



# SPRING 2018 - ENSOFT SHORT COURSE

## Design of Deep Foundations: Drilled Shafts and Piles Under Lateral and Axial Loading

*A Seminar and Workshop Featuring Computer Programs from Ensoft, Inc.*

**April 4-6, 2018**

### LOCATION & RESERVATIONS

#### Ensoft, Inc. – Office Building

3003 West Howard Lane, Austin, Texas 78728  
Tel. (512) 244-6464, Fax (512) 244-6067

#### Sample Hotel Information:

**Courtyard by Marriott**, Tel. (512) 502-8100  
9409 Stonelake Blvd, Austin, TX 78759

**Hampton Inn (Northwest)**, Tel. (512) 349-9898  
3908 W. Braker Lane, Austin, TX 78759

**La Quinta Inn & Suites**, Tel. (512) 832-2121  
11901 N Mopac Expy, Austin, TX 78759

*(These hotels are within 5-10 minutes driving distance from the training facility)*

### SPEAKERS

#### William M. Isenhower, Ph.D., P.E.

*Consultant for LPILE, Ensoft, Inc.* Dr. Isenhower is a registered professional engineer in the States of Texas and Louisiana, with over 40 years of experience in civil engineering, with an emphasis on geotechnical engineering. His experience has been in consulting, government service, university teaching, and contract research. He has been engaged in consulting projects, site investigations, foundation analysis and design, slope stability analysis and design, and retaining structure analysis and design. Dr. Isenhower has served as an Expert on Mission for the United Nations Development Program and has served as an independent technical reviewer for the US Army Corps of Engineers. He has authored over 30 technical papers and reports, and has presented invited lectures in the United States and abroad. Dr. Isenhower is a member of the Academy of Distinguished Graduates of the Department of Civil, Architectural, and Environmental Engineering of the University of Texas at Austin.

### REGISTRATION & FEES

<i>Single Registration</i> <sup>(1)(*)</sup>	Early Rates	Std. Rates
	(up to Mar. 4)	(after Mar. 4)
One-Day Session.....	\$570	\$690
Two-Day Session .....	\$820	\$1000
All 3-Day Sessions.....	\$1060	\$1290

<i>Multiple Registrations</i> <sup>(1)(2)(*)</sup> <i>(Rates per person)</i>	Early Rates	Std. Rates
	(up to Mar. 4)	(after Mar. 4)
One-Day Session.....	\$530	\$640
Two-Day Session .....	\$760	\$930
All 3-Day Sessions.....	\$990	\$1200

<sup>(1)</sup>Includes student workbook, lunch, coffee breaks and refreshments.

<sup>(2)</sup>Valid for 2 or more registrations from the same company.

<sup>(\*)</sup>See cancellation policy under General Notes on page 3.

TOTAL..... \$ \_\_\_\_\_

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

Company: \_\_\_\_\_

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

City/ST/Zip: \_\_\_\_\_

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

E-mail: \_\_\_\_\_

Please select your method of payment:

Check enclosed     Credit card

Name on card: \_\_\_\_\_

Number: \_\_\_\_\_ Exp.: \_\_\_\_\_

#### Shin-Tower Wang, Ph.D., P.E.

*President, Ensoft, Inc., Program Manager for SHAFT, APILE, and PYWALL.* Dr. Wang is a registered professional engineer in the States of Texas and Oklahoma, with over 40 years of experience in civil engineering, with an emphasis on geotechnical and structural engineering. He has engaged in numerous consulting projects in soil structure interaction analyses, pile loading tests, deep foundation designs, and numerical analyses. Dr. Wang received M.S. and Ph.D. degrees from The University of Texas at Austin. He has published over 30 technical papers and reports, and has coauthored several computer programs that are currently sold by Ensoft, Inc.

#### Gonzalo Vasquez, Ph.D., P.E.

*Program Manager for LPILE and GROUP, Ensoft, Inc.* Dr. Vasquez is a registered engineer in the States of Texas and California, with over 30 years of experience in civil engineering. Dr. Vasquez is an expert in solid structural modeling for nonlinear, three-dimensional stress analysis. Dr. Vasquez received M.S. and Ph.D. degrees from The University of Texas at Austin.

#### Faryuh Michael Menq, Ph.D.

*Program Engineer for Dynamic Tests, Ensoft, Inc.* Dr. Menq has been working in the field of dynamic testing in the past 20 years at the University of Texas. He has extensive experience in laboratory resonant column and torsional shear tests, laboratory free-free resonant column tests, Rolling Dynamic Deflectometer (RDD) tests, Stationary Dynamic Deflectometer (SDD) tests, Spectral Analysis of Surface Waves (SASW), impulse-echo tests, cross hole tests, downhole tests, in-situ nonlinear tests, and in-situ liquefaction tests. He has published over 30 technical papers and reports. Dr. Menq received his Ph. D. degree from the University of Texas at Austin.

### SPECIAL OFFER

Software products developed by ENSOFT, INC. may be purchased by course attendees at a 20% discount within one month of the Short Course. A bound manual of literature of covered topics is provided for Session 1 and a separate manual is provided for Session 2. Additional short-course manuals may be ordered in advance at \$80 per unit.

For more details or online registration, visit us at [www.ensoftinc.com](http://www.ensoftinc.com) or send email to [seminars@ensoftinc.com](mailto:seminars@ensoftinc.com)



## SPRING 2018 - ENSOFT SHORT COURSE

### Design of Deep Foundations: Drilled Shafts and Piles Under Lateral and Axial Loading

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#### Program

#### Wed. Apr. 4, 2018 (Full Day)

The first full day has been prepared for expert-level training in the design of single piles or shafts under lateral loads using the LPILE software.

Time	Subject	Speaker
8:00	Arrival, computer setup, software installation	Isenhower
8:15	Course introduction	Isenhower
8:30	Principles of Soil-Structure Interaction. Modern principles for design of foundations, types of loading.	Isenhower
9:30	Theoretical Basis of Lateral Load-Transfer Models and Experimental Validation	Isenhower
10:00	<i>Coffee Break</i>	
10:15	<i>p-y</i> Curves Available in LPILE and GROUP	Isenhower
11:00	Structural Analysis of Piles and Drilled Shafts, Nonlinear Moment-Curvature Behavior of Drilled Shafts and Prestressed Concrete Piles	Isenhower
12:00	<i>Lunch Break</i>	
1:00	Software Training for LPILE (Part 1)	Isenhower
2:45	<i>Coffee Break</i>	
3:00	Software Training for LPILE (Part 2)	Isenhower
4:00	General Question and Answer. Consultation on Problems of Interest	Isenhower

#### Thu. Apr. 5, 2018 (Full Day)

The second full day adds training in the design of single drilled shafts under axial loads and pile groups under combined loading.

Time	Subject	Speaker
8:00	Practical Considerations for Design of Drilled Shaft Foundations	Isenhower
9:30	Drilled Shafts and Driven Piles Under Axial Loading. Use of <i>t-z</i> and <i>q-w</i> curves	Isenhower
10:00	<i>Coffee Break</i>	
10:15	Software Training with SHAFT	Wang
11:00	Testing of a fully instrumented pile under axial/lateral loading. Inside and outside practical presentations.	Isenhower
12:00	<i>Lunch Break</i>	
1:00	Analysis of Pile Groups Under Axial and Lateral Loading.	Vasquez
2:30	<i>Coffee Break</i>	
2:45	Software Training for GROUP – Basic Input, Visualization of Results	Vasquez
4:00	Software Training for Group – Advanced Input, Interactive Group Modeling	Vasquez
5:00	Ensoft Reception at Office Yard – Full-Scale Lateral Loading of 24-in OD Instrumented Shafts ( <i>drinks and light refreshments will be provided</i> )	

For more details or online registration, visit us at [www.ensoftinc.com](http://www.ensoftinc.com) or send email to [seminars@ensoftinc.com](mailto:seminars@ensoftinc.com)



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#### Program

#### Fri. Apr. 6, 2018 (Full Day)

The final day adds training in the design of single piles under axial loads, NDT, modal analyses and flexible retaining walls.

Time	Subject	Speaker
8:00	Driven Piles Under Axial Loading	Wang
9:30	Software Training for APILE	Wang
10:30	<i>Coffee Break</i>	
10:30	Introduction to Non-Destructive Tests on Drilled Shafts	Menq
11:15	Structural Health Monitoring Using Ambient Vibrations	Menq
12:00	<i>Lunch Break</i>	
1:30	Introduction to the Designs of Flexible Retaining Walls	Wang
2:30	<i>Coffee Break</i>	
2:45	Software Training for PYWALL	Wang
3:30	General Question and Answer. Consultation on Problems of Interest	All
3:45	<i>End of Short Course</i>	
4:30-6:00	Course attendants are invited to participate in the Lymon C Reese Lecture Distinguished Lecture: "CPT-based Soil Behavior Type (SBT) Classification System: Recent Updates and Applications", by Dr. Peter K. Robertson, Geotechnical Consultant, Gregg Drilling & Testing, Inc., USA and Gregg Canada Ltd. (at nearby Advanced Computing Building, J.J. Pickle Research Campus, Building 205). Visit <a href="http://caee.utexas.edu/news/835-reese18">http://caee.utexas.edu/news/835-reese18</a>	
6:00	<i>Reception - Hors d'oeuvres and drinks</i>	

#### GENERAL NOTES

All students will receive a student notebook containing reference and lecture materials, along with USB memory stick of relevant technical materials.

Course attendees are encouraged to bring a laptop computer to the course. Attendees bringing computers to the course will be loaned software to use during the course and will be able to participate in the solution of design exercises. A limited number of computers can be loaned at no cost.

Those attending the short course are also encouraged to bring design problems of interest to them and their employers. Advice on how to set up design computations for the design problem and guidance about preparation of plans and specification will be provided by the instructors.

The number of spaces available in the short course is limited, so registration will be based on a first come-first served basis.

**Cancellations** made prior to two weeks from the Short Course will be charged half the total fees. Late cancellations are not refundable but payment may be extended to a future short course. Emergency cancellations may be accepted until five days before short course.

Companies wishing to inquire about having the same training course or another advanced training course to be held at their offices may call Ensoft to obtain a cost proposal.

Companies wanting information about the two-day short course on Design and Construction of Drilled Shafts offered by Ensoft may call to obtain a cost proposal.

#### COURSE BENEFITS

◆ **Learn how to use effective tools and proper numerical models for deep foundations** ◆ **Improve the efficiency of your future foundation designs** ◆ **Keep short course manuals and personal notes as reference for future numerical models and designs of deep foundations** ◆ **Use the limited 20% discount on software upgrades and new purchases for the whole office site of registered attendants to the short course** ◆ **Earn up to 19 PDH credits towards PE renewals for this course** ◆

**Call us at 512-244-6464 or visit our web site to register for the short course**

For more details or online registration, visit us at [www.ensoftinc.com](http://www.ensoftinc.com) or send email to [seminars@ensoftinc.com](mailto:seminars@ensoftinc.com)

# CURRENT ENSOFT PRICE LIST & NEW RELEASES

**Software Titles:**

LPILE 2018 .....	\$1,000
GROUP 2016 .....	\$1,800
SHAFT 2017 .....	\$850
PYWALL 2015 .....	\$850
APILE 2015 .....	\$850
APILE 2015 (Offshore Version) .....	\$1,250
TZPILE 2014 .....	\$850
StabIPro 2015 .....	\$580
LPA 3.0 .....	\$490
DynaPile 2016 .....	\$1,900
DynaMat 1.0 .....	\$1,490
DynaN 3.0 .....	\$2,900
Ensoft Dynamic Suite .....	\$5,000
GeoMat 2014 .....	\$1,450
UTexas4 .....	\$2,250
Atena (FEM analysis of reinforced concrete) .....	call
AMPS (3-D Finite Element Analysis) .....	call

**Call for volume, upgrades, and academic pricing**  
*(Prices above are before 20% participation discount)*

## GROUP 2016

- Introduced variable ground layers that can start at any soil layer and automatic calculation of load-vs-settlement for different pile penetrations.
- Apply & solve for user-specified displacements/rotations (in 3D space) in the GROUP model.
- Foundation stiffness can be generated based on equivalent elastic stiffness (thus generating a symmetric stiffness matrix);
- Users can specify *p-y* modification factors for lateral loads along the length (depth) of the piles;
- Tapered pile sections are now added to the type of piles that can be analyzed in group models;
- GROUP is able to estimate the variation of axial loads and axial displacements along the length of the piles;
- When using models with multiple load cases, graphs can be displayed for user-specified load cases;
- Users can select values to be printed in output files, so the tabular output text can fit into standard paper sizes;

## SHAFT 2017

- Adds a new option for load transfers in sand so users can select whether to use: i) Ko Method, ii) Beta Method or the iii) Kulhawy and Chen Method.
- Users may now enter a specific interface angle between shaft and sand when using the Ko Method or the Kulhawy and Chen Method.
- Includes a new Option to generate LRFD Design Charts for specified settlements. For each user-specified total settlement the program now provides a design chart of Total Axial Capacity versus Shaft Penetration for various user-specified Shaft Diameters.
- Users may now select to evaluate load transfers for multiple pile penetrations to see the results in one graph. This is useful to see impact of shaft penetration on plots of Axial Load vs Settlement or increased Total Axial Capacity vs. Depth.
- Added new types of graphs and improved versions of existing graphs.
- A new 3D View has been added to improve visualization of the modeled shaft and soils and for presentation.
- Users can now choose Elevation values in vertical axes instead of depths from top of soil (for applicable charts).
- With SHAFT v2017 users can export observed graphics to formatted Excel spreadsheets. Users can thus easily reformat the graphical display for use of different units, titles & presentation.
- Compatibility to Win 10 and new speed buttons and file-management features are also updated.

**Books/Publications:**

- Single Piles and Pile Groups Under Lateral Loading (2nd Ed.)* Lymon C. Reese and William F. Van Impe. (CRC Press/ Balkema, 2011, 507pp.)  
 Hardback.....\$130
- Analysis and Design of Shallow and Deep Foundations* Lymon C. Reese et al. (Wiley, Nov. 2005, 608pp.)  
 Hardback.....\$130

## LPILE 2018

- Specify any wide flange or AISC section as pile or structural insert using nonlinear or elastic models.
- Allows for analyses of embedded piles with pile head that is below one or more soil layers.
- New ability to turn off soil layering principles for all soils or only for soils of the same type. Useful for research or to study impact of layering on models.
- Confined concrete can now be modeled in drilled shafts using the Mander, Priestley & Park criteria.
- With LPILE v2018 users can export any graphical output to formatted Excel spreadsheets. Users can thus easily reformat the graphical display for use of different units, titles & presentation.
- Models with multiple load cases are analyzed independently & produce results or warnings if one or more load case fails to reach numerical convergence.
- New error & warning codes, plus ability to perform command-line installations.