

# Agenda

Presented by **Brian C. Eubanks, M.S.C.E., P.E., D.F.E.**

## Geotechnical Considerations

- Soil behavior                      USDA/NRCS soil regions
- When is a geotechnical investigation required?
- What constitutes a geotechnical investigation?
- Selecting a geotechnical engineer                      What does a geotechnical engineer need to know?
- How to read/interpret a geotechnical report
- Soil remediation/design options

## Foundations (Parts I and II)

- Engineered foundations                      Selecting a structural engineer                      Foundation types
- Engineering considerations                      What is the purpose of piers/piles?
- Pier/pile types                      Foundation construction

## Foundation Performance and Evaluation (Parts I and II)

- Guidelines for evaluation                      Modes of deformation                      Performance standards
- Mis-applied standards                      Performance analysis

## Foundation Evaluation Case Studies

- #1: Saved by original construction elevations                      #2: Re-analyzed with OCE survey
- #3: As-built tilt                      #4: Previous repairs affect evaluation

## Common Causes of Foundation Movement

### Potential Effects of Plumbing Leaks

- Soil behavior                      Information learned from plumbing reports
- Site investigation                      Additional investigation                      Method of analysis

### Plumbing Leak Case Studies

- #1: Slab-on-grade investigation #1                      #2: Slab-on-grade investigation #2
- #3: Pier-and-beam investigation #1                      #4: Pier-and-beam investigation #2
- #5: Previous elevation survey #1                      #6: Previous elevation survey #2

### Forensic Causation Case Studies

- #1: Fill settlement                      #2: Previous land use                      #3: Pre-existing vegetation
- #4: Fill settlement                      #5: Pre-existing vegetation                      #6: Negative drainage
- #7: Vegetation                      #8: Remediated building pad                      #9: Dishing

### Foundation Remediation

- Remediation guidelines                      Non-structural remedial measures
- Structural remedial measures for slab-on-grade
- Structural remedial measures for pier-and-beam
- Remediation methodology

### Post-Remediation and Maintenance

- Warranties                      Plumbing testing                      Floor elevations
- Moisture maintenance                      Owner education

### Remediation Case Studies

- #1: Watering                      #2: Mechanical Lowering
- #3: Moisture Barrier                      #4: Full Underpinning

### Additional Levels of Investigation (How to Avoid Becoming a Case Study)

## Foundations on Expansive Soils: Design Considerations, Evaluation, and Remediation Oklahoma City, OK - Thursday, May 16, 2019



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## Learning Objectives

### You'll be able to:

**Learn** about soil behavior and get tips on interpreting geotechnical reports.

**Identify** types of foundations and review standards for performance.

**Evaluate** common causes of foundation movement.

**Review** case studies on foundation damage and plumbing leaks.

**Receive** tips on how to avoid becoming a case study.

**Explore** foundation remediation and post-remediation maintenance.



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# Foundations on Expansive Soils: Design Considerations, Evaluation, and Remediation

Oklahoma City, OK - Thursday, May 16, 2019



**Learn** how to read and interpret geotechnical reports

**Review** types of foundations

**Understand** guidelines for foundation performance and evaluation

**Examine** case studies of plumbing leaks and foundation damage

**Consider** remedial measures and post-remediation maintenance

## Continuing Education Credits

### Professional Engineers

7.5 PDHs

### Contractors

Non-Credit Continuing Ed.

### Architects

7.5 HSW CEUs

7.5 AIA HSW Learning Units



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# Faculty

## Brian C. Eubanks, M.S.C.E., P.E., D.F.E.

Mr. Eubanks is the founder and principal structural engineer of Paragon Structural Engineering, LTD, (PSE) a structural design and forensic investigation firm based in Plano, Texas. He leads a technical staff comprised of professional engineers, graduate engineers, project managers, and field technicians in the structural design and forensic investigation of planned and existing structures. Mr. Eubanks' structural design services include analysis and engineering of large, custom single-family residences, multi-family apartment/condominium complexes, low-rise commercial facilities, warehouses and ancillary structures (retaining walls, screen walls, and swimming pools). He also performs construction-phase observations of the aforementioned structural systems to verify design compliance. Mr. Eubanks has performed engineering designs for thousands of residential and light commercial structures as well as hundreds of retaining walls, screen walls, and pools. His structural forensic services include investigations concerning soil-structure interactions, performance of structural systems, evaluation of building envelopes, and determination of cause, origin, and extent of peril damage. Soil-structure interaction assessments include claims relating to design, construction, historic/current site effects, and moisture source influences. Structural system assessments include claims relating to current or latent design and construction issues. Building envelope assessments include claims related to roof coverings, veneers, flashing, and weather resistive barriers. Peril assessments include claims relating to hurricane damage, tornado damage, lightning strikes, earthquakes, explosions, fire damage, and vehicle-structure collisions. Mr. Eubanks has performed hundreds of forensic investigations, and he has authored dozens of expert reports for use in mediation, arbitration,

and/or litigation. In addition, he has provided expert witness testimony in dozens of mediations, arbitrations, and court cases. Mr. Eubanks is a licensed professional engineer in 10 states and is a board certified diplomate in forensic engineering by the National Academy of Forensic Engineers. He also serves as a member of the American Concrete Institute's Design of Slabs-on-Ground Committee (360), the American Society of Civil Engineers Committee on Forensic Investigations and the Residential Foundation Investigation and Design Subcommittee (ASCE-Texas Section), the Post-Tensioning Institute's Structural (DC-10A) and Construction/Maintenance (DC-10D) Subcommittees, and the ASTM International Committees on Concrete Aggregates (C-09), Forensic Engineering (E-58), Soil and Rock (D-18), and Wood (D-07). Additionally, he serves on the Board of Trustees for Prestonwood Christian Academy. Mr. Eubanks aims to educate with regard to soil-structure interaction; the design, performance, and evaluation of structural systems; the evaluation of building envelopes; and causes and origins of damage to new and existing structures, as well as remedial solutions.

### Here's what past attendees had to say about the program and presenter Brian Eubanks:

"Both educational & entertaining." – *Professional Engineer*

"Thanks for all the case studies!" – *Structural Engineer*

"Overall, great job & I would recommend it to others!" – *Geotechnical Engineer*

"This was the best Halfmoon seminar I have attended. Mr. Eubanks did an excellent job!" – *Civil Engineer*

# Seminar Information

## Ambassador Hotel Oklahoma City

1200 North Walker Avenue  
Oklahoma City, OK 73103  
(405) 600-6200

Registration  
8:00 - 8:30 am  
Morning Session  
8:30 am - 12:20 pm  
Lunch (On your own)  
12:20 - 1:05 pm  
Afternoon Session  
1:05 - 5:00 pm

## Tuition

**\$289** for individual registration

**\$269** for three or more registrants from the same company at the same time.

**Included with your registration:** Complimentary continental breakfast and printed seminar manual.

**Receive a reduced tuition rate of \$101** by registering to be our on-site coordinator for the day. For availability and job description, please visit [www.halfmoonseminars.org](http://www.halfmoonseminars.org).

## How to Register

- Visit us online at [www.halfmoonseminars.org](http://www.halfmoonseminars.org)
- Mail-in or fax the attached form to 715-835-6066
- Call customer service at 715-835-5900

**Cancellations:** Cancel at least 48 hours before the start of the seminar, and receive a full tuition refund, minus a \$39 service charge for each registrant. Cancellations within 48 hours will receive a credit toward another seminar or the self-study package. You may also send another person to take your place.

## Continuing Education Credit Information

This seminar is open to the public and offers 7.5 PDHs to professional engineers and 7.5 HSW CEUs/continuing education hours to architects in all states\*. Educators and courses are not subject to pre-approval in Oklahoma.

This seminar is approved by the American Institute of Architects for 7.5 HSW Learning Units (Sponsor No. J885). Only full attendance can be reported to the AIA/CES.

HalfMoon Education is an approved continuing education sponsor for engineers in Florida, Indiana (License No. CE21700059), Maryland, New Jersey (Approval No. 24GP0000700), New York (NYSSED Sponsor No. 35), North Carolina, and North Dakota. HalfMoon Education is an approved Florida architect continuing education provider and is deemed an approved continuing education sponsor for New York architects.

This course also offers a non-credit continuing education opportunity to construction contractors.

Attendance will be monitored, and attendance certificates will be available after the seminar for most individuals who complete the entire event. Attendance certificates not available at the seminar will be mailed to participants within fifteen business days.

\*Oklahoma rules require course providers to verify the identity of architects and prohibit course participants from earning partial credit.

# Additional Learning

## Webinar Series

### Foundation Damage and Repair

#### • Structure Loads, Soil Mechanics, Bearing Capacity and Geo-Environmental Hazards

Thurs., March 28, 2019, 11:00 AM -12:30 PM CDT

#### • Foundation-Wall Design and Construction

Thurs., March 28, 2019, 1:00 -2:30 PM CDT

#### • Assessment of Foundation-Slab Damage & Repair Alternative

Fri., March 29, 2019, 11:00 AM -12:30 PM CDT

#### • Assessment of Foundation-Retaining Wall Damage & Repair Alternatives

Fri., March 29, 2019, 1:00 -2:30 PM CDT

For more information visit:  
[www.halfmoonseminars.org/webinars/](http://www.halfmoonseminars.org/webinars/)

### Can't Attend? Order the Manual and Audio from the Live Seminar as a Self-Study Package!

Audio recordings of this seminar are available for purchase starting at \$269. See registration panel for more information and please refer to specific state licensing rules or certification requirements to determine if this learning method is eligible for continuing education credit..

# Registration

## Foundations on Expansive Soils: Design Considerations, Evaluation, and Remediation

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How to Register		Registrant Information
<b>Online:</b> <a href="http://www.halfmoonseminars.org">www.halfmoonseminars.org</a>		Name: _____ Company/Firm: _____ Address: _____ City: _____ State: _____ Zip: _____ Occupation: _____ Email: _____ Phone: _____
<b>Phone:</b> 715-835-5900	<b>Code:</b>	<b>Additional Registrants:</b> Name: _____ Occupation: _____ Email: _____ Phone: _____ Name: _____ Occupation: _____ Email: _____ Phone: _____
<b>Fax:</b> 715-835-6066		
<b>Mail:</b> HalfMoon Education Inc., PO Box 278, Altoona, WI 54720-0278		
<b>Complete the entire form.</b> Attach duplicates if necessary.		Email address is required for credit card receipt, program changes, and notification of upcoming seminars and products. Your email will not be sold or transferred.
		( )  I need special accommodations. Please contact me.

## Tuition

( ) **I will be attending the live seminar.** Single Registrant - **\$289.00**. Three or more registrants from the same company registering at the same time - **\$269.00** each.

( ) **I am not attending.** Please send me the self-study package:

Downloadable MP3 Audio/PDF Manual for **\$269.00**.

CD/Manual Package for **\$289.00**.

(S&H included. Please allow five weeks from seminar date for delivery)

**Checks:** Make payable to HalfMoon Education Inc.

**Credit Card:** *Mastercard, Visa, American Express, or Discover*

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