

February 2018 Volume 64, Number 5

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February Section Meeting: I-66 Corridor Improvements: 2018 and Beyond

In December 2017, the Virginia Department of Transportation entered into a Comprehensive Agreement with a private partner, Express Mobility Partners, to deliver over \$2 Billion worth of improvements to 22.5 miles in the I-66 Corridor from University Boulevard in Gainesville, to I-495 in Fairfax. The project is managed out of the Northern Virginia District Megaprojects Office, led by Susan Shaw. To support VDOT in delivering this project, a General Engineering Consultant multi-disciplined team was hired in 2015/2016 to augment and work side-by-side a small VDOT team.

Leading up to the December 2017 Agreement, the VDOT/GEC team successfully completed preliminary and environmental studies, and helped to complete a "first of its kind" Public-Private-Partnership (P3) procurement process that included alternative technical concepts and multiple delivery methods. Following the December 2017 Agreement, early work activities have been underway to advance the design work. Now that Financial Close has been reached in November 2017, the VDOT/GEC team is focused on a variety of concurrent activities. Come and hear

about how this team is working together to help ensure the largest infrastructure project in Virginia will be successfully delivered by December 2022.

About the Speaker

Susan Shaw, PE, CCM, DBIA is a transportation engineer with more than 30 years of experience in both the public and private sectors. She currently leads the Virginia Megaprojects Office for the Department of Transportation in Northern Virginia, overseeing more than \$3 Billion in major design-build and P3 transportation projects, that include I-66 Outside and Inside, 395 Express Lanes, and Route 28 Corridor Improvements. Susan is currently managing the Transform I-66 Outside the Beltway project, a \$2+ Billion multimodal project to improve the I-66 Corridor between I-495 and Gainesville. In addition, she oversees the 8 mile extension of the 29 mile I-95 Express Lanes reversible system that opened in December 2014 traversing Stafford, Prince William, and Fairfax Counties. ■



Please join us on **Tuesday, February 20**, 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 [Brian Barna](#). Please click [here](#) to register by **February 15**.

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.

Annual Awards Banquet – March 20, 2018

By Emily Dean, PE, M.ASCE, NCS Vice President

You are cordially invited to the 2018 ASCE-NCS Annual Awards Banquet at the Hilton Arlington on the evening of Tuesday, March 20th. The evening will feature a keynote speech by ASCE 2018 President-Elect Robin Kemper. Throughout the evening we will recognize and celebrate projects, engineers, and students who have contributed to our profession and our community. Awards will be presented to the ASCE-NCS Outstanding Civil

Engineering Projects of the Year and the Sustainability Committee's Award Winning Project. The Section will also recognize Outstanding Graduating Seniors from each of the five local civil engineering universities, and the recipients of the NCS Student Scholarship Awards. Other individuals to be recognized include the Meritorious Service and Community Service Award winners, the President's Appreciation Award winner, and those members of the National

Capital Section who have achieved Life Member or Distinguished Member status during the past year. We hope you will help us celebrate our local civil engineering achievements by joining us at the Banquet in March! Sponsorship opportunities are available to support the banquet and other NCS activities. For additional information, please contact [Emily Dean](#) or [Brian Barna](#). ■

President's Corner

In 2004, Mark Zuckerberg created a program in his Harvard dorm room to form a social network of the students on campus. Today, Facebook is a \$500 billion company with over 23,000 employees and over 1 billion daily active users. Along with other popular programs such as Twitter, Instagram, and LinkedIn, over the last decade, social media has emerged to fundamentally change the way many of us communicate, obtain information, and do business.



Social media has had a large impact on the world around us, with both positive and negative aspects. Facebook has allowed you to keep in touch with people you may have otherwise lost contact with but also provides more insight into your uncle's political views than you probably care to know. Twitter provides everyone unprecedented access to celebrities and enables news to get out almost instantly (much faster than any form of traditional media, though sometimes at the expense of accuracy). However, the anonymity Twitter grants its users also makes the site a haven for internet "trolls" with bad intentions. Instagram makes it a breeze to produce and share attractive photographs, but somehow gave people the impression that others want to see pictures of their food before they eat it.

Individual social networking sites may rise and fall in popularity through the years, but overall, social media as a concept is likely here to stay. So whether you habitually check several social accounts on your smart phone, or you would rather just avoid the whole thing, at a minimum it is

important to be literate about social media and what it should and should not be used for. Here are some tips for effective usage of social media in your personal and professional lives:

Know your audience, i.e. make sure your posts are appropriate for the site you are using. Unless your job is political in nature, political posts are generally not appropriate for LinkedIn because you do not want to potentially alienate half of your work contacts. Conversely, Twitter has a reputation of being more casual, so a humorous observation may be great but a sterile post about the latest project that your company is working on is likely to be ignored.

Don't overshare or undershare. Oversharing can either mean making too many posts in a short time frame, which can clog up a follower's content feed, or it can mean posting information that most followers are not likely to care about, such as the daily activities of your cat. Both are annoying, and both can get your unfollowed. On the opposite end of the spectrum, if your account has no activity or if you rarely post anything of interest, then why should I follow you in the first place?

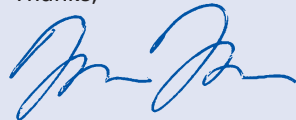
You don't have to participate. It seems a lot of companies feel an obligation to make a foray into social media from fear of missing out on opportunities. They sign up for accounts on several sites but then quickly find that it is a time-sink and it is not helping them get the traction they desired. The reason is many companies do not know how to use these tools effectively. Social media is just a form of communication – would you want to spend time

with a friend that only ever talked about herself and her job? In a similar vein, there has to be value added for the listener, not just advertisements for the company. If your company has more effective ways to market itself, then an extensive social media presence may not be necessary.

When in doubt, don't press send! People have opinions. Strong opinions. And while you have every right to post whatever comes to your mind, that doesn't always mean that you should. There have been many stories of employees losing their jobs over an errant social media post, even if the employee was not posting on behalf of the company. Most people will never post anything that ultimately causes them to be fired, but a controversial opinion or an inappropriate joke could damage their reputation. No amount of "likes" of a post is worth a lost job or damage reputation. Have fun, be yourself, just be careful.

Social media can be a fun, rewarding, and informational experience. It shouldn't be stressful or burdensome. If it is, then you should question your social media strategy and if you or your company really need to participate on a particular site. The best way to make your social media experience a success is to remember to treat it as a form of conversation. The normal rules of conversation and etiquette still should apply, even behind a computer screen.

Thanks,



Brian Barna, P.E.
ASCE-NCS President

Newsletter

Jim Palmer, Editor

Sumon Chatterjee, Editor-in-Training

March 2018 Issue Deadline: February 21, 2018

To Submit Articles: newsletter@asce-ncs.org

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

National Capital Section

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

26th Annual Discover Engineering Family Day – Volunteers Needed!

Help the NCS teach budding engineers about the importance of civil engineering at the Engineering Family Day on Saturday, February 17, at the National Building Museum in Washington, DC. The National Capital Section and our partner, Bechtel, will be looking for volunteers to lead a kid-friendly, educational, hands-on activity booth. The activity – Windy City Tower – is from Dream Big. We will be challenging children to build a paper tower that can withstand the test of wind!

The National Building Museum is located at: 401 F Street NW, Washington, DC 20001. The NBM is accessible by Metro and is located at the Judiciary Square Red Line stop. The event is free and open to the public. Visit <http://www.engineeringfamilyday.org/> for event details.

If you're interested in volunteering at the ASCE booth, please contact Rachel Boots (rboots@bohlerdc.com).

Volunteers are needed from 9am to 5pm, with flexible shift times.

Engineering Family Day is a great way to kick off Engineers Week (February 18–24, 2018). There are several ways to get involved. Visit <https://www.discover.org/our-programs/engineers-week> for more information. ■

January Section Meeting Recap Arts & Industries Building Revitalization

On Tuesday, January 16th 65 civil engineering history enthusiasts gathered for a unique presentation on the history and revitalization of one of the most iconic buildings on the Mall – the Smithsonian's Arts and Industries Building (AIB).

Architect Christopher Lethbridge, who has managed the AIB Revitalization, provided a captivating walk-through the building's design, construction, modifications, deterioration, and closure in 2006. Work has been underway since then to return the building to its original glory. Initial efforts focused on the building's exterior, windows, and roof. Then efforts progressed to restore the original open exhibition hall interior,



with its natural lighting, new HVAC, electrical and plumbing systems. Much work still remains, hinged on funding, but the intent is to reopen the building as soon as possible.

Originally known as the National Museum, the building opened in 1881 to house many of the displays donated to the Smithsonian after the Centennial Exposition of 1876 in Philadelphia. After an architectural competition, the Board of Regents selected the architectural firm of Adolf Cluss and Paul Schulze to design the new building. Civil Engineer Montgomery C Meigs's study of public museums in Europe influenced his structural system design and construction.



During his term as Smithsonian Secretary, Dr G Wayne Clough, noted civil engineer from Georgia Tech, initiated the AIB Revitalization. The audience was delighted with Mr. Lethbridge's display of historic photos from the Smithsonian archives. The evening was sponsored by the Section's History & Heritage Committee. Plans were discussed for a future tour of the Arts and Industries Building – stay tuned. ■

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The Emerging Revolution in Engineering

By Ranjit S Sahai, PE, F.ASCE

The first revolution in engineering occurred only 5,000 years ago in 3000 BCE. That’s when humans conceived a game-changing method of communication: the written language. Our ancestors used the written word to exchange recipes and track business transactions. They also used the written word in conjunction with drawings to communicate engineering designs and construction methods to build infrastructure to support their emerging urban lifestyle from a nomadic one. As the architectural concepts used in the design of the ancient White Temple in Figure 1 show, our ancestors induced the principles of geometry at about the same time they invented written language.

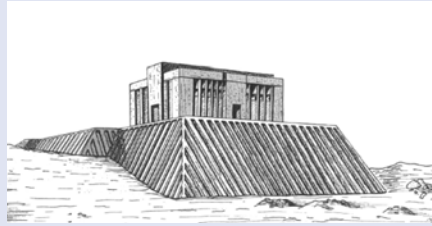


Figure 1: Sketch of the White Temple (3200 BCE) in the city of Uruk wedged between the Tigris and Euphrates rivers

3000 BCE to 1950 represents the first revolution in engineering when the physical medium, i.e. clay tablet or paper or similar physical medium was used to develop and communicate engineering design. Another significant event during this first revolution was the publication of The Elementary Treatise on Descriptive Geometry in 1799 by Gaspard Monge, a French mathematician.

Aristotle inferred the large-scale structure of our planet to be spherical by using the principles of geometry when he noticed that receding ships in the ocean vanish hull first, then

masts and sails. Monge developed the branch of geometry that provides the theoretical basis of representing three-dimensional objects through planar projections. His third-angle multi-view projection – objects are conceptually located in the third quadrant – continues to be the US standard for arranging plan and elevations on a physical medium. Thomas E French, a professor at the Ohio State University helped standardize the education of engineering drawings by publishing in 1911 the book *A Manual of Engineering Drawing* at a time when the building of American infrastructure was booming.

In the first revolution engineers communicate design for construction of 3D infrastructure by drawing on a 2D physical medium using geometric tools and principles of descriptive geometry.

Physical Medium: The First Revolution

The earliest written record of geometry is found in the 300 BCE book known as Elements by Euclid. It is one of the most significant historical works in mathematics that was used to teach geometry from 300 BCE to 1900. The timespan from the year

Digital Medium Projection on Planar Surfaces: The Second Revolution

Two material developments and a research thesis quietly ushered in the second revolution.

Early computational work used mechanical tools such as the slide-rule. Development of the transistor in 1947 (the first material) and of the integrated circuit in 1958 (the second material) replaced analog tools with digital tools such as calculators and computers. It was the invention in 1962 by Dr. Ivan Sutherland of SketchPad (aka Robot Draftsman), a revolutionary

continued on page 5

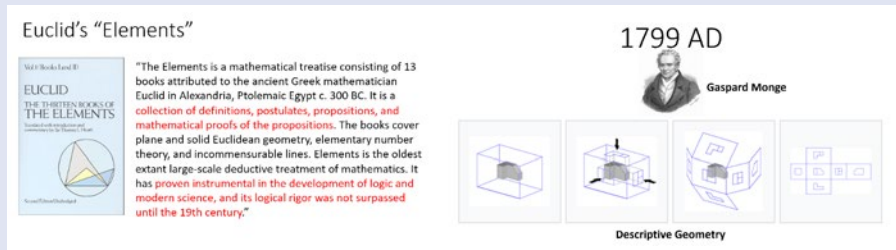


Figure 2: Two significant events in the first revolution in engineering (Physical Medium) are marked by the publication of Elements by Euclid in 300 BCE and of Descriptive Geometry by Monge in 1799

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**Ethan Grossman
Engineering**

computer program, as a part of his PhD thesis at MIT that spawned modern Computer Aided Drafting and Design (CADD) systems. These systems display geometric models on a planar surface (the computer screen) for humans to create and edit them.

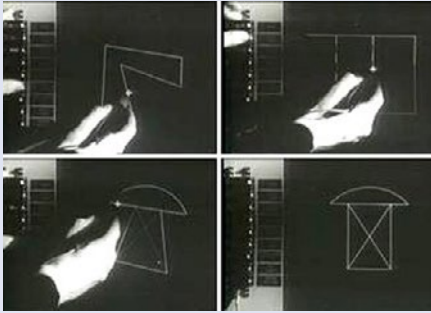


Figure 3: The innovative SketchPad used geometric constraint algorithms to draw a rivet directly on a computer screen using a light-pen

In the second revolution engineers create models of their design using CADD to store them on a digital medium, and to extract drawings on a physical medium to communicate design for construction.

Digital Medium Projection in Space: The Third Revolution

Advances in technology, specifically the development of the concepts of point-clouds and mixed reality (for details see the September 2017 issue of this newsletter), of the concepts of sensory-spatial modeling and sensors capable of adaptive response (for details see the October and November 2017 issues of this newsletter) are enabling emerging engineering workflows that were not possible before. Watch the 80-second video clip at

this link to experience the revolution: <https://vimeo.com/189961433>.

The video clip demonstrates the projection in space of an engineering digital model that aids a human with hand tools to construct the framing for a bathroom pod without the need for a traditional drawing or a tape measure. For other scenarios see the January 2018 edition of this newsletter.

In the third revolution engineers create models, stored on a digital medium, that can be projected in space as virtual models which recognize and react to real-world objects and to commands they receive.

Conclusion

To stay abreast of and to leverage this emerging revolution to your professional advantage, consider the advice dispensed at the Autodesk University 2017 event by the firm's CEO:

- Learn from case-studies of information modeling world-wide;
- Uncover the reasons it's improving productivity and reducing risk;
- Adapt to changing societal trends;
- Think Opportunity not Threat:
 - We're poor at predicting the future and exception at worrying about it
 - It's not automation vs jobs; It's automation and jobs
 - Leverage upheaval in the industry
 - Develop new skills
 - Find the resolve to up your game
 - Harvest new markets
- Collaborate across disciplines;
- Connect devices with infrastructure to help owners leverage models created during design to better operate and maintain their investment.



Figure 4: A mixed-reality headset projects a digital model in space as a virtual model that recognizes and responds to objects in the real world and to commands it receives

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Life Members Forum: Reflections

Beginning in 2017, NCS began publishing biographies and interviews to profile members within our local civil engineering community. This initiative is organized and coordinated by our Life Members Forum (LMF) President, Mr. Phillip Melville, PE, PhD, Fellow ASCE.

This month, we are excited to present reflections from Life Member, Dr. Robert Efimba, Sc.D., P.E., LM.ASCE. Dr. Efimba is an Associate Professor of Civil Engineering at Howard University where he has teaches courses in engineering mechanics and matrix structural analysis. Having served as the ASCE-NCS President from 1982–83, Dr. Efimba also served as President of the National Society of Professional Engineers (NSPE) No. Virginia Chapter; the Washington Society of Engineers (WSE); and the D.C. Council of Engineering and Architectural Societies (DCCEAS). He remains very active with ASCE, having recently served on the Board of Governors for Region 2, comprising Maryland, Delaware, Pennsylvania, and D.C. For the past 25 years, Dr. Efimba has been the Chief Advisor to Howard University's chapter of Tau Beta Pi (TBP), the international engineering honor society. He received the National Outstanding Advisor Award in 2010, and his chapter received 19 TBP Outstanding Chapter Awards in the past 20 years. He most recently could be found in a panel on the cover of the Winter 2018 issue of TBP's quarterly magazine, BENT.

I was born at the start of WWII in South-West Cameroon to Edward and Mary Efimba of Dienyi, parents from three different tribes, Mbonge and Balondo-Bakweri, respectively, and families that believed firmly in the value of an education. Inter-tribal marriage was very unusual at the time, and still is limited to this day like in many other parts of the world, but I was fortunate that my parents were brought together, just like my maternal grandparents in their own inter-tribal marriage, because of the search for education. You can say that the value and need for education was imprinted on me very early in life.

There were role models to follow: first my father who graduated top of his class at the Buea Normal College and became one of the greatest Elementary Schoolmasters of his time in neighboring Eastern Nigeria and South-West Cameroon, until his passing in 1988, at age 78. Then there was my eldest brother, now known as HRH Victor Akwo-Fese Efimba I, retired ophthalmologist, who was top of his class in elementary school, and then went on to win an automatic scholarship to the prestigious Government College, a boarding Secondary School at Umuahia in Eastern Nigeria, by placing among the top 8 students out of 3,000 candidates in a Region-wide competitive entrance exam and interview process. My only surviving grandparent when I was born was my maternal Grandfather ("Mbamba"), Mathias Efiem. He was a pillar of the Roman Catholic Church and helped immensely to establish it

in West Cameroon; then served his entire adult life, until his passing in 1979, at age 88, as the Catechist at Regina Pacis Cathedral in Soppo, near Buea, Capital of SW Cameroon. One can say that Mbamba Mathias instilled in me a moral compass that I continue to use to this day to treat all other persons with respect and compassion, regardless of their race, gender, religion, rank or economic and social status. I and my students, colleagues, friends, fellow professionals and my own extended family members owe a debt of gratitude to Mbamba.

I cannot claim to have had a master plan for my life and career, but as early as 1949 when I was in Standard I in my

village in SW Cameroon, (third Grade in the US), I saw the need for housing, drinking water, and roads, and was motivated to become a civil engineer even at that early age.

Even though my parents could not afford it, I was fortunate, in fact lucky, to have attended the very best schools, starting with St. Savior's Elementary School in Buguma, Nigeria, where I completed Standard 6 (8th grade), before proceeding to the regional Government Secondary Boarding School, Afikpo, Nigeria, as one of eight scholarship holders in the inaugural class of 50 students, where I started in 1953 and graduated in 1957. I went on to attend the two-year Sixth Form at King's College, a federal Government High School, in Lagos, Nigeria, beginning in 1958. That year, I suffered the most painful loss of my mother, but persevered and graduated in 1959, in honor of her blessed memory.

I then went to MIT, again on a full scholarship provided by the Cameroons Development Corporation, thanks to the intervention of MIT's Professor Carroll L. Wilson, whom I consider my benefactor. I came to MIT for a bachelor's degree, but ended up getting all four degrees that were awarded in Civil Engineering. I saw the need for practical experience to complement my strong academic credentials, and was fortunate to spend summers working for Burns & Roe in

continued on page 7



From left to right: DCCEAS President Dr. Tolu Odunlami; HRH Dr Victor AkwoFese Efimba I; Architect Zubeida Alawi; and Dr Bob Efimba, PE

Life Members Forum: Reflections

continued from page 6

New York City, then Oradell, NJ, and for Metcalf & Eddy, then in Boston, MA.

I am pleased that I have been privileged to design or contribute substantially to the design of some major engineering projects, such as the roof structure of the Hall of Ocean Life in New York City, for which I am featured in the MIT Online Museum; the Limbe Bridge in SW Cameroon; the containment structures of three nuclear power plants; the Water intake structure in IDAAN, Panama; and the 82-story Standard Oil of Indiana Building in Chicago, IL, for which I was a co-recipient of the 1974 ASCE Moissieff award for best paper in the field of structural design.

I am also pleased that I have served my church and professional communities, and am grateful for the many honors that they have bestowed upon me for Outstanding Service and Lifetime Achievements.

I have many persons to thank for my life and professional career. First, there is my loving family, starting with my parents and maternal grandfather, my extended family that includes relatives, friends, fellow parishioners, my great teachers in elementary and high schools, those outstanding professors at MIT, some great students and colleagues at the University of Nigeria and Howard University, fellow members in professional Societies, and most especially my daughter Donda, my daughter-in-law Celine, my son US Navy Commander Motale Efiem Efimba, and my two adoring grandsons Ronan Elangwe (5½) and Keenan Tabi (2).

As for regrets, I regret that I did not get to learn to play an African or western musical instrument. Speed reading could have been very useful. My greatest regret is that I did not succeed in my attempt to help the country of my birth, but hope that I can now work with other engineers to improve the lives of the poorest of the poor in Africa and here in North America.

My advice to younger and future engineers:

Take your education seriously, work hard and perform to the best of your ability, and as far as you can go in your field of study. Your emphasis should be on mastering the material, not so much on grades per se. If you have command of the material, the grades should follow, but not the other way around.

Respect yourself and all persons with whom you interact, especially your parents, family, teachers, friends, and colleagues.

Plan to become licensed as a Professional Engineer, whether or not it is required in your discipline, and whether or not you think you might ever need it.

As a first step, take the FE exam at the earliest possible opportunity in your junior year, but no later than the calendar year of your graduation

Pay attention to your assigned academic Advisors and Mentors, and select some yourself from amongst persons, whom you respect and can trust with your personal information. Visit your Advisors and Mentors on a fairly regular

basis, just to chat about your career and progress.

Pay attention to your mental and physical health, and include some form of regular hobby or exercise, and regular visits to your physician at least annually.

Select and stay in touch with a Financial Advisor, a Legal Advisor, and a Spiritual and/or moral Advisor, so that they are readily available when you need them, especially in a hurry.

Enroll as a member of one or two professional societies, starting with student chapters while in college, and progressing immediately after graduation, and avoid a lapse in membership. Start serving on a committee as a member, and advance up a Society's chain of command.

Find the time to go to occasional professional meetings of a general nature and about specific topics in your field.

Find the time to mentor some students and aspiring scientists and engineers, and some other ways to serve the community in which you live. Make it a point to help to advance careers of deserving students, associates, or even your professional seniors.

Keep a good professional diary, and make regular entries of your activities and accomplishments with dates, locations, event titles, sponsors, speakers, and other important details.

Spend as much time as possible with your family, and keep a good family diary with mementos. ■

ASCE-NCS Committee News and Updates



Younger Member's Forum

By Haley Carpenter, EIT

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

The ASCE-NCS YMF held our January Happy Hour at Mellow Mushroom in Adams Morgan, Washington, DC. Approximately 10 members attended the event. Join us for the next upcoming monthly happy hour, taking place in Navy Yard, Washington, DC at Bluejacket Brewery on Wednesday, February 7th.

The YMF held its first professional development seminar of the year on January 23 at Ragtime in Arlington. Approximately 25 young engineers came to see Mike Howell, Senior Structural Engineer at Allegheny Design Services and President of LWC Engineer discuss Engineering Mistakes. One PDH was awarded to attendees.



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.

Reston Committee

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

On December 7th, the Reston Branch met at Carpool in Herndon, VA for a social happy hour and meet and greet of the newly appointed interim Board of Directors. On January 9th, Lori Evans,



PE, Manager of Educational Outreach of the American Wood Council, presented "Tall Wood Buildings in the U.S. – A Codes and Standards Update."

The next meeting of the Reston Branch will be held on February 13th at ASCE Headquarters in Reston, VA starting at 11:45am. Tara Hoke, the General Counsel at ASCE, will present an ethics-related topic. One PDH will be awarded to attendees. As a reminder, one PDH of ethics-related training is required for Maryland PE registration renewal.

Education Committee: K-12

By Vic Crawford, PE, M. ASCE, Education Committee Co-Lead

This month the National Capital Section will be at the National Building Museum on February 17, 2018 for Discover Engineering Family Day. We are looking for volunteers for this outstanding opportunity to recruit for future Civil Engineers. As part of our Science, Technology, Engineering, and Math (STEM) Outreach, we will be talking about what we do and the benefits from becoming a Civil Engineer to several hundred students and parents. As always, our success in promoting our Profession requires your help, so let Rachael Boots (rboots@bohlerdc.com) know if you want to volunteer.

This event will be followed in April by the USA Science and Engineering Festival, where we will have an opportunity to reach out to thousands of student, parents, and teachers. We will be supporting ASCE Headquarters for this event, so please let us know you are interested so we can ensure you are notified when the roster for this major STEM event becomes available by contacting victor.crawford51@gmail.com.

In addition to these events in February and April, we will also be developing a

roster of STEM volunteers. As discussed in previous Newsletters, the Section receives more requests for representing our profession at K-12 (Elementary to High School) events than we can support due to the short lead time for the events. Therefore, we are developing a roster which will be used to quickly assign a STEM Volunteer to represent our profession by sharing their experiences and benefits as a civil engineer at STEM events held at various K-12 schools across the DC Area. If you are interested in influencing the next generation while having a lot of fun working with students excited about science and engineering, please contact victor.crawford51@gmail.com to add your name to the roster.

As always, you will be supported in this outreach with several tools to support your volunteering, such as Handouts provided by ASCE and a video that shows how recent civil engineering graduates are making the world better. In addition, you will be providing copies of our excellent and award-winning Book, *Engineering the Nation's Capital* to the STEM program at the school where you volunteer or make a presentation during a STEM event.

We are also continuing to support the American Association for the Advancement of Science (AAAS) program for STEM, which has been bring engineers and scientists into classrooms for over eleven years (<http://www.aaas.org/senior-scientists-and-engineers/programs-dc>). This program works particularly well for retirees, that can devote one day a week to volunteering.

Understanding the needs of the educators, we are focusing on the elementary schools where your expertise in civil engineering would be very welcome by teachers introducing science concepts to young students. Therefore, please consider becoming a AAAS volunteer in supporting STEM in the school districts in the DC metro area, including surrounding counties in both Virginia and Maryland. If you are interested in giving back to the profession while sharing the joy of engineering to eager young minds, please contact Vic Crawford at victor.crawford51@gmail.com.

continued on page 9

Education Committee: Collegiate

By Jameelah M. Ingram, PE, M. ASCE,
Education Committee Co-Lead

The start of a new year is a great time to set goals and resolutions. For the ASCE Student Chapter at the Catholic University of America (CUA ASCE), planning is well underway for the 2018 Virginias' Section Regional Student Conference. CUA ASCE is pleased to host the conference from March 22nd to 24th. It will attract students from fourteen universities in Virginia,

West Virginia, and Washington, DC. The conference consists of business meetings, technical presentations, an awards banquet, social activities, and competitions.

The competitions will vary in degree of difficulty and foster community within the section. CUA ASCE is currently seeking sponsorships and volunteers for the events. Events include the Steel Bridge, Concrete Canoe, and Concrete Frisbee Competitions. If you would like to volunteer at the conference,

please visit <http://ascecuawixsite.com/cuaasce/2018-virginia-region-competition> and contact Elizabeth Cossel at 29cossel@cua.edu.

Participation as a professional member of ASCE will make an impact on students and help to make this conference a success. It may even check a new year's resolution to volunteer off of your list! ■

Celebrating Civil Engineers in Cinema

By Ranjit Sahai, PE, F.ASCE, ASCE-NCS Past President (2013–14)

Production is, in a civilized society, your primary means of physical survival – and it's demanding work. Art is, on the other hand, nourishment for your soul; it can relax you, recharge your batteries and provide the fuel you need to charge ahead against all odds.

Whenever facing seemingly insurmountable challenges on a project, I recall the story I had read over two decades ago and it gives me the inspiration to think different and conquer. The riveting story I refer to is about a civil engineering project manager who overcomes one hurdle after another then another and yet another to build what was thought to be unbuildable.

A civil engineer as a hero in a novel? Yes! The story was published in 1901, a time when America was building infrastructure at a pace unprecedented in human history. The novel is *Calumet "K"* by Samuel Merwin and Henry Kitchell Webster. It is available as a free download at www.gutenberg.org.

The celebration of engineers and their achievements through art (literature, plays, poems, sketches, songs, cinema) is an exception in modern culture that celebrates celebrities. One such exception was the release last year of the IMAX film *Dream Big*. There is another organization you may not have heard of that celebrates civil engineers through cinema: sOlar eye communications

(www.solareye.biz). I first heard of them in Fall 2015 in a newsletter from AISC when their documentary film *Bridging Urban America* (www.bridginguamericafilm.com) was released. The film is an inspiring story about Ralph Modjeski, a master bridge builder – his life and the signature bridges he built. I had alluded to this film in my [Your Medium Is Infrastructure](#) blog on the Section's Website.

sOlar eye's next film is titled *Leaning Out*. Its focus is on Les Robertson, a structural engineer, and on the monument to human ingenuity and achievement he engineered as the Twin Towers. The film footage is shot and post-production work remains before the film will be ready for release. If you wish to change our culture so it reaches a state where engineers and their accomplishments are celebrated as a matter of course in art, and to the time when kids look to engineering as an inspiring career, there is no easier way than to contribute to the post-production funding sOlar eye is looking for. Those looking to sponsor the film at any level are encouraged to contact Basia Myszynski, Filmmaker/Producer at leaningout@solareye.biz. She will be happy to share details about levels of sponsorship and benefits available to sponsors (i.e. potential screen credit or Website listing for contribution). Be sure to watch and be inspired by the film when it is released.



What does the title *Leaning Out* have to do with structural engineering and high rises? Basia answered thus, "As he describes it, Les was able to excel at specific extreme sports, such as wind surfing, mountain climbing, racing cars, because he leaned out. He found the ideal technique! I think it applies to his engineering innovations, iconic hi-rises and approach to collaborations. It's a metaphor for his life philosophy; how he sees things based on his experiences. He really stands out. And remember, he's seen a lot [at] 89 years old." ■

New Specifications (2018) for Structural Engineering (SE) Exams, Part-2

Structural Engineering Exams Are Administered Over Two Days

Last month we started discussing the new specifications for Structural Engineering (SE) Exams. The National Council of Examiners for Engineering and Surveying (NCEES) will be using new specifications for the Structural Engineering (SE) exams effective beginning with the April 2018 examinations. Registration for the pencil-and-paper April 2018 SE exams is currently open and will close at 3:00 p.m. EST on February 15, 2018. It is important to remind our readers that the registration for the computer-based FE and PE exams is open year-round and for details our readers should always consult with the NCEES website.

The new NCEES Structural Engineering exams will be administered as a single 16-hour exam given in two successive days (Friday and Saturday). The 8-hour exam on Friday focuses on vertical forces – gravity loads and lateral earth pressures. Both Friday and Saturday exams consist of breadth (morning) and depth (afternoon) modules. The 8-hour exam on lateral forces is offered only on Saturday and focuses on wind & earthquake loads. In summary:

Friday morning breadth exam: Vertical Forces (4-hour and 40 multiple choice questions. The exam uses the US Customary System (USCS) of units)

Friday afternoon depth exam: Vertical Forces (4-hour, examinees must choose either the BUILDINGS or the BRIDGES module. Examinees must work the same module on both components. Depth exam is not multiple choice; questions are constructed response, essay-type questions. The exam uses the US Customary System of units only).

Saturday morning breadth exam: Lateral Forces, Wind & Earthquake (4-hour and 40 multiple choice questions. The exam uses the US Customary System of units).

Saturday afternoon depth exam: Lateral Forces, Wind & Earthquake (4-hour, examinees must choose either

the BUILDINGS or the BRIDGES module. Examinees must work the same module on both components. Depth exam is not multiple choice; questions are constructed response, essay type questions and the exam uses the US Customary System of units only).

In a nutshell, the new SE exam tests engineer's ability to safely design buildings or bridges, particularly in areas of high seismicity and high wind.

Now let's discuss the topics and number of questions for Friday and Saturday exams in detail:

Friday Morning Breadth Exam Specifications: Vertical Forces (Gravity/Other) and Incidental Lateral Component. Topics and Number of Questions:

Friday morning breadth exam has total 40 multiple choice problems in which 13 questions are from Analysis of Structures and 27 questions from Design and Detail of Structures. As always, find Dr Z's practice problems [here](#).

Friday Afternoon Depth Exam Specifications: Vertical Forces (Gravity/Other) and Incidental Lateral Component. Either BUILDINGS or BRIDGES

The BUILDING module covers loads, lateral earth pressures, analysis methods, general structural considerations (element design), structural systems integration (connections), and foundations and retaining structures. This 4-hour module contains one problem from each of the following areas: Steel Structures, Concrete Structures, Wood Structures and Masonry structures. All problems are equally weighted. At least one problem includes a multi-story building, and at least one problem includes a foundation.

The BRIDGES module covers gravity loads, superstructures, substructures, and lateral loads other than wind and seismic. This 4-hour module contains three problems, one from each of the following areas: Concrete superstructure (25% of your score), other

elements of bridges (e.g., culverts, abutments, retaining walls) (25% of your score), steel superstructure (50% of your score).

Saturday Morning Breadth Exam Specifications: Lateral Forces (Wind/Earthquake): Topics and Number of Questions

Saturday morning breadth exam has total 40 multiple choice problems in which 15 questions are from Analysis of Structures and 25 questions from Design and Detail of Structures areas.

Saturday Afternoon Depth Exam Specifications: Lateral Forces (Wind/Earthquake): Either BUILDINGS or BRIDGES

The BUILDING module covers lateral forces, lateral force distribution, analysis methods, general structural considerations (element design), structural systems integration (connections), and foundations and retaining structures. This 4-hour module contains one problem from each of the following areas: Steel Structures, Concrete Structures, Wood and/or Masonry Structure and General Analysis (e.g., existing structures, secondary structures, nonbuilding structures, and/or computer verification). In this section, all problems are equally weighted.

The BRIDGES module covers lateral forces, lateral force distribution, analysis methods, general structural considerations (element design), structural systems integration (connections), and foundations and retaining structures. For details the readers should see the NCEES website.

And finally, an important reminder. PE/SE is an open-book exam and make sure to bring the books to the exam that you are intimate with. You do not want to be fumbling through a strange book during the exam. Stay relaxed and confident and always keep a good attitude. Focus on the ultimate goal and remind yourself that you are going to do your best!

Until next time,
Ahmet Zeytinci, P.E.
az@akfen.com



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

February 7

YMF Happy Hour, 6:00–8:00 pm, Blue Jacket Brewery, Washington DC. Celebrate our monthly happy hour and network with fellow engineers. Look for an email announcement with more details.

February 9–10

Regions 1, 2, 4 and 5 Multi-Region Leadership Conference, Buffalo, NY. The conference includes Workshop for Section and Branch Leaders (WSBL), the Eastern Region Younger Member Council (ERYMC) and the Workshop for Student Chapter Leaders (WSCL). More information: <https://www.asce.org/event/2018/regions-1-2-4-and-5-multi-region-leadership-conference/>

February 10

Career Development Seminar, 8:30 am–1:00 pm, Bechtel Corporation, Reston, VA. Engineers get very specific educational and employment training to develop their careers in their technical disciplines. However, leadership and communication skills are often as critical to career success and advancement as the technical skills. This seminar will offer direct, hands-on educational sessions from industry leaders on topics that are important in today's workforce. Whether one works in private practice, construction, or public service, these skills are important to your career development. [Register here.](#)

February 13

Reston Branch Lunch Meeting, 11:45 am, ASCE Headquarters, Reston, VA. Tara Hoke, the General Counsel at ASCE, will present an

ethics-related topic. One PDH will be awarded to attendees. As a reminder, one PDH of ethics-related training is required for Maryland PE registration renewal. Contact Reston Branch President Lisa Anderson (lmanders@bechtel.com) for more details.

February 17–24

Engineers Week. The National Capital Section and our partner, Bechtel Corporation, are looking for volunteers to lead a kid-friendly, educational, hands-on activity booth on Feb 17 at the National Building Museum. The activity – Windy City Tower – is from Dream Big. We will be challenging children to build a paper tower that can withstand the test of wind! If you're interested in volunteering at the ASCE booth, please contact Rachel Boots (rboots@bohlerdc.com). Volunteers are needed from 9am to 5pm, with flexible shift times.

February 21

Geotechnical Executive Committee Lunch Meeting, 11:30 am, Maggiano's Tysons Corner, VA. Please contact Kellie Owens (kowens@geostructures.com) or Ed O'Malley (eomalley@geostructures.com) for information or to sign up.

March 7

YMF Happy Hour, 6:00–8:00 pm, Four Courts, Arlington VA. Celebrate our monthly happy hour and network with fellow engineers. Look for an email announcement with more details.

March 13

Legislative Fly-In. Look for an email announcement with more details.

March 21

Geotechnical Executive Committee Lunch Meeting, 11:30 am, Maggiano's Tysons Corner, VA. Please contact Kellie Owens (kowens@geostructures.com) or Ed O'Malley (eomalley@geostructures.com) for information or to sign up.

March 22

2018 Virginias' Section Regional Student Conference, Catholic University of America. Local Professional Engineer Volunteers are needed for this big event celebrating civil engineering and competition between young people. Visit <http://ascecu.wixsite.com/cuaasce/2018-virginia-region-competition> and contact Elizabeth Cossel at 29cossel@cua.edu to get involved today!

April 18

Geotechnical Executive Committee Symposium, Tysons Corner, VA. A one-day symposium on Engineering Geology will be held in Tysons Corner. Please contact Kellie Owens (kowens@geostructures.com) or Ed O'Malley (eomalley@geostructures.com) for information or to sign up.

Employment Clearinghouse

Booz Allen Hamilton seeks Water Infrastructure Engineer with 8+ years' experience in water systems design and operations, drinking water quality compliance, and sampling procedures. Experience conducting sanitary surveys, audits, and inspections. Qualified applicants should hold a Bachelor's Degree in Civil or Environmental Engineering and PE license. Please apply at [https://bah.](https://bah.wd1.myworkdayjobs.com/BAH_Jobs/job/USA-DC-Washington-901-15th-St-NW/Water-Resources-Specialist_R0020834-1)

[wd1.myworkdayjobs.com/BAH_Jobs/job/USA-DC-Washington-901-15th-St-NW/Water-Resources-Specialist_R0020834-1](https://bah.wd1.myworkdayjobs.com/BAH_Jobs/job/USA-DC-Washington-901-15th-St-NW/Water-Resources-Specialist_R0020834-1) or email resume to taylor_michelle@ne.bah.com. We are proud of our diverse environment, EOE, M/F/Disability/Vet.

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](#).