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Further Details Inside



Forensics of Bridge Inspection—It's More Interesting (and Important) Than You Might Think

by Gabriel Gabrielli, PE, Bridge Inspection Group Leader, Green International Affiliates, Inc.

Working as a bridge inspection team leader and contract project manager, I have heard criticisms, opinions, and statements against bridge inspections and the people who perform them. I have included a few of them below:

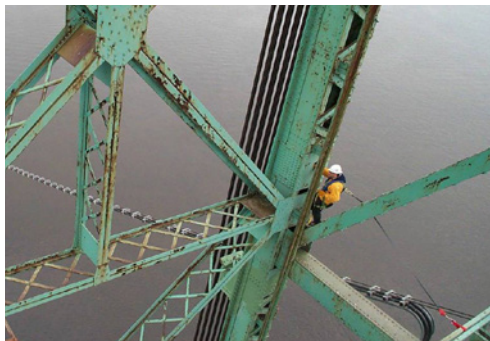
"It's boring"

"It's not real engineering"

"Anyone can do it"

"I don't want to get 'stuck' doing (bridge) inspections"

While I agree that the bridge inspection process can seem to be monotonous and unstimulating (if you let it be), it may be that a person with these sentiments is missing the real importance of the work and a great opportunity to learn how bridges actually work. Engineers, professional or in training, who show a genuine interest or desire to perform bridge inspections, usually have a few things in common with each other: they can appreciate the different structural details found on a bridge or between bridges; they enjoy on-the-fly evaluation of structures;



Gabe Gabrielli inspecting the Carlton Bridge, a vertical lift bridge over the Kennebec River between Bath and Woolwich, Maine

they have a natural curiosity; they can remain diligent and focused throughout the inspection; and, most important of all, they are stimulated by the forensics involved in bridge inspections.

So what does that mean? Well, let's go back to one of the original criticisms of bridge inspection, "anyone can do it." Well, that is somewhat true. It sounds like the Disney movie, *Ratatouille*,

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doesn't it? I have found that a good (bridge) inspector is usually a creative and detail oriented person and does not need to be an engineer. Typically, they have a background in some type of technical field, CAD, or construction. This creates the literal "detail" interest in how things fit and work together. Some of the best team members I have worked with fit into this

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President's Report

by Ellen P. White, PE, Senior Program Manager, Patrick Engineering Inc.



June marks the start of summer but it also marks the end of the BSCES 2016 fiscal year and my tenure as president. This has been a very active and successful year for our organization. We sponsored over 60 events including close to 40 technical presentations and seminars; published ten newsletters; provided tens of thousands of dollars in scholarships, grants and awards; revitalized the website; supported our legislative fellow; spoke at the Massachusetts State House in support of CAMP legislation; participated in Engineers and Land Surveyors Day and the ASCE Fly-In;

helped energize the next generation of civil engineers at events such as the Future City and Model Bridge Competitions; hosted several mentoring and caucus events for our ten student chapters; supported the Steel Bridge and Concrete Canoe Competitions at Northeastern University and Wentworth Institute of Technology; recognized peers and students at the Annual Awards Dinner and Spring Awards Banquet; and much more.

For the fourth time in five years, BSCES was honored to receive the Outstanding Section and Branch Award for Very Large Sections from ASCE. We also received the History and

Heritage Citation from ASCE due to our efforts to promote historical landmarks such as the 100th anniversary of the Cape Cod Canal and the 250th anniversary of Ipswich's Choate Bridge. Additionally, we were the recipient of the ASCE Section and Branch Diversity and Inclusion Award. Thanks to BSCES Vice President Bruce Jacobs for spearheading the application processes. This year, our celebration of infrastructure continued in Holyoke with Infrastructure Day. Many of you may be familiar with Holyoke's Great Stone Dam on the Connecticut River and extensive canal system, which powered the paper mills a century ago

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Bridge Inspection

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category. Conversely, I have worked with highly educated engineers who did not have the desire to do the work, and appeared to have a difficulty in understanding the structures they were looking at and what was and was not important to that particular structure. Most likely one of these was the cause of the other.

This is where the interest and the importance of the forensics of bridge inspections comes into play. When a deficiency is found on a bridge during an inspection, the inspection of that portion of the structure cannot be considered complete until we inspect "up" to determine the cause of the deficiency, and the effect of that deficiency, until we reach the source of the problem. We also need to inspect "down" to determine where the problem stops or does not affect the structure anymore. It is all about cause and effect.

The problem could be as simple as flange or web section loss caused by leakage onto the steel, through the deck, which seeped through a pothole or curb line above. This information may be enough to complete the investigation, but it may also prompt a further look. Is there a clogged drain on or off the bridge that is causing the water to pool in this area or is the mortar around the curbstones deteriorated?

Looking down, if the drainage freely falls off the beam to the roadway or river below, we have found the end of the effect. It could be continuing onto a main support member below. In both cases, the inspection is not completed until we finish determining the cause and the extent of the effect.

This was a simple example but other findings can be more complex, each requiring its own investigation. Such deficiencies include: member misalignment; a mysteriously supported beam (or beams) with no holes and no web remaining over the bearing; bouncing or excess vibration of a structure; banging noises; broken or pulled out bearing anchors; web deflections at connections; cracks and types of cracks or failures; frozen or restricted expansion/contraction joints or bearings, etc. The modes of the failure is also very important in being able to identify why the failure occurred. For instance, identifying a fatigue failure vs. a corrosion related failure in a beam flange or web will lead the investigation in different directions with very different origination points.

It is interesting to note that collision or damage related inspections function in exactly the same way. Each of these items are investigated during the inspection and may need to continue back



Harold Ntiamoah performing a top of deck inspection on the elevated portion of Route 1 (northbound) over Arlington Street and Fifth street in Chelsea, MA



Peggy Seabright inspecting a truss bridge along Howard Road over Abbott Run in Cumberland, RI



Aniket Mahajan performing a nighttime inspection of a Steel Multi Beam K-Frame carrying Middle Road over Route 4 in East Greenwich, RI

in the office where all the bridge plans, live load rating materials, and bridge historical data can be used for reference.

Why is this work so important? The inspection team should perform their inspections and present their inspection findings, or prepare their inspection report(s), in a manner which allows for an accurate live load rating to be performed for the structure. The only way for the team to properly do this is to understand how the structure is working or not working, and the load paths taken.

Having a bridge inspection team that is proficient in evaluating a wide variety of structure and material types, and that can perform these forensic evaluations on the fly, will create a situation where the client gets a better product and the individual(s) remain engaged.

This doesn't sound very boring to me.

EPA Issues Final NPDES MS4 Stormwater Permit

by Matthew I. Shuman, PE, Town Engineer, Town of Watertown

On April 13, 2016, the US EPA issued the *2016 Massachusetts Small Municipal Separate Storm Sewer (MS4) General Permit*. The permit, which will regulate stormwater in 260 Massachusetts municipalities, updates and replaces the original MS4 permit that was issued in 2003. The Clean Water Act requires these general permits be re-evaluated every five years, and the EPA previously published draft general permits for comment in 2010 and 2014. The new permit builds upon the requirements of the previous, and also modifies the previously issued drafts based on public comment.

The 2016 MS4 permit continues to require regulated communities to develop and implement a stormwater management program to control pollutants to the maximum extent practicable, as well as protect water quality. It also retains the six minimum control measures needed to comply with the permit requirements, namely: public outreach and education; community involvement; public involvement and participation; illicit discharge detection and elimination (IDDE); construction site stormwater runoff control; post-construction runoff control in new development and redevelopment; and municipal good housekeeping and pollution prevention.

For each control measure, there are new, more detailed requirements, such as:

- Implementation of an enhanced IDDE program through assessment and ranking of each outfall for the potential to have illicit

discharges and sanitary sewer overflows. Additional dry weather screening and sampling will be required, as well as wet weather sampling in catchments with potential sanitary cross-connections.

- Development of written procedures for a number of routine activities, such as construction inspections and site plan review.
- Development of operation and maintenance plans for public facilities such as parks and buildings. More detailed stormwater pollution prevention plans (SWPPPs) will be required for facilities such as maintenance garages, public works yards, and waste handling/transfer stations.
- Assessment of municipal regulations and requirements that affect impervious cover and water quality, such as street and parking lot design, to determine the feasibility to support low impact and green infrastructure design options. In addition to general assessments, at least five municipally-owned properties must be identified for potential stormwater retrofits.

For municipalities that discharge to certain impaired waters that are subject to approved Total Maximum Daily Load (TMDL) allocations, there are additional requirements for pollution reduction. These include watersheds such as the Charles River, Assabet River, Cape Cod, Connecticut River, as well as certain lakes and ponds. The exact requirements vary based on the watershed and pollutant of concern, but many include the

development of nutrient control plans that identify and implement non-structural and structural BMPs to meet specific nutrient reduction requirements.

Some of the requirements will also impact the development community, in addition to the municipalities regulated under the permit. For example, stormwater treatment requirements for new development and redevelopments will go further than the current *Massachusetts Stormwater Handbook Standards*, by requiring retention of at least one-inch of runoff volume from impervious surfaces at new development sites and 0.8 inches at redevelopment sites. Where retention is not possible, there are numeric Total Suspended Solids (TSS) and Total Phosphorus treatment requirements.

Implementing the new MS4 permit will certainly have cost implications for municipalities. Recognizing the need to plan for and fund additional resources, the EPA has set effective date of July 1, 2017.

As with the previous permit, there is a five-year implementation schedule for the 2016 permit. The first deadlines include submitting a Notice of Intent to EPA by September 29, 2017 and a Stormwater Management Plan by July 1, 2018.

[Click here](#) for more information about the permit. The EPA has already sponsored several public information meetings, and additional technical assistance is sure to come as the permit deadlines approach.



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When it Comes to Water, "D" Does Not Stand for Delicious

by Ronald K. Burns, PE, Principal Engineer, CHA Consulting, Inc.

The US water infrastructure (drinking water/wastewater) like the rest of our infrastructure is in very poor condition. The latest ASCE Infrastructure Report Card in 2013 gave our drinking water and wastewater infrastructure a "D." The US drinking water systems are getting old and consist of over one million miles of water pipes. According to the report card, there are 240,000 water main breaks a year. Many of the pipes are over 100 years old. The US wastewater system consists of nearly 15,000 wastewater treatment systems and nearly 20,000 wastewater pipe systems (approximately 800,000 miles of pipe) as of 2008. The systems are old; many built following World War II. According to the USEPA, wastewater systems experience approximately 75,000 sewer overflows annually. These result in the discharge of 3-10 billion gallons of untreated wastewater resulting in over 5,500 water borne illnesses annually. The impact on our environment can also be seen where according to a 2008 study by the USEPA, 55% of our nation's rivers and streams, along with 68% of lakes (by acreage) do not support healthy aquatic life.

This deterioration in our infrastructure didn't occur overnight but was due to a pattern of

under investment by local, state and federal government over many years:

- A report by the Congressional Budget Office in 2014 on spending on public infrastructure found that real spending on water infrastructure from 2001 to 2014 dropped by 19% for the federal government and by 5% for local government.
- A study by the Center for Budget and Policy found that spending on water infrastructure as a percentage of GDP shows a somewhat similar trend with state and local government spending falling from 2.9 to 2.4% as percentage of GDP from 2001 to 2014.

Some increase was seen in federal spending as result of the 2009 Recovery Act to help with the impact of the Great Recession. Capital spending fell once those funds were depleted in the majority of States.

To add further to the funding need, local and regional water/wastewater treatment systems are having to comply with more regulations that include more stringent drinking water standards and those related to climate change and sustainability. Federal funding accounts for roughly 30% of the funding for water infra-



55% of our nation's rivers and streams, along with 68% of lakes (by acreage) do not support healthy aquatic life.

structure projects according to research by the Center for Business and Policy. This funding is provided via two federal revolving funds: Clean Water State Revolving Fund (CWSRF) and Drinking Water State Revolving Fund (DWSRF). The CWSRF is used to fund wastewater/storm water infrastructure projects, while the DWSRF is utilized for drinking water related projects. In 2015 USEPA required that 20% of the CWSRF be used for green infrastructure projects. All of these needs, while worthwhile from a public health and environment perspective, divert funds from the needed repairs and upgrades of the aging infrastructure.

All of this has left an immense funding gap.

- Again according ASCE Report Card current funding needs until 2020 amount to approximately \$126 billion. Estimated funding to 2020 is approximately \$42 Billion. This leaves a gap of \$84 Billion. ASCE estimates the gap will increase to almost a \$144 billion by 2040.

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Submit an Article to BSCESNews

The BSCES Newsletter Editorial Board invites BSCES members to write and submit an article for publication in *BSCESNews*. Typically 400 to 800 words, *BSCESNews* featured articles are about technical topics or professional matters of interest to civil engineers. The September 2016 issue of the newsletter for example, will highlight the ASCE Transportation & Development Institute Boston Chapter and feature one or more articles about on the topic of Transportation.

Email your article in Microsoft Word format to BSCES Newsletter Editorial Board Chair Mike Cunningham at mcunningham@kleinfelder.com or BSCES Association Manager Rich Keenan at rkeen@engineers.org.



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Water Infrastructure

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- According to the US EPA our water infrastructure (includes storm water management) has an investment need of over \$655 billion over the next 20 years.
- In Massachusetts, the Water Infrastructure Commission in 2012 found that the state has a shortfall in funding for drinking water and wastewater infrastructure of \$21.4 billion over the next 20 years. Storm water management needs add an additional \$18 billion over that same period.

Now in 2016 it looks like there is not going to be any significant movement to bridge the funding gap. EPA is proposing in its FY2017 budget to include \$2.0 Billion for the state revolving funds and another \$42 Million for

training and grants for Water Infrastructure Innovation and Finance Act (WIFA) program funds. Assuming this represents one third of the funding for wastewater projects, it amounts to roughly the equivalent insufficient annual funding projected by ASCE. If this continues it will leave us with the \$84 billion gap by 2020 forecasted by ASCE.

What will it take to go from a D to C to B or even an A? The biggest challenge to improving our grade and getting our water infrastructure to a sustainable level is not technological. The challenge is an economic and social challenge. The lack of funding is a sign of priorities and while it may be easy to point the finger at the politicians, they are taking their cue from the

general public. A recent survey of residents by the Water Coalition found that 95% of those surveyed think it is important to invest in our water systems. However a lackluster 47% were willing to pay more. This means half the people that said it was important aren't willing to pay for it. The Water Coalition tested the effect of education on the issue by reaching out to the survey participants and providing education on the importance and need for water infrastructure. When they surveyed again after the outreach the number of those willing to pay extra for water infrastructure jumped to 60%. We as engineers can make a difference and we must continue to help educate the public and provide leadership on this important issue.

BSCES Seeks Legislative Fellow

by Anthony M. Puntin, PE, BSCES Executive Director

BSCES is looking for a member to become our 2017–2018 Legislative Fellow in the Massachusetts Legislature. The BSCES Legislative Fellows Program provides an opportunity for a BSCES member to work for approximately 16 months on the staff of a Massachusetts legislative committee. It is possible to serve in this role on a part-time basis, while doing your regular job, depending on

certain restrictions. The application deadline is October 31, 2016 for the Fellowship year beginning in early February 2017 and ending on July 31, 2018, the probable end of the legislature's formal session in 2018.

A BSCES Legislative Fellow participates directly in the lawmaking process and learns how the state government operates. The Massachusetts Legislature benefits from the Fellow's engineering

expertise. Plus, at the end of the fellowship, the civil engineering community has an engineer with in-depth knowledge of the legislature's decision-making process.

For more information, visit the [BSCES Legislative Fellow page](#) on BSCES' website or contact Rich Keenan at 617/305-4110 or at rkeenan@engineers.org.

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President's Report

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but there is more to the significance of Holyoke's infrastructure. Clemens Herschel, the noted hydraulic engineer and a past president of BSCES and ASCE, worked for the Holyoke Water Power Company in the 1880's. The power company had trouble measuring the amount of water that was being used by the individual water mills so Herschel developed the first commercial flowmeter based on the Venturi tube to measure the pressure drop. His Venturi Meter, which is known for its longevity, reliability, and accuracy, is still widely used today. [Click here](#) to view a television clip about the event. Thanks to everyone who made this event so successful including Dave Westerling, AnaCristina Fragoso, Sara Campbell, Carlos Pena, Reed Brockman, and Olivia Richards.

Another major accomplishment this year was the revitalization of the BSCES website. Several BSCES volunteers and TECET staff worked diligently to update the site, make it more user-friendly, and create content that better reflected the work of our organization. The new site was launched in early January and provides the flexibility to grow as the needs of BSCES change. It is also supported on mobile platforms.

Thanks to the efforts of former BSCES president Danielle Spicer, a Membership Committee was formed to implement initiatives to attract new members and retain current ones. Among its accomplishments, the committee developed a presentation that highlights what opportunities ASCE and BSCES offer. BSCES members will start presenting this information and discussing these topics with employees of local engineering firms later this year.

Our outreach efforts geared to the K-12 community have always been robust and this year was no exception thanks to Public Awareness & Outreach Committee Chair Olivia Richards. Olivia and her team organized the Model Bridge Competition (33 schools made and load tested bridges constructed from pasta), the Future City Competition (36 teams built sustainable cities of the future), and the Ralph Salvucci Online Bridge Competition (105 teams participated). They also held the first Spring Awards Banquet to celebrate student contest winners and recipients of various Society awards, recognize local recipients of ASCE's New Faces of Civil Engineering, and honor BSCES and ASCE Life Members. Speakers included the Ernest Herzog Award winner and Norma Jean Mattei, president-elect of ASCE. Reed Brockman and AnaCristina Fragoso also hosted several episodes of *Civil Engineering Today*.

This monthly BSCES television talk show highlights developments and people within our profession. The Public Awareness & Outreach Committee also conducted several Boston Bridge Tours for students and the public. The committee continued to focus on STEM education by purchasing a cushion Arch Bridge which is used at STEM-related events. This complements their Zakim Bridge model and shake table which helps the public and potential future civil engineers further understand our profession and become engaged. Because of the popularity of their programs and reputation that they have established, the BSCES Public Awareness & Outreach Committee has been asked to participate in numerous events including the Cambridge Science Festival, Girl Scouts of Eastern Massachusetts STEM Expo, and Jr. Tech "Girls STEM Summit."

The Younger Member Group and Student Chapter Committee, chaired by Cara Pirkey and Jessica Yarmarkovich respectively, have had numerous successful events, several sponsored jointly with BSCES institute chapters. These included Red Sox outings and socials, bocce and billiards tournaments, an event to experience the Massport 360 Flight Simulator, history of the MWRA, and a Structural Engineering Feud. The group also supported the ASCE Student Conference, which included the Concrete Canoe and Steel Bridge Competitions (co-hosted by Northeastern University and Wentworth Institute of Technology); the BSCES Student Chapter Officers' Caucus with the ten Massachusetts ASCE student chapters; a mentoring event where students were matched with BSCES professionals; and community service undertakings including the Middlesex Fells Reservation clean-up, a Thanksgiving Food Drive for the Greater Boston Food Bank, and a Toys-for-Tots Drive.

Bill Lyons and Ana Cristina Fragoso, co-chairs of the BSCES Government Affairs & Professional Practice Committee, and the other member volunteers who comprise this group also accomplished a great deal this year. The committee published a brochure that highlights the advantages of investing in our infrastructure rather than deferring funding. *Infrastructure: Worth the Investment* outlines these benefits with local examples. Thanks to Matthew Bosch-Willett for leading this effort. Additionally, Former BSCES president Peter Richardson was an instrumental advocate of the statewide Climate Adaptation Management Plan (CAMP) legislation. He spoke at a legislative briefing at the State House in support of this initiative. This legislation requires the state to develop a climate change mitigation plan and meet new long-term

carbon emission reduction benchmarks. A few weeks after he spoke, the legislation passed unanimously in the State Senate. Also, our legislative fellow, Mike Sullivan continued his service at the Massachusetts State House. He writes monthly reports that are published in this newsletter.

Our newsletter continues to be one of the greatest benefits of BSCES membership. Chair Mike Cunningham and the Newsletter Editorial Board published over 100 articles within the past year and kept our membership abreast of the latest developments in our profession, updates on projects, member profiles, notifications of upcoming events, and many other items.

Our technical groups, institute chapters and committees hosted over sixty events this year. These included dinner meetings, field trips, networking events, seminars, workshops, and lunch-and-learn sessions. Some of the most notable ones were the first Ladd Lecture (Geo-Institute Boston Chapter), Keville Dinner (Construction Institute Boston Chapter), Lawler Lecture (Engineering Management Group), Camp Lecture (Environmental & Water Resources Institute Boston Chapter), Freeman Lecture (Environmental & Water Resources Institute Boston Chapter), Bertram Berger Seminar (Transportation & Development Institute Boston Chapter), and the Structural Lecture Series (Structural Engineering Institute Boston Chapter). BSCES also held several training courses including two Professional Engineer Refresher Courses, NHI In-Service Bridge and Tunnel Safety inspection courses.

The Past Presidents Committee, chaired by Carlos Pena, also provided direction and guidance to the current leadership of BSCES. Their recommendations to address budgetary and operational issues have been invaluable. Accomplishing our numerous goals while maintaining fiscal responsibility of an organization is a difficult balance. Thankfully Bob Leger and Greg Mirliss, BSCES treasurer and assistant treasurer respectively, have done just that. Their skills, attention to detail, and direction have made BSCES a stronger organization.

I also want to thank all of the TECET staff who makes all of our work possible. Association Manager Rich Keenan is involved with every aspect of the organization and his institutional knowledge of BSCES (and ability to subtly remind the sitting president of her overdue newsletter articles) is greatly appreciated. Will Ognibene has served as the membership

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MassDOT Transportation Projects—Highlight Women in Engineering and Construction

written in collaboration with MassDOT District 5 and Barletta Heavy/Regina Villa

During National Women's History Month and Women in Construction Week in March, MassDOT celebrated its own team of women in the industry. From top management to laborer, women are embedded in MassDOT's construction work every day. MassDOT always seeks the right person for every position, and in construction and engineering, increasingly, that person is a woman. Leadership at the top of the agency and support on the job and in the office are making a difference in Massachusetts transportation projects.

According to Occupational Safety and Health Administration, the number of women working in the United States construction industry increased by 81.3% from 1985 to 2007. Yet the construction industry still has one of the most male-dominated workforces in the country. The Bureau of Labor Statistics reported in 2014 that only 872,000 (8.9%) of the 9.8 million people working in the industry were women. Less than 3% of production workers, such as laborers, are women. Although construction is usually considered a nontraditional occupation for women, they have actually been active in the construction and building industry for centuries. Some of the earliest written and graphic accounts of women working in construction as laborers, suppliers and tradespeople date back to 13th century Spain.

Engineering has begun to see a modest increase in women earning degrees and working in the field. Participation varies depending on the sector: civil, mechanical, software, etc. Despite increasing emphasis on STEM education—science, technology, engineering, and mathematics—it's been a struggle to increase women's participation. In 2004, according to the National Society of Professional Engineers, women made up about 13% of the engineering workforce overall, with about one-third of those being software engineers. In a 2012 report by the Congressional Joint Economic Committee, the overall number had risen just 1%.

There has been progress but there's more to do, and MassDOT is doing its part to increase training and opportunities for women. Women now play a role in all aspects of the industry, including managers, engineers, loader operators, and bricklayers. Walk by almost any construction site or attend a public meeting, and you will see engineers discussing major infrastructure projects and women working side-by-side with men.

MassDOT's Route 79/Braga Bridge Improvements Project features women involved at all levels, including MassDOT's Project Manager Amy Getchell and engineers from Vanasse Hangen Brustlin which is on the design side of the Braga project. Women also have a strong presence in the field working for the project's contractor, Barletta Heavy/O&G Joint Venture, in jobs ranging from iron worker to equipment operator to laborer and office personnel. In all, there are more than 50 women from MassDOT and its contractor's team who work on the Route 79/Braga Bridge Improvements Project.

Stephanie Pollack is MassDOT's first female Transportation Secretary and CEO; Patricia Leavenworth is MassDOT Highway Division's first female Chief Highway Engineer; Francisca Heming just recently was named District 1 Highway Director, and Mary-Joe Perry is the District 5 Highway Director.

As a sophomore civil engineering student at Northeastern University, Project Manager Amy Getchell began taking degree specific classes. She found herself in classrooms surrounded by men, both professors and classmates. While her classmates welcomed her with open arms, some professors had the "old school" mentality that women shouldn't be engineers. Getchell, in one specific instance that she'll never forget, was attending a professor's office hours for her Structural Mechanics I class. She asked for help and the professor said, "What do you care about your grade, you are only here to find a husband."

"As an 18-year-old who had never experienced feedback like that, I was dumbfounded and not quite sure what to do," Getchell said. "Had I known then what I know now, I would have marched into the Dean's office and filed a complaint. I never went back to another professor's office hours and instead surrounded myself with my male classmates, forming a tight knit study group to help me get through the next four years. That professor's attitude has empowered me in my career to be the best engineer I can be."

April Letourneau knew she wanted to be an engineer in high school. Similar to Getchell, Letourneau didn't get much encouragement from those around her early on. Once she got beyond the high school guidance counselor who thought engineering wasn't an appropriate career for a "young lady," she encountered some pretty amazing professors in college who inspired her.

Letourneau finished a five-year program in four years, with an engineering physicist degree and a concentration in civil and environmental engineering. It took some time for her to find her niche at MassDOT, and she worked hard. "I went to every training I could. Got as many certifications as I could," said Letourneau. She moved to District 5 where she flourished under the mentorship of her supervisor. Letourneau is now a Civil Engineer III (CE III) managing five jobs as one of District 5's two female resident engineers (RE). "When people ask why I work so hard, I tell them I'm paving the way to a future where even more women can work in the industry," said Letourneau.

Amy Aveiro, District 5's other female resident engineer, felt expectations were higher for her than for men in the industry. She worked hard to be taken seriously by her older colleagues. At MassDOT, Aveiro was encouraged to interview for promotions, learn new job duties and take classes. "I was given additional responsibilities beyond my grade, so I could learn and grow. I was even given the opportunity as a CE II to run my own jobs and become an RE," Aveiro said. "I was soon promoted to CE III and now supervise multiple projects and people."

What is the future for women in engineering and construction? Individual women like Getchell, Letourneau, and Aveiro are paving the way for more women to join their ranks. And, MassDOT is encouraging the next generation of engineers and laborers. Elementary school classes have visited construction sites, such as the Longfellow Bridge Rehabilitation and Whittier Bridge/I-95 Improvements, where many of the enthusiastic students were 3rd and 5th grade girls. College students are given an opportunity to work at MassDOT as interns and co-ops during the summer months, and female students are taking full advantage of this opportunity. And, finally, MassDOT provides on-the-job training and continuing education classes to encourage and advance all the engineers who represent the agency.

The National Association of Women in Construction honored Women in Construction from March 6 through 12. MassDOT is proud to continue the tradition of recognizing the achievements of these women who break ground and serve Massachusetts communities.

Engineers and Land Surveyors Day at the State House, 2016

by Peter A. Richardson, PE, CFM, LEED AP, ENV SP, Vice President, Green International Affiliates, Inc.

On May 10, 2016, approximately forty engineering and surveying professionals from BSCES, ACEC-MA, MALSCE and Massachusetts Highway Association (a new partner this year) met with their state senators, state representatives, and/or legislative staff on Beacon Hill for the nineteenth year in a row in order to discuss issues that are important to the engineering/land surveying community, in particular infrastructure investment in Massachusetts. Participants met at The Engineering Center for a continental breakfast and briefing session before heading to the State House. At the State House, participants listened to remarks from State Representative Carolyn Dykema before heading off to scheduled appointments with their respective representatives' and senators' offices.

Engineers & Land Surveyors Day (E&LSD) at the State House is the premiere government affairs activity for the three sponsors of The Engineering Center Education Trust (TECET) where sponsors work together to project one coordinated voice from the engineering/land surveying community to the legislature. BSCES, working through its Government Affairs & Professional Practice Committee (chaired by Bill Lyons), contributed significantly to this year's effort by developing a fact sheet on Resiliency/Climate Change Adaptation and a brochure entitled *Infrastructure: Worth the Investment*. A special thanks goes out to Matthew Bosch-Willett, PE, Structural Engineer at WSP/PB for his leadership in developing the brochure.

There were five main topics that were discussed with legislators and their staff as follows:

Transportation Infrastructure

- Creation of a Small Bridge Program to help municipalities repair or replace non-federally aided bridges and approaches with span lengths no greater than 20 feet.

- MassDOT's proposed modifications to the Complete Streets program to help more municipalities participate.
- New revenue for transportation, including increased use of tolling, in conjunction with the other New England states or a pilot project for collecting fees on VMTs (Vehicle Miles Traveled).
- Financial Management Control Board as it works to improve business processes and develops a long-term plan for the MBTA.
- A multiyear commitment of \$300 M/year for Chapter 90 funding.

Water Infrastructure

- Increased funding for water infrastructure, including H. 657—An Act providing for the establishment of sustainable water resource funds.
- Chapter 259 of the Acts of 2014 raised the state capitalization of the SRF program from \$88 million to \$138 million, but the legislature needs to appropriate the funding.

Resiliency-Comprehensive Adaptation Management Planning (CAMP)

- BSCES has been advocating for the inclusion of CAMP language into either a stand-alone Bill or as an attachment to either the Energy Bill, Economic Development Bill or the state budget.
- CAMP is included in S.2121, An Act relative to 2030 and 2040 emissions benchmarks, which is currently before the House Committee on Ways and Means and approved by the Senate.

Lyme Disease treatment

- Support of the Lyme disease amendment in the Senate version of the FY2017 state budget, specifically having the Senate keep the same language that is in the House FY2017 budget (H.4201)



Past BSCES President, Danielle Spicer and Past ACEC-MA President (and BSCES Member), Ko Ishikura, both of Green International, met with State Representative Kate Hogan at E&LSD.

- Support of HB 901 and SB 502, which will expand and reinforce the long-term treatment of Lyme disease and require insurance companies to provide the needed insurance coverage.

Maximizing Private Sector Innovation

- Opposition to S.1697—An Act to promote safety, efficiency and accountability in transportation projects through public inspections
- Opposition to S.1702—An Act relative to protecting the taxpayers of the Commonwealth.
- Opposition to S.1711—An Act relative to transparency in government with regard to consultant expenses
- Opposition to any legislation that prevents state agencies from contracting out services when appropriate to the private sector

A sincere thanks to our Executive Director, Tony Puntin and to ACEC-MA Executive Director, Abbie Goodman, along with the rest of the TECET staff who helped make this year's E&LSD successful. Fact Sheets used in the meetings with State Representatives and State Senators are available online.



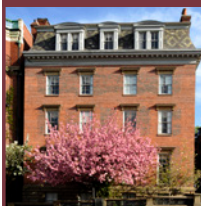
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Branch & Committee Reports

SEMAC Enters Into Contract Discussions

by John C. Cavanaro, PE, Principal, Cavanaro Consulting

Engineers are increasingly under pressure to give in to clients' demands to reduce fees and release work product due to the pressure in our highly competitive industry. But how does the successful engineer address these demands and preserve potential revenue generation? Knowing your legal rights can help you determine what to protect, how to protect it, and how much time you have to make a claim.

The Southeastern Mass Committee (SEMAC) took up this often neglected and/or mishandled topic during their 4th successful event on Friday May 20th at the Abington Ale House in Abington, MA, to a gathering of over twenty participants for an informative workshop session with Attorney Robert Pellegrini, president of

Pellegrini-Keogh Law. Prior to starting his private practice in Bridgewater, Attorney Pellegrini served as senior attorney for Cumberland Farms, Inc. and Gulf Oil, where he was primarily responsible for permitting and real estate, including site selection and acquisition, project team selection, schematic design, construction law, contracts, and related litigation. Robert has represented clients before the Architectural Access Board (ADA issues) and with respect to the Petroleum Marketers Act.

After a delicious buffet breakfast, Attorney Pellegrini guided his audience through common mistakes and pitfalls that can cost engineers millions, while reviewing and discussing opportunities to reap additional income that's

rightfully theirs by means of drafting comprehensive contract documents prior to engagement to start every job on the right foot.

SEMAC has been holding monthly lunch meetings on the 3rd Friday of the month on the South Shore, and extends an open invitation to all interested parties. Please contact any of the folks below for additional information on becoming active in the SEMAC.

Azu Etoniru, SE, PE, PLS, committee chair
aetoniru@etengineering.com

Charles Gross, PE, committee vice chair
chgpellc@me.com

John Cavanaro, PE, committee clerk/secretary
jcavanaro@cavanaroconsulting.com

A Message from BSCES Executive Director Tony Puntin



For the past five years it has been my privilege to serve as the executive director of the Boston Society of Civil Engineers Section/ASCE. After the conclusion of this fiscal year on

June 30, I will be leaving BSCES. I will take with me many fond memories of people and events. It has been a great experience to serve under the direction of five unique presidents. They have each challenged me and made me venture outside of my comfort zone. For that I am eternally grateful.

Truth be told, when I accepted the position, I was not exactly sure what to expect. My engineering curriculum at UMass-Amherst did not include an "Executive Directing" class. I quickly learned the depth and breadth of BSCES and its activities. From its numerous scholarships

and grants to the Technical Groups to the Legislative Fellow program, BSCES is unparalleled within ASCE. To that end, BSCES has been recognized by ASCE as the most outstanding branch four of the last five years. We should all be very proud of this accomplishment.

The best part of this position (like most things in life) is the people. I have met and interacted with many fantastic individuals that are truly dedicated to our profession. There is no greater expression of your commitment to your industry than to serve in a volunteer capacity. Whether serving as the president of the section, chairing a technical group, or volunteering for Future City, dedicated volunteers giving their time and effort are the heart and soul of BSCES.

What will I miss? Of course my co-workers at The Engineering Center for the past 5 years:

Rich, Elizabeth and Abbie. The relationship between The Engineering Center, BSCES, and the other sponsors (ACEC/MA and MALSE) is truly unique and should be celebrated. However, what I will miss most of all is serving the BSCES membership. As engineers, much of what we do is serving the public; serving the greater good of society. I tried to emulate this "service for the greater good" in my role at BSCES.

I intend to continue my involvement with BSCES as a member and will still be active with ASCE on a local and national level. The civil engineering profession has given much to me and my family and I will always give back to it. The skills, knowledge, experience, connection, and friendships I have obtained over these past years at BSCES have shaped my professional career. I wish all of you well and thank you for allowing me to be a part of this great organization.

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BSCES Legislative Fellow Update from Beacon Hill— Proposed 2017 Senate Budget Amendments

by Michael Sullivan, PE, Senior Bridge Engineer, Collins Engineers, Inc., 2015-2016 BSCES Legislative Fellow



The 2015–2016 legislative session will be coming to a close in the next few weeks and one of the final orders of business is to adopt a state budget for fiscal year 2017, which begins on July 1st. The House already passed

their proposed recommendations for the state budget back in April. The senate finalized their proposed recommendations the final week of May and now the two budgets will have to be reconciled into one final version to be presented to Governor Baker for his approval.

The House budget can be viewed [here](#). The Senate budget can be viewed [here](#).

Here are a few amendment highlights from both budgets pertaining to the civil engineering profession:

Senate

- Changes to MassDOT's Complete Streets program to encourage municipalities to include complete streets design elements and infrastructure on new, reconstruction, and maintenance projects on locally-funded roads. Municipalities are eligible to receive grant funding by adopting a complete streets by-law, ordinance, or administrative policy; ensure a municipal employee participates in MassDOT training for the program; develop a complete

streets prioritization plan, and; comply with other MassDOT requirements.

- A feasibility study for a Springfield to Boston High-Speed Rail Line
- An Interchange Study on Route 90 between the towns of Westfield and Lee. The study will examine and evaluate the costs and economic opportunities related to establishing the interchange between the two towns and will include projected capital costs; projected operating costs; projected use levels; environmental and community impact estimates; funding sources; and the resulting economic, social, and cultural benefits to the surrounding region and the Commonwealth.
- \$75,000 for a water treatment study in the City of Peabody.
- \$250,000 for the creation of a park on Truman Parkway on or near the Neponset River in the Town of Milton.
- \$50,000 for a feasibility study on connecting the town of Sutton to public sewer water treatment services.

House

- A Transportation System Assessment report prepared by the Secretary of Transportation that includes an analysis and assessment of current capacity constraints, safety conditions and the state of good repair of the commonwealth's transportation system, including all

modes of surface transportation. The report shall analyze the operating and capital expenditures of MassDOT and the MBTA and state the baseline revenues available and projected from fiscal 2017 to fiscal 2028.

- \$10 million for the Dam and Seawall Repair and Removal Fund
- \$598,500,790 for the Massachusetts Department of Transportation (approximately 2.5% more than FY16)
- \$50,000 shall be expended for a grant to the 128 Business Council for planning and development of a transportation management association serving the Arsenal Street and Pleasant Street corridors in Watertown
- \$50,000 for the planning, engineering, and construction to redesign the intersection of Front Street, Central Street and Spring Street in Winchendon
- \$100,000 for improvements at Aquinnah Circle in the town of Aquinnah
- \$200,000 for the purpose of funding the planning, preliminary design and engineering costs for the construction of a skate park at Farm Pond in Framingham
- \$50,000 for the creation of a park at the beginning of the Mansfield Norton Bike Trail in Mansfield
- \$50,000 for a feasibility study for the reconfiguration and expansion of the parking lots at the commuter rail station in Sharon to facilitate travel to Boston
- \$25,000 for an economic development study for the redevelopment of the downtown area in Foxboro

President's Report

continued from page 6

coordinator and has been instrumental in informing members of upcoming events, however his real success was leading much of the website design effort. This was a herculean feat. I also wish to thank Elizabeth Tyminski and Brendy Gonzalez who makes sure our financial matters are in order. We are also grateful to Abbie Goodman, Caroline Dzialo, and Anita Lum for their continued support.

BSCES would not be where it is today if it was not for Tony Puntin. As our executive director for the past five years, he has become a fixture in the Boston engineering community. His dedication, enthusiasm, and extensive knowledge of our local and national organization have helped us thrive. He has been an advocate of our profession and our organization. Tony

will be departing BSCES at the end of June and he will be greatly missed.

I would like to thank all of our corporate sponsors, particularly this month's featured sponsor, Green International Affiliates, Inc. We are grateful for their support of BSCES and encourage you to read their featured article entitled "Forensics of Bridge Inspection—It's More Interesting (and Important) Than You Might Think," which was written by Gabriel Gabrielli, PE. The Government Affairs & Professional Practice Committee is our featured committee and is co-chaired by Bill Lyons of Fort Hill Companies and AnaCristina Fragoso of WSP/Parsons Brinckerhoff. I encourage you to become actively involved with this group. [Click here](#) to learn more about BSCES advocacy efforts.

Of course BSCES is a volunteer-led organization and we are indebted to our member volunteers and the organizations that support them and all of our financial sponsors. Our Board of Government, which includes the technical group and institute chapter chairs, steers the direction of the organization. You can learn more about the Board of Government and leadership [here](#). Thank you to everyone who has volunteered and supported our efforts.

It has been an honor to serve as BSCES president for the past year. Much has been accomplished and I am excited about the future of the organization and its leadership. President-Elect Brian Morgan has been actively involved with the various elements of BSCES and we are fortunate to have him as our incoming president. I look forward to assisting him, the Board of Government, and the organization as we continue to grow and I thank all of you for your support.

Upcoming Events

For more information and to register for events, please visit www.bscs.org

To register online for an event at the BSCES member rate you must login using your BSCES assigned username and password. If you do not know your BSCES member login information, call 617/227-5551.

COPRI Networking Event

Thursday, July 14, 2016

Cambridge Brewing Company
1 Kendall Square, Cambridge, MA

6:00 PM – 9:00 PM

What's COPRI? This is your chance to learn more about the Coasts, Oceans, Ports & Rivers

Institute Boston Chapter; who we are and what we do! COPRI would like to invite you to join us at the Cambridge Brewing Company for an informal social gathering on Thursday, July 14. Join us for a night of networking, food, and fresh beer!

Please see the Insert at the end of this month's newsletter for further details.

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tion documents; planning, grading, drainage & roadway/utility design, hydrological analysis, septic design, and permitting; construction insp. & admin.; and field survey/investigations.

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the design standards of municipalities in the Boston Metro Area including the City of Boston and/or MassDOT is advantageous.

For more information:
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COASTS, OCEANS,
PORTS & RIVERS
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Boston Chapter



COPRI Summer Networking Event

Thursday, July 14, 2016

Cambridge Brewing Company, 1 Kendall Square, Cambridge, MA

6:00 PM – 9:00 PM

What's COPRI? This is your chance to learn more about the Coasts, Oceans, Ports & Rivers Institute Boston Chapter; who we are and what we do! COPRI and the Younger Member Group would like to invite you to join us at the Cambridge Brewing Company for an informal social gathering on Thursday, July 14. Join us for a night of networking, food, and fresh beer!

This no-cost event is open to anyone and everyone who is interested in learning more about COPRI; what our interests are; COPRI's role as a BSCES institute chapter; and how you can become more involved! Appetizers will be provided along with a cash bar.

Registration Not Required

Registration Fees: FREE!