

# Agenda

*Presented by Chris Zamaites, P.E., CFM, CPESC, ENV SP*

## Stormwater Management System Objectives and Design Considerations

Complying with stormwater regulations  
Site assessment  
Additional considerations: siting, outlet location and control, and tributary areas  
Stormwater control measures and total suspended solids (TSS) removal

## Stormwater Conveyance Systems and Detention

Impact area  
Watershed and terrain considerations  
Stormwater quality  
Community and environmental factors

## Types of Stormwater Storage

Detention basins  
• Stormwater routing, sediment handling, outlet, variations of storage  
Retention ponds  
• Stormwater routing, sediment handling, soils and vegetation  
Infiltration basins  
• Stormwater routing, sediment and chemical handlings, soils and vegetation  
Operation and maintenance of stormwater detention systems

## Choosing Storage System -

### Underground Storage Benefits vs. Conventional Storage

Site topography, restrictions, outlet considerations  
Retention systems  
• Stormwater routing, sizing, design criteria  
Detention/infiltration systems  
• Stormwater routing, infiltration, sizing, design criteria, treatment options for total suspended solids (TSS) removal

## Preparing Stormwater Pollution Prevention Plans

Stormwater goals  
Design considerations

## Sustainable Best Practices in Stormwater Detention/Retention

Naturalizing detention/retention basins  
Atypical storage; rain gardens, french drains, dry wells  
Underground storage, water reuse options, recharging ground water table

## Stormwater Basins and Underground Systems

Toledo, OH - Monday, December 9, 2019

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## Learning Objectives

### You'll be able to:

**Comply** with stormwater regulations and assist with preparing stormwater pollution prevention plans.

**Explain** the criteria for stormwater basins and underground systems, including impact area, watershed and terrain considerations, and stormwater content.

**Choose** stormwater basin types, including detention basins, retention ponds and infiltration basins.

**Consider** underground storage systems.

**Describe** sustainable stormwater best practices, including rain gardens, underground storage and water reuse.



# Stormwater Basins and Underground Systems

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**Understand** stormwater management system objectives

**Consider** impact area, watershed, terrain, and stormwater quality

**Discuss** detention basins, retention ponds, and infiltration basins

**Get** tips on stormwater routing, infiltration and treatment options for TSS removal

**Explore** underground storage and water reuse options

**Get** tips on preparing stormwater pollution prevention plans

## Continuing Education Credits

**Professional Engineers**  
6.5 CPD Hours

**Professional Surveyors**  
6.5 PDHs

**Floodplain Managers**  
6.5 ASFPM CECs

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6.5 AIA LU|HSW  
6.5 LA/CES HSW PDHs

**Construction Contractors**  
Non-Credit Continuing Ed.



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# Faculty

**Chris Zamaite, P.E., CFM, CPESC, ENV SP** *Civil Engineer at Burns & McDonnell*

Ms. Zamaite is a senior civil engineer with Burns & McDonnell in Chicago. She has 28 years of experience with planning and design covering municipal infrastructure and commercial, residential, and recreational development; along with planned community design. Ms. Zamaite’s experience includes utility design/relocation for water transmission and distribution systems, sewage collection, and stormwater management systems including that for arterial, collector and local street systems. She works on floodplain evaluation and management, utility relocation, hydrology and hydraulics, earthen dam inspections, stream modeling with scour countermeasures, erosion and sediment control, and meeting all regulatory criteria associated with local planning and zoning ordinances, stormwater ordinances, and other applicable regulatory criteria from local to the federal level. Ms. Zamaite’s hydrologic and hydraulic modeling experience includes HEC 1, HEC 2, WSP2, WSPRO, WIN TR-20, TR 55, SWMM, HEC-RAS, HydroCAD, SewerCAD, StormCAD, Culvert Master, and Flow Master.

# Seminar Information

<b>Radisson Hotel at The University Toledo Medical Center</b>	Registration	Lunch (On your own)
3100 Glendale Avenue	8:00 - 8:30 am	12:15 - 1:15 pm
Toledo, OH 43614	Morning Session	Afternoon Session
(419) 381-6800	8:30 am - 12:15 pm	1:15 - 4:30 pm

**Tuition**

**\$289** for individual registration

**\$269** for three or more simultaneous 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.

# Additional Learning

- Webinar Series**
- Component Tolerance Analysis**
- **Introduction to Component Tolerance Analysis**  
Thurs., Oct. 17, 2019, 11:00 AM - 12:00 PM CDT
  - **Dimensional Tolerance Analysis**  
Thurs., Oct. 17, 2019, 12:30 - 3:00 PM CDT
  - **Application of Dimensional Tolerance Analysis**  
Fri., Oct. 18, 2019, 11:00 AM - 2:15 PM CDT
- National Electrical Code**
- **National Electrical Code, Part I**  
Tues., Oct. 22, 2019, 11:00 AM - 3:30 PM CDT
  - **National Electrical Code, Part II**  
Wed., Oct. 23, 2019, 11:00 AM - 3:30 PM CDT
  - **National Electrical Code, Part III**  
Thurs., Oct. 24, 2019, 11:00 AM - 3:30 PM CDT
- Slope Stability and Landslide Prevention**
- **Slope Movement and Mechanisms**  
Thurs., Oct. 24, 2019, 11:00 AM - 1:00 PM CDT
  - **Slope Stabilization Methods**  
Thurs., Oct. 24, 2019, 1:30 - 3:00 PM CDT
  - **Landslide Hazard and Risk Assessment**  
Fri., Oct. 25, 2019, 11:00 AM - 12:00 PM CDT
  - **Slope Stabilization and Landslide Mitigation**  
Fri., Oct. 25, 2019, 12:30 - 2:30 PM CDT

- HEC-RAS Webinar Series**
- **Hydraulic Principles and Applications**  
Tues., Oct. 29, 2019, 11:00 AM - 1:00 PM CDT
  - **Working with the HEC-RAS User Interface**  
Tues., Oct. 29, 2019, 1:30 - 3:00 PM CDT
  - **Water Surface Profiling**  
Thurs., Oct. 31, 2019, 11:00 AM - 1:00 PM CDT
  - **Steady Flow Surface Profile Demonstrations**  
Thurs., Oct. 31, 2019, 1:30 - 3:30 PM CDT
- For more information and other online learning opportunities visit: [www.halfmoonseminars.org/webinars/](http://www.halfmoonseminars.org/webinars/)

## Continuing Education Credit Information

This live lecture presentation is open to the public and offers 6.5 CPD (PDHs) to professional engineers and 6.5 PDHs to professional surveyors, as well as 6.5 HSW contact/continuing education hours to architects and landscape architects in most states, including Ohio. Educators and courses are not subject to preapproval in Ohio.

This seminar is approved by the American Institute of Architects Continuing Education System for 6.5 LU|HSW (Sponsor No. J885) and the Landscape Architecture Continuing Education System for 6.5 HSW PDHs. Only full attendance is reportable 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 activity for 6.5 CECs.

This course offers a continuing education opportunity to construction contractors. It has not been approved by any state contractor licensing board.

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.

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

A full recording of this seminar is starting at \$269, which includes shipping and handling. This learning method does not qualify for the continuing education credit in Ohio or for the AIA/CES and LA/CES. Please allow five weeks from the seminar date for delivery.

# Registration

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### How to Register

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**Complete the entire form.** Attach duplicates if necessary.

### Registrant Information

Name: \_\_\_\_\_

Company/Firm: \_\_\_\_\_

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

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Occupation: \_\_\_\_\_

Email: \_\_\_\_\_

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

**Additional Registrants:**

Name: \_\_\_\_\_

Occupation: \_\_\_\_\_

Email: \_\_\_\_\_

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

Name: \_\_\_\_\_

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

( ) **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**. ☐ USB/Manual Package **\$289.00**.  
(S&H included. Please allow five weeks from seminar date for delivery)

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

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