



**Pile Driving Contractors Association  
and  
Pile Dynamics, Inc.**

**Present**

**Seminar on Deep Foundation Integrity Testing and Wave Equation Analysis  
October 11 (Wed), 2017**

**High Strain Dynamic Foundation Testing Workshop  
October 12 and 13 (Thu - Fri), 2017**



**at the  
PDI Headquarters  
30725 Aurora Road  
Cleveland, Ohio 44139  
1-216-831-6131**

## Registration starts at 8:00am

**Wednesday, October 11, 8:30am – 5:00pm**

### **Seminar on Deep Foundation Integrity Testing and Wave Equation Analysis**

**Who should attend:** Geotechnical, structural and construction engineers; owners, contractors and other professionals involved in the design, construction and specification of deep foundations.

- This seminar is suitable for those new to the field of Foundation Testing and Analysis, and includes an overview of non-destructive testing methods (integrity and load testing) and their applications.
- It is suitable also for those specifying the testing to gain basic understanding for assessing the results presented in reports.
- This seminar is suitable for those needing an understanding of wave equation analysis methods.
- **Those attending the Workshop that follows this Seminar are strongly encouraged to attend this review of wave equation background materials.**

**Learning objectives:** At the end of the seminar, attendees will be able to:

- Select an appropriate method of integrity assessment of deep foundations for a particular application.
- Review reports of integrity and dynamic load testing of deep foundations conducted by others.
- Run a basic wave equation analysis of pile driving.

### **Program** (subject to change)

8:00 Registration  
8:30 Wave Mechanics – Basics  
9:30 Non-destructive testing – High and Low Strain  
10:15 Break  
10:30 Non-destructive testing – Crosshole Sonic Logging  
11:00 Thermal Integrity Profiling  
11:45 PDA Applications  
12:15 Lunch  
1:15 Wave Equation Background  
2:15 Wave Equation Workshop: Bearing Graph, Insp. Chart  
3:00 Break  
3:15 Wave Equation Workshop: Bearing Graph, Insp. Chart-cont'd  
3:45 Wave Equation Workshop: Driveability  
5:00 Adjourn

**CAPWAP/PDAS & GRLWEAP Workshop Materials:** Attendees may either observe the lecture or optionally follow the examples along on their laptops. This optional use of the attendee's computer requires having a license of the CAPWAP/PDAS & GRLWEAP 2010 software installed on that computer. **You will receive the CAPWAP/PDAS & GRLWEAP temporary licenses the week prior of training.**

### **Digital/ Hard copy of the Presentation:**

- **All training material will be available digitally for download prior to the event.** It is suggested that attendees download this material to their laptop and bring their laptop, or print the training material and bring their own hard copy. **A colored, 3 slide per page printout may be requested from PDCA up to two weeks prior to the seminar (\$100 charge will apply).** Please contact PDCA at [debbie@piledrivers.org](mailto:debbie@piledrivers.org) if you want PDCA to provide the hard copy.
- Attendees are encouraged to use their own laptops for the GRLWEAP and CAPWAP® sessions; charging stations will be available.

**Thursday, October 12, 8:30am – 5:00pm**  
**High Strain Dynamic Foundation Testing Workshop part 1**

**Who should attend:**

- Users of the Pile Driving Analyzer® (PDA) system and CAPWAP® software interested in sharpening their skills.
- Engineers, foundation testing professionals, students and professors already familiar with the basic concepts of deep foundation dynamic testing and analysis.
- Professionals who desire to have a basic understanding of the dynamic test results being presented to them.
- Those interested in taking the **Dynamic Measurement and Analysis Proficiency Test\***

**Learning objectives:**

At the end of this two day workshop attendees will be able to:

- Operate the PDA in a manner conducive to acquiring good quality data
- Assess pile bearing capacity, pile driving stresses, hammer performance and pile integrity by various methods
- Avoid pitfalls when analyzing PDA data with the CAPWAP software
- Interpret PDA testing and CAPWAP software results
- Describe the soil-model used in CAPWAP
- Prepare the input for CAPWAP
- Review options for CAPWAP analysis and output
- Calculate bearing capacity and its distribution for driven piles from impact records

**Program** (subject to change)

8:30 Wave Mechanics for PDA testers (90 min)  
10:00 Break  
10:15 PDA Testing – Proper Practices  
12:30 Lunch  
1:15 Dynamic Testing of Drilled Shafts and Augered Piles  
1:30 Testing Economics  
3:15 Break  
3:30 Set-up  
4:15 PDA Workshop: Integrity, Stresses, Energy  
5:00 Adjourn

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- Attendees are encouraged to use their own laptops for the GRLWEAP and CAPWAP® sessions; charging stations will be available.

**Friday, October 13, 8:30am – 5:00pm**  
**High Strain Dynamic Foundation Testing Workshop part 2**

**Program** (subject to change)

8:30 PDA Workshop: Capacity Calculation  
9:15 CAPWAP Background  
10:45 Break  
11:00 CAPWAP Examples  
12:30 Lunch  
1:15 CAPWAP and Refined Wave Equation  
1:45 iCAP® – Instant Signal Matching  
2:15 PDA Data Quality – Examples  
3:15 Break  
3:30 Dynamic Measurement and Analysis Proficiency Test \*  
5:00 Adjourn

**CAPWAP/PDAS & GRLWEAP Workshop Materials:** Attendees may either observe the lecture or optionally follow the examples along on their laptops. This optional use of the attendee's computer requires having a license of the CAPWAP/PDAS & GRLWEAP 2010 software installed on that computer. **You will receive the CAPWAP/PDAS & GRLWEAP temporary licenses the week prior of training.**

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- Attendees are encouraged to use their own laptops for the GRLWEAP and CAPWAP® sessions; charging stations will be available.

A Certificate of Participation documenting the number of hours of instruction (PDH) will be provided. Check with your engineering board of registration for their continuing education requirements.

\* At the end of the High Strain Dynamic Testing Workshop participants may take a multiple choice **Dynamic Measurement and Analysis Proficiency Test** which will take less than 1-½ hours to complete. The test will cover the theory of Wave Mechanics, Case Method (PDA) equations, data quality assessment, data interpretation and basic CAPWAP analysis. The test is designed for those with experience in using the Pile Driving Analyzer® system and CAPWAP to perform High Strain Dynamic Foundation Tests. The best preparation for the test is work experience following an initial PDA training. The workshop will refresh the participant's theoretical background and be a reminder of some important points. Those taking the test are advised to study "Appendix A" and "Helpful Hints" of the PDA manual, review some of the EXAMPLE data provided with the PDA, and read the CAPWAP background material. These materials are supplied with PDA purchases. Those without access to the manuals and examples should please contact [softwaresales@pile.com](mailto:softwaresales@pile.com) in advance of the test date. For more information about the Proficiency Test website: [www.PDAProficiencyTest.com](http://www.PDAProficiencyTest.com).

A Certificate of Proficiency in High Strain Dynamic Pile Testing will be awarded to those who pass the test. The Level indicated on the Certificate is dependent on the score achieved on the test. Those who do not pass the test will receive full credit of test registration fee to be applied towards retaking the test at the next opportunity.

**\*Please note it will take up to two weeks to receive your exam results\***

## Workshop and Seminar Lecturers

**Frank Rausche, Ph.D., P.E., D.GE**, is a principal of Pile Dynamics, Inc. (PDI) and of GRL Engineers, Inc. (GRL). He has been involved in the research and development of dynamic testing and analysis methods since his mid-1960s work at Case Western Reserve University, where he derived the Case Method equations for dynamic pile testing and developed the CAPWAP and GRLWEAP software. Dr. Rausche has been a consultant throughout his career applying the dynamic and testing methods to solve practical problems on construction sites. He has published numerous papers and lectures frequently both in the USA and internationally.

**Garland Likins, P.E., M.ASCE**, is the senior partner and past president of Pile Dynamics, Inc., a manufacturer of quality assurance products for deep foundations. He is a licensed Professional Engineer in Ohio and a former principal of GRL Engineers, Inc., providers of deep foundation testing services. In his 45 years since participating in the original dynamic pile testing research at Case Western Reserve University, Garland has performed countless field tests and directed the development of several field testing devices for deep foundations. He is active in committees for ASTM, ADSC, DFI, and PDCA. He authored numerous publications and frequently lectures on deep foundations.

**Brent Robinson, Ph.D., P.E.**, is a partner in PDI and GRL. He oversees civil engineering and research and development activities and trains users of PDI equipment. Since joining GRL in 1999, he has performed measurement and analysis for foundation projects around the world. Brent is a frequent lecturer, chair of the Geotechnical Committee of the Cleveland Section of the American Society of Civil Engineers, a member of standing committees of the Transportation Research Board, and the recipient of the TRB Best Paper Award in Soil Mechanics in 2010.

**Ryan Allin, P.E.**, is a senior engineer and partner in GRL Engineers and Pile Dynamics. He has a B.S. in Civil Engineering from Cleveland State University and has achieved Expert level on the PDCA/PDI Dynamic Measurement and Analysis Proficiency Test. After several years performing the entire range of services offered by GRL throughout the United States and in international offshore projects, Ryan is currently responsible for all GRL's educational programs for foundation testing professionals. In that capacity he has lectured on numerous seminars, webinars and workshops on foundation testing and has co-authored papers on the subject. Ryan is a member of the American Society of Civil Engineers and a registered professional engineer in Ohio, Pennsylvania, West Virginia, Delaware and Kentucky.

**Van E. Komurka, P.E., D.GE**, is a senior engineer at GRL. He received a B.S. degree in Civil Engineering from the University of Wisconsin–Platteville, and an M.S. degree in Civil Engineering from Colorado State University. He has 31 years' experience as a geotechnical engineer, most-recently at the helm of Wagner Komurka Geotechnical Group, Inc. Van has extensively published and presented on new approaches to characterizing and incorporating soil set-up into design and installation, the value-engineering concept of support cost, and the unique principle of load matching. He serves on ASCE's Deep Foundations Committee, DFI's Driven Pile Committee, PDCA's Technical Committee PDCA, and is an instructor for the FHWA's National Highway Institute's course on Design and Construction of Driven Pile Foundations. Van received PDCA's Professional Engineer's Service Award, and PDCA's Presidential Award for Distinguished Service.

Hotel Reservations – INFORMATION ON LAST PAGE

Attendees should make their own hotel reservations.

The Hampton Inn

## Registration

For online Registration go to the **PDCA website**, or Mail, Fax, or Email this completed registration form by **Wednesday September 27 to:**

**Pile Driving Contractors Association**  
**1857 Wells Road, Suite 6**  
**Orange Park, FL 32073**  
**Fax: 904-215-2977**  
[debbie@piledrivers.org](mailto:debbie@piledrivers.org)

**Early Bird Deadline – September 20, 2017**

**REFUND POLICY:** cancellations prior to three weeks before the event would receive a 50% refund.

For more information contact Debbie Schmidt from PDCA: 888-311-7322 [debbie@piledrivers.org](mailto:debbie@piledrivers.org)

Name(s): \_\_\_\_\_

Organization: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State/Province: \_\_\_\_\_ Postal Code: \_\_\_\_\_ Country: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_

**Registration Fees (includes, course notes, breakfast, AM/PM breaks and lunch):**

- Seminar on Deep Foundation Integrity Testing and Wave Equation Analysis                      **\$250.00**
- High Strain Dynamic Foundation Testing Workshop                      **\$500.00**
- Dynamic Measurement and Analysis Proficiency Test (*No Discounts*)                      **\$200.00**

*\*If you do not pass the test you are allowed one (1) retake of the test at no additional charge at the next course*

- \$50 discount on *each* workshop for Early Bird registration prior to **September 20, 2017**
- Government Employees - \$50.00 discount on each workshop

Amount: Program total	\$ _____
Discount (if applicable) subtract	\$ _____
<b>Grand total</b>	<b>\$ _____</b>

**CREDIT CARD INFORMATION**

I am paying by:    \_\_\_ VISA       \_\_\_ MasterCard       \_\_\_ American Express       \_\_\_ Check

Name (as on credit card): \_\_\_\_\_

Account no.: \_\_\_\_\_ Expiration date: \_\_\_/\_\_\_ Verification code: \_\_\_\_\_

Statement Billing Address: \_\_\_\_\_

City \_\_\_\_\_ State / Province \_\_\_\_\_ Zip \_\_\_\_\_ Country \_\_\_\_\_

Signature \_\_\_\_\_