



# CAROLINAS ENGINEERING

## CONFERENCE & TRADE SHOW

**Hilton Myrtle Beach Resort  
Myrtle Beach, South Carolina  
June 7 - 9, 2018**

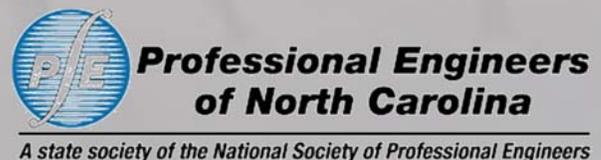


The SC Engineering Conference & Trade Show takes on a larger identity for its 11th year. Since the Professional Engineers of North Carolina joined the conference, it is now the CAROLINAS ENGINEERING CONFERENCE & TRADE SHOW. South Carolina welcomes our Tar Heel partners with the anticipation that this year is going to be memorable.

Although the name has changed, the conference's mission remains "timely presentations on various engineering subjects, keynote presentations and enough professional development hours to substantially meet the annual requirement." Additionally, the conference offers a trade show where products and services engineers use directly or specify are offered with knowledgeable representatives to assist you. This year's trade show is sold out.

Conferences are always about more than technical programs and trade shows; the 2018 Carolinas Engineering Conference also realizes the importance of opportunities to meet and converse with fellow professionals. An exhibitor reception on Thursday evening serves as a networking opportunity between engineers and exhibitors. Session breaks, lunches and the banquet are also great times for meeting and talking with fellow professionals.

Engineers attending the conference June 7-9 at the Hilton Myrtle Beach resort may gain up to 15.5 PDHs and choose from a variety of more than 40 programs.





# CAROLINAS ENGINEERING

## CONFERENCE & TRADE SHOW

The 2018 Carolinas Engineering Conference is offering 15 PDHs. For attending a program in every time slot you can accumulate 15 PDHs of the 15 required annually.

### THURSDAY - June 7, 2018

4 PDHs Available for the Day

- 7:00 AM – 5:00 PM ..... Registration
  - 8:30 AM – 10:15 AM .....SCSPE Board & Annual Meeting
  - 8:30 AM – 10:00 PM ..... ASCE-SC Board Meeting
  - 10:30 AM – 12:15 PM .....ACEC-SC Board & Annual Meeting
  - 10:30 AM – 2:30 PM .....PENC Board Meeting
  - 11:15 AM - 1:15 PM ..... Lunch
  - 12:00 PM – 6:00 PM ..... Trade Show
  - 1:00 PM – 2:15 PM ..... (1.5 PDH)  
 Engineers Registration Board Panel Discussion and Updates  
 SC State Board of Professional Engineers and Land Surveyors  
 NC Board of Examiners for Engineers and Surveyors
  - 2:25 PM – 2:55 PM ..... (.5 PDH)  
 SCDHEC Update
  - 2:55 PM – 3:10 PM..... Break
  - 3:00 PM – 5:00 PM.....PENC Education Foundation Meeting
  - 3:10 PM – 4:00 PM ..... (1 PDH)  
 SCDOT Update
  - 4:10 PM – 5:00 PM ..... (1 PDH)  
 Legislative Process  
 Earl Hunter, SCCJC
  - 5:00 PM – 6:00 PM..... Trade Show Reception
- Dinner on Your Own

### EDUCATION SPONSOR

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Professional Engineers and Surveyors



### SILVER SPONSORS



## FRIDAY - June 8, 2018

7 PDHs Available for the Day

7:00 AM – 5:00 PM ..... Registration

8:00 AM – 4:00 PM ..... Trade Show

**8:00 - 8:50 AM .....(1 PDH).....CONCURRENT SESSIONS  
CIVIL TRACK**

### Why Can't We Use a Pond

Michael Barnes, PE, Oldcastle Precast, Inc.

*With increased urbanization and the cost of land skyrocketing, the days of using above-ground stormwater management basins in urban areas are disappearing. It's important to understand underground stormwater storage and treatments systems' are necessary for today's development. However, each municipality has unique requirements, which greatly impacts your design choices. It is better if the designers truly understand the Pros and Cons for each type of system for true structural capacity, footprint, constructability and longevity for project, and who is responsible should the system fail. This presentation will take an in-depth look at the use of various types of underground detention systems and treatment solutions germane to the markets; How are they designed/constructed and discuss the method that produces the most reliable and construction sensitive designs.*

## ENVIRONMENTAL TRACK

### A Market Approach to Water Reuse

Michael Gallant, PE

*Three different models of monetizing reuse water will be discussed.*

*1. Sale of groundwater to the general public through metered connections and a distribution system. 2. Sale of groundwater to a single municipal entity as a bulk resource. 3. Sale of groundwater to a single home owner's association (HOA).*

*These models are based on setting rates for reuse water at 50% to 75% of potable water rates. This pricing gives the end user a financial incentive to use reuse water for non-potable uses such as irrigation.*

## GEOTECH TRACK

### Mission Hospital Project, Asheville, NC

Jesse Jacobson, BLE

## STRUCTURAL/FORENSIC TRACK

### Forensic Engineering, Analysis of a Shopping Mall Explosion

Jerry Tindal, PE, SAFE Laboratories & Engineering Corp.

*Proper engineering design involving underground utilities is an important aspect of fire and life safety. In 2009 a catastrophic explosion occurred at a shopping mall located just outside of Washington, D.C. As a result of the explosion several persons, including multiple firefighters were injured and a large portion of the mall was destroyed. This presentation examines the cause of the explosion.*

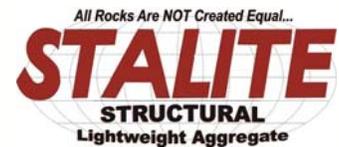
## TRANSPORTATION TRACK

### Geophysical Methods for Roadway Settlement and Voids

Ed (Ned) Billington, PG, ESP Associates, P.A.

*Subsurface voids and roadway settlement can have a number of causes, such as broken or blocked storm drains, limestone dissolution (karst), inadequately compacted fill, or poor fill materials. Voids often develop to significant size before collapse, presenting a potential hazard to vehicle traffic. This presentation will provide examples of non-intrusive investigations used to evaluate roadway voids and settlement issues. Examples include a study of a sinkhole caused by possible karst activity, an emergency investigation of a void caused by a blocked storm drain, mapping of a depression probably caused by poor fill, and investigation of sinkholes caused by underground mining activity. Methods discussed will include ground-penetrating radar (GPR), 2D resistivity imaging, micro-gravity, surface wave seismic, and mobile LiDAR.*

## BRONZE SPONSORS



8:00 AM - 9:50 AM ..... (2 PDH)

## ELECTRICAL TRACK

### Energy 2050

Johnston Peebles, PhD, PE, The Citadel, Professor, Electrical Engineering

*This outlook of energy generation and consumption through the year 2050 focuses on passenger and freight transportation trends, as well as industrial, commercial and residential energy use. Technology and policy that can affect adoption of alternative energy sources will be discussed. This complex challenge will touch each of us as we engineer our way to a sustainable future.*

## FIRE/LIFE/SAFETY TRACK

### High Challenge Problems and Atypical Solutions-A Fire 2,150 underground

Bernie Till, Bernie Till & Associates

What do you do when faced with substantial challenges for which normally recognized engineering solutions won't work? The speaker will discuss an approach used at a unique facility in New Mexico following an event which had the potential for a major loss of life. How do you protect people from a fire 2,150 feet underground when the only way out is up the chimney?

## GENERAL BUSINESS TRACK

### Risk Management

Stephanie Burton, JD, Gibbes Burton, LLC

J. Dale Crow, General Counsel of Professional Services. Risk Strategies Company

9:00 - 9:50 AM ..... (1 PDH).....CONCURRENT SESSIONS

## CIVIL TRACK

### Evaluation of SCDOT Roads Over Privately Owned Earthen Dams

Jim Devereaux, HDR

In October 2015, South Carolina experienced record rainfall and catastrophic, 1,000-year flooding. Some areas received more than two feet of rain in four days, in the state's worst weather event since Hurricane Hugo (1989).

Transportation infrastructure damage included culverts and bridges being overtopped or undermined; and, damage occurring to numerous privately owned, earthen dams traversed by SCDOT roads. Many SCDOT road crossing breached or damaged earthen dams remain closed today as a result of flood damage. The SCDOT contracted HDR to perform site assessments and field studies to determine whether damage occurred within the dam or within the roadway embankment, and what repairs were needed to reopen the road.

The HDR team assessed 10 dams in Lexington, Calhoun, Clarendon and Richland Counties. Observed damage ranged from extensive embankment erosion, breaching, slope failure, pavement collapse, and debris accumulation to utility and culvert damage. Each site required unique analysis and professional assessment.

## ENVIRONMENTAL TRACK

### Improving the Dredging Process: Pre and Post-Construction Sediment Mapping Combined with Innovative methods of Sediment Removal

Mick Rebault, Dragon Fly Pond Works

*Problems associated with sedimentation of lakes and ponds are well documented, and most ponds will require some level of sediment removal over their lifespan. As sediment removal projects arise, Requests for Proposals (RFP's) for dredging are often vague and lack standardized methods for quantifying material. Lake owners and managers commonly generate RFP's that indicate a specific quantity of material to be removed (generally expressed in cubic yards). However, actual amounts can be difficult to verify and quantify. This presentation emphasizes the importance of establishing and incorporating standard methods for quantifying sediment volumes on large-scale dredging projects. This presentation will explore ideas for improving RFP's, as well as ways to accurately measure a contractor's success post-construction using lake mapping software.*

*Conventional dredging typically involves use of excavators and heavy equipment to remove sediment. In some cases, this material can be utilized or blended into existing grades on site but generally the material is hauled off site for disposal. In some cases, hydraulic dredging can provide advantages over conventional excavation, especially at sites where dewatering is a challenge and truck and equipment access is limited. Hydraulic dredges pump material to a series of geotextile tubes or bags for de-watering.*

*Repair of eroded shorelines can also be accomplished by hydraulic dredging, thus saving on hauling and disposal costs. In this application, geotextile tubes are anchored along the shoreline and filled with pond sediment. Once suitably drained, the material can be blending into existing grades and the areas planted.*

THURSDAY LUNCH  
SPONSOR



FRIDAY LUNCH  
SPONSOR



## GEOTECH TRACK

### Bonner Bridge Foundation Design and Testing

Scott Webster, GRL Engineers and Michael Batten, HDR

## STRUCTURAL/FORENSIC TRACK

### Forensic Engineering Analysis - Apartment Building Explosion Involving Flammable Refrigerant

Jerry Tindal, PE, SAFE Laboratories & Engineering Corp.

*The use of flammable refrigerants is an area of increasing engineering interest in recent years and will continue to be so for the foreseeable future. The forensic engineering case study presented examines the origin and cause of an apartment building explosion involving flammable refrigerant that, in addition to the property damages, resulted in serious burn injuries to an occupant.*

## TRANSPORTATION TRACK

### Underwater Bridge Inspection

Jeff Rowe, PE and Aaron McHan, PE, Infrastructure Engineers, Inc.

*Infrastructure Engineers will be presenting on the intricacies of underwater bridge inspection techniques and findings. The presentation will cover several topics including typical structural defects, scour, remote operated vehicles, and underwater acoustic imaging. The presenter is Aaron McHan PE, an underwater bridge inspector, structural engineer and transportation engineer with 14 years experience in the field.*

**10:00 AM – 10:50 AM .....(1 PDH).....CONCURRENT SESSIONS**

## CIVIL TRACK

### Merging Survey Data from Multiple Collection Platforms

Paul Badr, CP, PLS, PPS, SP, Geospatial, President

*This course pertains to merging data collected from various survey platforms, in that it instructs and informs the attendee of the various platforms, challenges and advantages, accuracy analysis, project coverage (including potential gaps and overlaps), data merging and seamless product delivery.*

## ENVIRONMENTAL TRACK

### Northern Long-Eared Bat Survey in SC

Michael Zavaslak, NRCC-EAC, CHMN, CIH, PE, Summit

*This presentation will focus on bats survey for the Northern Long-Eared Bat (NLEB). The first part of the presentation will cover the history of White Nose Syndrome (WNS) and its impact on the NLEB. The range of the NLEB and its effects in South Carolina and necessity. The second portion will cover a survey conducted in 2017 at a federal facility along the Savannah River. The presentation will cover the background of the site, site conditions and layout. We will cover the US Fish and Wildlife Service bat capture guidelines and the South Carolina Department of Natural Resources bat capture guidelines, with regards to the 2017 Range-Wide Indiana Bat Summer Survey Guidelines. In addition, we will cover the logistical challenges for capturing and tagging all bat species encountered.*

## FIRE/LIFE/SAFETY TRACK

### What Could Go Wrong with Fire Protection Services

Ralph Foster, PE, Foster Engineering & Consulting, LLC

*This seminar will review the fire protection for a project in the Caribbean. The project was a design build project and the contractor did not engage a fire protection engineer until forced by the developer. The presentation will show problems found with building egress and the installation of the sprinkler system, fire alarm system, clean agent systems, emergency lighting, and exit signage. The presentation will highlight the difference between construction in the US versus outside the US.*

## BREAK SPONSORS



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## GENERAL BUSINESS TRACK

### Emotional Intelligence For Engineers

Susan Habina Woolard, PE and Sean Gleason, PE

We will discuss emotional intelligence for engineers with the added perspectives coming from a government engineer and a private consultant. Emotional intelligence will be defined and keys to being an excellent leader identified. We will describe the components that make up emotional intelligence including emotions, feelings and moods. Using interactive exercises with attendees, we will explore constructive emotions and destructive emotions. We will identify how and when they are helpful and unhelpful in the workplace, how to recognize them in others, and how to influence or defuse them as needed. The exercises and lecture will be a step towards a better understanding of these soft skills that separate great leaders from just the boss.

## GEOTECH TRACK

### Unintended Consequences – Karst in South Carolina’s Low Country

Stephen Geiger, PE, ECS Southeast, LLP

The Coastal Plain geologic setting of South Carolina’s Low Country is unique and challenging. The array of geotechnical challenges includes shallow groundwater, soft marine deposits, dredge spoils, urban fill, submerged sand, and a host of related geo-hazards. Of particular interest are the effects of karst in the Georgetown area.

Georgetown is underlain by urban fills, Estuarine deposits, dense/hard materials of the Williamsburg formation and void laden limestone. The Williamsburg formation creates an aquitard between an upper unconfined aquifer and confined lower aquifer in the limestone. During 2011 storm water improvements, the Williamsburg formation and underlying limestone were penetrated by the earth retention system used to create a large wet well. To control flow from the confined aquifer into the excavation, large volumes of water were pumped. These activities resulted in the development of sinkholes, some large enough to cause collapse of buildings and streets. Over 40 properties are alleged to have experienced subsidence related damage.

Of particular interest are conditions that developed in the new county courthouse located about 1/3 mile from the wet well. The courthouse is founded on timber piles above the Williamsburg formation and limestone. Displacement of the pile foundations and grade supported floor slabs has occurred with associated collateral damage.

The presentation is intended to highlight the local geo-hazards, general design and construction aspects of the wet well and courthouse, the unintended consequences of karst, and impact of mitigating unexpected conditions during and after construction.

## STRUCTURAL/FORENSIC TRACK

### A Little Water Can Do a Lot of Damage

James (Jim) Justus, PE, F NSPE, Mosaic Engineering and Consulting

A little water leaking over a long term can do significant damage. This presentation will summarize a project where small leaks over a long time frame caused significant structural damage, resulting in replacement of large steel sections in difficult spaces. In addition, the project included waterproofing repairs to the plaza above. The presentation will cover the repair analysis and construction issues, waterproofing issues, stone plaza replacements, and miscellaneous other related topics. Hopefully, a lesson to everyone who attends about the impacts of long term water penetration into structural systems.

## TRANSPORTATION TRACK

### Black to Basics - Asphalt Inspection

Jayson Jordan, PE, SCAPA, Technical Director

10:00 AM - 11:50 AM..... (2 PDH)

## ELECTRICAL TRACK

### Transportation Energy; Where Will it Come From?

Johnston Peeples, PhD, PE, The Citadel, Professor, Electrical Engineering

11:00 AM – 11:50 AM ..... (1 PDH) ....CONCURRENT SESSIONS

## TRADESHOW PARTICIPANTS



## CIVIL TRACK

### Flood Mitigation

Zach Faulkner, SmartVent

This course describes floodplains and the potential hazards to buildings. Unless there are flood openings that allow floodwaters to flow into and out of enclosures below the Base Flood Elevation, hydrostatic pressure builds up on the foundation walls and can cause major damage. The course also defines the differences in engineered and non-engineered flood openings and their ability to ensure resilient structures. It explains the differences between wet floodproofing and dry floodproofing techniques, and when they are applicable. It also clarifies the regulations, codes, and standards as they relate to sustaining foundations in flood hazard areas. This course analyzes the role of building compliance in lowering flood insurance rates and what mitigation solutions are available to existing structures.

## ENVIRONMENTAL TRACK

### EPA Under Trump

Ethan Ware, JD, Williams Mullen

Review of Trumps changes to EPA and Environmental policies since the election. From climate change to budgets, the new EPA is changing focus and policies. This course will review relevant revisions to those policies over the last 12 months.

## FIRE/LIFE/SAFETY TRACK

### Specialty Valves for Fire Protection

Brian Berkley, Viking Corporation

## GENERAL BUSINESS TRACK

### Driving Economic Growth in SC - Volvo

John Culbreath, PE, Thomas & Hutton

Thomas & Hutton laid the groundwork for Volvo's first American manufacturing facility in Berkeley County, SC to develop an industrial region that will impact Berkeley County beyond the first tenant. A thick timberland forest site of over 6,000 acres was configured for future industrial development. The initial investment by the County and State will grow the region and economy and create thousands of jobs over the next few years. Thomas & Hutton graded the site and prepared temporary services needed for construction. With the expected regional impact, adjacent multi-lane roadway improvements were designed and approved by local, state, and federal agencies, along with permanent water, sewer, and storm drainage improvements to support Volvo and future industrial developments. Berkeley County's expectation was for Thomas & Hutton to uncomplicate a project of this magnitude with an aggressive timeline. Multiple teams working in phases, while responding to three damaging weather events that included a historical flood event, was very challenging. Teamwork, creativity, and communication was paramount for keeping the schedule on time and constructing a successful project.

## GEOTECH TRACK

### Columbia Baseball Stadium

Adam Shannon and John Hamilton, F&ME

## STRUCTURAL/FORENSIC TRACK

### AirTran JFK - The Longest Segmental Girder Construction Erected in the New York City Environs

Henry W. Hessing, PE, F.ASCE

The \$ 1.9 Billion Airport Access Project connects John F Kennedy International Airport (JFKIA) located in Jamaica, New York with two major intermodal connections -Long Island Rail Road (LIRR) and New York City Transit (NYCT).

## TRANSPORTATION TRACK

### The Nexton Parkway Exchange

John Walsh, PE, Michael Baker International

## TRADESHOW PARTICIPANTS



**12:15 – 1:50 PM ..... KEYNOTE ADDRESS**

**Augusta Canal - What Makes This a Civil Engineering Historic Landmark Still in Use**

Mark W. Lorah, PE, F.ASCE, Johnson, Laschober & Associates, P.C.

Thomas Robertson, PE, RLS, AICP, Cranston Engineering Group

Cherri DeFigh-Price, PE, F.ASCE, Parsons Corporation

*The Central Savannah River Branch of the South Carolina Section of ASCE submitted the Augusta Canal for National ASCE Historic Landmark designation. The National ASCE Committee on History and Heritage recently approved it and the presentation of the Plaque is anticipated in June 2018.*

*This presentation will provide a brief history of this canal which was designed and constructed in 1844 and is still in use. The presenters will emphasize the uniqueness of this design for its time and what has made it so successful over its 174-year life. The role of the city planners as well as the key designer/surveyor in defining this, the engineering challenges and the robustness of the design will be emphasized.*

*The Augusta Canal has been continuously under the direction of civil engineers for all three of its original purposes from the time of its original conception, design and construction (1844) through the present time (2018), including planning, engineering, designing, building, operating, and managing.*

*The upgrades of the canal over the last 174 years will be discussed as well it continues to support the City of Augusta through Power production, water control and more recently recreation. This includes elements of the headwater that have been in continuous use for over 170 years and what the future holds for this canal and its headwater structure. The presentation will include extensive photographs, particularly of the headwater and power generation structures, as well as examples of some of the original documentation.*

*At the end of the presentation, the presenters will also summarize what was involved in developing the package to allow this key engineering heritage site to be recognized as well as how groups can find out more about the design and engineering challenges.*

**2:00 PM – 2:50 PM ..... (1 PDH) .....CONCURRENT SESSIONS**

**CIVIL TRACK**

**Aluminum Structural Plate Culverts & Head Walls**

Maston Boyd, Pomona Pipe Products

**ELECTRICAL TRACK**

**Seismic Provisions - Will the Lights Come Back On?**

Phillip Caldwell, Schneider Electric

**ENVIRONMENTAL TRACK**

**Designing Vapor Intrusion Mitigation Systems (VIMS) to Depressurize Low Permeable Soils**

Thomas Hatton, Clean Vapor

*Designing efficient Vapor Intrusion Mitigation Systems (VIMS) to mitigate buildings constructed over low permeable soils requires an understanding of the complex variables that induce Vapor Intrusion coupled with precision under-slab pressure field extension testing. These buildings are the least understood and can present the greatest design and installation challenges. The presentation will share the diagnostic and design methodology as well as how integrating response driven remote management technology can optimize efficiency, provide assured performance and reduce operational costs. We will explore the benefits of remotely managed mitigation systems, automated fault notifications and the online management tools that improve system performance and streamline client and regulator reports. The presentation will include a case study of a recently mitigated North Carolina manufacturing building where we will demonstrate the relationship between low permeable soils, weather induced pressure variables, the application of dynamic motor technology, and the resultant cost savings that can be realized.*

**GENERAL BUSINESS TRACK**

**INSURANCE 101**

Karen McCabe, IMCI

**GEOTECH TRACK**

**Hugh Leatherman Terminal**

Ryan Keiper, Terracon

**TRADESHOW PARTICIPANTS**



## STRUCTURAL/FORENSIC TRACK

### Understanding the Challenges of Mid-Rise Wood-Frame Construction

Derek A. Hodgin, PE, Construction Science and Engineering, Inc.

Recent changes in the building code helped fuel the current surge in mid-rise wood frame construction projects. Over the past several years, there has been an increasing number of water intrusion claims in relatively new mid-rise wood frame buildings. While the code requires the building envelope to provide protection from the weather, it does not provide the details necessary for designers and/or contractors to meet this requirement. Typical construction details, that have had limited success on 1 to 3 story wood frame buildings, are even more problematic on taller buildings. Specifically, vertical and lateral movements, caused by frame compression, shrinkage, external loads and material incompatibility, can compromise the function of flashing and waterproofing details. Differential movements between the wood framing and exterior cladding components can cause physical damages to building envelope components that increases the extent of water intrusion. Once the water reaches the wood framing components, significant damages such as rot, corrosion and mold can result. Additionally, once compromised, the effectiveness of products used to meet fire resistance requirements is unknown. If our design and construction of the building envelope does not incorporate "best practices", mid-rise wood frame buildings may become the "black eye" of the construction industry.

## TRANSPORTATION TRACK

### Carolina Crossroads

Brian Klauk, PE and Ladd Gibson, PR, SCDOT

2:00 PM – 3:50 PM .....(2 PDH)

## FIRE/LIFE/SAFETY TRACK

### The Secret Life of Fire Department Connections: Parts 1 & 2

Robert O'Neill, SRS

3:00 PM – 3:50 PM..... (1 PDH) .....CONCURRENT SESSIONS

## CIVIL TRACK

### Hard Armor Erosion Alternatives-Reinforced Grass

Joe Church, PE, Low and Bonar and  
Andy Constantine, Platypus Anchors

Have you ever specified a Turf Reinforcement Mat (TRM), only to find no grass would grow on it?  
As site preparation technologies evolve and provide engineers and contractors more alternatives for establishing grasses on jobsites, the combination of Turf Reinforcement Mat (TRM'S) and hydraulically applied mulches have set themselves apart as the premier weapon against erosion. These products not only allow vegetation, but enhance vegetation when properly specified and applied. This presentation will cover the basics of TRM's applied with hydraulic mulch, and is divided into the following 3 sections:  
Part 1: A primer on hydro mulch TRM applications, including advantages, disadvantages, and installation techniques.  
Part 2: What characteristics in a TRM make for a great infill product, and how can other tools enhance selection.  
Part 3: We will explore real life applications (Case Studies) and lessons learned.  
Attendees will learn the basics of hydro mulch TRM applications, how to plan, design and execute these applications, and what to expect from a performance perspective

## ELECTRICAL TRACK

### Energy Efficient Lighting: It Depends

M.K. Baldwin, PE, Retired

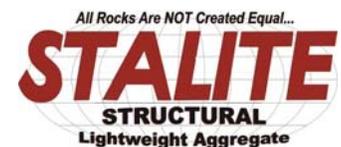
## ENVIRONMENTAL TRACK

### Histories Mysteries-Why Projects Sometimes Require Cultural Resource Surveys

Kimberly Nagel, S&ME

Have you ever wondered why some of your projects require State Historic Preservation Office (SHPO) consultation and others don't? In this session, Kimberly will answer that question and others regarding cultural resources, the Section 106 process, and how it relates to your projects. She will discuss the different types of surveys used and what the results of those surveys mean as it relates to project development and overall timelines; the process of consultation with state and federal agencies regarding cultural resources; what can be done to streamline the cultural resource process, making it relatively painless; and what should be done to avoid significant delays associated with cultural resources and/or consultation with state and federal agencies.

## TRADESHOW PARTICIPANTS



## GENERAL BUSINESS TRACK

### Innovative Solutions in Vegetation Establishment and Erosion Control

Melanie Fuhrman, Profile Products LLC

## GEOTECH TRACK

### Thermal Integrity Profiling for Drilled Shafts

David Schoen, S&ME

Three case studies are presented demonstrating TIP use in drilled shafts. The first study compares the results of 22 bridge shafts tested with CSL and TIP, using both an infrared probe and thermal wires, with a focus on the effects of bleed water on NDT results. The second study compares CSL and TIP on a test shaft instrumented with dual level O-Cells and manufactured defects consisting of bags of gravel to simulate segregated concrete. TIP was performed with thermal wires embedded within the concrete as well as wires placed within the water filled CSL tubes to determine the effectiveness of defining the known anomalies. The third project consisted of a private job and 450 drilled shafts constructed during two phases. Each phase had an accelerated schedule with multiple rigs working simultaneously. TIP identified anomalies, and those anomalies which were thought to impact shaft performance were confirmed regularly with coring.

## STRUCTURAL/FORENSIC TRACK

### Unique Structural Engineering to Support Restoration of the Historic Miller Theater

Mark W. Lorah, PE, F.ASCE, Johnson, Laschober & Associates, P.C.

## TRANSPORTATION TRACK

### NC DOT Update

Bobby Lewis, Chief Operating Officer, N.C. Department of Transportation

4:00 PM ..... Trade Show Closes

4:00 - 5:00 PM ..... Work Life Balance  
Women in Engineering

6:30 PM ..... Reception

7:00 PM ..... Awards Banquet



# SATURDAY - June 9, 2018

4 PDHs Available for the Day

7:00 AM - 12:00 PM ..... Registration

7:00 AM - 7:50 PM ..... PENC Annual Business Meeting

7:30 AM - 8:30 AM ..... Break

## 8:00 AM - 12:00 PM ..... (4 PDH) ..... CONCURRENT SESSIONS

8:00 AM - 8:50 AM ..... (1PDH)

### Data Analytics: Saving More than Energy

Kevin Day, PE, CEM, CCP, LEED AP, GGP and James Mascaro, PE, CCP, MBP®

Building automation systems are collecting and storing massive amounts of data. Reviewing that data typically involves downloading trends from the previous 30 days, converting the data into a plottable format, and expending countless hours of engineering analysis. As a result, other than system failures and hot/cold calls, poor system performance does not get identified for two or three months after an issue arises.

Data analytics accesses and evaluates big data within the building automation system in real time. See how Big Data was used to defend a design firm from a \$1 million claim, and how data analytics could have prevented the claim from occurring. Learn how to leverage data analytics to prioritize your maintenance work orders so that your limited resources can be focused more on resolving critical performance issues, and less time treating the symptoms. Understand how energy managers can utilize data analytics to track energy metrics as well as fine tune system performance through real time trend analysis.

9:00 AM - 10:20 AM ..... (1.5 PDH)

### Pipe Fundamentals & Design of Reinforced Concrete Pipe

Al Hogan and Tiffany Ferrell, Rinker Pipe

Every engineer should be able to structurally design the pipe products they wish to utilize in their overall site or roadway plans. This interactive technical presentation will review the fundamentals of storm drain piping systems and will culminate in the attendees participating in a RCP structural design example. The fundamentals will discuss how all pipe systems utilize the soil-pipe interaction to accommodate all loads anticipated on the installed pipe. The importance of foundation, bedding and structural backfill will be discussed. In the design section, we will discuss the steps in the structural design of RCP. The importance of the designer, producer, installer, and inspector to achieve a successful structural design will be shared with the audience. We will discuss design aids available to assist the engineer to safely and accurately complete a structural design for RCP. With the help of the attendees, we will work through a structural design example using one of the design aids. (Each attendee will receive a copy of the design aid utilized in the example structural design.)

10:30 AM - 12:00 PM ..... (1.5 PDH)

### Pipe Installation & Inspection Milestones

Al Hogan and Tiffany Ferrell, Rinker Pipe

A properly installed pipe should remain in service for 50 to 100 years with little or no repair. The class promotes a solid understanding of installation, specifications, design requirements and material differences for pipe systems. Empower your staff with the ability to properly inspect, design, install and accept both flexible and rigid pipe systems. It is in the best interest of the Owner to know that all pipes in their system have been properly installed and were not damaged such that the pipe system was compromised. Post installation inspection (PII) provides the Owner the information needed to determine whether proper installation occurred prior to project close-out or final acceptance.

This presentation will discuss briefly the key components of a successful storm pipe installation and associated inspection tools and techniques. The required trench conditions will be discussed and will include the importance of proper foundation, bedding, jointing, and structural backfill for pipe installation. Our discussion will be centered around current national standards and NCDOT and SCDOT specifications.

Much of the presentation will focus on the important inspection milestones and current tools and techniques that should be utilized for a pipe installation. Our inspection milestone discussion will include the inspection requirements during pre-installation, installation and post installation of a pipe installation. We will review current national standards for the pre-installation (AASHTO R-73) and post installation inspection (ASTM C1840) of RCP which are the main tools that may prove to be helpful to the engineer or inspector on a project.

The audience will participate in the evaluation of RCP in both the pre-installed condition and post installation inspection examples. The post installation evaluation examples will utilize current inspection evaluation tools to practice the process of proper evaluation of an installed pipe.

## TRADESHOW PARTICIPANTS



If you are interested in becoming a Tradeshow Exhibitor, please use the link below:

[Tradeshow Exhibitor](#)

**8:00 AM – 12:00 PM..... (4 PDH)..... CONCURRENT SESSIONS**

8:00 AM - 9:50 AM..... (2 PDH)

**Leadership Institute Presentations**  
Sean Gleason, PENC

10:00 AM - 10:50 AM ..... (1 PDH)

**Building Envelope Evaluations - Uncovering the Source and Cause of Moisture Intrusion, Paint Failures, and Poor Energy Performance**  
Terry Carroll, P.E. – KTA-Tator, Inc.

11:00 AM - 11:50 AM ..... (1 PDH)

**3-D Above Ground and Below Ground Deliverables for Subsurface Utility Engineering (SUE)**  
Matthew J. Wolf, GEL Geophysics



**REGISTRATION INFORMATION**

**Registration Rates**

Thursday Only ..... \$108.00  
Full Conference ..... \$350.00  
Thursday/Friday ..... \$265.00  
Friday/Saturday ..... \$288.00  
Friday Only ..... \$175.00  
Saturday Only ..... \$96.00  
Spouse/Guest ..... \$150.00  
Banquet Only ..... \$85.00

**REGISTRATION DEADLINE - JUNE 1**

To Register for the Conference click on the link below:

[Conference Registration](#)

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**HOTEL INFORMATION**

Hilton Myrtle Beach Resort  
10000 Beach Club Drive  
Myrtle Beach, SC 29572-5304  
Phone: 843.449.5000

[Hilton Registration](#)

**Alternate Hotel**

Courtyard by Marriott  
Barefoot Landing  
1000 Commons Boulevard  
Myrtle Beach, SC 29572  
843-361-1730

[Marriott Registration](#)

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**CONTACT INFORMATION**

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