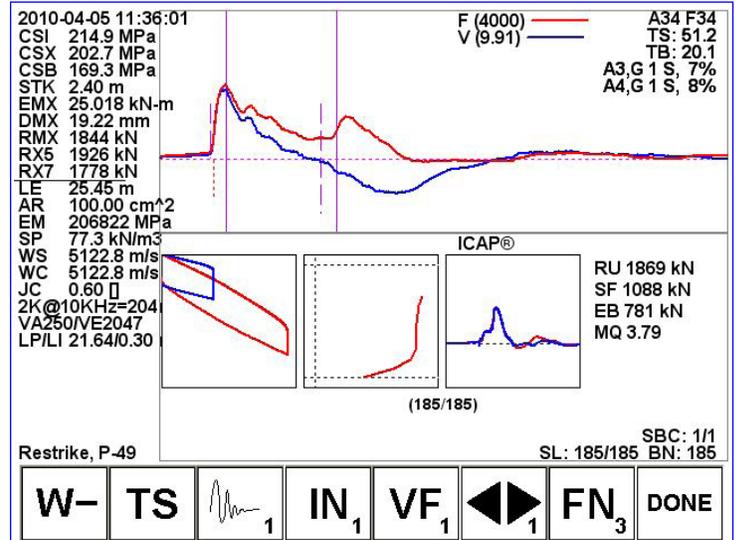
Dynamic testing with the Pile Driving Analyzer® (PDA) is state-of-the-practice to assess deep foundation capacity. Its widespread use underscores the importance of having a system that reduces turnaround time for issuing recommendations, contains testing costs and outputs dependable results.

It is often easier to take measurements during pile driving or restrike testing than to analyze dynamic testing data with a reliable method. Measurement without analysis is, however, insufficient. For this reason, documents such as the American Association of State Highway and Transportation Officials Load and Resistance Factor Design (LRFD) Bridge Design Specifications (AASHTO 2010), Eurocode 7, the Australian Standard Piling Code AS2159 and the Brazilian Piling Code NBR 13208 either recommend signal matching, mandate it or allow for more favorable design parameters when it is performed. The only documented signal matching program with a significant database of correlations with static load tests is CAPWAP®, the “gold standard” of dynamic pile data analysis.

Decades ago, a highly specialized engineer traveled from the field to the office, then spent hours at a computer interacting with the CAPWAP program. The final report could take several days. As computers have become more powerful, the time required to complete the analysis has dramatically decreased. The CAPWAP software also has matured to the point where it offers the engineer a variety of automatic features that speed up the interactive analysis. This has encouraged many PDA engineers to perform CAPWAP signal matching on their laptops in the field, immediately following data acquisition.



PDA model PAX running SiteLink™



iCAP as seen on the screen of the PAX. Graphs, counterclockwise from top, are: Measured Signals; Simulated Static Load Test; Force in Pile Load Distribution and Signal Match

Pile Dynamics is now going a step further, and revolutionizing the data interpretation process with the introduction of iCAP. iCAP performs a fully automated signal matching analysis in real time, during pile driving.

iCAP instant signal matching leverages 40 years of continued improvement and development of the globally-accepted CAPWAP logic. With no user interaction, iCAP extracts the soil behavior from dynamic measurements, computes capacity at the time of the test, and produces a simulated static load test graph. All this is done in real time during testing.

iCAP provides reliable and instant capacity results. There is, however, a basic difference between the “gold standard” CAPWAP and iCAP. The interaction between the engineer and the CAPWAP software adds an often essential layer of engineering know-how to the analysis. On the other hand, the fully automated iCAP responds to researchers’ call for a unique solution, to the contractor’s need for immediate answers and to the specifications requirements for signal matching.

Wireless data transmission from the sensors to the PDA simplifies and speeds the testing process by allowing the sensors to be attached to the pile prior to lifting the pile into the leads. SiteLink technology saves time and money by enabling field personnel to operate a PDA model PAX while the testing engineer receives data in the office and controls the test in real time, through the internet. By combining the advantages of wireless data acquisition and SiteLink with iCAP’s instant answers, the user of a PDA model PAX is equipped to meet the ever increasing demands of quick turnaround and reliable pile load testing and monitoring results.

**What's happening through
early Autumn 2010 -
more info at www.pile.com/events**

- May 24 (Lima, Peru), 26 (Bogota, Colombia) and 28 (Mexico City, Mexico): Dynamic Foundation Testing Seminar. Sponsored by PDI and local partners. **Camilo Alvarez will present.** Registration flyers at www.pile.com/events.
- May 26-28, London, UK: 11th Geotechnical Conference - Geotechnical Challenges in Urban Regeneration. Sponsored by DFI-Europe and EFFC. **Meet several PDI representatives at Booth Number 4.** Info: constructconferences@emap.com.
- June 6-9, Pittsburgh, Pennsylvania: 2010 International Bridge Conference®. Sponsored by Engineers' Society of Western Pennsylvania and ARTBA. **Michael Morgano will teach a Seminar on Deep Foundation Testing and Analysis on June 9 from 1 to 5 pm.** Info: www.eswp.com/bridge/index.htm.
- June 10-11, New Orleans, LA: DFI Superpile 2010. **Visit the PDI exhibit booth and listen to presentations by George Piscalko and Mohamad Hussein.** Info: www.dfi.org/update/SP2010CFP.pdf
- June 17-18, Phoenix, Arizona: ASCE Seminar: Deep Foundations: Design, Construction and Quality Control. **Mohamad Hussein will present.** Info: www.asce.org/conted/seminars
- July 21-25, Colorado Springs, CO :ADSC Summer Meeting. **Visit the GRL table.** Info: www.adsc-iafd.com.
- August 28-September 1, Little Rock, AR: SASHTO 2010. Sponsored by Southeastern Association of State Highway and Transportation. **Visit the PDI exhibit booth.** Info: www.sashto.org/sashto2010
- September 23-24, Miami, FL: ASCE Seminar: Deep Foundations: Design, Construction and Quality Control. **Mohamad Hussein will present.** Info: www.asce.org/conted/seminars
- October 10-13, Hollywood, CA: DFI 35th Annual Conference on Deep Foundations. **Visit the PDI exhibit booth.** Info: www.dfi.org.
- October 12-14, Chicago, IL: Roads & Bridges Live: 2010 - Bridge Infrastructure. **Pat Hannigan will present.** Info: www.roadsbridgeslive.com.

COMING UP IN FALL 2010

Seminars on Dynamic Foundation Testing and Analysis in Poland and Spain. Watch our web Calendar of Events, and keep your email up-to-date to receive a notice as soon as details are available (you can do that by emailing us at info@pile.com or visiting www.pile.com/brochure).

SITELINK™

Most readers of this Newsletter are familiar with Remote Dynamic Foundation Testing (featured in Newsletter 62, January of 2010). As more and more Pile Driving Analyzer® users adopt the technology, we gave it an aesthetic makeover: Watch for the SiteLink logo wherever dynamic testing is performed the cutting edge way. If you are serious about cutting the costs of dynamic testing, you need to look into SiteLink.



NEW VERSION OF ASTM STANDARD FOR SPT CALIBRATION

It is good engineering practice – and in many cases it is mandatory – to normalize Standard Penetration Test results based on the energy transferred by the SPT hammer to the rod. The energy should be obtained from force and velocity measurements as described in ASTM D4633-10 “Standard Test Method for Energy Measurement for Dynamic Penetrometers”. The 2010 document replaced the 2005 version and may be purchased from the ASTM website. Current Pile Dynamics models of the SPT Analyzer and of the Pile Driving Analyzer model PAX comply with D4633-10 and may be used to obtain the required measurements.

NEW AUGERED CAST-IN-PLACE PILE INSPECTOR'S GUIDE

The Deep Foundations Institute (DFI) has released the second edition of the Augered Cast-in-Place (ACIP) Pile Inspector's Guide. According to www.dfi.org, “The manual, updated from the original version published in 1994, summarizes the requirements expected of all parties concerned in the successful installation of these piles and now includes information on Automated Monitoring Equipment (AME) and Non-Destructive Testing (NDT)”. Pile Dynamics offers an AME device known as Pile Installation Recorder, as well as various NDT solutions for ACIP piles.

NOTABLE PROJECT: SR 46 OVER LAKE JESUP BRIDGE IN GENEVA, FLORIDA.

The State Route 46 Bridge over Lake Jesup is 3800 ft long, and crosses an environmentally sensitive water basin. The Florida Office of GRL provided dynamic pile testing and related services as a member of the design/build team for this US\$38 million project that was ranked number 6 in Roads and Bridges Magazine's Top 10 Bridges for 2009.



PDI WELCOMES NEW SALES TEAM MEMBERS AND INTERNATIONAL REPRESENTATIVES

In an effort to better service its clients, Pile Dynamics has expanded its sales team. Dana Shea and Sam Mangano have joined Bill Herman and Tony Barbieri as Client Account Managers and Nicole Angie as Sales and Marketing Administrator. They may be reached by emailing sales@pile.com.



PDI new team members received field training to better help clients

PDI has also added three new Representatives in the past year: Index SA represents PDI in Chile, PDPSA represents PDI in Mexico, and Arsen Makina represents PDI in Iraq, Jordan, Lebanon, and Libya.

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