



# eNewsletter

National Capital Section  
FOUNDED 1916

November/December 2016 Volume 63, Number 3

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## November Section Meeting: The Capitol Crossing Project

By Brian Barna, PE, LEED AP, Vice President, ASCE-NCS

**The Capitol Crossing Project** has completed the first phase of construction for an elevated deck above Interstate 395 in Washington, DC, and has begun vertical construction on the first building at Capitol Crossing, a three-block, seven-acre, 2.2 million-square-foot project that will consist of five mixed-use buildings. The completed work includes upgraded infrastructure such as a new high-voltage electrical line and new water mains. The second phase will consist of almost 30,000 square feet of ground-floor retail space with 11 stories of offices above, as well as completion of the highway deck over I-395 to E Street, NW.

The Capitol Crossing Project is a multi-phase master-planned development located in Washington's central business district. Newly designed pedestrian and vehicular corridors will reconnect the Capitol Hill and East End communities, update traffic patterns, and deliver new safety features. The project is bordered by Massachusetts Avenue to the North, E Street to the South, Third Street to the West and Second Street to the East.

The infrastructure portion will include three areas of improvement: utility upgrades along Massachusetts Avenue;



new entry and exit portals to I-395 to ease traffic congestion and deliver new safety features for pedestrians and cyclists; and a continuous deck that will be constructed above the existing I-395 Center Leg Freeway, from Massachusetts Avenue to E Street between 2nd and 3rd Streets. This platform will reconnect the District's street grid at F and G Streets, NW as originally designed in L'Enfant's master plan of the city. It will also support the Capitol Crossings development, which will be a 2.2 million square-foot mixed-use project.

The District of Columbia has long encouraged the development of a platform over I-395. Following an extensive environmental assessment, outreach to the affected communities and approval

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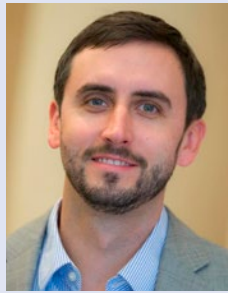
Please join us on **Tuesday, November 15**, at the Hilton Arlington, 950 North Stafford Street, Arlington, VA, on the second floor in the Gallery Ballrooms. Parking is available at the hotel (\$10), at the Ballston Mall garage (\$1 after 6 pm), and on the street (free after 6 pm). The Hilton is on the same block as the Ballston Station on Metro's orange and silver lines. Registration and networking will be from 6–6:45 pm, followed by dinner. The program will end by 8:30 pm. The cost is \$45 for those preregistering, \$10 for students, and \$55 for walk-ins, as space allows. One Professional Development Hour is available to attendees. For questions, please contact [Jordan Pitt](#). Please click [HERE](#) to register by **November 10**.

*Note that no-shows will be charged the full registration fee. We welcome walk-ins, including any registrations made after the guaranteed number of guests is provided to the hotel. However, the cost for walk-ins is higher because the Section is charged accordingly by the hotel for late registrations.*



## President's Corner

"Live with Purpose." It is amazing how three simple words can carry such a great deal of meaning. These three words help fuel not only my personal charge for the future, but also my charge to all Civil Engineers in our region: what can you do in your life and within our organization to better your life and the lives of those around you? My goal: focus more on living life with purpose.



Each day we make all sorts of decisions that are perceived by others in a variety of ways – sometimes good, sometimes bad – depending on the situation and our audience. Living with purpose involves taking responsibility for our actions, giving insight to what we want and who we are, being true to what we say and choosing how we act in all situations, and *being intentional* about the contributions we make in our personal and professional lives.

With these thoughts in mind, I look around our Section and see so many of our fellow Civil Engineers living their lives with great purpose and making a difference in the lives of others. As a recent example, we were privileged to have Dr Hunter Fanney, PhD, as the keynote speaker for our October Section meeting, who for the past several years has been leading research towards "net-zero energy" buildings,

or facilities that generate just as much energy as they consume. At one point during the presentation I found myself looking around the room to see others, much like myself, intimately engaged with Dr. Fanney's presentation. Was it the technical material that was so fascinating? – hearing

trivia about building energy consumption or learning about renewable energy system technologies and ways we can incorporate these systems in our own homes? Absolutely! But just as engaging as the presentation material was the delivery of the presentation itself. The presentation was *delivered with purpose*, and therefore had a resounding effect on how the material was perceived.

Every one of us has a unique set of skills and abilities that we apply every day to solve complex engineering problems. Each day we make decisions that, in some way, make a difference in the world around us. If we focus more on living with purpose and being intentional, about the work we do, the ideas we want to communicate, and the goals we set for ourselves, it will undoubtedly have a positive effect on others around us.

Throughout the next month, we have a variety of events and opportunities for you to engage in ASCE around the

Section and help transfer your skills and knowledge to your colleagues and future Civil Engineers. Aside from our November Section Meeting and usual Committee events will be the ASCE Region 2 Assembly which will be held at Morgan State University on November 12. I along with several other members from our section will be in attendance to learn about other events and initiatives by other ASCE Sections and Chapters around the region that provide value to their membership. I encourage you to reach out to me or your fellow ASCE members to express your feedback about what we can do to provide value to our members. We encourage our membership to speak about Civil Engineering at local events, help provide student and college outreach, suggest volunteer opportunities, and help inform others about the interesting projects you are working on in and around our region.

I look forward to hearing from our members about the work you are doing and how you are living your life with purpose!



Jordan Pitt  
ASCE-NCS President

## Newsletter

Jim Palmer, Editor

**November/December 2016 Issue Deadline:** October 26, 2016

**To Submit Articles:** [newsletter@asce-ncs.org](mailto:newsletter@asce-ncs.org)

**NCS eNewsletter Archives:** go to [www.asce-ncs.org](http://www.asce-ncs.org) and view along the sidebar.

**Address Changes:** Call 1-800-548-ASCE, e-mail [member@asce.org](mailto:member@asce.org), visit [www.asce.org](http://www.asce.org), or write: ASCE – Membership, 1801 Alexander Bell Drive, Reston, VA 20191. Include your membership number.

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### Committee Chairs

Please refer to the [NCS website](http://www.asce-ncs.org) for a current list of NCS committees and chairs.

## Director Letter

It is with pleasure that I write my first Letter as Region 2 Director. I would like to begin by expressing my thanks to Chris Menna for his Service as Director from 2013 to 2016. I had the opportunity to observe my first ASCE Board Meeting during our ASCE Annual Convention in Portland.



While there were differences on specific issues, in my opinion each member acted in the best interest of the Society as they saw it. The Annual Convention was an action-packed event, with strong technical sessions, a dynamic keynote address on innovation, and an opportunity to network with ASCE members throughout the

world. We were treated to a preview of ASCE's DREAM BIG, the IMAX film scheduled for release in February 2017.

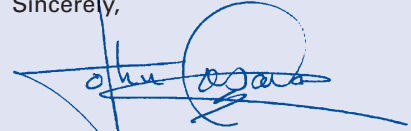
I am pleased that we will show a preview of DREAM BIG at our Region 2 Assembly on Saturday, November 12, at Morgan State University, Baltimore, MD.

Speakers include ASCE President-Elect Kristina Swallow, and Anthony Bartolomeo, President and CEO of Pennoni Associates who will discuss one of ASCE's Strategic Initiatives, "The Grand Challenge." The event will kick-off at Morgan State at 8AM with breakfast in the Center for the Built

Environment located at 5251 Perring Parkway, Baltimore, MD. All Section/Branch Members, Younger Members, Students, and Faculty/Practitioner Advisors are very welcome to attend. Best of all there is no registration fee to attend. Space is limited – click [HERE](#) for your registration form.

I will write another Letter in January 2017 after participating my first ASCE Board meeting as a Director.

Sincerely,



John Casana, PE, D WRE, M ASCE  
Director, Region 2

## November Section Meeting: The Capitol Crossing Project

*continued from page 1*

of the necessary permits, construction commenced at the end of March 2014. DDOT and other agencies have worked closely with the developer and contractor to create a viable maintenance of traffic plan for the project during all phases of construction.

### About the Speakers

Michael Randolph, PE, Design Manager for STV Incorporated and Rebecca Nordby, Project Executive for Balfour Beatty Construction DC will be discussing the design and construction successes and challenges for the first phase of construction and present what will be in store for the completion of the Capitol Crossing Project.

Michael Randolph joined STV in 2002 and has served as the lead highway engineer for the environmental assessment phase and currently is the design manager for the transportation related improvements for the final design phase of the Capitol Crossing Project. He holds a BS in Civil Engineering from the University of Maryland and is a registered Professional Engineer in Washington DC, Maryland and Virginia.

Rebecca Nordby brings 19 years of local experience leading complex construction projects in the Washington DC area. With Balfour Beatty Construction, she has worked to deliver many projects in the District, including 2101 L Street NW

and the design-build National Research Council for the National Academy of Sciences. Most notably, as project manager Ms. Nordby led the first phase of the high profile US Capitol Visitor Center. Rebecca worked for several years on the preconstruction effort for Property Group Partners on the Capitol Crossing project and is now the on-site Project Executive responsible for execution of the work. She holds a BAE in Architectural Engineering (Construction option) from Penn State and is a LEED Accredited Professional. ■

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# Engineering the Nation's Capital: A Century of Innovation & Promise for the Future Now an Award-Winning Book

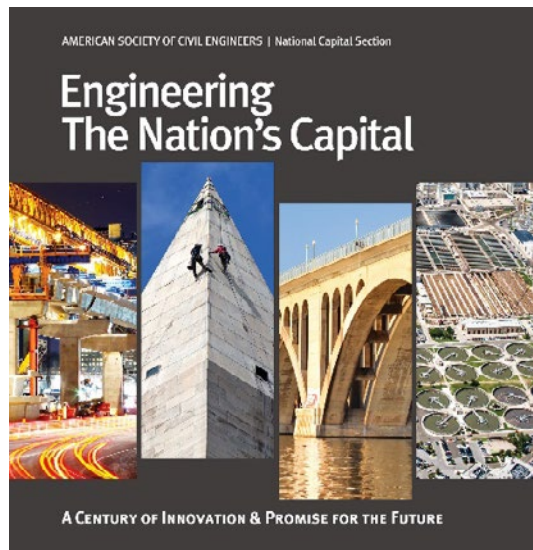
Special Author Roundtable and Book-Signing This Month!

Graphic Design USA (GDUSA) has announced the winners of its 53rd annual American Graphic Design Awards™. These awards honor the best graphic design work of the year in categories including print and collateral, identity and branding, packaging and point-of-purchase, advertising and sales promotion, direct mail and catalogs, magazines and books, broadcast and video, social media and infographics, and Internet and interactive design. This year also featured a new category, Creative Use of Color.

For more than five decades, GDUSA has sponsored design competitions that spotlight areas of excellence and opportunity for creative professionals. The American Graphic Design Awards is the flagship competition, and is open to everyone in the graphic arts community – including graphic design firms, advertising agencies, in-house corporate and institutional designers, publishers and other media. This year, there were just a shade more than 10,000 entries; a very selective 15 percent were selected for recognition.

Designed by Spectrum Creative, *Engineering the Nation's Capital: A Century of Innovation & Promise for the Future* was published in May 2016 by the American Society of Civil Engineers, National Capital Section (ASCE-NCS), for their 2016 centennial celebration. Filled with brief histories and beautiful photos of prominent DC-area buildings, memorials, and infrastructure systems, the book is a tribute to local civil engineers, past and present. It will also serve an educational purpose, with the intent of inspiring new generations of civil engineers. Placement in libraries and schools is underway.

Spectrum Creative was contracted to coordinate and guide the production process from design to printing. In conjunction with publisher ASCE-NCS, Spectrum also participated in researching facts and obtaining historical and contemporary photos. An interesting feature is the printed endpapers, which illustrate a timeline of select civil engineering accomplishments in the D.C. area from 1916–2016.



ASCE National Capital Section invites you to attend a book signing with the authors of the award-winning *Engineering the Nation's Capital – A Century of Innovation and Promise for the Future*. This award-winning book was released in May 2016, just ahead of the Section's centennial anniversary in June. The 130-page coffee-table book features dozens of local civil engineering projects accomplished by our Section members over the past 100 years. Learn the stories behind these magnificent achievements – the civil engineers who built them, their challenges, and the ground-breaking innovations that were employed. This



book includes iconic structures such as the Lincoln Memorial and the Pentagon and critical transportation systems, including the Capital Beltway, bridges, Metrorail, and Reagan and Dulles airports. Learn about our water and wastewater utilities, the Chesapeake Bay restoration effort, and much more.

*Engineering the Nation's Capital* makes a great companion for students just entering the profession, to help better

understand the possibilities of what can be achieved through a civil engineering education. For those already practicing, the book allows persons to better convey the unique special nature of their work to others, including family members, neighbors, and friends. It answers what it means to be a civil engineer and what it is that civil engineers do. The book explores the profession's rich legacy in the D.C. metropolitan area and provides engineering details behind the structures and systems that persons see and use every day. Every page of this book is full of historic photos never seen in your typical D.C. tourist-focused publications. The book surely makes a great addition for your office reception areas as well as your living room coffee table.

ASCE-NCS is ever grateful for the hard work of authors Norine Walker, L.J. Sauter, and David Smith, our design/publishing companion Spectrum Creative (Marcella Drula-Johnson and Andi Harris), and all those that contributed to this special achievement. **Please join us in welcoming Norine, L.J., David, Marcella, and Andi to our November Section meeting and hear about their experience creating this book. Also, obtain for your-**

**self your own personalized, signed copy of *Engineering the Nation's Capital*.** Years in the making (100 to be exact), publication of this book is limited. Do not miss your chance to own a copy as this is a once-in-a-career opportunity. **Meeting registrants receive a \$5 discount off the purchase of a book.** And if you've already purchased a copy, bring it to the meeting and have it signed by the crew who made it all possible! ■

## 2017 ASCE-NCS Awards Banquet

### Award Nominations Now Being Accepted

The Annual Awards Banquet provides an opportunity to recognize and celebrate local projects, engineers, and students who have contributed to our section and our community. Every year, the NCS presents a number of awards during its annual banquet, including Outstanding Engineering Project team, Community Service Award winner, Meritorious Service Award Winner, Student Scholarship award winners, and members of the NCS who have achieved Life Member Status.

NCS award candidates are nominated by the Awards and Nominations Committee which actively seeks recommendations from NCS committees and members. All members are encouraged to nominate, either by email of traditional mail, members and/or projects for one of these awards. The awards are given by the Awards and Nominations Committee and are given at the Section's Annual Awards Banquet held in March 2017.

Please submit all nominations to Brian Barna no later than December 31, 2016.



Brian Barna, PE, M.ASCE  
Chair, Awards and  
Nomination Committee  
[bbarna@wrallp.com](mailto:bbarna@wrallp.com)  
2339 Archdale Road  
Reston, VA 20191

### Outstanding Civil Engineering Project

This award recognizes a civil engineering project within the Nation Capital region that demonstrates the greatest

civil engineering skills and represents the greatest contribution to civil engineering progress. The project must have been substantially completed within the preceding three years. In granting the awards, the Awards and Nominations Committee considers the contribution to the well-being of individuals, the resourcefulness in planning, the solution of design problems, the pioneering use of materials and methods, innovations in construction, impact on the physical environment, unusual aspects, an aesthetic values.

An award plaque is given, naming the project and the firms or agencies involved. The nominees are notified and invited to attend the banquet as guests.

### Community Service Award

The Community Service Award recognizes outstanding contributions by an individual toward community improvement in the Washington metropolitan area. The nomination can be submitted directly by the individual or by another member. The nomination shall briefly

describe the achievements and contributions of time and talent toward a civil engineering-related activity that has furthered the welfare of the community within a three-year period preceding the award. The Awards Committee reviews and selects the winner for this award. The awardee will be notified and invited as an honored guest to attend the banquet and to receive the award – an engraved plaque, naming the individual and accomplishment.

### Meritorious Service Award

This award recognizes an individual member of the National Capital Section who has made outstanding contributions to the work of the Section. The awardee must be an active member who has contributed significant time and talent to the Section and who sets a high standard of professionalism through service. The awardee will be notified and invited as an honored guest to attend the banquet and to receive the award – an engraved plaque, naming the individual and accomplishment. ■

## ASCE-NCS Newsletter Editor-In-Training: Get Involved in your Local Section!

The NCS is looking for an energetic professional to contribute to the Section while developing technical communication skills and professional relationships with local civil engineers and ASCE-NCS Board members. Duties include helping to produce eight newsletters annually; volunteer hours do not exceed five

to eight hours per month. Editors-In-Training typically go on to be Newsletter Editors and hold NCS Board Positions. A *great way to get more involved!*

Email Jim Palmer, Newsletter Editor at [newsletter@asce-ncs.org](mailto:newsletter@asce-ncs.org) with "Editor-In-Training" in the subject line. ■

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# October Meeting Recap: NIST's Net-Zero Energy Residential Test Facility

By Alex Rosenheim, PE, LEED AP, M.ASCE, Sustainability Chair

Dr. A. Hunter Fanney, a Senior Research Scientist in the Engineering Laboratory (EL) at the National Institute of Standards and Technology (NIST) was the special guest speaker at the ASCE-NCS's October 2016 Dinner Meeting held at the Arlington Hilton. Dr. Fanney discussed his role leading NIST's Net-Zero Energy Residential Test Facility (NZERTF), lessons learned from its first two years as an operational experiment and NIST's plans for the future of the facility.



The facility, completed and put into service in 2012, is being used to demonstrate that a home similar in size, aesthetics, and amenities to those in the surrounding communities can generate as much energy as it consumes on an annual basis while meeting the needs of a family of four. The facility has been subsequently serving as a test-bed to facilitate the development and improvement of methods of test and performance metrics for existing and future energy efficient technologies. Buildings account for 41% of the primary energy consumption and 74% of the electricity consumption in the United States, while accounting for 39% of the CO<sub>2</sub> emissions. In response to this, the building community has embraced the idea of net-zero energy buildings, which generate as much energy through renewable means as is consumed by the building.

Dr. Fanney's presentation to the ASCE-NCS described the design of the facility and the methods being explored to achieve a net-zero energy facility. He

identified focusing on five primary tools for this goal. Their team designed the house to have a well-insulated and air-tight building envelope with acceptable indoor air quality, placed equipment within conditioned spaces, provided controlled ventilation, selected energy efficient equipment and appliances, and added on-site renewables. He also described the virtual family that resides in the facility, the instrumentation used in the experiment.

Dr. Fanney presented data collected during the first two years of operation and discussed lessons learned. The facility produced more energy than it consumed during both years of testing. All technologies are commercially available, meaning the approaches can be implemented today. Initial costs at the time of the construction were about 20% higher than a comparable house, but the technologies used in the house would reduce this with more

widespread use and with lowering costs observed in renewable markets over the past few decades. Minor changes in the operation of the house based on observations from the first year resulted in further significant energy reductions during second year of testing. Future use of the facility include developing test methods for energy technologies and renewables, developing performance metrics, evaluating new/alternate building energy technologies and studying and evaluating small duct high velocity heat pump systems. A lively discussion followed the presentation. The ASCE-NCS Sustainability Committee plans to host a tour of the facility in Spring 2017. ■



## Employment Clearinghouse

The NCS provides the Employment Clearinghouse as a free service to its membership. The Clearinghouse allows members to post short notices for available positions or candidates seeking employment. All employers listed herein are equal opportunity employers. If you have questions, are seeking employment or would like to post a position please contact the [newsletter editor](#) and visit our [jobs page](#).

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# Thanks for a Great Centennial Celebration

By Victor Crawford, PE, M.ASCE, Centennial Committee Chair

What began in 2013 as planning for our Hundred Year Anniversary has now come to an end as we move into our next hundred years. Thanks to all our volunteers that have worked so hard since 2013, we have truly honored our Section's history, which began on June 23, 1916, at the American Society of Civil Engineers' Annual Convention being held at the William Penn Hotel, in Pittsburgh, PA.

We have many volunteers to thank for making this such a great Centennial, beginning with our June Centennial Engineer of the Month, Chris Manalo. He established and served as the first Chair of the Committee. In addition, he worked diligently on the Report Card for the District of Columbia and was a key player in our very successful Centennial Conference.

Our excellent Centennial Engineer of the Month Series was made possible by Elena Rocchio and Engineer Phillip Melville. We also have Elena and Phillip to thank for obtaining the Proclamations we received from the Commonwealth of Virginia, the District of Columbia, and the State of Maryland. These proclamations recognize how our civil engineers have been Engineering the Nation's Capital since 1916.

Our Centennial had two major public events to honor our past while promoting our future through student outreach. We began in February at the Discover Engineering Family Day at the National Building Museum. This was followed in April at the USA Science and Engineering Festival, where over 350,000 students and their parents, teachers, and the public learned about civil engineering. At these events, we had booths where students learned about liquefaction during earthquakes and built a cable-stayed bridge, we promoted the IMAX Dream Big movie coming out in 2017, and we showed how civil engineers support sustainability. These outreach events were made possible thanks to Dean Westman

as our champion, to Alex Rosenheim for our sustainability demonstration, to Jeannine Finton for her hard work along with family and co-workers from ASCE Headquarters, and to all the volunteers that came out to support these excellent

opportunities promoting Science, Technology, Engineering, and Math (STEM).

Of course, the most lasting item from our Centennial Celebration will be our award winning *Engineering the Nation's Capital: A Century of Innovation and Promise for the Future* developed by David Smith, Norine Walker, and L.J. Sauter.

We are indebted to them and the many volunteers that worked so hard on this legacy of our Centennial. This book not only serves as an excellent outreach tool for the public and for directing students to pursue civil engineering, but also allows our members to let their family and friends know about our profession and what we do as civil engineers. We believe this is such an outstanding tool for outreach that we have donated copies to libraries and will send copies with our members that share their experience and knowledge with students during school events.

Thanks to Alex Rosenheim, Piers Causton, Ed O'Malley, and Ranjit Sahai, our members learned about our accomplishments firsthand on educational tours. These tours by our members included the Washington Aqueduct and the C&O Canal. In addition, we had two events not only for our members, but out future civil engineers (their children), when we took a tour by boat to see the design and construction of the DC bridges, and a train ride on the historic railroad at Walkersville, Maryland.

The highlight of our celebration was our Conference, which was the Civil Engineering event of our Centennial Year. Major General Mark Yenter from the Army Corps of Engineers was our keynote speaker. The General not only gave an excellent history of the

Corps work in engineering the Nation's Capital, but also represented a former Chief of the Corps, General Alexander MacKenzie, whose action eventually lead to our Charter being approved at the ASCE National Convention in 1916. Representing ASCE at our Conference was the current President of ASCE, Mark Woodson. We are indeed indebted to our many volunteers for this excellent Conference, especially Chris Manalo, Lucy Menon, Alan McDonald, Summer Guerrero, Emily Dean, Ranjit Sahai, Alex Rosenheim, Mike Henry, Hari Aamidala, Stuart Crooks, Gillian Love, Brian Barna, and Dirk Bouma, along with our student volunteers.

Many action items from our Centennial will continue as we transition our student outreach to the Educational Committee and our Dream Big subcommittee becomes a full Committee to publicize and support the release of the IMAX movie in the Nation's Capital. We will also continue to use our award winning *Engineering the Nation's Capital: A Century of Innovation and Promise for the Future* by working to place this excellent tool into museum stores in addition to libraries and schools. Whether you are a Young Member, a Life Member, or somewhere in between, we need your help: please volunteer for the Educational Committee, the Dream Big Committee, and other opportunities so we can continue to support our profession for the next hundred years.

I would like to thank Chris Manalo and the Board for allowing me the opportunity to Chair the Centennial Celebration Committee. I want to also offer a special thanks to all the Centennial Committee Members for their dedication and tireless work to allow us to truly represent the American Society of Civil Engineers in the Capital Area through our Centennial Celebration. ■

*Editor's Note: A huge thank-you to Vic Crawford for chairing the Centennial Committee through a successful year! The celebration wouldn't have been what it was without your leadership.*



## P.S. Stands for Professional Licensed Surveyor: Let's Talk about Surveying Licensure, Part-I

First, to make some of our readers smile, let me start my note with good news on exam charges for *Fundamentals of Engineering* (FE) and *Fundamentals of Surveying* (FS). Yes, it is official; beginning January 2018 the price for the (FE) and (FS) exams will be just \$175 instead of current \$225.

In this issue of Dr Z's Corner, we will be answering some of our readers' questions regarding the requirements for becoming a Professional Licensed Surveyor (PS). When it comes to buying or selling property, making exact measurements and determining property boundaries, providing data relevant to the shape, contour, location, elevation, or dimension of land or land features on or near the earth's surface for engineering, mapmaking, mining, land evaluation, construction, and other purposes, like driving down a highway or walking a public trail, Professional Surveyors (PS) are charged with protecting the health, safety, and welfare of the public.

In the United States every state and territory requires those who perform the tasks defined as the "Practice of Surveying" to hold a professional surveying license and surveyors are licensed at the state level by professional licensing boards. Surveying boards confer the PS license when licensure candidates meet a combination of requirements in education, experience, and exams; sometimes referred to as EEE requirements.

### Education

Complete the appropriate level of education in your state. Check the requirements of your state licensing board. Some require only a high school diploma, while many others require a degree from an accredited four-year surveying program.

### Exams

Licensure candidates typically must pass the Fundamentals of Surveying (FS) exam, the Principals and Practice of Surveying (PS) exam, and a state-specific exam.

### Experience

Most states require *four years* of acceptable, progressive, and verifiable work experience under the supervision of a licensed surveyor.

Before registering for an upcoming NCEES' (National Council of Examiners for Engineering and Surveying) surveying exam, a candidate for PS should review and understand his/her state's approval and registration process. This can easily be done by referring to NCEES site and selecting the state or territory of interest from the map with a drop-down list.

According to NCEES, the FS and PS exams are administered via computer-based testing and the registration is open year-round. In order to register for your FS and PS exams, it is necessary to contact your state licensing board directly for information about state-specific surveying exams.

Similar to FE and PE exams, NCEES develops and scores the FS and PS exams for surveying licensure as well. The FS exam is generally your first step in the process to becoming a professional licensed surveyor (P.S.). It is designed for recent graduates and students who are close to finishing an undergraduate surveying degree from an EAC/ABET accredited program. The PS exam tests your ability to practice the surveying profession competently. It is designed for surveyors who have gained at least four years of professional experience.

### Fundamentals of Surveying (FS) Exam Specifications for Computer Based Test (CBT)

The FS exam is a computer-based test (CBT). It is closed book with an electronic reference. Examinees have 6 hours to complete the FS exam, which contains 110 multiple-choice questions. It is important to know that the FS exam uses only the *US Customary System* (USCS) of units.

Topics & Number of Questions:

1. *Mathematics*: (about 13–20 questions) Topics include: Algebra, trigonometry, basic geometry, spherical

trigonometry, linear algebra and matrix theory, analytic geometry and calculus.

2. *Basic Sciences*: (about 5–8 questions) Topics include: Geology, dendrology, cartography and environmental sciences,

3. *Spatial Data Acquisition and Reduction* (about 6–9 questions) Topics include: Vertical measurement, distance measurement, angle measurement, unit conversions, redundancy, knowledge and utilization of instruments and methods, and understanding of historical methods & instruments.

4. *Survey Computations and Computer Applications* (about 19–29 questions) Topics include: Coordinate geometry, traverse closure and adjustment, area, volume, horizontal curves, vertical curves, spirals and spreadsheets

5. *Statistics and Adjustments* (about 6–9 questions) Topics include: Mean, median, mode, variance, standard deviation, Error analysis, least squares adjustment, measurement and positional tolerance, relative, network, and positional accuracy.

6. *Geodesy* (about 5–8 questions) Topics include: Basic theory, satellite positioning, gravity, coordinate systems, datums, and map projections

There are seven more categories – total 13 categories – and we'll continue in the next month's issue, January 2016.

And finally, I would also like to include a statistic from NCEES. During January through June of 2016, total 363 examinees took the FS test and 47% passed the test on their first try.

I shall close with a final thought as usual: During the FS and PS exams, the more time you spend on a difficult question, the more time you risk second guessing yourself. Trust your intuition. You have worked hard, don't doubt yourself. Come back to that difficult question when you might have a clearer mind (and visit some difficult questions in this month's [problem set](#)).

Until next time,  
Ahmet Zeytinci, P.E.  
Dr.Z. ([az@alfam.com](mailto:az@alfam.com))





## Committee News and Updates



### Younger Member Group

**Happy Hours:** The ASCE-NCS Younger Members Forum (YMF) holds monthly happy hours in Arlington, VA or Washington, D.C. Happy hours are typically held the first Wednesday of each month unless a holiday falls during that week.

The ASCE-NCS YMF held their October Happy Hour at Sauf Haus Bier Hall in Washington DC on October 5<sup>th</sup>. Approximately 15 members attended the event.



The next monthly happy hour will take place in Arlington at World of Beer at 6pm on Wednesday, November 2nd, followed by Front Page in Arlington, VA on Wednesday, December 7th. Look out for emails with specific locations for future monthly happy hours!

**Stay Connected!** Check out photos and stay up-to-date with YMF events by visiting the new YMF Facebook page: <http://www.facebook.com/ASCENationalCapitalYMF>. Also, follow us on Twitter (@asce\_ncsYMF) at [https://twitter.com/asce\\_ncsYMF](https://twitter.com/asce_ncsYMF).

**Get Involved!** Are you interested in getting involved with more Younger Members activities? Do you have ideas for social events or volunteering activities? Would you like to be a board member? The ASCE NCS Younger Members Group is always looking for new members! Let us know if you are not already on our mailing list!

If you would like to become more active with the YMF or would like more information on our events, please contact the YMF President ([ncsymfpresident@gmail.com](mailto:ncsymfpresident@gmail.com)).

### Transportation Committee

The Transportation Committee met at the George Washington University on October 4<sup>th</sup>, 2016. Michael Scott, PE who is the Founder and President of ADOJAM, LLC presented "Innovative Ground Penetrating Radar (GPR) Applications to Civil Infrastructure That Add Value and Minimize Risk." Among attendance were participants from a wide variety of fields. Several examples of innovative results from applying GPR techniques were presented in addition to practical recommendations for GPR applications and services.

Our next presentation will be held on November 8<sup>th</sup>, 2016. The speaker Dr. Samer Hamdar, the director of the Center for Intelligent Systems Research at George Washington University, will be presenting "Bridging the Gap between Social and Transportation Networks: An Integrated Evacuation Decision Making Model." Please look forward to registration emails that are sent out periodically. And remember, the attendance is free and includes food and beverages!

### Construction Committee

By Jeff Tan, PE, PMP, LEED AP, Chair of ASCE-NCS Construction Committee



#### Professional Development Session:

In celebration of our anniversary, the construction committee Professional Development Session was held on October 6<sup>th</sup>, 2016 from 6:00 pm to 8:30 pm at Reston Regional Library, Meeting Room 1 (11925 Bowman Towne Drive, Reston, VA 20190). Mr. Michael O'Connor presented on Henry Campbell who was one of those amazing, early 19<sup>th</sup> century American civil engineers who not only located the railroad, built track and bridges but, in Campbell's case, also designed steam locomotives.



Thirteen attendees received the professional development hour certificate.

#### Upcoming Professional

**Development Workshop:** The Construction Committee will meet on March 9<sup>th</sup>, 2017 from 5:00 pm to 6:00 pm at Bechtel, 12011 Sunset Hills Rd #110, Reston, VA 20190. This workshop will focus on the program management activities of the Federal Transit Administration from 2006–2010 when it conducted program reviews of three projects. One of them was a local project, Dulles Phase I which was the initial build out of the system to its current terminus, Wiehle Avenue, second was New Jersey Transit's ARC, and the last will be NYCTA's Eastside Access. In all three cases, the projects were subjected to tremendous cost pressures, but all three responded differently.

**Call for Committee Members:** Please join our mailist at this link: <https://groups.google.com/d/forum/asce-ncs-cc> and we will share information such as upcoming professional development events, job openings, and construction news. Please contact me at [sunjeffsun@gmail.com](mailto:sunjeffsun@gmail.com) if you need more information or wish to serve on the Committee's leadership team. Committee members commit to regular meeting attendance, have the ability to receive communication by phone and/or e-mail and are comfortable communicating their ideas in a group setting. We'd be delighted if you considered being a part of the committee.

#### Geotech Committee

**Meeting Announcement:** Rabi Shankar Yadava PhD, PE, PMP; Vice-President, Schnabel Engineering.

#### About the Speaker:

Rabi Yadava has about 20 years of design and construction experience in the field of underground construction, fossil and nuclear power plants, petrochemical complexes, buildings, highway structures, structural rehabilitation, and geotechnical instrumentation and monitoring. Rabi also has extensive experience in Automated Web-based Geotechnical Instrumentation & Monitoring System (GIMS). His experience includes



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planning of large-scale instrumentation projects, risk assessment, instrumentation installation, datalogger setup, programming and data reduction, and web portal setup. Rabi is well-versed in various types of instruments including in-place inclinometer (IPI), shape accelerometer array (SAA), piezometer (VWP), single and multilevel extensometer (SPBX & MPBX), tiltmeter, crack gauge, rebar strain gauge, concrete strain gauge, earth pressure cell, thermistor, load cell and others.

*Abstract:* Advancements in automatic data acquisition systems (dataloggers), cellular data network, and computerized data processing have led to real-time web-based monitoring of a large number of structural and geotechnical monitoring instruments. A state-of-the-art system to collect automated data, data reduction, real-time publication in web and alert handling was developed for the Blue Plains Tunnel Project in Washington DC, which is part of District of Columbia Water and Sewer Authority's Long Term Control Plan project for control of Combined Sewer Overflows to the Anacostia River. The construction included five large-diameter shafts (50 ft to 132 ft diameter, 120 ft to 198 ft deep) and approximately 4½ miles of 23-foot diameter tunnel traversing along and under the Potomac and Anacostia Rivers. A comprehensive "Automated Geotechnical Instrumentation Monitoring System" was implemented to monitor, evaluate, and document the effects of the tunnel and shaft construction on the surrounding ground, groundwater, and existing adjacent structures and facilities. The geotechnical instrumentation effort consisted of more than thirty-five dataloggers monitoring 1500+ sensors spread over 4½ miles. This integrated system performed seamlessly in real-time providing web-based instrumentation data and plots. A web-based publishing site was organized to systematically handle large number of plot, sensor status dashboard, and reports. The presentation will also cover instrumentation monitoring for the First Street Tunnel project, which involves construction of a half-mile long tunnel under the DC Clean River project initiative.

The meeting will be Wednesday, November 16<sup>th</sup> at 11:30 am at Maggiano's in Tysons Corner. A sign-up link is available from [kowens@geostructures.com](mailto:kowens@geostructures.com)

## Reston Committee

By Lisa Anderson, PE, LEED AP, M. ASCE, Reston Committee Chair

You are invited to attend a social happy hour with the Reston Committee, tentatively scheduled for December 9<sup>th</sup>. More details will be forthcoming. On January 10<sup>th</sup>, Ranjit S. Sahai, P.E., F.ASCE of RAM Corporation will present an Ethics-related topic. As a reminder, Engineers Registered in the State of Maryland must obtain 1 PDH pertaining to Ethics for continuing education.

To be added to the Reston Committee distribution list, please contact Lisa Anderson: [lmanders@bechtel.com](mailto:lmanders@bechtel.com) or [703-429-6631](tel:703-429-6631).

## Education Committee

By Mike O'Connor, PE F.ASCE, Education Committee Chair

**Continuing to Mobilize for a New Year:** We reported last month about the Committee being reorganized with the arrival of its new chairman. The focus being in three major areas: K-12 outreach; University/College Outreach; and Raise the Bar.

NCS' Vic Crawford continues working with American Association for the Advancement of Science (AAAS) to recruit volunteer engineers for their Senior Scientists and Engineers: [STEM Volunteer Program](#), currently preparing for the Fall 2016 and Spring 2017 semesters. Retirees and others who can devote time for volunteering in a school setting are encouraged to contact Vic at [victor.crawford51@gmail.com](mailto:victor.crawford51@gmail.com) Vic's other efforts involve [Project Lead the Way \(PLTW\)](#), which has a [civil engineering](#) component. In the past, this effort has been successful in providing copies of NCS' *Engineering the Nation's Capital: A Century of Innovation and Promise for the Future* for use in science/engineering classrooms. This past effort has also included recruiting volunteers for the annual "Engineers Week" activities coming up next February.

One of the key opportunities in this area is the emergence of social media and volunteer matching software. We are looking at some of the feasible solutions that could be used to identify teachers that are interested with civil engineering volunteers that are equally motivated. We will be exploring this concept over the next year with the hope of raising some funding for implementing a pilot project. The beneficial outcome in this is

increased participation by teachers and volunteers.

We continue in our efforts to remobilize the committee with respect to student chapter outreach. NCS is responsible for the student chapter programs at Catholic University, University of DC campus at Van Ness, George Mason University, George Washington University and Howard University. There are also engineering programs at Georgetown and American Universities. These schools have [civil engineering programs](#) which they run jointly with Columbia University (NYC). Several universities in the Baltimore area have the same arrangement with Columbia as part of what is called "[The Combined Plan.](#)"

NCS also has in its region several associate degree programs in engineering. Montgomery County Community College offers an associate degree in Civil Engineering and Engineering Science while Prince George's Community College offers a more general degree in engineering ([AS in engineering](#)). There are currently no dedicated ASCE activities at these schools. The committee hopes to reach out to these schools to identify transfer students that might be planning on a four-year degree in civil engineering at another school.

We have been collecting available materials on these engineering programs, contact data, etc. Our work-plan is to make these collated and edited materials available to NCS and Student chapter leadership by June 2017 while helping local programs better track their own materials.

Overall, the committee's objectives include reestablishing contacts with faculty advisors and student leadership and conducting listening sessions to determine priorities and objectives by NCS June Board planning meeting. This would allow the committee to work with the NCS Board of Directors. The follow-on objective then would be to fully integrate student chapters into 2017-2018 NCS Section and committee session planning. Ideally, the NCS and its committees would sponsor events that boost student attendance while feeding back into student chapter programming and objectives.

Another area of committee focus is the major policy initiative for ASCE which

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## Upcoming Events *(Also available on the NCS website under the Events tab.)*

### November 2

**Younger Member Group Happy Hour from 6–8 pm**, World of Beer (901 N. Glebe Road #105, Arlington, VA 22203). Join younger members from the area for free appetizers and drink specials. Look for an email announcement with more details.

### November 15

**NCS Section Meeting**, 6:30–8:30 pm, Hilton Arlington. Michael Randolph, PA and Rebecca Nordby will share with us details on the Capitol Crossing Project where vertical construction on the first of five buildings has begun. Look for more information in emails and on our [website](#).

### December 1–2

**Steel Bridge and Tall Building Design Seminars**, 440 NW First Street, Washington, DC. Florida International University (FIU) invites

you to learn from award-winning faculty in two separate seminars coming to Washington, D.C. December 1 and 2. These seminars can be taken as introductory or refresher courses and are approved for continuing education credit by the New York and Florida boards of professional engineers. Register [here](#).

### December 7

**Younger Member Group Happy Hour from 6–8 pm**, Front Page (4201 Wilson Blvd., Arlington, VA 22203). Join younger members from the area for free appetizers and drink specials. Note, attendees are encouraged to bring a tory for Toys for Tots. Look for an email announcement with more details.

### December 9

**Reston Committee Social Happy Hour!** Details forthcoming. Contact

Lisa Anderson for more information: [lmanders@bechtel.com](mailto:lmanders@bechtel.com).

### January 10, 2017

**Reston Committee Ethics Presentation**, ASCE National Headquarters, Reston, VA. Join the Reston Committee as we welcome Ranjit Sahai, PE, F.ASCE of RAM Corporation presenting an Ethics-Related Topic. Contact Lisa Anderson for more information: [lmanders@bechtel.com](mailto:lmanders@bechtel.com).

### January 20–21, 2017

**Regions 1,2,4 & 5 Multi-Region Leadership Conference** in Newark, NJ. The conference includes the Workshop for Section and Branch Leaders (WSBL), the Ester Region Younger Member Council (ERYMC), and the Workshop for Student Chapter Leaders (WSCL). More information available [here](#).

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is the “Raise the Bar” for Engineering program or RTB. The Committee’s goal will be to educate our local colleges and universities on RTB. We encourage any member that has questions to approach the committee and we will try to engage them in a dialogue. This is a very complex subject with several possible actions at the local and State level. The Committee hopes to start the dialog with briefing materials developed by ASCE Global and then to “think locally.” Civil Engineering professionals

interested in joining the Education Committee should contact Mike O’Connor at [mike@fplmuseum.org](mailto:mike@fplmuseum.org).

The success of the NCS Education program depends upon the capacity of the section to mobilize enough volunteers of a necessary quality and depth in response. This means that to realize the full potential of our outreach and education efforts, a significant commitment of volunteer effort and fund-raising is required. The committee’s objectives

are to encourage section members to affiliate with engineering programs in the region and participate in volunteering events.

Engineering professionals who are interested in learning development or fund raising for these programs as well as identifying resources or grants are encouraged to join the Education Committee and should contact Mike O’Connor at [mike@fplmuseum.org](mailto:mike@fplmuseum.org) or Ranjit Sahai at [rsahai@ram-corp.com](mailto:rsahai@ram-corp.com). ■

## The ASCE Younger Member Leadership Symposium

By Sumon Chatterjee, AM.ASCE

Over the weekend of August 5–7, 42 Younger Members from different ASCE-Young Member Forums across the country attended the ASCE Young Member Leadership Symposium (YMLS) at ASCE Headquarters in Reston, including NCS Young Member Sumon Chatterjee. The ASCE YMLS was open to all younger members and free of cost; it focused on leadership and professional development sessions. Overall, this was a great networking opportunity to meet other Younger Member Groups and learn

about their chapter events and compare approaches to engaging younger members.

The sessions were very interactive and covered communication styles, presentation skills, personal branding and tips on managing change in the workplace. The event also covered technical resources available



to younger members and a tour of the ASCE headquarters. Younger Members are encouraged to attend the 2017 Symposium on August 4–6, 2017. ■