Oldcastle Commercial CE Presentation Topics and Program Affiliations

Credit Legend

AIA CEU– American Institute of Architects Learning Units (LU); courses that are Health, Safety and Welfare (HSW) Approved are identified

GBCI CEU – Green Building Certification Institute (15 CE hours biennially (3 LEED specific) for LEED Green Associates, 30 CE hours biennially (6 LEED specific) for LEED Aps

ICPI CEU – Interlocking Concrete Pavement Institute Continuing Education Program for Certified Installer Renewal (8 credits required in two years)

LA CES PDHs - Landscape Architecture Continuing Education System Professional Development Hours (Education criteria are dictated by each state's ASLA)

DP PDHs – Design Professional's Professional Development Hours.

NCBOLA – North Carolina Board of Landscape Architects

PIE (NY) – The Practicing Institute of Engineering

FBPE – Florida Board of Professional Engineers.

SRW Presentations

1.) Segmental Retaining Wall Design & Construction

Length: 1 hour **Course Content Level = Basic**

AIA Provider Number: J374	**AIA** Course Code: OC105	**AIA** Credit: 1 LU/HSW
LA CES	**LA CES** Course Code: OC105	**LA CES** Credit: 1 PDH (HSW)
DP PDH: 1 PDH for Engineers*	**NCBOLA** Course Code: 11409	**NCBOLA** Credit: 1 Hour
FBPE Provider Number 0007790	**FL DBPR** Course Code: 0011736 (Landscape Architecture)	

Overview:

This program will address the basic concepts about segmental retaining wall (SRW) systems. The presentation will address the history of reinforced earth structures and summarize the site conditions that impact SRW performance and design. Installation details, the proper construction sequence, and specifications are also addressed.

Learning Objectives:

- Participants will learn the types and applications for earth retaining wall systems.
- Participants will gain a greater understanding of how to specify segmental retaining walls.
- Participants will learn the site conditions that influence system performance and design.
- Participants will understand the overall construction sequence for segmental retaining walls.

*Certain State restrictions may apply. Check with your state to confirm specific requirements.

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2.) **Innovations In Segmental Retaining Walls**

Length: 1 hour **Course Content Level = Basic**

AIA Provider Number: J374 | **AIA** Course Code: OC106 | **AIA** Credit: 1 LU/HSW

LA CES | **LA CES** Course Code: OC106 | **LA CES** Credit: 1 PDH (HSW)

DP PDH: 1 PDH for Engineers* | **NCBOLA** Course Code: 11417 | **NCBOLA** Credit: 1 Hour

PIE (NY) Course Code: 20170432 | **PIE (NY)** Credit: 1 PDH

FBPE Provider Number 0007790 | **FL DBPR** Course Code: 0011737 (Landscape Architecture)

Overview:

This program will address the latest innovative solutions for using Segmental Retaining Walls (SRWs) to address challenging site access conditions. The presentation reviews the characteristics of gravity wall and reinforced wall systems and introduces a new solution for utilizing SRWs in conditions where room for reinforcement is not available. The use of structural backfill and newly developed aesthetic facing systems can be used to create gravity wall structures. Installation details, the proper construction sequence, and specifications are also addressed.

Learning Objectives

- Participants will learn the different features of gravity and reinforced wall structures.
- Participants will be able to describe the characteristics of structural backfill for use with SRWs.
- Participants will learn the site conditions that influence SRWs constructed using structural backfill, including application limitations.
- Participants will understand the overall construction sequence related to SRWs utilizing structural backfill.

3.) **Building Retaining Walls Using Direct-Anchorage Installation Methods**

(Nat'l team member to present course.

Length: 1 hour **Course Content Level = Advanced**

AIA Provider Number: J374 | AIA Course Code: OC107 | AIA Credit: 1 LU/HSW

LA CES | LA CES Course Code: OC107 | LA CES Credit: 1 PDH (HSW)

DP PDH: 1 PDH for Engineers* | **NCBOLA** Course Code: 11418 | NCBOLA Credit: 1 Hour

FBPE Provider Number 0007790

Overview:

This program will address the use of Direct-Anchorage installation methods for segmental retaining wall (SRW) applications. The presentation identifies site conditions that require innovative construction solutions to stabilize soil or rock conditions, and explains how tieback, soil nailing and anchorage system can be utilized. An overview comparing top-down construction techniques with traditional bottom-up methods for SRW applications is also reviewed.

Learning Objectives:

- Participants will be able to describe applications that could benefit from direct-anchorage systems.
- Participants will understand the difference between top-down and bottom-up wall construction.
- Participants will be able to explain what geotechnical soil parameters are needed for direct-anchorage wall design.
- Participants will understand the general construction sequence related to direct-anchorage systems with SRWs. The process of actual wall installation from start to finish.

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4.) **A New Design Solution to Reduce the Cost and Time of Bridge Construction: GRS-IBS**

Length: 1 hour **Course Content Level = Advanced**

AIA Provider Number: J374 | AIA Course Code: OC109 | AIA Credit: 1 LU/HSW

LA CES | LA CES Course Code: OC109 | LA CES Credit: 1 PDH (HSW)

DP PDH: 1 PDH for Engineers* | **NCBOLA** Course Code: 11577 | NCBOLA Credit: 1 Hour

FBPE Provider Number 0007790

Overview:

This program will provide an overview of Geosynthetic Reinforced Soil – Integrated Bridge System (GRS-IBS), a bridge design concept being promoted by the Federal Highway Administration to accelerate construction time and offer significant cost savings for the construction of local, county and state bridges. Segmental Retaining Wall (SRW) facing elements, along with geosynthetic reinforcement material, is proving to be a viable solution for a majority of the bridges known to be structurally deficient and in need of replacement across our nation. The presentation addresses the design concept, key materials, specifications and important construction details. A case study example illustrating the construction sequence is also provided.

Learning Objectives:

- Participants will learn the advantages and limitations of a GRS-IBS and what makes these systems so cost effective compared to traditional methods.
- Participants will be able to describe the key components that make up a GRS-IBS structural system.
- Participants will understand the design process for a GRS-IBS system, and what is included in project drawings and specifications.

5.) Best Practices for Segmental Retaining Walls

Length: 1 hour **Course Content Level = Basic**

AIA Provider Number: J374 | **AIA** Course Code: OC110 | **AIA** Credit: 1 LU/HSW

LA CES | **LA CES** Course Code: OC110 | **LA CES** Credit: 1 PDH (HSW)

DP PDH: 1 PDH for Engineers* | **NCBOLA** Course Code: 11578 | **NCBOLA** Credit: 1 Hour

FBPE Provider Number 0007790 | **FL DBPR** Course Code: 0011738 (Landscape Architecture)

Overview:

This presentation covers best practices for designing, specifying and building segmental retaining walls (SRWs) as developed by industry since it's start. The purpose of this session is to promote a zero wall failure initiative by educating the designers and specifiers in best practices related to segmental retaining walls.

Learning Objectives:

Participants will leave with an understanding of:

- Terminology and components of a segmental retaining wall system.
- Industry developed best practices for the design of segmental retaining walls.
- Industry developed best practices for material specifications for segmental retaining walls projects.
- Industry developed best practices for construction of segmental retaining walls.

*Certain State restrictions may apply. Check with your state to confirm specific requirements.

Paver Presentations

6.) **Commercial Applications for Interlocking Concrete Pavers**

Length: 1 hour **Course Content Level = Basic**

AIA Provider Number: J374 | **AIA** Course Code: OC111 | **AIA** Credit: 1 LU/HSW
LA CES | **LA CES** Course Code: OC111 | **LA CES** Credit: 1 PDH (HSW)
DP PDH: 1 PDH for Engineers* | **NCBOLA** Course Code: 11410 | **NCBOLA** Credit: 1 Hour
FBPE Provider Number 0007790 | **FL DBPR** Course Code: 0010654 (Landscape Architecture)

Overview:

This program will provide an overview of how interlocking concrete pavement systems can be applied to commercial projects to enhance the value, performance and pavement life cycle costs. The presentation addresses how pavers can aid in defining themes, character and space through creative patterns, and explains how paver systems work. Site conditions that impact paver performance are highlighted, including issues related to access, safety, specifications, and construction details. Finally, the program concludes with a discussion on sustainability and attributes that pavers offer commercial installations.

Learning Objectives:

- Participants will be able to describe how different concrete paver shapes and patterns can be used to enhance a project design.
- Participants will learn the fundamental components of an interlocking concrete pavement system.
- Participants will understand the site conditions that contribute to paver performance.
- Participants will be able to identify sustainable attributes to paver systems and resources available to create designs and specifications.

7.) **PICP System Design and Construction**

Length: 1 hour **Course Content Level = Basic**

AIA Provider Number: J374 | **AIA** Course Code: OC112 | **AIA** Credit: 1 LU/HSW
LA CES | **LA CES** Course Code: OC112 | **LA CES** Credit: 1 PDH (HSW)
DP PDH: 1 PDH for Engineers* | **NCBOLA** Course Code: 11412 | **NCBOLA** Credit: 1 Hour
PIE (NY) Course Code: 20180620A | **PIE (NY)** Credit: 1 PDH
FBPE Provider Number 0007790 | **FL DBPR** Course Code: 0010653 (Landscape Architecture)

Overview: This presentation provides an introduction to permeable interlocking concrete pavement (PICP) systems. An overview of the problem with impervious surfaces and the advantages of Low Impact Development, specifically stormwater infiltration practices through pavement surfaces. The presentation addresses designing for hydrological and structural requirements, and reviews required details. The design approach discussed is based on the Interlocking Concrete Pavement Institute's PICP design manual. Specifications and maintenance requirements are reviewed along with information on winter performance. Several project case studies illustrate the construction process.

Learning Objectives:

- Participants will leave course with the understanding of how permeable interlocking concrete pavement can provide stormwater management benefits to land development projects.
- Participants will leave course with the understanding of proper specifications for construction of PICP systems.
- Participants will leave course with the understanding of industry recommendations for maintenance of PICP systems.
- Participants will leave course with the ability to identify industry resources for specifying and designing PICP systems.

*Certain State restrictions may apply. Check with your state to confirm specific requirements.

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8.) **PICP System Design and Construction LD (LEED Specific Version) –** separate slide set. See Nat'l Team Member
Length: 1 hour **Course Content Level = Advanced (due to LEED Specific Content)**
AIA Provider Number: J374 AIA Course Code: OC112**LD** AIA Credit: 1 LU/HSW
LA CES LA CES Course Code: OC112**LD** LA CES Credit: 1 PDH (HSW)
USGBC: USGBC LEED AP BD + C v4 Specific Course Code: # 0920006805
DP PDH: 1 PDH for Engineers*
FBPE Provider Number 0007790

Overview:
This presentation provides an introduction to permeable interlocking concrete pavement (PICP) systems. An overview of the problem with impervious surfaces and the advantages of Low Impact Development, specifically stormwater infiltration practices through pavement surfaces. The presentation addresses designing for hydrological and structural requirements, and reviews required details. The design approach discussed is based on the Interlocking Concrete Pavement Institute's PICP design manual. Specifications and maintenance requirements are reviewed along with information on winter performance. Several project case studies illustrate the construction process.

Learning Objectives:

- Participants will be able to demonstrate how permeable pavement systems can be part of an overall Low Impact Design solution to allow LEED project teams to achieve points in the LEED v4 BD+C Sustainable Sites-Rainwater Management credit area.
- Participants will be able to calculate how all interlocking concrete pavements, including permeable pavements, can contribute towards the LEED BD+C v4 Sustainable Sites Open Space Credit as a pedestrian or recreational type of pavement.
- Participants will be able to identify products whose manufacture and delivery are documented by an Environmental Product Declaration and Corporate Sustainability report as required by the LEED BD+C v4 Materials and Resources Building Disclosure and Optimization credit areas.
- Participants will be able to select a pavement with a solar reflectance of .33 or higher in order to pursue points in the Sustainable Sites-Heat Island Effect

9.) **Long Term Performance and Maintenance of Permeable Interlocking Concrete Pavement Systems**
Length: 1 hour **Course Content Level = Advanced**
AIA Provider Number: J374 AIA Course Code: OC113 AIA Credit: 1 LU/HSW
LA CES LA CES Course Code: OC113 LA CES Credit: 1 PDH (HSW)
DP PDH: 1 PDH for Engineers* **NCBOLA** Course Code: 11413 NCBOLA Credit: 1 Hour
FBPE Provider Number 0007790

Overview: This program provides a brief overview of Permeable Interlocking Concrete Pavement (PICP) systems and then focuses on the long-term surface infiltration performance of these effective stormwater control measures. Mechanisms for sedimentation and clogging of PICP joints is discussed along with a review of ASTM C 1781 testing procedures. Total Suspended Solids (TSS) removal efficiencies and current research on variables that contribute to hydraulic performance of PICPs are discussed. The presentation concludes with information on surface infiltration maintenance and restoration methods including a review of available cleaning machines. PICP maintenance costs and inspection checklists are also reviewed.

Learning Objectives:

- Participants will understand clogging mechanisms for PICP surfaces.
- Participants will be able to identify relationships among PICP joint widths, jointing stone size, and contributing impervious areas.
- Participants will be able to identify different PICP joint cleaning machines, and their applications and effectiveness.
- Participants will understand performance & maintenance criteria recommended for PICP systems.

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10.) **Porcelain Pavers: Applications and Use**

Length: 1 hour **Course Content Level = Basic**

AIA Provider Number: J374 **AIA** Course Code: OC114 **AIA** Credit: 1 LU/HSW
LA CES **LA CES** Course Code: OC114 **LA CES** Credit: 1 PDH (HSW)
DP PDH: 1 PDH for Engineers* **NCBOLA** Course Code: 12285 **NCBOLA** Credit: 1 Hour
FBPE Provider Number 0007790 **FL DBPR** Course Code: 0010655 (Landscape Architecture)

Overview:

One of the most exciting developments in outdoor living is the arrival of ¾" thick porcelain outdoor pavers. The concept began to spark interest in 2012 and is continuing to grow in popularity. Outdoor porcelain pavers have the same benefits as regular porcelain –being frost-resistant, skid-resistant, durable and easy to clean – combined with incredibly high breakage loads (up to 2,000 pounds) creates the perfect solution for gardens, terraces and high traffic outdoor areas. Outdoor porcelain pavers can be dry laid onto grass, gravel, dirt and sand – or onto terraces and roofs using raised supports – without grout, adhesives or specialized workers, making installation incredibly easy.

Learning Objectives:

- Participants will be able to describe how porcelain pavers are generally manufactured and the differences between porcelain and other paving materials.
- Participants will learn about the different applications in landscape design for porcelain pavers
- Participants will learn how to specify porcelain pavers.
- Participants will be able to identify the proper methods of installation for porcelain paving projects.

11.) **Using Municipal Roadways to Control Stormwater in Urban Environments with Permeable Interlocking Concrete Pavement**

Length: 1 hour **Course Content Level = Advanced**

AIA Provider Number: J374 **AIA** Course Code: OC116 **AIA** Credit: 1 LU/HSW
LA CES **LA CES** Course Code: OC116 **LA CES** Credit: 1 PDH (HSW)
DP PDH: 1 PDH for Engineers* **NCBOLA** Course Code: 12097 **NCBOLA** Credit: 1 Hour
PIE (NY) Course Code: 20180095 **PIE (NY)** Credit: 1 PDH
FBPE Provider Number 0007790 **FL DBPR** Course Code: 0011419 (Landscape Architecture)

Overview:

In many urban watersheds regulators are adopting green infrastructure solutions for stormwater management. Retrofitting impervious pavement with materials designed to infiltrate stormwater is one obvious solution. The use of permeable interlocking concrete pavement (PICP) in parking lots and driveways has grown significantly in the last decade. Dozens of publications have demonstrated the runoff and pollutant control benefits these systems provide. However, parking lots and driveways cover relatively small areas within an urban watershed. Some municipalities now recognize that municipal roadways and alleyways can be designed to handle vehicular traffic while also functioning as a stormwater control measure using PICP. This presentation will describe how PICP systems are designed and constructed. Examples will illustrate the keys to properly constructing and maintaining these effective stormwater management systems. An update on the Southeast Atlanta Green Infrastructure Project will be provided highlighting how Atlanta converted six miles of impervious roadway to PICP to reduce flooding and combined sewer overflows. The presentation will conclude with lessons learned related to utilities, roadway slopes, and maintenance.

Learning Objectives:

- Participants will learn how PICP can be used as a stormwater control measure.
- Participants will understand proper construction and maintenance methods for PICP.
- Participants will learn how the City of Atlanta implemented permeable pavement in municipal roadways to control runoff and mitigate flooding.
- Participants will gain insight to design lessons learned related to municipal PICP retrofit projects.

*Certain State restrictions may apply. Check with your state to confirm specific requirements.

12.) Using PICP to Meet Stormwater Treatment Objectives

Length: 1 hour **Course Content Level = Advanced**

(Nat'l team member to present course)

AIA Provider Number: J374 AIA Course Code: OC117 AIA Credit: 1 LU/HSW

LA CES LA CES Course Code: OC117 LA CES Credit: 1 PDH(HSW)

DP PDH: 1 PDH for Engineers* **NCBOLA** Course Code: 12771 NCBOLA Credit: 1 Hour

FBPE Provider Number 0007790

Overview:

This program begins with a brief summary of the evolution of stormwater management beginning with conveyance and transitioning to water quantity management, and most recently stormwater treatment. Stormwater Control Measures using Low Impact Development and Green Infrastructure design that can accomplish all of these objectives are now desired in many municipalities that deal with flooding or have environmentally sensitive waterways. This presentation will compare surface-based BMPs to manufactured treatment system options, and highlight Permeable Interlocking Concrete Pavement (PICP) as a viable solution to address conveyance, water quantity and quality objectives. A summary of the academic and industry research to date on using PICP for water treatment will be presented, along with strategies for combining the benefits of PICP with manufactured treatment systems.

Learning Objectives:

- Participants will understand the general trend towards focusing on stormwater quality and treatment solutions.
- Participants will learn about PICP systems and the available research addressing water treatment effectiveness.
- Participants will understand the importance of PICP maintenance requirements related to meeting stormwater quality objectives.
- Participants will be able to identify how PICP systems can be used as part of a treatment train process.

13.) Roof Top Paver Systems (Westile) – OC Team Members to Contact Mike McVey prior to first presentation

Length: 1 hour **Course Content Level = Basic**

AIA Provider Number: J374 AIA Course Code: WEST10 AIA Credit: 1 LU/HSW

LA CES LA CES Course Code: WEST10 LA CES Credit: 1 PDH (HSW)

DP PDH: 1 PDH for Engineers* **NCBOLA** Course Code: 12772 NCBOLA Credit: 1 Hour

FBPE Provider Number 0007790 **FL DBPR** Course Code: 0011422 (Landscape Architecture)

Overview:

Roof top paver systems have become an integral part of commercial roofing that not only improves the energy efficiency but also increases the life expectancy. Roof top pavers provide a durable surface protecting the roofing system from thermal shock, UV degradation and impact. In addition to these benefits, roof top pavers also add the ability to increase the useable square footage of a structure by providing a durable pedestrian surface on roof decks.

Learning Objectives:

- Participants will understand applications for pavers as a specified part of commercial roofing systems
- Participants will be able to communicate the financial and environmental drivers which influence the construction of plaza decks.
- Participants will understand how building plaza decks with pavers and pedestals improves occupant comfort.
- Participants will be able to communicate the various design options for roof top pavers, and identify proper installation methods.

*Certain State restrictions may apply. Check with your state to confirm specific requirements.

14.) **Public Safety and Access Issues for Concrete Pavers**

Length: 1 hour **Course Content Level = Basic**

AIA Provider Number: J374	AIA Course Code: OC118	AIA Credit: 1 LU/HSW
LA CES	LA CES Course Code: OC118	LA CES Credit: 1 PDH(HSW)
DP PDH: 1 PDH for Engineers*	**NCBOLA** Course Code: 13412	NCBOLA Credit: 1 Hour

FBPE Provider Number 0007790

Overview: This presentation reviews public safety and accessibility design considerations when selecting unit concrete pavers for walkway surfaces. Current ADA criteria, slip resistance standards and test methods, and latest developments related to a new roughness index for wheelchair vibration will be addressed. Other paver safety topics covered include: chamfer widths and ease of transition, visibility and color contrast, truncated dome requirements, permeable pavement surface openings, snowplowing, use of deicing chemicals, and traffic calming benefits.

Learning Objectives:

- Participants will understand the key criteria for selecting concrete pavers for accessible walkway surfaces.
- Participants will be able to identify the latest standards and industry guidelines related to slip resistance for unit concrete pavers.
- Participants will be able to identify suitable permeable concrete paver configurations related to surface openings.
- Participants will understand important winter maintenance issues related to concrete pavers.

15.) NEW for 2020: Permeable Paver Design Using ASCE 68-18 - (Nat'l Team Member to Present)

Length: 1 hour **Course Content Level = Basic**

AIA Provider Number: J374	AIA Course Code: OC119	AIA Credit: Approved
LA CES	LA CES Course Code: OC119	LA CES Credit: Approved
DP PDH: 1 PDH for Engineers*	**NCBOLA** Course Code: PENDING	NCBOLA Credit: PENDING

FBPE Provider Number 0007790

Overview: This presentation reviews ASCE 68-18 Permeable Interlocking Concrete Pavement, which is the design standard published by the American Society of Civil Engineers in late 2018. The topics covered include design parameters and limitations, site selection and optimization, structural design, and hydrologic design of permeable paver systems. Other topics include construction and maintenance of permeable paver systems including in-depth knowledge of specification writing to ensure that the design intent is clear.

Learning Objectives:

- Participants will learn what parameters and inputs are required to design safe and reliable permeable paver systems.
- Participants will gain knowledge of structural analysis of permeable paver systems with focus on the design tables in ASCE 68-18.
- Participants will learn the water balance method for hydrologic design of permeable paver systems with an introduction to more complex hydrologic modeling to mitigate flooding and create needed green infrastructure for stormwater management.
- Participants will learn what information and ASTM standards are pertinent to permeable paver systems and what to include in a project specification.

*Certain State restrictions may apply. Check with your state to confirm specific requirements.