

# Agenda

*Presented by Terry McCleary*

### Types of Retaining Walls

- Traditional cantilevered retaining walls
  - Reinforced concrete walls
  - Reinforced concrete masonry walls
- Soldier pile and lagging walls
- Traditional timber walls
- Traditional gravity walls
  - Mass concrete
  - Stone
  - Gabion walls
  - Crib walls
- Reinforced soil retaining walls
- Anchored retaining walls (tie-backs, soil nailing, etc.)
- Temporary retaining walls
- Over-steepened reinforced slopes
- Sheet pile
- Fabric wrapped walls
- Private-sector vs. highway retaining wall systems

### Retaining Wall Design

- Soil design parameters
- Lateral earth pressure
- External stability
  - Sliding
  - Bearing capacity
  - Settlement
  - Overturning
  - Scour
- Internal stability
- Global stability
- Special considerations for tiered retaining walls
  - Backfill
  - Groundwater
  - Service life
  - Design software

### Slope Stabilization

- Science of slope stability
- Surficial vs. deep-seated slope stability
- Long term vs. short term stability
- Slope stabilization techniques
  - Regrading
  - Excavation and replacement
  - Slope reinforcement/pinning
  - Ground improvement
  - Toe retaining walls

### Retaining Wall and Slope Stabilization Case Histories

- Various commercial, residential projects
- Various highway and institutional projects

## Retaining Wall Design and Slope Stabilization Techniques

Bozeman, MT - Friday, November 15, 2019



Halfmoon Education Inc.  
PO Box 278  
Altoona, WI 54720-0278

NON-PROFIT  
U.S. POSTAGE PAID  
EAU CLAIRE, WI  
PERMIT NO. 2016

## Learning Objectives

### You'll be able to:

- Differentiate** the types of forces that act on retaining walls.
- Describe** methods to achieve slope stability, including regrading, slope reinforcement/pinning, ground improvement, retaining structures, and excavation and replacement.
- Identify** the features and applications of various types of retaining walls, including cantilevered retaining walls, gravity walls, timber walls, and reinforced soil retaining walls.
- Describe** the factors that must be considered when designing retaining walls, including soil design parameters, lateral earth pressure, bearing capacity, settlement, groundwater and backfill.



## Retaining Wall Design and Slope Stabilization Techniques

Bozeman, MT - Friday, November 15, 2019



- Identify** types of retaining walls, such as cantilevered walls, gravity walls and soldier pile walls, and learn when to use each
- Review** the forces acting on retaining walls including pressure from retained soil and the impacts of groundwater

- Design** retaining walls for internal and external stability
- Use** slope stabilization techniques such as reinforcement and ground improvement
- Review** retaining wall and slope stabilization case studies

### Continuing Education Credits

- Professional Engineers**
  - 7.0 PDHs
  - MSE Pending

- Architects & Landscape Architects**
  - 7.0 HSW CE Hours
  - 7.0 AIA LU|HSW
  - 7.0 LA CES HSW PDHs

- Floodplain Managers**
  - 7.0 ASFPM CECs
- Contractors**
  - Non-Credit Continuing Ed.



HalfMoon Education Inc.  
WWW.HALFMOONSEMINARS.ORG



AIA  
Continuing  
Education  
Provider

# Faculty

**Terry McCleary** *McCleary Engineering*  
McCleary Engineering specializes in geotechnical investigations and recommendations for foundation design, retaining walls, slope stability, embankments, pavement design and rehabilitation, subgrade treatments and other engineering services such as drainage studies. McCleary Engineering is Illinois Department of Transportation (IDOT) prequalified in the general geotechnical services, subsurface explorations, structure geotechnical reports and construction inspection categories.

Mr. McCleary has nearly 19 years of construction and geotechnical engineering experience with IDOT. Six years were spent on the front lines of contract administration in construction as a resident engineer on bridge and roadway projects which included construction layout, material inspection and construction practice inspection. For the last 13 years at IDOT, Mr. McCleary was the District #3 geotechnical engineer, working with hands-on subsurface investigations; analysis, design, and inspection of geotechnical engineering projects; and on-the-spot problem solving. He has served on numerous statewide committees involving abutment design, piling, aggregate subgrade, subgrade stability, pavement under drains and pavement rehabilitation. He served on a nationwide Federal Highway Administration (FHWA) pooled fund study on deep soil mixing technology. In 2009, Mr. McCleary left IDOT to work full time at his company, McCleary Engineering. Mr. McCleary is a licensed professional engineer in the states of Illinois, Indiana, Iowa, Georgia, Montana, Ohio, Oklahoma and Wisconsin. He is a member of the American Society of Civil Engineers, National Society of Professional Engineers, Deep Foundations Institute, the Pile Driving Contractors Association and the Illinois Association of Highway Engineers. He is currently serving on the NCHRP Committee for the Research of Bridge Scour on Gravel Bed Rivers.

## Here’s what past attendees had to say about the program and presenter Terry McCleary:

“Terry is a good presenter. Great content and photos.” – *Landscape Architect*

“Extremely smart, engaging.” – *Project Manager (Construction)*

“Really enjoyed the seminar. Mr. McCleary is a very impressive authority on this subject.” – *Structural Engineer*

# Seminar Information

**Homewood Suites by Hilton Bozeman**  
1023 Baxter Lane  
Bozeman, MT 59715  
(406) 587-8180

**Tuition**  
**\$289** for individual registration  
**\$269** for three or more registrations.

**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.

**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.

**Continuing Education Credit Information**  
This seminar is open to the public and offers up to 7.0 PDHs to professional engineers and 7.0 HSW continuing education hours to architects all states. Educators and courses for architects are not subject to preapproval in Montana. HalfMoon Education has applied to the Montana Society of Engineers for course approval recommendation, which is pending. Current information regarding the MSE approval can be found at [www.halfmoonseminars.org](http://www.halfmoonseminars.org) under this course listing.

This seminar has been approved by the American Institute of Architects Continuing Education System for 7.0 LU|HSW (Sponsor No. J885) and by the Landscape Architecture Continuing Education System for 7.0 HSW PDHs. Only full attendance can be reported to the AIA/CES and LA/CES. Visit [www.halfmoonseminars.org](http://www.halfmoonseminars.org) for complete AIA/CES information under this course listing.

HalfMoon Education is an approved continuing education sponsor for engineers in Florida, Indiana (License No. CE21700059), Maryland, New Jersey (Approval No. 24GP00000700), North Carolina, and North Dakota. HalfMoon Education is deemed an approved continuing education sponsor for New York engineers, architects and landscape architects.

The Association of State Floodplain Managers has approved this program for 7.0 CECs.

This seminar offers a continuing education opportunity to construction contractors but has not been submitted to any state contractor licensing board for continuing education approval.

# Additional Learning

## Webinar Series

### National Electrical Code

- **National Electrical Code, Part I**  
Tues., October 22, 2019, 11:00 AM - 3:30 PM CDT
- **National Electrical Code, Part II**  
Wed., October 23, 2019, 11:00 AM - 3:30 PM CDT
- **National Electrical Code, Part III**  
Thurs., October 24, 2019, 11:00 AM - 3:30 PM CDT

### Slope Stability and Landslide Prevention

- **Slope Movement and Mechanisms**  
Thurs., October 24, 2019, 11:00 AM - 1:00 PM CDT
- **Slope Stabilization Methods**  
Thurs., October 24, 2019, 1:30 - 3:00 PM CDT
- **Landslide Hazard and Risk Assessment**  
Fri., October 25, 2019, 11:00 AM - 12:00 PM CDT
- **Slope Stabilization and Landslide Mitigation**  
Fri., October 25, 2019, 12:30 - 2:30 PM CDT

### HEC-RAS Webinar Series

- **Hydraulic Principles and Applications**  
Tues., October 29, 2019, 11:00 AM - 1:00 PM CDT
- **Working with the HEC-RAS User Interface**  
Tues., October 29, 2019, 1:30 - 3:00 PM CDT
- **Water Surface Profiling**  
Thurs., October 31, 2019, 11:00 AM - 1:00 PM CDT
- **Steady Flow Surface Profile Demonstrations**  
Thurs., October 31, 2019, 1:30 - 3:30 PM CDT

### Tree Preservation

- **Concrete and Pavement Design Principles**  
Wed., October 30, 2019, 11:00 AM - 12:00 PM CDT
- **Exterior Concrete Pavement Design**  
Wed., October 30, 2019, 12:30 - 3:15 PM CDT
- **Interior Concrete Slabs-on-Ground Design**  
Thurs., October 31, 2019, 11:00 AM - 1:00 PM CDT
- **Concrete and Pavement Maintenance and Sustainability**  
Thurs., October 31, 2019, 1:30 - 3:00 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

## Retaining Wall Design and Slope Stabilization Techniques

Bozeman, MT - Friday, November 15, 2019

How to Register		Registrant Information
<b>Online:</b> <a href="http://www.halfmoonseminars.org">www.halfmoonseminars.org</a>		Name: _____
		Company/Firm: _____
<b>Phone:</b> 715-835-5900		Address: _____
		City: _____ State: _____ Zip _____
<b>Fax:</b> 715-835-6066		Occupation: _____
		Email: _____
<b>Code:</b>		Phone: _____
<b>Mail:</b> HalfMoon Education Inc., PO Box 278, Altoona, WI 54720-0278		<b>Additional Registrants:</b>
		Name: _____
<b>Complete the entire form.</b> Attach duplicates if necessary.		Occupation: _____
		Email: _____
		Phone: _____
		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
( ) <b>I will be attending the live seminar.</b> Single Registrant - <b>\$289.00</b> . Three or more registrants from the same company registering at the same time - <b>\$269.00</b> each.
( ) <b>I am not attending.</b> Please send me the self study package:
<input type="checkbox"/> Downloadable MP3 Audio/PDF Manual for <b>\$269.00</b> .
<input type="checkbox"/> CD/Manual Package for <b>\$289.00</b> . <input type="checkbox"/> USB/Manual Package <b>\$289.00</b> .
(Please allow four weeks from seminar date for delivery)
<b>Checks:</b> Make payable to HalfMoon Education Inc.
<b>Credit Card:</b> <i>Mastercard, Visa, American Express, or Discover</i>
Credit Card Number: _____
Expiration Date: _____ CVV2 Code: _____
Cardholder Name: _____
Billing Address: _____
City: _____ State: _____ Zip: _____
Signature: _____
Email: _____