



# Present a Three-Day Seminar/Workshop



## Location

**Cleveland Marriott East  
26300 Harvard Rd. Warrensville  
Heights, OH 44122  
[www.marriott.com/cleem](http://www.marriott.com/cleem)**

<b>Wednesday</b>	<b>November 3, 2021</b>	<b>Seminar on Deep Foundation Integrity Testing and Wave Equation Analysis</b>	<b>8:30am – 5:00pm</b>
<b>Thursday &amp; Friday</b>	<b>November 4 &amp; 5, 2021</b>	<b>High Strain Dynamic Foundation Testing Workshop &amp; Proficiency Test</b>	<b>8:30am – 5:00pm</b>

**Registration begins at 8:00am**

**Wednesday, November 3<sup>rd</sup> - Seminar on Deep Foundation Integrity Testing and Wave Equation**

<b>Who should attend:</b>	<b>Learning objectives:</b>
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.	Select an appropriate method of integrity assessment of deep foundations for a particular application.
Geotechnical, structural and construction engineers; owners, contractors and other professionals involved in the design, construction and specification of deep foundations.	Review reports of integrity and dynamic load testing of deep foundations conducted by others.
This seminar is suitable for those needing an understanding of wave equation analysis methods.	Run a basic wave equation analysis of pile driving.
It is suitable also for those specifying the testing to gain basic understanding for assessing the results presented in reports.	
<b>Those attending the Workshop that follows this Seminar are strongly encouraged to attend this review of wave equation background materials.</b>	

### **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.

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

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### Thursday, November 4<sup>th</sup> - High Strain Dynamic Foundation Testing Workshop & Proficiency Test Part 1

Who should attend:	Learning objectives:
Users of the Pile Driving Analyzer® (PDA) system and CAPWAP® software interested in sharpening their skills.	Operate the PDA in a manner conducive to acquiring good quality data
Engineers, foundation testing professionals, students and professors already familiar with the basic concepts of deep foundation dynamic testing and analysis	Assess pile bearing capacity, pile driving stresses, hammer performance and pile integrity by various methods
Professionals who desire to have a basic understanding of the dynamic test results being presented to them.	Avoid pitfalls when analyzing PDA data with the CAPWAP software
Those interested in taking the <b>Dynamic Measurement and Analysis Proficiency Test*</b>	Interpret PDA testing and CAPWAP software results
	Describe the soil-model used in CAPWAP and prepare the input needed
	Review options for CAPWAP analysis and output
	Calculate bearing capacity and its distribution for driven piles from impact records

### High Strain Dynamic Foundation Testing Workshop & Proficiency Test Part 1 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 (Capital Gain with Time)
- 4:15 PDA Workshop: Integrity, Stresses, Energy
- 5:00 Adjourn

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### Friday, November 5<sup>th</sup> - High Strain Dynamic Foundation Testing Workshop & Proficiency Test 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

**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.

**Certificate of Completion:**

- A Certificate of Completion documenting the number of hours of instruction – Professional Development Hours (PDH's) will be provided. Check with your engineering board of registration for their continuing education requirements.

**Dynamic Measurement and Analysis Proficiency Test:**

- 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\***

## **Hotel Reservations**

Attendees should make their own hotel reservations. Click **HERE** to make reservations online.

[Cleveland Marriott East](http://www.marriott.com/cleem)  
[26300 Harvard Rd.](http://www.marriott.com/cleem)  
[Warrensville Heights, OH 44122](http://www.marriott.com/cleem)  
[www.marriott.com/cleem](http://www.marriott.com/cleem)

[The hotel rate is \\$119/night.](http://www.marriott.com/cleem)

**Phone: 1-216-378-9191**

**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.

**Patrick Hannigan, P.E.**, is the President of GRL Engineers, Inc. He has spent the vast majority of his 39 year engineering career focused on deep foundation design and testing. He received a Bachelor of Science degree in Civil Engineering from the University of Notre Dame, and a Master of Science degree in Civil Engineering from the University of Missouri-Rolla. He has published numerous technical papers and was the principal author for the 1996, 2006, and 2016 editions of the Federal Highway Administration manual "Design and Construction of Driven Pile Foundations". He is a licensed professional engineer in 22 states and is a member of the American Society of Civil Engineers, Deep Foundations Institute, Pile Driving Contractors Association, and the Association of Drilled Shaft Contractors.

**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.

# REGISTRATION

**Online Registration:** [www.piledrivers.org](http://www.piledrivers.org)

**Early Bird Deadline:** Friday, October 15, 2021

**Mail, Fax, or Email:** Registration form by Friday, October 29, 2021 to:

**Pile Driving Contractors Association**  
33 Knight Boxx Road, Suite 1, Orange Park, FL 32065  
Phone: 904-215-4771; Fax: 904-215-2977  
kathy@piledrivers.org

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

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

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

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

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

## **REGISTRATION FEES (Includes: AM/PM Breaks and Lunch):**

- Seminar on Deep Foundation Integrity Testing and Wave Equation Analysis: **\$300.00**
- High Strain Dynamic Foundation Testing Workshop: **\$550.00**
- 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*
- Early Bird Registration: \$50 discount on **each** Seminar and Workshop by August 9, 2019
- Government Employees: \$50.00 discount on **each** Seminar and Workshop

Amount sub-total: \$ \_\_\_\_\_

Discount (if applicable – subtract): \$ \_\_\_\_\_

**Grand Total:** \$ \_\_\_\_\_

## **CREDIT CARD INFORMATION:**

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

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

Account Number: \_\_\_\_\_ Expiration date: \_\_\_ / \_\_\_ Verification code: \_  
\_\_\_\_\_

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

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

Signature \_\_\_\_\_

**Refund Policy:** Cancellations received by October 22, 2021 will receive a 50% refund. After this date, there will be no refunds, however name changes are permissible. There will be no transfer of funds to the next course permitted.