

Chattanooga Development Symposium 2018

August 6, 2018

Note: Abstracts are in no certain order.

Symposium Keynote

Abstract: This keynote will high-light past & present development in the greater Chattanooga area and the intricacies involved with developing in the scenic city. Presenters will quantify past & current development status and success and discuss how development in the City will move forward.

Presenter Bios:

(1) **Jim Williamson**, VP Planning & Development, River City Company

Jim Williamson received his degree in Architecture from the University of Tennessee Knoxville and his background and work experience in architecture, development and construction gives him a unique perspective when working with potential businesses, government and other strategic partners to advance Downtown Chattanooga.

With a history of directing sustainability initiatives and managing development projects, Jim's major responsibilities include the oversight of the day to day operations and facilities maintenance of all properties owned and controlled by River City Company. He also oversees the property acquisition process, often leading to the sale or partnership with developers for specific development projects typically including property due diligence, contract negotiations, assembling request for proposals and general project management.

Jim also oversees and manages planning studies involving multiple consultants and stakeholders. As warranted, he manages development projects from inception, due diligence and entitlement through design, construction and completion often including tenant negotiation and leasing.

Bringing 26 years of experience in project management to River City Company, Jim utilizes a multitude of acquired skill sets from architecture, development and construction to balance the design, budgeting, management and general understanding of the development process.

(2) **City of Chattanooga Mayor Andy Berke**

After graduating with honors from Stanford University in 1990, Andy worked as a legislative assistant in the office of Tennessee Congressman Bart Gordon. Seeing Congressman Gordon's attentiveness to his constituents' needs, Andy decided public service was where he could best serve his community.

Andy graduated with honors from the University of Chicago Law School in 1994. Following law school, he worked as a law clerk in the United States Court of Appeals in Denver, Colorado. During this time he also taught at Kansas University Law School as an adjunct professor.

Elected to the State Senate in 2007 & re-elected in 2008, Andy became the Vice-Chairman of the Senate Democratic Caucus. He served on the Senate Education and Transportation Committees and was appointed by Governor Phil Bredesen to the State Workforce Development Board.

Immediately following his election to Mayor of Chattanooga in March 2013, Mayor Berke streamlined government with a top to bottom reorganization that eliminated three departments and saved taxpayer dollars in the process. Since the reorganization, the Berke Administration has relentlessly focused on making Chattanooga streets safer, families stronger, growing middle class jobs, and using taxpayer dollars efficiently.

During the Mayor's tenure, Chattanooga has seen a number of improvements in quality of life ranging from a decrease in both property and violent crime to a drop in unemployment of more than 2% and over 6,157 new jobs have come to the Chattanooga region. Foreclosure rates have decreased while Chattanooga had the third highest wage growth in the country for a mid-sized city in 2014 and more than 117 homeless veterans have been housed in the Chattanooga area.

Under Mayor Berke's leadership, following a robust public engagement process, Chattanooga established an Innovation District -- 140 acres in the heart of downtown that houses a catalytic mix of start-up businesses, incubators, and accelerators alongside investors and public amenities.

For his many works, Mayor Berke was named Municipal Leader of the Year by American City and County magazine.

Certified Floodplain Surveyor Program Overview

Abstract: This 50-minute presentation will focus on the background of the National Flood Insurance Program (NFIP). In addition, the presentation will focus on Tennessee's Certified Floodplain Surveyor (CFS) Program. This certification program educates surveyors on the forms and processes associated with floodplain properties and the submittal of Elevation Certificates. To become CFS certified, licensed surveyors must successfully complete the 2 ½ day certification seminar and exam. The presentation will review the roles of the federal, state and local community. In addition, there will be an overview of the complexities of completing the elevation certificate documentation and a summary of the CFS statewide program.

Presenter Bios:

C. Barton Crattie is a land surveyor licensed to practice in Tennessee and Georgia. Bart holds a BFA degree in three dimensional design through Murray State University. He has been a Certified Floodplain Manager for 9 years. Many of his articles on floodplain issues have appeared in American Surveyor magazine and other publications. A large part of his business with Niles Surveying Co, Inc. in Chattanooga is related to floodplain consultation in general, Letters of Map Change and Elevation Certificates.

Amy Miller is the State NFIP coordinator for the State of Tennessee. Amy holds a Bachelor's degree in Agricultural Education and a Master's degree in City and Regional Planning both from The Ohio State University. She has been the NFIP Coordinator for 3 years. In this role, she assists citizens and professionals with questions regarding the National Flood Insurance Program and aids local elected

officials and staff to implement effective floodplain management strategies in their communities ensuring compliance with their NFIP requirements.

Chattanooga's Consent Decree Program Update: Are We Done Yet?

Abstract:

The short answer is...not quite, but we are making good progress. A quick recap of the program is the City is executing an aggressive 17 ½ year, EPA driven Consent Decree (CD) wet weather capital improvements program in two Phases. Phase 1 is 7.5 years with Phase 2 the following 10 years. Phase 1 is expected to cost \$264M. The CD is in response to lawsuits filed against the City of Chattanooga by the EPA alleging violations of the Clean Water Act. An agreement was reached between Chattanooga and the EPA in the form of the CD entered on April 24, 2013. The overall compliance plan of the CD is to significantly minimize, and eliminate where possible, sanitary sewer overflows ("SSOs") and improve the operation of its sewer system. Phase 1 includes targeted projects to assess and rehabilitation pipelines in the top critical basins, update the CMOM program, GIS development/Hydraulic model, wet weather volume reduction projects, CSO Long Term Control Plan solutions, and WWTP and pump station reliability improvement projects.

Thus far for Phase 1 we are approximately 66 % complete on projects in the program with 74 % of the CD Phase 1 time elapsed, and 62 % spent of our stated budget for Phase 1. A quick analysis suggests that we are projecting within budget and should finish the projects on schedule. This is welcomed news to City managers as they have vowed to keep the sewer rate hikes to residents to a minimum as they comply with the CD. A few significant accomplishments to date include maintaining the original compliance plan to solve the problem and address the EPA concerns in the CD, having all the projects stated in the CD under contract with most completed or in the construction phase, and having completed 78% of the over 105 compliance submittals on time and without penalties.

This presentation will focus on various elements of the status Chattanooga's CD program and the key elements and configuration that have put the City in a position of sustainable compliance and success.

Presenter Bio: Mike Marino, P.E., Jacobs

Mike Marino is currently the Operations Manager in the Jacobs Chattanooga, Tennessee office, and the Program Manager of the City of Chattanooga Consent Decree Program. Mike has more than 25 years of consulting, management, and project engineering experience. Mike earned his BS in Chemical Engineering from Rutgers University and MS in Environmental Engineering from Mississippi State University. Mike's professional interests include, wastewater collection system engineering, program management office development and execution, and wet weather consent decree negotiation. Mike enjoys traveling the world, exploring of all types and spending time with his wonderful wife Ruth beautiful child Melanie.

Buffer, Survey and Preconstruction Requirements

Abstract: For construction projects in the City of Chattanooga:

- Pre-construction meeting requirements & notification
- Delineating water quality & landscape buffers in the field - surveyed & marked
- Stay-on Volume
- Requirements from surveyors & their role in the process
- As-builts & closeout procedures

Presenter Bio: Jeremy Swilley, CPESC, CPMSM, HMT, is the Construction Program Supervisor for the City of Chattanooga's Land Development Office.

Developing the waterfront-Working with TVA managed waterways

Abstract: Topics covered as it relates to TVA:

- TVA Control & Boundary Data including common errors in vertical control, contours, contour boundaries
- Plane table, land acquisition map, land sale, coordinate systems
- Drawings: symbols, legends & title blocks
- Land scale map
- Drafting standards
- Land Use Orientation: Surveying, Mapping & Legal Descriptions
- Examples

Presenter Bio: Barry Savage is currently manager of the Survey Products group at the Tennessee Valley Authority (TVA) in Chattanooga, Tennessee. Prior to his service at TVA he was in private survey practice for 10 years specializing in dispute resolution and expert witness services. He has surveyed several disputed state boundaries to resolve jurisdictional conflicts. Mr. Savage is an adjunct professor at Cleveland State Community College where he teaches courses in boundary law, geodesy, GIS, and surveying fundamentals. He has researched and retraced the historical surveys of Henry David Thoreau and has published several articles on the subject. Mr. Savage teaches exam review and continuing education seminars at various state and local conferences across the country. He has served as director of production for Cook and Spencer Consultants in Chattanooga. Mr. Savage was senior designer at Psi Consulting Engineers where he worked on structural and environmental design. And, he was a survey supervisor at Whitfield Engineering in Dalton, Georgia. Mr. Savage received his B.S. degree, with high honors, in civil engineering technology from the University of Tennessee at Martin.

Form-Based Code 12-month edits

Abstract: Feeling confused and overwhelmed with the 30 pages of recent Form-Based Code edits? Not to worry! We will review the edits, their implications for your project and address commonly asked questions.

Presenter Bio: Emily Dixon works for the City of Chattanooga Land Development Office as a Development Review Planner. Using the Form Based Code she reviews plans, makes suggestions to reduce variances and prepares variance cases to go before the Form Based Committee. Emily holds a degree from the University of Georgia in Athens.

Emily Dixon

Development Review Planner

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Case Study: St. Elmo Drainage Project (The Big Dig)

Session Description

To prevent a catastrophic failing of their stormwater infrastructure and potential water contamination from a former landfill, the City of Chattanooga took action to redesign the storm conveyance in the historic St. Elmo area of the city. The new storm drainage is designed to accommodate a 100-year storm event for an 1,100 acre drainage area. The discovery of contaminated soils complicated the project and brought in additional stakeholders. The new infrastructure has been designed with expansion in mind to pave the way for future development of the area in conjunction with the planned extension of the Chattanooga Riverwalk.

This project was an archeological find away from having everything! The session will discuss some of the unique challenges, including extremely large excavation (big dig), contaminated soil testing and handling, tight schedule windows, endangered bats and multiple tunnels.

Presenters Bios (2):

Philip Nelson, P.E. joined Civic Engineering and Information Technologies, Inc. (Civic) in Nashville in 2006 as a Project Manager and now serves as the Director of Engineering. He has over 19 years experience in stormwater, water/wastewater and transportation projects. Philip received a BS in Civil Engineering from Auburn University in 1999.

Rick Bruce, PG, CHMM joined S&ME, Inc. in Knoxville in 2006 as a Project Manager and has served in various roles, including Senior Project Manager, Environmental Group Leader, Senior Reviewer, Remediation Work Group Member and is currently the Technical Lead for Site Assessment Services at S&ME. He has 6 years oil and gas exploration experience in the Mid-Continent region of Oklahoma and Illinois Basin and more than 28 years of environmental project experience, including environmental investigation and remediation, regulatory compliance, demolition and decommissioning, hazardous and non-hazardous waste management, and Brownfield assessment and redevelopment. Rick received a BS in Geology from the Murray State University in 1983 and is a Certified Hazardous Materials Manager.

Innovations in Green Infrastructure Designs: Seeing the Green in GI

Abstract:

Green Infrastructure practices, including Stormwater Control Measures (SCMs) such as bioretention areas, permeable pavement, constructed wetlands and regenerative conveyance systems, have been found via recent research efforts to be highly effective at infiltrating excessive runoff and improving downstream water quality. This research has suggested a more refined methodology in accounting for SCM effectiveness; specifically the nutrient mass balance approach, which has been successfully implemented in most North Carolina watersheds. Other design modifications will also be discussed, including incorporation of Internal Water Storage (IWS) zones within bioretention areas and permeable pavement. These discussed design modifications have been shown, via peer-reviewed research models, to increase the overall infiltration potential, and subsequently water quality improvements, of these practices.

Primary learning objectives:

1. Describe the ideal balance between green and grey infrastructure in upsizing an urban core stormwater drainage system.
2. Discuss the H&H modeling challenges and opportunities related to a complex urban retrofit project.
3. Demonstrate infiltration based SCM modeling that was used to quantify water quality improvement.

Presenter Bio:

Marc is a Project Manager for the WK Dickson Stormwater Group with an emphasis on municipal stormwater infrastructure, including planning and design, hydraulic and hydrologic modeling, innovative and sustainable site design, and stormwater SCM design. He has both Undergraduate and Master of Science Degrees from the Biological Engineering Department at North Carolina State University. His career expertise includes mathematically modeling complex hydrologic and hydraulic systems; including using models such as EPA SWMM, HEC-HMS, HEC-RAS, and AutoDesk HydraFlow Storm Sewers/Hydrographs. In addition to modeling proficiency, Marc's expertise includes planning and designing innovative water quality devices for Capital Improvement Projects (CIPs), LID and infrastructure upgrade projects. He has also served as an advisor for the Nutrient Crediting Committee for the State's BMP minimal design criteria. Marc is a registered Professional Engineer in Georgia, North

Carolina, and South Carolina, is also a certified Professional Hydrologist and a Certified Floodplain Manager.

Marc Horstman, PE, PH, CFM, Project Manager
WK Dickson & Co., Inc., 720 Corporate Center, Raleigh, NC 27607
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Historic Preservation in the Chattanooga Area

Abstract: Historic Preservation is often seen as a hindrance to development. Learn how historic preservation can benefit development projects through preservation programming.

Presenter Bio:

Melissa Mortimer has a bachelor's degree in Interior Design and a Masters of Historic Preservation from the University of Kentucky. She currently serves on the Chattanooga Historic Zoning Commission and works as the Historic Preservation Planner for the Southeast Tennessee Development district, assisting 10 counties with preservation work.

Lessons in designing a city wide Flood Preparedness Program for Chattanooga

Abstract: Flood Preparedness Study – focuses on creating tools and informational aids that quickly allow decision makers to understand potential risk before and during a storm event. Installation of additional real time stream flow gages in several watersheds. Updated hydrologic and hydraulic modeling of previously unstudied areas. GIS map layers of the eight standard frequency estimates (2-year to 500-year). “Real Time Simulation” modeling that uses rainfall estimates to create flood risk scenarios.

Presenter Bio: Steve Stello, PE, is a native of Baltimore, Pennsylvania. He attended Pennsylvania State University where he studied hydraulic engineering, and began working for the Corps of Engineers 16 years ago. Steve joined the Nashville District in 2012 after transferring from the Honolulu District and is a civil hydraulic engineer in the water resources section of the hydraulics and hydrology branch of the U.S. Army Corps of Engineers Nashville District.

Demonstration of Web & Mobile GIS Tools

Abstract: The City of Chattanooga's Public Works Department leverages several different ESRI products to improve workflows and increase productivity. We will demonstrate a sample of our mobile and desktop applications, including Collector for ArcGIS, Survey123, and Web AppBuilder.

Presenter Bio: Johnny O'Donnell has a BA in Anthropology from Sewanee and has been with the City of Chattanooga for about 4 years. He is a GIS Analyst for the Department of Public Works and is married with 2 daughters.

Chattanooga Design Studio: Then & Now

Abstract: This session will provide a historical view of Chattanooga and the downtown's resurgence through the lens of the Studio's work. The subject matter will explore the planning and design history related to Downtown Chattanooga from the early 80's to the present. The presentation will also highlight the studio and it's current work in shaping our city.

Presenter Bio:

ERIC R. MYERS, AIA, NCARB, LEED® AP BD+C

Eric Myers was appointed as the Executive Director of the Chattanooga Design Studio in March 2017. In this role he oversees strategic development, fiscal performance, and is the Studio's primary spokesperson to the media and the general public. Under his leadership, the Studio has begun to strengthen relationships with various outside organizations and has aligned the studio's program focus to help the Board of Directors engage on specific mission related opportunities.

A native of Maryland, Myers is a LEED accredited registered architect and urban designer with a broad ranging background and breadth of experience in Chattanooga and the Southeast. For over 22 years Eric has practiced architecture and urban design in Chattanooga. Prior to joining the Chattanooga Design Studio, Eric founded a design firm and through his 10 years of leadership, the organization helped create urban housing, commercial retail and offices, healthcare facilities, historic preservation efforts, as well as urban design and neighborhood structure plans. Eric was also urban design coordinator at the community's legacy studio which operated from 1980 until 2005. He holds a bachelor of architecture degree from the University of Tennessee, Knoxville.

Eric currently serves on the Chattanooga Neighborhood Enterprise Board of Directors. He is the immediate past president of Cornerstones, Inc. and past president of the Chattanooga Chapter of the American Institute of Architects. Myers also served a 2014 to 2017 appointment to the Chattanooga-Hamilton County Regional Planning Commission.

Emerging Positioning Technologies

Abstract: This session will cover emerging positioning technologies including equipment and tools to be utilized in the field.

Presenter Bio: Troy Deaton started learning the trade at the young age of 18. Fast forward to today, he now has over 27 years of experience specializing in a variety of positioning technologies including: robotic repairs, radio communication, GNSS, UAS, and much more. In 2013, he decided to branch out on his own and Deaton's Geo-Tronics was born and is still going strong today. When he is not working, he enjoys attending church and spending time with his family. He hopes this class will be an asset to you and your crew.

Pervious Concrete-Mix Design, System Design, Maintenance and Cleaning

Abstract: Pervious concrete is an important tool to help owners and regulators meet stormwater objectives in new construction or renovation projects. Pervious concrete allows the 'stacking' of multiple services into a single system and provides many benefits to the project. Properly designed pervious concrete systems provide reduced stormwater generation, detention storage, hard surface & handicap accessible parking along with other benefits AND they are straightforward to maintain as well as clean. Much has been learned about pervious concrete mix designs, installation procedures, maintenance and cleaning over the past 10 years and this presentation will compile what has been learned to quickly bring your knowledge about pervious concrete up to speed.

Presenter Bio: Alan Sparkman has served as the Executive Director of the Tennessee Concrete Association since 1998. He regularly teaches concrete industry professional courses across the US and served as an Assistant Professor at Middle Tennessee State University for the Concrete Industry Management program for the 2010-2011 academic year. He developed and teaches a class on Concrete Construction Sustainability for the "Concrete" MBA program at MTSU.

He has been deeply involved with pervious concrete for over a decade and regularly places pervious concrete both for TCA demonstration projects and commercial projects where he is asked to assist and train contractors learning about the correct placement of pervious concrete. Alan holds the NRMCA Pervious Concrete Craftsman certification and is a co-author on several research publications relating to pervious concrete, as well as other concrete topics. He works closely with universities in Tennessee to design and direct research relating directly to current concrete issues, and TCA publishes this research in Tennessee Concrete magazine on an ongoing basis.

Alan maintains an active teaching and training schedule and has taught parts of the NRMCA Concrete Sales Professional program for California, Tennessee, Georgia, Kentucky, Indiana, Texas and New Jersey, as well as for the National Ready Mixed Concrete Association. In addition, he is an approved examiner for the ACI Flatwork Finisher program and is certified to teach the NCCER Wheels of Learning Concrete Craft Training.

As a firm believer in lifelong learning, he completed his Masters of Business Administration degree in May of 2004 from Jones International University. In November of 2006, Alan became a LEED Accredited Professional through the U.S Green Building Council and in January of 2007 Alan earned his Certified Association Executive (CAE) designation, a certification earned by less than 5% of all association professionals. He currently holds 15 technical and professional certifications related to concrete, construction and association management.

Alan was honored to receive one of the prestigious Kodak American Greenways Awards in 2004 for his efforts in making the Count on Concrete bike ride across America a success. He was honored with the 2010 Tennessee Sustainability Award by the Tennessee Environmental Council, and has twice been honored with the TCA President's Award (2008 & 2013). In April of 2016, Alan received the Concrete Sustainability Award from the American Concrete Institute "for significant mentorship of the concrete community in the field of sustainability and exemplary outreach to those in the public, private and social sectors improving recognition, understanding and appreciation for the sustainable benefits of concrete as a building material." Also in 2016, Alan was recognized as the 2015 Association Executive of the Year

by the Tennessee Society of Association Executives.

TCA has been named by the National Ready Mixed Concrete Association as the State Association of the Year three times under Alan's leadership, with the most recent award coming for 2015.

Cutting Edge of Concrete Mix Designs

Abstract: Technology is rapidly improving the capabilities of modern concrete and providing benefits to designers, owners and installers - if you know how to take advantage of the latest advancements. This session will provide an overview of the latest trends in concrete mix designs and will include information on self-compacting and self-consolidating concrete, roller compacted concrete, and current ACI specifications for durable concrete in exterior applications.

Presenter Bio: Alan Sparkman has served as the Executive Director of the Tennessee Concrete Association since 1998. He regularly teaches concrete industry professional courses across the US and served as an Assistant Professor at Middle Tennessee State University for the Concrete Industry Management program for the 2010-2011 academic year. He developed and teaches a class on Concrete Construction Sustainability for the "Concrete" MBA program at MTSU.

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The Cutting Edge of SCM O&M

Abstract: Mr. Lawrence's presentation shares important information from the ASCE EWRI SCM O&M conference held in Denver in November of 2017 by highlighting the speakers for the sessions he attended and important points from each that are applicable to SCM O&M in the Southeast. Additionally, the presentation weaves Mr. Lawrence's own experience with SCM O&M from both the regulator and consulting engineer viewpoints.

ASCE - American Society of Civil Engineers
EWRI - Environmental and Water Resources Institute
SCM - Stormwater Control Measure
O&M - Operation and Maintenance

Presenter Bio: **Thomas B. Lawrence**, PE is a consulting engineer with Thomas Lawrence Engineering, PLLC specializing in water quality protection and restoration, including projects as varied as underground tank remediation, Industrial SWPPP and SPCC development, construction site erosion prevention and sediment control design and implementation, and municipal storm water pollution prevention. He is an experienced and well-received speaker and instructor, having spoken at professional conferences throughout the country.

He is past President of the TN Section of ASCE, the Environmental and Water Resources Institute Tennessee Chapter, the West TN ASCE Branch, the Engineer's Club of Memphis, and the Memphis Chapter of TSPE.

He is a registered Professional Engineer in California, Illinois and Tennessee and has been working as a Civil Engineer for over 25 years.

Using Design-Build-Monitoring to Inform LID in Tennessee

Abstract: Ongoing efforts at the University of Tennessee (UT) aim to better understand and design stormwater management practices. This presentation will review the process of designing, building, and monitoring stormwater controls by UT, and illustrate the value of research in better informing design and regulatory decisions.

Presenter Bio: Jon Hathaway received his PhD from North Carolina State University in 2010, where he studied the fate, transport, and removal of indicator bacteria in urban stormwater runoff. After a brief research fellowship at Monash University in Melbourne, Australia, and nearly two and half years at one of the nation's leading ecological design and consulting firms, Hathaway joined the faculty of the Department of Civil and Environmental Engineering at the University of Tennessee at Knoxville.

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The LID Technology Selection Pyramid: A Green Infrastructure Design Approach

Abstract: With the expanding demand to implement green infrastructure and low impact development (LID) practices, a variety of innovative site development designs are emerging. Incorporating technically feasible and cost-effective stormwater management practices into these design strategies requires an understanding of the regulatory framework within which LID technologies are selected. Agencies commonly follow a preferred technology selection process instead of simply identifying a given technology and implementing it. If the most preferred technology cannot be installed due to limiting site conditions, then the next technology option should be considered, and so on, until the appropriate technology(s) can be utilized.

A five step LID technology selection pyramid has been developed to illustrate how to select an appropriate green infrastructure approach for site development plans. The five LID technologies are listed below in descending order of selection:

1. Surface Infiltration,
2. Subsurface Infiltration,
3. Rainwater Harvesting,
4. Biofiltration, and
5. Treatment Train Options including Media Filtration, Hydrodynamic Separation, Detention and Storage.

The fundamental goal of LID is to mimic pre-development hydrology by not creating runoff and allowing on-site stormwater to infiltrate to the ground. This presentation explores how the pyramid depicts the LID selection processes and compares those technologies to whether they focus on runoff reduction, stormwater treatment, or a combination of both through treatment train designs. Consideration is also given to whether implementation of any technology is feasible and/or cost-effective given the intended land use(s).

A case installation is described where elements of the LID technology selection process were implemented at the five acre (former) Cavalier Plant Brownfield site near downtown Chattanooga, Tennessee. The property was used for a variety of manufacturing purposes for well over 100 years and is now used as an operations center for the local electric utility. The retrofit stormwater design includes surface infiltration using driveable grass, underground infiltration and detention using modular polyethylene structures, biofiltration using a land based design, and hydrodynamic separation for pretreatment using a manufactured treatment device. The installation of these design elements necessitated management of previously contaminated soils on the brownfield site. These technologies utilize an integrated technology solutions approach to both enhance and complement the principles of LID design goals. Lessons learned regarding the installation of the design components are also described.

A second case installation is provided where a combination of surface infiltration, rainwater harvesting, water quality treatment using a post-construction treatment device and water re-use are applied at a corporate office development located within a small industrial park in Hixson, Tennessee. Harvested water is used for irrigation, toilet flushing and a decorative fountain. The green infrastructure development approach used 100% of the available land space versus 89% land use had a conventional detention pond been utilized. A favorable return on investment and a stormwater fee reduction was

realized using the integrated LID technologies. The design reduced the volume of potable water use to allow the local drinking water utility to provide potable water elsewhere. Lessons learned associated with the stormwater infiltration design are also be identified.

Presenter Bio: Mark Miller serves as Research Scientist for AquaShield™, Inc., a manufacturer of stormwater treatment systems headquartered in Chattanooga, Tennessee. He is responsible for product development, regulatory affairs as well as directing lab and field testing programs. Mark is a member of the Chattanooga Stormwater Regulations Board and is a former Technical Committee Chairman for the Stormwater Equipment Manufacturers Association. Mark holds an M.S. in Geology from Centenary College in Shreveport, Louisiana and a B.A. in Geology from the University of Tennessee, Knoxville.

Mark B. Miller, Research Scientist, AquaShield™, Inc., 2733 Kanasita Drive, Suite 111, Hixson, TN 37343, mmiller@aquashieldinc.com

Ethics Case Study – The Citicorp Center: A Near-Disaster Averted

Abstract: The practice of engineering & architecture can be extremely rewarding, but like any profession, the practice must include attention to a host of various business and legal issues. For many design professionals, dealing with the myriad of requirements and the complexities they impose can be challenging, and there is a related subject that is often overlooked—ethics. In most instances, sound business or legal decisions will also serve to fulfill one’s ethical obligations. However, there are times when general business acumen will not serve to fully address ethical responsibilities or when ethical obligations dictate choices that are completely different than those from the business or legal perspective. It is in these situations that design professionals will be challenged to identify issues and formulate important yet difficult decisions that may serve to define one’s practice.

The design of the Citicorp Center in New York City provides an excellent case study to analyze the competing demands placed on design professionals and to examine how business, legal and ethical responsibilities must be carefully considered and balanced.

Presenter Bio: Tim Gibbons

Building on his first career as a licensed architect, Tim Gibbons has focused on construction law and related topics in his law practice at Chambliss, Bahner & Stophel where he serves as Chair of the Construction Group. He has resolved a wide range of construction disputes in the courtroom and through arbitration and mediation, including disputes over differing site conditions, lost efficiency, change orders, defective design and construction claims, structure collapses, and job site fatalities.

Tim received his Bachelor of Science (1979), Master of Architecture (1981), and Master of Science in industrial management (1982) degrees from the Georgia Institute of Technology. He practiced for seven years as a licensed architect in the State of Georgia prior to attending law school. He received his law degree from the University of Georgia (1991).

Tim is a member of the National Construction Panel of the American Arbitration Association, and has served as an arbitrator on construction cases involving payment disputes, defect claims, terminations, and concealed conditions. Some of the disputes in which he has served as arbitrator have involved

claims in excess of \$5 million.

He is a founding fellow of the Construction Lawyers Society of America and is also a founding member of the Tennessee Association of Construction Counsel.

Engineered Nanomaterial in Surface Water Systems as Pollutant

Abstract: Over the past decade, ever-evolving applications of nanotechnology have extended its reach to almost every sector of human life. Cutting-edge advancements in nanotechnology have led to the increased production volume of consumer products containing engineered nanoparticles (ENPs). Manufacturing Industries across the globe employ ENPs for applications such as chemical and medical equipment, cosmetics, catalysts, environmental remediation solutions, pharmaceuticals, and electronics. Increased production and use of newly developed ENPs ultimately have led to its increased presence in surface waters. ENPs are emerging pollutants with potential concern in surface waters. Our presentation will focus on identifying physiochemical properties of ENPs that are ubiquitous in surface waters, explore how these properties affect the fate and transport of the ENPs and uncover how environmental factors play a role in the fate of ENPs that can provide insight into their treatment.

Presenter Bios:

- (1) Breana Harvell received her Bachelor's of Science in Materials Science and Engineering from the University of Tennessee at Knoxville. She has been employed at Steward Advanced Materials, here in Chattanooga, for four years as a Process Engineer. In addition to working full-time, she is pursuing a Master's degree in Chemical Engineering from the University of Tennessee at Chattanooga. During her tenure at the UTC, she has worked diligently with Dr. Jejal Bathi to shine a light on the importance of monitoring the fate and occurrence of engineered nanomaterials in our surface waters, as the release of these materials ultimately affects not only the health of our ecosystems but our drinking waters as well.
 - (2) Dr. Jejal Reddy Bathi is a Visiting Assistant Professor in the Civil and Chemical Engineering Department at the University of Tennessee at Chattanooga (UTC). Dr. Bathi is a certified professional engineer and has been the project manager and principal investigator for several urban water resources engineering projects and as an independent engineer he executed engineering projects worth about a million dollars. Dr. Bathi received his PhD in Civil Engineering with major in Water Resources Engineering from the University of Alabama (UA) in 2008 and he received double MS degrees in Environmental Engineering (National University of Singapore, 2004 and UA, 2007). Dr. Bathi worked on research projects funded by both public and private agencies including National Science Foundation (NSF), U.S. Environmental Protection Agency (US EPA), National Institute of Health (NIH) and Institute of Scrap Recycling Industries Inc (ISRI). In addition to more than 12 years of professional experience, his past academic experiences include Post-Doctoral Fellowship at UA and as a Research Scientist at Jackson State University, MS. In this current calendar year, Dr. Bathi has developed and taught two new courses in Environmental Engineering at UTC. As an independent practicing engineer. Dr. Bathi's expertise include: (1) urban runoff characterization, (2) understanding the fate and transport of emerging contaminants in surface water environment, (3) application of distributed and lumped simulation programs to understand sensitivity of water resources for changing land uses and weather patterns, and (4) application of green infrastructure for urban drainage and water quality management.
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A Guide to Sizing a Stormwater Quality Manufactured Treatment Device

Abstract: Proper sizing of post-construction, proprietary manufactured treatment devices (MTDs) is critical to ensure both long term performance and functionality to meet stormwater quality treatment goals. Green infrastructure and stormwater control measures (SCMs) are integral components of the Low Impact Development (LID) design approach. An LID technology pyramid is presented to illustrate a hierarchical approach to the selection of both non-structural and structural SCMs (including MTDs) within a stormwater management framework. These LID technologies, when implemented individually or in a treatment train that can include an MTD, rely on site designs to achieve the primary LID goal of runoff reduction and secondary goal of water quality treatment.

In order to properly size an MTD, the following facility design elements should be defined:

- Water quality flow rate (WQf) that the MTD is to treat,
- Peak flow rate that exceeds the WQf,
- Conveyance piping network and pipe diameter(s) for the WQf and peak flows,
- Conveyance piping elevations and slopes,
- MTD layout in either an offline or online configuration.

Each of these design elements will be explained in terms of function, limitations and interrelationships that dictate MTD sizing and facility design. For example, an online configuration at a facility may be preferred to treat and convey the WQf and peak flow, but the peak flow rate may exceed the hydraulic capacity of the MTD and/or piping. Consequences of improperly undersizing and oversizing are also identified which can impact MTD performance, footprint, external engineering controls, and costs associated with model size, facility installation and operations.

MTD performance claims for sediment removal efficiency and associated sizing criteria are based on results of laboratory and/or field testing programs. Stormwater manuals commonly cite a water quality treatment goal of 80% removal of suspended sediment from runoff; however, fail to specify the particle size for that sediment. MTD performance claims and sizing criteria are based on a number of parameters including the influent test sediment particle size distribution (PSD). This presentation further explores the critical role that PSD plays for MTDs performance testing and how those gradations affect sediment removal efficiency and MTD sizing criteria for different PSDs.

Presenter Bio: Mark Miller serves as Research Scientist for AquaShield™, Inc., a manufacturer of stormwater treatment systems headquartered in Chattanooga, Tennessee. He is responsible for product development, regulatory affairs as well as directing lab and field testing programs. Mark is a member of the Chattanooga Stormwater Regulations Board and is a former Technical Committee Chairman for the Stormwater Equipment Manufacturers Association. Mark holds an M.S. in Geology from Centenary College in Shreveport, Louisiana and a B.A. in Geology from the University of Tennessee, Knoxville.

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The Hydrologic Determination Process

Abstract: The Hydrologic Determination was developed by TDEC as a way to identify water features which may need to be considered during site permitting. Understanding this process will help inform site design and streamline coverage issuance for the Construction General Permit and Aquatic Resource Alteration Permits.

Presenter Bio: Jason Dees is an Environmental Scientist with TDEC's Division of Water Resources. He has 11 years of experience conducting Hydrologic Determinations.

Do androids dream of electric cars?

Abstract: This session will cover the City's shift to multi-modal transportation and discuss the finer points of developing with this in mind.

Presenter Bio: Mark Heinzer is the City of Chattanooga's Transportation Engineer. He was formerly the Engineering Manager for Drainage and Flood Control at the City of Chattanooga. Mark has a Master's Degree in Civil Engineering and over 15 years of experience with infrastructure projects in Ohio, Illinois, Kentucky and Tennessee. He has been with the City of Chattanooga since 2010. Mark was the project manager for Chattanooga as they transitioned from the former water quality requirements to the new "runoff reduction" requirements. Mark also serves on the external stakeholder committee for TDEC's runoff reduction program and is the Past-President of the TN Stormwater Association.

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Infrastructure Report Card

Abstract: Lukas Salyer, ASCE-TN Section Vice President, will present both the National and State of TN, ASCE-Infrastructure Report Card. The ASCE Report Card depicts the condition and performance of our infrastructure in the familiar form of a school report card-assigning letter grades based on the physical condition and needed investments for improvement. The presentation will focus on areas that are crucial to our local region, including Inland Waterways, Aviation, as well as Roads and Bridges. For more information visit www.infrastructurereportcard.org

Presenter Bio: Lukas Salyer came to the Precast Concrete Industry in October of 2014 via his hiring by Sherman Dixie Concrete Industries. Prior to joining the industry, Lukas was employed as a District Sales Manager with General Shale Brick as well as the director of Architectural Services for the East Tennessee region with General Shale. Lukas carries over 10 years experience of Technical Marketing within the Professional Construction Industry, and has worked with both Engineers and Architects throughout the Mid-South area on a variety of both Public and Privately funded projects. He is currently Forterra's Technical Resource Engineer for the Kentucky Region.

Lukas has served in several directorial roles for a variety of professional trade organizations, and currently serves as Vice-President for the American Society of Civil Engineer's TN Section, and as a Past-President for the ASCE's Chattanooga Branch.

Mr. Salyer served as an Infrastructure expert & author for the 2016 TN ASCE Infrastructure Report Card. Additionally, Mr. Salyer is actively involved with the TN Infrastructure Alliance (TIA), and the Tennessee Road Builders Association (TRBA). Lukas volunteers as a speaker and expert representative for these organizations, and has provided several presentations focused on raising awareness of infrastructure issues.

Mr. Salyer is a graduate of East TN State University, and he and his wife (Mary) are proud parents to twin children (Amelia & Ben). Lukas' personal interests include Aviation, Hunting, and Family Travel.

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