

Agenda

Presented by Nathan Walsman

Parking Geometrics and Layout

Typical parking layout

- One-way vs two-way traffic
- End bay parking
- Turning bay requirements
- Square footage per space

Vertical circulation

- Parking ramp requirements
- Helical ramp requirements
- Express ramp requirements and transitions

ADA requirements

- Required amount of ADA accessible spaces
- Required amount of van accessible spaces
- Vertical clearance requirements
- Floor slope requirements

Egress requirements

Open vs enclosed classification

Expansion joint locations

Structural Systems for Parking Structures

Typical construction types

- Cast-in-place, post-tensioned concrete
 - One-way beam/slab
 - Two-way flat plate
- Prestressed, precast concrete
- Steel construction

Comparisons of the systems

- Durability of the systems
- Confined site issues
- Construction issues
- Restraint considerations
- Lighting

Parking Structure Design

Loading requirements

- Live load
- Snow load
- Wind load
- Seismic load
- Thermal, creep, shrinkage, shortening

Design criteria

- Tensile stresses and classification
- Minimum P/A stress
- Minimum bonded reinforcement
- Balanced dead load
- Loss of tendons during construction

Lateral Force Resisting Systems

Types of lateral force resisting systems

- Moment frames
- Cantilevered columns
- Shear walls and lightwalls

Ideal locations for shear walls

- Visibility and safety
- Effects on volume change

Durability and Maintenance

Mix design and classification

Life cycle cost analysis

Routine maintenance guidelines

Add mixture options

Finishing and curing

Construction Issues

Sleeves and conduits

Tendon blowouts

Tendon profile issues

Post installed anchors

Parking Structure Design, Construction and Maintenance

Indianapolis, IN - Tuesday, September 17, 2019



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Learning Objectives

You'll be able to:

Identify and describe requirements for parking layout, including one-way vs. two-way traffic, turning bay requirements and square footage per space.

Consider requirements for vertical circulation in parking structures, and meet standards for accessible parking spaces required under the Americans with Disabilities Act.

Compare typical construction types for parking structures, including cast-in-place, prestressed precast concrete, and steel construction.

Comply with loading requirements for parking structures, including live loads, snow loads, wind loads and seismic loads, and utilize lateral force resisting systems in parking structures.



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Discuss parking lot layout and vertical circulation requirements

Review ADA accessibility standards and egress requirements

Examine cast-in-place and post-tensioned structures

Explore loading requirements for live loads, and for snow, wind and seismic loads

Learn techniques for improving durability

Continuing Education Credits

Professional Engineers

6.5 Continuing Ed. Hours/PDHs

Contractors

Non-Credit Continuing Ed.

Architects

6.5 HSW Contact Hours

6.5 AIA LU|HSW



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Faculty

Nathan Walsman, P.E. *Principal at Schaefer in Cincinnati, OH*

Mr. Walsman graduated from Purdue University with BS and MS degrees. He has been a principal engineer at Schaefer in Cincinnati since 2005. Mr. Walsman has a proven resume of work experience in the area of structural engineering and in parking structures in particular. He has been working in structural engineering since 1999, and he has since designed over 40 parking structures.

Additional Learning

Webinar Series

Shallow Foundations

- **Evaluating Building Sites**
Thurs., July 25, 2019, 11:00 AM - 12:30 PM CDT
- **Shallow Foundation Design**
Thurs., July 25, 2019, 1:00 - 2:30 PM CDT
- **Special Considerations in Foundation Design and Construction**
Fri., July 26, 2019, 11:00 AM - 12:30 PM CDT
- **Soil Improvement and Foundation Diagnosis and Repair**
Fri., July 26, 2019, 1:00 - 2:30 PM CDT

Foundation Damage and Repair

- **Science of Structures and Soils**
Tues., July 30, 2019, 11:00 AM - 12:30 PM CDT
- **Foundation Design and Construction**
Tues., July 30, 2019, 1:00 - 2:30 PM CDT
- **Diagnosing Foundation and Slab Damage and Evaluating Repair Methods**
Wed., July 31, 2019, 11:00 AM - 12:30 PM CDT
- **Diagnosing Basement Wall Damage and Evaluating Repair Methods**
Wed., July 31, 2019, 1:00 - 2:30 PM CDT

Off-grid Master Class

- **Off-grid Master Class, Part I**
Thurs., August 1, 2019, 11:00 AM - 2:15 PM CDT
- **Off-grid Master Class, Part II**
Fri., August 2, 2019, 11:00 AM - 2:15 PM CDT

Stormwater Infiltration

- **Infiltration and Soil: Water Science**
Thurs., August 8, 2019, 11:00 AM - 12:30 PM CDT
- **Infiltrating Stormwater and Maximizing Infiltration**
Thurs., August 8, 2019, 1:00 - 2:30 PM CDT
- **Improving Infiltration with Low Impact Development Techniques**
Fri., August 9, 2019, 11:00 AM - 12:30 PM CDT

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

Registration

Parking Structure Design, Construction and Maintenance
Indianapolis, IN - Tuesday, September 17, 2019

How to Register	Registrant Information
Online: www.halfmoonseminars.org	Name: _____ Company/Firm: _____ Address: _____ City: _____ State: _____ Zip: _____ Occupation: _____ Email: _____ Phone: _____
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Complete the entire form. 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.

Seminar Information

Indianapolis Marriott East

7202 East 21st
Indianapolis, IN 46219
(317) 352-1231

Registration 8:00 - 8:30 am	Lunch (On your own) 12:15 - 1:15 pm
Morning Session 8:30 am - 12:15 pm	Afternoon Session 1:15 - 4:30 pm

Tuition

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

Each registration includes a 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.

How to Register

- Visit us online at 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 6.5 continuing education hours/PDHs to professional engineers and 6.5 HSW contact hours to architects in all states. HalfMoon Education is an approved continuing education provider for Indiana engineers. Architect continuing education providers and courses are not subject to preapproval in Indiana.

The American Institute of Architects has approved this course for 6.5 LU|HSW (Sponsor No. J885). Only full attendance can be reported to the AIA. Visit www.halfmoonseminars.org for complete AIA information under this course listing.

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

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!

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.

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.

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

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