

Agenda

Presented by
Ibraheem Shunnar, PE at The Mannik & Smith Group, Inc.

Retaining Walls – Stability & Types

Loads and Forces

- Lateral earth pressure
- Water pressure
- Surcharge and traffic loading
- Seismic loading

External stability of retaining walls

- Sliding
- Overturning
- Bearing capacity
- Global stability
- Settlement

LRFD vs ASD

Types of stability of retaining walls

- Conventional gravity walls
- Segmental retaining walls
- MSE
- Cellular confinement wall
- Gabions
- Cantilevered walls
- Sheet pile wall

Selection of wall type

Internal Stability of Retaining Walls

Cantilevered retaining walls

MSE walls

Cellar confinement walls

Cantilever wall design example

Slope Stability and Stabilization

Slope stability analysis

Evaluation of slope failures

Stabilization techniques and monitoring

- Unloading
- Drainage
- Buttrressing
- Reinforcement
- Monitoring methods and criteria

Biotechnical Slope Stabilization

Introduction

Principles of biotechnical stabilization

Case studies

Retaining Wall Design and Slope Stabilization Techniques

Ann Arbor, MI - Wednesday, January 15, 2020

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Learning Objectives

You'll be able to:

Identify the loads and forces that act on retaining walls, including lateral earth pressure, water pressure, surcharge and traffic loading, and seismic loading.

Describe different types of retaining walls, including conventional gravity walls, segmental retaining walls, mechanically-stabilized earth walls, cellular confinement walls, cantilevered walls and sheet pile walls.

Design for internal and external stability of retaining walls.

Evaluate common slope failures and appropriate slope stabilization techniques, such as unloading, drainage, buttressing and reinforcement.

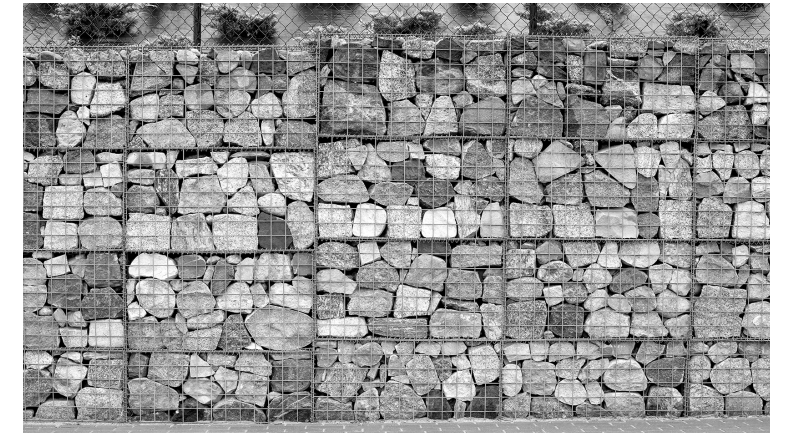
Discuss the benefits and drawbacks of biotechnical slope stabilization, which uses live and dead plant material.



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Retaining Wall Design and Slope Stabilization Techniques

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Understand internal and external stability of retaining walls

Review the forces acting on retaining walls including pressure from soil and water

Learn about gravity walls, MSE, gabions, cantilevered walls and sheet pile walls

Examine key factors that influence slope stability

Learn about slope stabilization techniques

Discuss retaining wall and slope stabilization case histories with our experienced faculty

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Ibraheem Shunnar *Director of Engineering at The Mannik & Smith Group*

Mr. Shunnar has more than 25 years of experience in geotechnical engineering with expertise in specialty foundations, ground improvement, slope stability, instrumentation and waste management. He has a master’s degree in Geotechnical Engineering from the University of Michigan and is a registered professional engineer. He is the author of many articles and papers on geotechnical engineering. He was the project manager for the Fairlane Green redevelopment project, winner of the 2008 National Phoenix Award. He is also the recipient of the distinguished achievement award from the University of Michigan.

Seminar Information

Courtyard by Marriott Ann Arbor 3205 Boardwalk Drive Ann Arbor, MI 48108 (734) 995-5900	Registration 8:00 - 8:30 am Morning Session 8:30 am - 12:00 pm	Lunch (On your own) 12:00 - 1:00 pm Afternoon Session 1:00 - 4:30 pm
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Tuition

\$289 for individual registration

\$269 for three or more simultaneous registrations.

Included with your registration:

Complimentary continental breakfast and printed seminar manual.

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How to Register

- Visit us online at www.halfmoonseminars.org
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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.

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.

Additional Learning

Webinar Series

Complying with ADA Standards for Accessible Design

- **Complying with State & Federal Accessibility Requirements**
Thurs., Nov. 7, 2019, 11:00 AM - 1:30 PM CST
- **Applying the 2010 & A117.1 Accessibility Standards**
Fri., Nov. 8, 2019, 11:00 AM - 1:30 PM CST

Fire Protection and Building Codes

- **Fire Protection and Life Safety Design**
Tues., Nov. 12, 2019, 11:00 AM - 12:00 PM CST
- **Occupancy Classifications**
Tues., Nov. 12, 2019, 12:30 - 2:30 PM CST
- **Means of Egress**
Tues., Nov. 19, 2019, 11:00 AM - 1:00 PM CST
- **Fire Protection Features and Equipment**
Tues., Nov. 19, 2019, 1:30 - 3:00 PM CST

Structural Forensic Engineering

- **Introduction to the Forensic Engineering Process**
Tues., Nov. 12, 2019, 11:00 AM - 1:00 PM CST
- **Causes of Failures and the Forensic Engineering Report**
Tues., Nov. 12, 2019, 1:30 - 3:30 PM CST
- **Forensic Examination of Structures and Use in Litigation**
Wed., Nov. 13, 2019, 11:00 AM - 1:00 PM CST

For more information and other online learning opportunities visit:
www.halfmoonseminars.org/webinars/

Continuing Education Credit Information

This seminar is open to the public and offers 6.5 continuing education hours to professional engineers, 6.5 CECs to certified floodplain managers, and 6.5 HSW continuing education hours to landscape architects and architects in most states, including Michigan architects and engineers. Educators and courses are not subject to pre-approval in Michigan.

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 an approved Florida engineer and architect continuing education provider and is deemed an approved continuing education sponsor for New York engineers, architects and landscape architects.

This course has been approved by the American Institute of Architects Continuing Education System for 6.5 LU|HSW (Provider No. J885) and the Landscape Architecture Continuing Education System for 6.5 HSW PDHs. Only full attendance is reportable to LA/CES and AIA/CES. Visit www.halfmoonseminars.org for complete AIA/CES information under this course listing.

The Association of State Floodplain Managers has approved this activity for 6.5 CECs.

This seminar offers a non-credit continuing education opportunity to construction contractors. It has not been approved by any contractor licensing entity with a continuing education requirement.

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.

Registration

Retaining Wall Design and Slope Stabilization Techniques
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