# BSCES NEWS

A MONTHLY PUBLICATION OF THE BOSTON SOCIETY OF CIVIL ENGINEERS SECTION/ASCE

VOL. 42 | NO. 3 | NOVEMBER 2017 SEI Boston Chapter/Structures


## UPCOMING EVENTS

***BSCES Sponsored Seminar***
*December 5 – 6, 2017*

***T&DI Boston Chapter & YMG Holiday Event***
*December 7, 2017*

***ASCE and BSCES Sponsored Seminar***
*December 7 – 8, 2017*

***169th Annual BSCES Awards Dinner***
*December 12, 2017*

***BSCES and BCAP Sponsored Event***
*December 14, 2017*

***Further Details Inside***

## 2017–18 Society Sponsors:

Louis Berger
CDM Smith
AECOM
earthsoft
Robinson+Cole
GZA

# Replacement of Four Bridges Along the Future South Coast Rail, New Bedford and Fall River, Massachusetts

*by Kristofer Kretsch, PE, Senior Structural Engineer, VHB; Shanta Keller, PE, Structural Engineer, VHB; Brittany D. Pinto, Senior Marketing Specialist, VHB*

VHB was the prime consultant and lead designer for the fast-paced $45M replacement of four bridges, an elevated freight-access loading dock, and associated track and roadway construction along the future South Coast Rail (SCR) corridor in New Bedford and Fall River. The Early Action 4 Bridge (EA4B) Project was identified early on as one of Governor Patrick's infrastructure initiatives in 2014, intended to improve freight service, while setting the stage for the future SCR project. The replacement of the four aged bridges significantly improved the state of repair for the system and safety for the traveling public. The EA4B project included five locations:

- Golf Club Road over SCR, Fall River: 90-foot, single span, integral abutment with Mechanically Stabilized Earth walls, carrying the roadway over the future SCR corridor
- SCR over President Avenue, Fall River: 100-foot, single-span, thru-girder railroad bridge, supported on H-piles
- SCR over Brownell Street, Fall River: 80-foot, single-span, thru-girder railroad bridge, supported on H-piles
- SCR over Route 18/Wamsutta Street/Acushnet Avenue, New Bedford: 450-foot, three-span, thru-girder railroad bridge, supported on precast concrete abutments and piers
- Freight Platform at Sid Wainer, New Bedford: 400-foot elevated freight platform and covered loading dock

*Wamsutta Bridge: This bridge carrying the future South Coast Rail over Rt 18/Acushnet Avenue/Wamsutta Street was the largest of the four bridges replaced as part of the EA4B Project.*

### Innovative Design

Each project location required a thoughtful approach to design detailing and construction phasing to enable scheduling around the active rail corridor. To speed the process, VHB used accelerated bridge construction (ABC) techniques, including prefabricated bridge elements at the Wamsutta and Golf Club Road locations.

The Sid Wainer freight platform and loading dock, north of the Wamsutta Bridge, was constructed as part of the traffic phasing. It served as a temporary access point for freight rail-dependent businesses in New Bedford and an expanded commercial access point for the area, post-construction.

*continued on page 2*

# *President's Report*

*by Malek A. Al-Khatib, PE, Vice President, Louis Berger*

It is with great honor that I report that BSCES has won the ASCE 2017 Outstanding Section and Branch Web Award for Very Large Sections and Branches. We appreciate BSCES Website Committee Chair Cara Pirkey of HNTB Corporation for her efforts to maintain such a high quality website. I am proud to report that BSCES won this award for the second consecutive year. Thank you to all our technical group, institute chapter, and committee members and leaders who work hard and make our Society website very rich in information and win for all the numerous criteria that distinguishes our organization as offering the most value to its members.

Please celebrate our success by attending our Annual Awards Dinner. On December 12 we are celebrating 169 years of BSCES success. BSCES and the engineering profession will recognize BSCES leaders and honor distinguished BSCES award winners and our newest Honorary Members. Our Keynote Speaker is Matthew A. Beaton, Secretary, Executive Office of Energy and Environmental Affairs and the event will be hosted by our 169th President Brian Morgan of CDM Smith. I look forward to seeing you at the 169th Annual Awards Dinner on December 12 at the Royal Sonesta Hotel in Cambridge and celebrating both our longevity and stature within the industry as the premier membership organization in the engineering industry.

Winning such recognition year after year is a highly prestigious and nationally recognized

*continued on page 3*

**Boston Society of Civil Engineers Section/ASCE**
The Engineering Center, One Walnut Street , Boston, MA 02108
*Phone:* 617/227-5551, *Fax:* 617/227-6783
*Email:* bsces@engineers.org, *Website:* www.bsces.org






# Replacement of Four Bridges


*continued from page 1*


The track crosses the Wamsutta Bridge on a curved alignment, and the spans cross the roadways at a significant skew. The highly complex bridge required significant traffic management and innovative construction sequencing and techniques to construct, including the ABC techniques such as precast substructure elements and self-propelled modular transporters.

The Wamsutta Bridge included the use of large, heavy steel and concrete elements, which is unique to bridge construction. Lessons learned from the fabrication and erection, including material and handling limits, will improve design details for future projects. Strategies for handling complex construction staging in multiple locations simultaneously provide valuable lessons.

The Golf Club Road Bridge was designed using Prefabricated Bridge Units (PBU) to speed superstructure installation.

## Complexity

The EA4B project's accelerated timeline required a fast-paced design process, with varying types of bridges and structures in multiple locations with multiple stakeholders, including MassDOT and the MBTA. Complex geometry, rail alignment, and restrictive shutdown requirements resulted in a unique solution for the Wamsutta Bridge, crossing over Route 18 and Acushnet Avenue. The heavy skew and curved alignment required an "over-widened" bridge deck for a typical through plate girder (TPG), stretching the span length limits for the TPG design. Construction staging design included prefabricating substructure elements and preassembly of the superstructure with a heavy lift installation. Large precast abutment footings and stems challenged the limits for casting, handling, and erecting.

To complete the project within the accelerated schedule, VHB assembled dedicated design teams for each location, and therefore, was able to complete the full design in less than 12 months. For Wamsutta, these teams completed the superstructure and substructure designs on a parallel track with close coordination.

VHB collaborated with MassDOT Research & Materials Section on the precast concrete elements—meeting with the precaster and reviewing new mass concrete mix designs, thermal analyses, and curing plans. The team


*continued on page 3*


*Wamsutta Bridge Precast Wingwall Erection (top) and Aerial View of Span 3 Erected (above)*

*Wamsutta Bridge Girder in Fabrication: Span 3 over Acushnet Avenue was the longest at 145 feet. Each of the 3 spans required 12.5-feet deep girders to support Cooper E80 loading.*

*Wamsutta Railroad Track: Span 1 deck width is 35 feet wide to accommodate the curved track alignment.*

## Replacement of Four Bridges

*continued from page 2*

provided examples and recommendations for development of precast and PBU special provisions to be used on future projects.

### Social, Economic, and Sustainable Development

The Wamsutta Bridge was an obsolete railroad structure. Its deteriorated condition made it vulnerable to closure, restricting street and rail mobility due to substandard track alignment and deficient vertical clearances. The bridge's critical role in supporting existing freight transport and expanding the freight industry in the economically distressed New Bedford, meant it needed to be replaced.

The EA4B project provides opportunities to further advance the passenger rail expansion and creates a foundation for transit-oriented communities and economic development through future growth, including more housing and job opportunities. This project improves safety for drivers—through roadway and guardrail improvements and increased vertical clearance under the bridges—and trains—through improved bridge capacity, clearances, and alignment. Improved aesthetics, including lighting, create a more vibrant place for residents.

*Wamsutta Bridge (before): The existing span arrangement and clearance over Acushnet Avenue had caused numerous accidents.*

*"SCR, when implemented, will build on the industrial capacity of this rail line while bringing the full scope of redevelopment to New Bedford. Regionally, the SCR project will catalyze smart growth, serving as the spine for 10 new transit-oriented development stations and as the engine for implementing a corridor plan that maps priority natural areas for preservation. Recognizing that this project provides immediate benefits that preserve freight rail capacity in the corridor, the Wamsutta Bridge reconstruction will also make an inherent long-term contribution to a larger range of job creation and sustainability."*
—Jean Fox, MassDOT Project Manager

### Project Team

- **VHB**
  Overall project management, environmental permitting, temporary traffic control, utilities, highway and roadway design, structural design, and track design
- **HNTB Corporation**
  Structural design and lighting design support
- **Jacobs Engineering Group**
  Geotechnical engineering
- **Keville Enterprises, Inc.**
  Estimating and scheduling
- **Prime AE Group, Inc.**
  Survey
- **Regina Villa Associates**
  Public outreach
- **Green International Affiliates, Inc.**
  Peer review
- **Cardi Corporation:** General contractor

### Authors

*Kristofer Kretsch, P.E.*
Senior Structural Engineer, VHB

*Shanta Keller, P.E.*
Structural Engineer, VHB

*Brittany D. Pinto*
Senior Marketing Specialist, VHB

## President's Report

*continued from page 1*

distinction. We are most proud of our welcoming culture that promotes participation, mentoring and supporting our members. Your success has led to our success, which leads to successive successes. To amplify our message of inclusiveness, we are offering a new opportunity for our members and nonmembers, to meet for lunch to learn more about the many benefits and opportunities offered by membership in ASCE and BSCES. With the enthusiastic and skillful leadership of BSCES Senior Vice President and Membership Committee Chair Bruce Jacobs of EarthSoft we are hosting the pizza luncheons at your engineering offices to:

1. Present ASCE and BSCES organization, activities, and members benefits;
2. Discuss BSCES programs and exchange ideas with engineers to tailor our programs to meet your needs;
3. Connect members with the technical group or institute chapter of interest to them;
4. Share with nonmembers the opportunities in ASCE and BSCES and facilitate their participation.

Let us know if you would be interested in hosting an on-site lunch-time meeting at your office for your staff or colleagues. Pizzas on us!

In addition, we are holding BSCES events in member engineering offices to the extent practical. Such events reduce BSCES costs and allow us to partner with our members. We know that having events and seminars at engineering offices will allow for more networking between our members, expose our members to the various offices in the area, improve relationships between engineers, especially employees of the firm, and create a healthier dialogue at the events.

I am inviting the engineering firms to participate in our programs and arrange for a BSCES activity in their office. Please contact me at President@bsces.org and we will be happy to schedule a mutually convenient visit to your office.

The Structural Engineering Institute Boston Chapter, chaired by Shahvir Vimadalal, is the featured group for this month. To learn more about this group, please read the article written by Shahvir in this issue of *BSCESNews*.

Finally, I wish you and your family a Happy Thanksgiving. We have a lot to grateful for. I thank you, our members for your continued support and contribution to successfully complete the 169th year of our BSCES. Also, I thank our Society and Program Sponsors for their support.

# Anderson Memorial Bridge Rehabilitation

*by Paul Harrington, PE, Senior Principal, Stantec; Mike McCall, PE, Associate, Stantec; Peter Moser, PE, Structural Engineer, Stantec*

This article describes a project to rehabilitate the Anderson Memorial Bridge connecting Alston to Cambridge. Originally built in 1915, Anderson Memorial Bridge is a three-span earth filled concrete arch that spans the Charles River. The bridge accommodates significant volumes of vehicular, pedestrian and bicycle traffic. It also serves as the primary connection between the two Harvard Campuses and is listed on the State and National Registers of Historic Places. The structure suffered from significant deterioration. But a carefully considered testing and inspection process led us to find that rehabilitating instead of replacing key features of the bridge would preserve its historical significance while meeting the needs of current users.

*Anderson Bridge Cambridge*

The work included an in-depth inspection and an extensive testing program that was used to establish the basis for the rehabilitation and to determine the condition of the nearly 100-year old concrete arches. The project also included the replacement of the brick masonry, cast stone, granite, spandrel walls and parapets, wingwalls, stairways, drainage, and lighting.

The concrete arches were structurally sound despite significant deterioration. Addressing this deterioration was crucial to ensuring the long-term performance of the bridge. We developed an extensive concrete rehabilitation process, including repair of cracks, surface defects, spalls, and corroded reinforcement. The rehabilitation also included replacement of the arch fill material as well as significant improvements to waterproofing and drainage to protect the concrete arches.

The original concrete at arch facias as well as brickwork was determined to be unrepairable. We designed unique precast concrete arches that met both the architectural and structural needs of the project. The precast elements were cast using careful field measurements and adjustments to match the profile of the existing arches. The outer and underside faces of the precast arches incorporated brick matching the layout of the overall masonry repair

Unfortunately, concrete spandrel walls, approach wingwalls, sidewalks, and masonry stairs were also in an advanced state of deterioration and required total replacement. The spandrel walls required careful analysis to accommodate traffic staging. We designed a unique gravity wall for support of excavation as the fill behind spandrels was removed from one side of the bridge with all traffic moved to the opposite side. The new Cambridge-side wingwalls, sidewalk, and stairs were founded on drilled micropiles to prevent settlement of the soft subgrade while minimizing construction noise.

The project also included development of architecturally sensitive details required to maintain the historic character of the bridge.

*Construction of precast arch segment with brickwork*

The historic brick arch appearance was restored while conforming to modern waterproofing and structural standards. This provides an historic structure that will be rugged and attractive for many years to come. In addition, the bridge featured unique sculptures at the four corners. The original sculptures were removed, restored, and reset.

Landscape architecture was also a critical aspect of the project. The parklands, located within

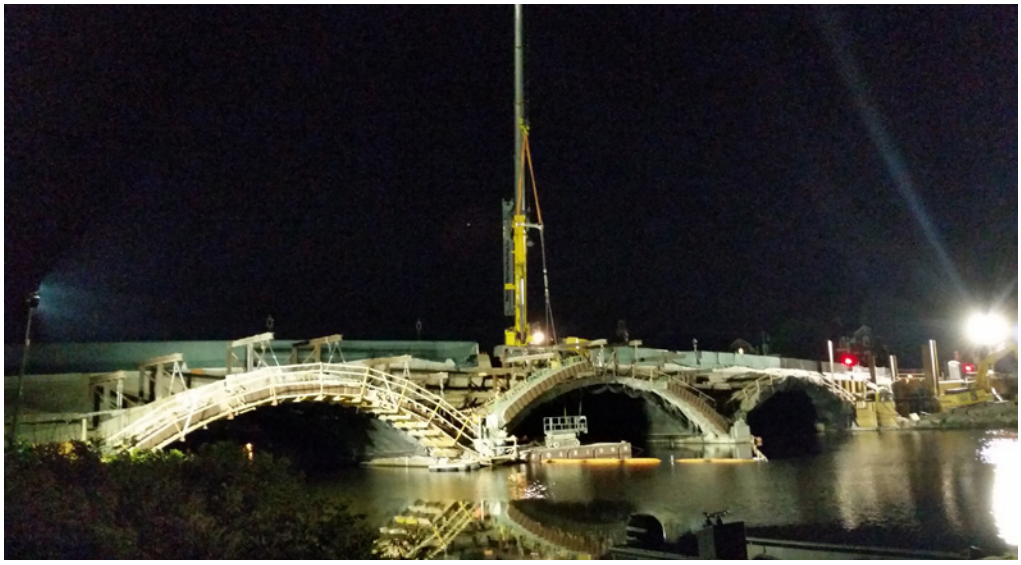
*continued on page 5*

## Anderson Memorial Bridge

*continued from page 4*

the Charles River Basin, required significant plantings, restoration of the river bank protection, and pathway connectivity extensive coordination with the DCR, Boston and Cambridge.

The work also included rehabilitation of the approach roadways, improvements to pedestrian/bicycle features, landscaping and environmental permitting. During the design phase, feedback from the community regarding the need for wider sidewalks was received, as pedestrian and bicycle volumes are high. Due to the historic nature of the bridge, expansion of the footprint to accommodate additional travel lanes was not an option.



*Construction at night*

As a result, our team developed a 'road diet' to achieve a complete street that would accommodate all transportation modes. We determined that two northbound travel lanes and one southbound lane could still provide the necessary capacity to efficiently move vehicular traffic, while providing the space on the road way to add dedicated on-road bicycle lanes. Traffic signals at each end of the bridge were also coordinated to provide the synchronization necessary to mitigate the removal of travel lane in one direction.

At this time, the project has achieved substantial completion. The reconstructed Anderson Memorial Bridge again graces the banks of the Charles. Its rehabilitation respects and reflects on its historic shape and form, with durable updates that will serve the public for many decades to come.

## The Benefits of Joining BSCES

*by Bruce L. Jacobs, PhD, PE, EarthSoft, Inc., BSCES Membership Committee Chair*

As you are likely aware, the American Society of Civil Engineers acts as a strong advocate for the interests of the civil engineering community. Joining ASCE provides you with access to five free professional development hours, 35 technical journals, as well as the celebrated Civil Engineering magazine.

The Boston Society of Civil Engineers Section/ASCE (BSCES) is the Massachusetts section of ASCE. Joining the 3,400 members of the Boston Section gives you access to other more tangible resources that are not afforded by membership in the ASCE alone. These include:

- Active membership in one of the eight technical groups and institutes chapters that plan BSCES's educational and networking events. Active membership in the institutes or attendance at these events provide opportunities for keeping up-to-date with technical advances in the profession and networking with clients and colleagues within the engineering community.
- The Younger Members Group is one of these unsung heroes that assists engineers in managing the transition between school and work.
- BSCES also works locally with other like-minded organizations to advocate for local initiatives that foster investment the Commonwealth's infrastructure and STEM education to ensure there is a future generation of civil engineers.

BSCES has a strong tradition in support of civil engineers that extends back to its founding in 1848. We strongly encourage you to help us to carry that tradition forward by joining BSCES when becoming an ASCE member or renewing your membership with ASCE.

# Value Engineering Constructability Solutions for a US Army Corps of Engineers Project

*by Mike Walker, PE, Vice President/Senior Principal, GEI Consultants, Inc.; Mike Sabulis, Senior Scientist/PM, GEI Consultants, Inc.; Chris Pray, PE, Senior Engineer/PM, GEI Consultants, Inc.; Chelsea Hoplin, EIT, Staff Engineer, GEI Consultants, Inc.*

Anselmi & DeCicco (Anselmi) is currently in the process of constructing a new levee and tide gate structure for Phase II, Contract 2 of the Hurricane and Storm Damage Reduction Project in Raritan Bay and Sandy Hook Bay in Port Monmouth, New Jersey.

Upon award, Anselmi was presented with two constructability issues to resolve; (1) how to contend with ~12,000 cubic yards of unsuitable organic material that was specified for removal and disposal, and (2) how to construct the temporary works (cofferdam and diversion channel) required to complete the project while abiding by the requirements of the environmental related permits.

## Problem 1: Solving What to do with Unsuitable Organic Material

The unsuitable organics were located within the proposed levee platform area and, if left in place, would have caused an unacceptable amount of settlement once the new levee platform was constructed. As in most other densely populated areas of the country, landfill space in New Jersey comes at a premium and material that is unable to be used for daily cover, such as the organics at the site, can be challenging to dispose of. The President of Anselmi, Henry Meyers, had an idea for a solution to this issue via a value engineering (VE) proposal that involved ground improvement and engaged GEI to assist in the development of the proposal based on the recommendation of their ground improvement subcontractor, Lang Tool Company (Lang).

Instead of excavation and off-site disposal of the unsuitable organic material, Anselmi proposed treating it in place via In-Situ Stabilization (ISS) to improve the soil properties such that the material could remain on-site. In addition to reducing the costs associated with disposal, this VE proposal would also eliminate the need for an expensive cantilever sheet pile wall that would have been required for temporary support along the toe of the existing levee as the unsuitable material was being removed. As an added benefit, the large volume of trucks that would have been needed to export unsuitable material/import acceptable material, the route for which would have been through a residential area, would no longer be required.

ISS is a highly controlled process by which pre-selected reagents, in this case Portland cement, are blended with the in-situ soils to create a high strength and low permeability material. GEI has


*Aerial image of the site*

a great deal of experience designing solutions using ISS as it is currently a popular tool for ground improvement as well as site remediation where GEI has been on the forefront of its use.

The USACE was interested in the idea (note: the savings from USACE approved VEs are split evenly between the government and the contractor) but had concerns, a lot of them. Prior to construction, GEI would undertake the following to help Anselmi demonstrate the feasibility of their VE idea to the USACE:

- Collected samples and performing a bench scale ISS treatability study.
- Performing calculations on the anticipated post-ISS conditions to show that seepage, slope stability, and settlement of the ISS monolith would all fall within acceptable parameters.
- Delineating the lateral and vertical extent of a pocket of deeper than expected unsuitable materials and devising a solution.
- Creating an ISS cell pattern that would be protective of the existing levee (a slot trench approach somewhat similar to that used in underpinning was selected).

After responding to the concerns expressed by the USACE, the VE was approved and construction commenced.

After the ISS has been completed, the in-situ soil had gone from being a weight-of-hammer material to having a strength of approximately 20 psi along the center of the levee and approximately 50 psi near the west wall of the cofferdam where the additional strength was needed to support the design of the temporary works.

*Performing the first cell of ISS*

*The Lang dual rotary mixing tool*

## Problem 2: How to Design a Better Cofferdam When the Footprint Can't be Changed

The final piece of the puzzle needing to be resolved was the design of the cofferdam in which the new tide gate structure would be constructed. The conceptual design furnished by the USACE in the contract documents was a large section modulus king pile cantilever system. Unfortunately, a cantilever system of sufficient size to resist the design flood event would be so large that it would preclude removal at the end of the project via any normal construction methods. This was compounded by the need for the cofferdam to not exceed the limits that had already been approved by the New Jersey Department of Environmental Protection as doing so would trigger a lengthy re-permitting process.

Working collaboratively, Anselmi and GEI were able to devise a cofferdam solution that used a

*continued on page 7*

## Value Engineering Constructability Solutions

*continued from page 6*

single level of internal bracing. To avoid interferences, a temporary berm would be left in place during the excavation and pile driving phase of construction (the new tide gate structure will be pile supported). Once excavation and pile driving are completed, the struts will be installed and the berm removed as the foundation and lower portion of the structure are constructed. The permitting restrictions on the limits of the cofferdam precluded the use of a permanent berm during construction as it would have interfered with the construction of the foundation for the structure.

To support the large crane needed for construction, a dead men system was put in place along the levee side of the project effectively making the west end of the cofferdam a standalone restrained wall. The properties of the ISS improved soil allowed for economization of design in the restrained wall and the use of only a single level of internal bracing (after berm removal) for the cofferdam.

The USACE approved the cofferdam design submittal, along with a separately prepared dewatering plan submittal also prepared by GEI, which allowed the next phase of the project to move forward.

The success of this project has been dependent on the ongoing close collaboration between all parties, listening to concerns expressed by the owner, and responding to those concerns in a timely manner with clear and technically sound deliverables. In the end, the Anselmi VE idea brought value to the project by sharing the cost savings that would have been incurred by the excavation and disposal of the unsuitable materials, provided a more constructible cofferdam solution, increased overall project efficiency, and created a team with a collaborative partnership looking forward to their next challenge.

*Cofferdam and diversion channel installed with excavation work ongoing.*

*Aerial image captured via drone of the ongoing work on the project.*

# Featured Group

## ASCE Structural Engineering Institute (SEI) Boston Chapter

*by Shahvir Vimadalal, PE, SEI Boston Chapter Chair*

The SEI Boston Chapter is about 860 members strong, and is represented by structural engineers with various backgrounds and interest, including bridge and building design, academics and government. Our mission is to advance structural engineering through increased awareness of sound engineering principles and to provide a forum for gathering and disseminating information on the latest developments in the field.

Over the years, our SEI Boston Chapter Committee has steadily grown and our committee currently consist of 26 members. Our committee is also represented by both bridge and building structural engineers as well as structural engineering professors. Our committee's goal is to serve our members by organizing a variety of events throughout the year that provide opportunities to learn and grow, while networking and socializing at the same time. Each year (July-June), we generally plan to have couple of dinner or lunch meetings, a field or plant tour, and a fun social event with our BSCES Younger Members Group (YMG) that we just started doing since last couple years and hope to make it an ongoing annual event. To help streamline our efforts as well as to allow opportunity for all committee members to be engaged, we have four subcommittees:

- Programs—plans, organizes and coordinates our events and programs
- Lecture Series—plans, organizes and coordinates our Biennial Lecture Series
- Membership—helps on getting new members, increasing member attendance, membership surveys and coordinating social events
- External Affairs—helps on structural engineering related outreach activities

One of our very popular events is our Biennial Lecture Series that we present in the fall of every other year in odd years. We just completed our 23rd Biennial Lecture Series with our last lecture on November 7. Our 2017 Lecture Series entitled Construction Aspects of Structural Engineering—"If You Design It, Can They Build It?" included following five lectures:

- Virtual Design and Construction by David Odeh, PE, SE
- Blurred Lines by Joseph Gill, P.E. and Kevin Lampron, PE
- Structural Issues during Construction by Alan Fisher, PE
- Legal Aspects / Risk Management by David Hatem, PC and Paul Kelley, PE
- You Want to Build It How by Thomas Zieman, PE

Our average attendance per lecture for this year's Lecture Series was 70. A lot of thought, planning and coordination goes into presenting the lecture series. I would like to thank our SEI committee, and especially our Lecture Series subcommittee and the ASCE Tufts Student Club for all their help in completing another successful Lecture Series. Typically, we start planning our Lecture Series in the first quarter of the prior year. So, planning for our 2019 Lecture Series will begin in early 2018. We would welcome any suggestions for the next Lecture Series theme, topics and speakers.

Keep an eye out in the upcoming BSCES emails for other events that we are planning for this year and mark your calendars:

- January 25, 2018 dinner meeting at Wentworth Institute of Technology: We Don't Need More Engineers, We Need Better Engineers—Automation and Its Effects on Both Trades and Profession
- March 13 and March 20, 2018 two-day seminar at MassDOT: Bridge Coatings
- Dinner meeting in May 2018—TBD
- Social event with the YMG in June 2018—TBD

We are also considering a joint event with Structural Engineers Association of Massachusetts (SEAMASS) sometime in the fall of 2018. It would be a half-day seminar on wood design related topic presented by American Wood Council.

We are always looking for members' input, and would love to hear from you if you have any suggestions for a dinner meeting program, a site or plant tour, an educational seminar or the next lecture series. I also encourage you to get involved and participate on our SEI Boston Committee to help shape the future of our organization.

If you have any questions regarding SEI Boston Chapter, want to attend an event, or get involved, please contact any member of our current executive committee leadership team:

Shahvir Vimadalal, PE, Chair
shahvir@yahoo.com

Nathan Rosencranz, PE, SE, Vice Chair
rosencranzn@wseinc.com

Michael Cruz, PE, Secretary
mcruz@greenintl.com

## Become a BSCESNews Contributor

Would you like to contribute to the newsletter of the oldest civil engineering society in the country? The BSCES Newsletter Editorial Board is seeking members who are willing to write articles for publication in *BSCESNews* or to join the Editorial Board.

Typically 300 to 700 words, BSCESNews featured articles are about technical topics or professional matters of interest to civil engineers. The January 2018 issue of the newsletter for example, will highlight the Engineering Management Group and feature one or more articles on the theme of Business Management.

Editorial Board members meet monthly via conference call to plan upcoming issues of the newsletter. They also solicit, write and/or review newsletter articles.

For more information on how you can become a BSCESNews contributor contact BSCES Association Manager Rich Keenan at rkeenan@engineers.org or at 617/305-4110.

## ASCE Structural Engineering Institute (SEI)

*by Andrew Herrmann PE, SECB, Pres.12 ASCE, F.SEI, SEI President 2017, ASCE President 2012, Partner Emeritus, Hardesty & Hanover Consulting Engineers*

Nationally and globally, SEI has had an interesting year. We have made progress in reaching out to other structural engineering organizations, including CASE (Council of American Structural Engineers) and NCSEA (National Council of Structural Engineering Associations) where we have updated our Memorandum of Understanding and are coordinating participation in common goals. SEI is an active participant in SELC (Structural Engineering Licensing Coalition) which has participated in several state SE licensing attempts and the annual meeting of NCEES (National Council of Examiners for Engineers and Surveyors) to advocate for structural engineering licensure. We have participated in the IABSE (International Association of Bridge and Structural Engineers) Symposium in Vancouver, BC, where SEI as part of its global initiative hosted their symposium dinner and presented a session on Structural Engineering Global Interoperability. Positive meetings have been held this year with IStrucE (Institute of Structural Engineers) and we look forward to a joint international conference, adaptation of their system of sharing lessons learned from structural engineering failures, and co-participation of our student organizations.

Internally, our Structural Engineering Education, Continuing Education, Conferences, Global Activities, and Performance Based Codes and Standards committees are moving forward as we seek to implement SEI's Vision of the Future of Structural Engineering. Next year, we are also planning to step back and evaluate our direction and progress with a new Task Committee on Confirmation and an Update of SEI's Vision for the Future.

SEI is a volunteer organization and, as 2017 President, I would like to thank all of our members, especially those volunteers who support our committees, divisions, and publications, and especially our Futures Fund, which provides startup funding for our initiatives. Finally, I thank our SEI staff who continually supply support, guidance, and continuity throughout the year..

## Help the Younger Member Group Support the Greater Boston Food Bank Holiday Meal Drive

*by Anthony M. Richardson, PE, Structural Engineer, Jacobs*

For the past several years, the BSCES Younger Members Group (YMG) has put am emphasis on giving back to the Boston community by participating in community service and philanthropic events, especially during the holiday season. One of the most successful events that the YMG has supported is the Greater Boston Food Bank's (GBFB) annual "Holiday Meal Drive." The Holiday Meal Drive is a hunger relief effort and as GBFB states on their website: "GBFB's annual Holiday Meal Drive helps to ensure that our neighbors in need can enjoy the tradition of a holiday meal, which they may not be able to afford on their own. Together, we can provide healthy holiday meals to struggling families across Eastern Massachusetts."

According to the GBFB website, one in three people served by their hunger relief efforts are children and 72% of the families they serve rely on food pantries to have enough food to eat. Even a small donation helps assist GBFB with their goal of eliminating hunger in Massachusetts this holiday season. YMG hopes to assist GBFB this year with a donation goal of $2,500. YMG is asking all BSCES members to consider donating a minimum of $20 to the YMG team page on the GBFB website. If YMG is able to meet or exceed its goal of raising $2,500, a total of over 600 meals would be provided to the Boston community. Since 2014, YMG's support of the Holiday Meal Drive has resulted in over $6,000 in total donations from the Boston civil engineering community. The $6,000 has provided over 1,500 meals over the holiday seasons to families in need.

In 2016, YMG was awarded by ASCE for their efforts in organizing donations to the Holiday Meal Drive and received the Outstanding Younger Member Group Project!

In addition to donations, members of YMG will be attending events at GBFB and other philanthropic organizations to assist in organizing of donations or serving food, as the need arises. While all are welcome to come offer their time to GBFB, they prefers donations during the holiday season as they are able to utilize $0.92 per every dollar donated to purchase healthy food for those in need.

Please donate what you can and encourage your coworkers, friends and family members to donate as well! If you have any questions, contact me at anthony.richardson@jacobs.com.

Click here to Donate Now!

# Recent News and Updates

**BSCES Welcomes its New Members**

The BSCES Board of Government is pleased to welcome the following new members who joined BSCES in September 2017:

*Members*

Thomas Army, ENSOL, Inc.
Georgi Chaykov, RSE Associates
Darrell Kennedy, AECOM
Kelsey Munns, VHB

*Students*

Theodore Adams, Worcester Polytechnic Institute
Amanda Alzaim, University of Massachusetts Amherst
Ahmed Alzeyadi, University of Massachusetts Lowell
Garrett Anderson, University of Massachusetts
Alvaro Asevedo, University of Massachusetts Dartmouth
Nicole Barrett, Worcester Polytechnic Institute
Will Bergendahl, University of Massachusetts Amherst
Sergey Bobrov, Wentworth Institute of Technology
Laura Boccio, Worcester Polytechnic Institute
Nicholas Briggs, Northeastern University
Andrew Bronk, Northeastern University
Eliza Brush, Lehigh University
Emma Burleson, Worcester Polytechnic Institute
Emiliano Camarena, Northeastern University
Tin Fung Ingrid Chan, University of Massachusetts Amherst
Geoffrey Circosta, Western New England University
Daniel Cowen, University of Massachusetts Amherst
Alexander Cruz, University of Massachusetts Lowell
Robert Donohue, Northeastern University
Jihan Eljadidi, University of Massachusetts Amherst
Michael Favreau, University of Massachusetts Lowell
Jessica Fernandez Pena, Wentworth Institute of Technology
Michael Gake, Worcester Polytechnic Institute
Zylmar Garcia, University of Massachusetts Lowell
Richa Gotecha, University of Massachusetts Lowell
Brendon Gray, University of Massachusetts Amherst
Emily Han, Worcester Polytechnic Institute
Conor Hill, University of Massachusetts Amherst
Ronald Judkins , University of Massachusetts Lowell
Benjamin King, Western New England University
Bryce-Kai Krause, Northeastern University
Karl Lausten, West Virginia University
Natasha Leipziger Mundis, Northeastern University
Lucy Lockwood, University Of Massachusetts Boston
Kyle Mitchell, University of Massachusetts Amherst
Isabella Morrison Ouellette, Worcester Polytechnic Institute
Aline Mukai De Mattos, Merrimack College
Jessica Nguyen, Worcester Polytechnic Institute
Sridatta Sai Polisetty, Northeastern University
Eva Power, Northeastern University
Domenic Privitera, Northeastern University
Paul Rivera, Worcester Polytechnic Institute
Carson Rosa, University of Massachusetts Amherst
Sofia Savoca, University of Massachusetts Lowell
Matthew Schomacker, Northeastern University
Stephanie Siu, Northeastern University
Matthew Stidham, University of Massachusetts Amherst
Summer Tobin, Massachusetts Bay Community College
Christian Van Kleeff, University of Massachusetts Amherst
Zachary Visaggi, Tufts University
Qi Wang, University of Massachusetts Lowell
Kaitlyn Wilson, Northeastern University
Oscar Yubi, Northeastern University

**BSCES Thanks CDM Smith for its Society Sponsorship**

The BSCES Board of Government would like to thank CDM Smith for becoming the newest 2017–2018 BSCES Society Sponsor. Other firms supporting BSCES as 2017–2018 Society Sponsors include AECOM, EarthSoft, GZA, Louis Berger, and Robinson + Cole LLP.

**BSCES Thanks its Newest 2017–2018 Program Sponsors**

The BSCES Board of Government would like to thank the following firms for becoming the newest 2017–2018 BSCES Program Sponsors:

Cianbro Corporation
Massport
Skanska Civil
Weston & Sampson Engineers, Inc.

These companies join 15 other organizations that had previously committed to becoming BSCES Program Sponsors. A complete list of the 19 BSCES Program Sponsors can be found at the bottom of the Upcoming Events page (See page 11).

**Renew Your BSCES Membership Today!**

As an ASCE member you received a notice to renew your society membership. When renewing your ASCE membership, please don't forget to also renew your BSCES membership to continue to receive the numerous member benefits that BSCES has to offer and be among the leaders of your profession who make a difference. Thank you for your contribution.

**Northeastern University's Engineers Without Borders Chapter Seeks Professional Mentors**

The Engineers Without Borders Chapter at Northeastern University is seeking a qualified Professional Engineer to mentor students in their Uganda Program. The program is currently in the final stages of construction of a water distribution system in Bbanda, Central District, Mityana. The role of a professional mentor is to advise program leaders, review all design work, and travel with the team to oversee work in the country. For more information on this mentorship opportunity, please see the insert at the end of this newsletter or contact Uganda Program Director, Roisin Floyd-O'Sullivan, at director.uganda.ewbneu@gmail.com.

**ASCE 2017 Board of Government Establishes Future Objectives**

Among the highlights of the 2017 ASCE Board o Direction's final quarterly meeting, which occurred October 7–8 in New Orleans, was the approval of six goal statements for ASCE that will help guide actions of the 2018 leadership and beyond. Developed with significant input from ASCE committees and others, the six are as follows:

- Civil engineers develop and apply innovative, state-of-the-art practices and technologies
- All infrastructure is safe, efficient, and sustainable
- ASCE advances the educational and professional standards for civil engineers
- The public values civil engineers' essential role in society
- An ever-growing number of civil engineers are members of, and engage in, ASCE
- ASCE excels in strategic and operational effectiveness

The six goals and their associated performance metrics and strategies will be shared for further feedback from ASCE leaders at all levels of the Society, and are expected to be complete by March.

*continued on page 11*

**SEND US YOUR NEWS!** Looking to strengthen the community that is BSCES, the BSCES Executive Committee and Newsletter Editorial Board has decided to expand the content of this *BSCESNews* Recent News and Updates column by including more member news. Have you recently been recognized for a professional accomplishment, passed the Professional Engineer Exam, received a promotion, or changed employers? If so, send your news items to BSCES Association Manager, Rich Keenan, rkeenan@bsces.org.

# Recent News and Updates (continued from page 10)

**Professional Development in your Wheelhouse**
Stay on the cutting edge of your technical discipline with the most up-to-date codes and standards, professional practice publications, conferences, e-updates, and continuing education courses all designed to provide the resources you need to advance your career. ASCE can and should be one of your best references to continue your Professional Development. Click here for more information.

*Some of the material includes the following:*

- The ASCE Library gives you access to professional journal articles online, across all disciplines of civil engineering.
- Professional Books available to you at a significant member discount, give you access to the latest technical information, codes and standards, and best practices in civil engineering.
- ASCE Conferences open doors to new professional opportunities, let you exchange ideas with peers, and shake hands with industry colleagues.
- ASCE proactively promotes diversity and includes various backgrounds, skills, and experiences to develop appropriate solutions and actions that will embrace and enhance opportunities in civil engineering.
- Nine Specialty Institutes, making specialty area information and services even easier to access
  - Architectural Engineering Institute
  - Coasts, Oceans, Ports and Rivers Institute
  - Construction Institute
  - Engineering Mechanics Institute
  - Environmental & Water Resources Institute
  - Geo-Institute
  - Structural Engineering Institute
  - Transportation and Development Institute
  - Utility Engineering and Surveying

# Volunteer Opportunities

## Outreach Volunteers Needed!

*by Olivia A. Richards, PE, Structural Engineer, Gill Engineering and BSCES Public Awareness & Outreach Committee Chair*

The BSCES Public Awareness & Outreach Committee needs volunteers to serve as mentors and perform other duties for the following committee-sponsored student contests:

### Future City Mentors

Future City teams are signing up to compete in this year's Future City Competition on January 20, 2017 and we are looking for engineers to mentor teams. Mentoring consists of advising the students on how to design a successful city. This year's theme is Age-Friendly City Design. Ideally, you will be able to work with the middle school students and provide engineering advice throughout the project. This may happen in person, via email, or even Skype. Typically, most engineers devote an hour a week until January. We have teams from all over Massachusetts and surrounding New England states, tell us the areas that are convenient for you. Please contact Sofia Puerto at sofiapuerto@gmail.com if you are interested! We are looking for engineers to mentor teams in the following cities:

Chelmsford, MA
East Longmeadow, MA
Leominster, MA
Salem, MA
Watertown, MA

### Model Bridge Mentors

Model Bridge teams will begin registering for the BSCES Model Bridge Competition that kicked off at the end of October. We need engineers to mentor these teams! Mentoring consists of advising the students while they design a small-scale bridge (40 inches in length) with the specified materials. Ideally, the mentor will be able to work with the kids and provide advice throughout the project (from now until February). This may happen in person, via email, or even Skype. Typically, most engineers visit the school weekly or every other week from November to January. Please contact us at bscesmodelbridge@gmail.com if you are interested. We are looking for engineers to mentor teams in the following cities:

Dorchester, MA
Hingham, MA
Malden, MA
Mattapan, MA

### New England Future City Competition Day: Saturday, January 20, 2018

**Overview:** Competition day for all teams to present model cities

**Location:** MassDOT Headquarters, 2nd floor, 10 Park Plaza, Boston, MA

**Time:** 8:00 AM to 3:00 PM

**Looking for:** Engineering volunteers to be judges on competition day (model judges, presentation judges, or special awards judges). Judges can be any engineer or engineering college student. No previous judging experience needed. Volunteers should check-in at the volunteer check-in table, which is located at MassDOT, 2nd floor mezzanine, by 8:00 AM to attend the judges' orientation session before competition day begins. Presentation and model judges will be placed in conference rooms where student teams will present their Future Cities and judges will use rubrics to provide scores. Special Awards judges will be in the mezzanine area walking around to various Future City team tables and scoring Future City models according to the Special Award rubric. Please email me if you have further questions regarding the event at outreach.comm@bsces.org. Click here to sign up.

### BSCES Model Bridge Competition Day: Saturday, February 3, 2018

**Overview:** Competition day for all teams to present model bridges and load test models

**Location:** Wentworth Institute of Technology, 550 Huntington Ave, Boston, MA

**Time:** 8:00 AM to 1:00 PM

**Looking for:** Volunteers to help run the competition. Volunteers will be running the registration table, distributing t-shirts, loading the bridges, guiding teams to the stage, etc. Please email me if you have further questions regarding the event at outreach.comm@bsces.org. Click here to sign up.

For more information on volunteering opportunities or becoming part of the BSCES Public Awareness & Outreach Committee, please contact me at outreach.comm@bsces.org.

## BSCES Legislative Fellow Update from Beacon Hill—190th Massachusetts Legislative Session

*by Bryon S. Clemence, PE, 2017–2018 BSCES Legislative Fellow*

The Joint Committee on Environment, Natural Resources and Agriculture continued to evaluate H. 2777. This is Governor Baker's proposed bill to allow Massachusetts to administer the federal National Pollutant Discharge Elimination System (NPDES) permit program. The NPDES program applies to surface water discharges from municipal and industrial wastewater treatment plants, municipal stormwater systems (separate and combined), and certain industrial stormwater systems, federal facilities, and large construction sites.

The Committee held a hearing on H. 2777 on October 10. Arguments against H. 2777 focused on its cost, the lack of a dedicated funding source, and recent cuts in staff and funding at DEP. Arguments for H. 2777 are improved integration with other water programs and DEP's better understanding of local conditions. Proponents of the bill cite DEP's successful administration of other federally mandated programs: drinking water, clean air, and hazardous waste. This argument seems valid, yet opponents of the bill foresee a reduction in water quality protection due to inadequate funding and political pressure.

That hearing also included H. 2139. This bill would require the Water Resources Commission to (1) evaluate state and federal water quality and pollution control programs and (2) provide recommendations for meeting the goals of the federal Clean Water Act. This evaluation would include the state administration of the NPDES program being proposed by H. 2777. A few people spoke in favor of this bill over H. 2777. They felt it would give the NPDES program the comprehensive review that it deserves.

The Joint Committee on Environment, Natural Resources and Agriculture also held hearings in October for bills on drought management (H. 2115/S. 425), standards for restoring and maintaining stream flows (S. 420), and several bills pertaining to infrastructure, water supply, underground storage tanks, hazardous waste, and siting of solid waste facilities.

The Joint Committee on Transportation held a hearing on October 24. The bills included high-speed rail between Springfield and Boston (S. 1935/H. 3429), pavement design requirements (S. 1966), and several bills pertaining to transportation funding. The pavement bill would require MassDOT pavements projects to evaluate life-cycle costs of both hot mix asphalt (HMA) and plain joined cementitious concrete (PJCC) and to approve those projects having the lowest life-cycle costs.

Further information on specific bills is available on the Legislature's website. There are links to legislators, bills, hearings, and session laws.

# Upcoming Events

### For more information and to register for events, please visit www.bsces.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.*

### BSCES Sponsored Seminar

**Tuesday & Wednesday, December 5 – 6, 2017**
Simpson Gumpertz & Heger, Waltham
*8:00 AM – 4:30 PM*

**Culvert Design for Peak Flow and Aquatic Organism Passage**

The purpose of this ASCE-developed seminar is to increase your ability to confidently design culverts given the many policies either in place or being considered in your jurisdiction. Upon completing this seminar, participants will have a solid understanding of the policies and procedures involved in culvert design, and will be able to design a culvert including determining peak discharge and any Aquatic Organism Passage requirements.

*Register by Tuesday, November 28, 2017. Please see the Insert at the end of this month's newsletter for further details.*

### T&DI Boston Chapter and YMG Holiday Event

**Thursday, December 7, 2017**
Market, 21 Broad Street, Boston
*6:00 PM*

**Holiday Party**

Join the Transportation & Development Institute Boston Chapter and Younger Member Group for a fun and festive evening at the Annual Holiday Party! We will be hosting a Toys-for-Tots drive, bring a new, unwrapped toy to donate (all ages) to get one entry into the raffle for a prize.

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

continued on page 13

### TECET Presents

**Know Your Audience: How to Present your Profession to K–12 Students**

*Free TECET Webinar for Engineers and Land Surveyors*

**December 8, Noon – 12:45 PM**

FEATURING:
**Reed Brockman**, PE, TECET Trustee, Past BSCES Public Awarenees & Outreach Committee Chair

**Olivia Richards**, PE, Current BSCES Public Awarenees & Outreach Committee Chair

Join us for this lunchtime webinar for insider tips on getting involved in volunteering with K–12 students. You will learn about recommended activities for K–12 students, speaking to K–12 students in a classroom setting, and mentoring K–12 student teams.

*CLICK HERE for advance registration and for more information.*

# Upcoming Events (continued from page 12)

## ASCE and BSCES Sponsored Seminar

**Thursday & Friday, December 7 – 8, 2017**
Wyndham Boston Beacon Hill Hotel, Boston
*8:00 AM – 5:00 PM*

**Leadership Development for the Engineer**

*Jim Marino, PE, President, Taylor Engineering, Inc.*

This seminar will guide you through the steps required to become a successful leader in an engineering organization. You will recognize the need for honing not only your technical but also your leadership skills. You will understand the differences in and the need for the art of leadership and the discipline of management. You will be introduced to important leadership philosophies and powerful tools and have the opportunity to apply many of them in the seminar setting.

*For more information, click here.*

## 169th Annual BSCES Awards Dinner

**Tuesday, December 12, 2017**
Royal Sonesta Boston, Cambridge, MA
*5:30 PM Cocktail Reception; 6:30 PM Dinner*

**169th Annual BSCES Awards Dinner**

*Keynote Speaker: Matthew A. Beaton, Secretary, Executive Office of Energy and Environmental Affairs*

Please join us for an evening celebrating BSCES and the engineering profession. BSCES will recognize volunteer leaders, present annual awards, and honor our newest Honorary Members, Robert S. Brustlin, PE, LEED AP, Founder & Chairman of the Board, VHB and David L. Westerling, PE, PhD, PLS, Emeritus Professor, Department of Civil and Mechanical Engineering, Merrimack College.

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

## BSCES and BCAP Sponsored Event

**Thursday, December 14, 2017**
Boston Society of Architects Space, Boston
*9:00 AM – 4:00 PM*

**STEP Into the Sun: Solar Training for Design Professionals in Boston**

This training is specially-designed to introduce architects and engineers to the fundamental design considerations for incorporating solar photovoltaics (PV), how to speak with clients about the benefits of solar photovoltaics, where to find information on financial incentives, and more. This BSCES sponsored training was developed by the Building Codes Assistance Project (BCAP), the Center for Sustainable Energy (CSE), and national solar energy experts and is sponsored by the U.S. Department of Energy (DOE) Sunshot Initiative.

*Click here for registration information.*

## Save the Date!

**Thursday, January 25, 2018**

**We Don't Need More Engineers, We Need Better Engineers—Automation and Its Effects on Both Trades and Professions**

*Sponsored by the Structural Engineering Institute Boston Chapter*

FEATURING: **Paul Kassabian**, PE
Associate Principal, Simpson Gumpertz & Heger

Wentworth Institute of Technology, Boston

6:00 PM Registration, Social, and Pizza

7:15 PM Presentation

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

## Mark Your Calendar!

**Saturday, January 27, 2018**

**Seismic and Construction-Induced Vibrations: State of the Art and Practice**

*Sponsored by the Geo-Institute Boston Chapter*

Tufts University, Medford, MA

8:15 AM – 4:15 PM

This seminar will present a selection of speakers to provide an overview of the latest research on the assessment of seismically-induced liquefaction, application of seismic building code provisions, remediation concepts for liquefaction-susceptible sites, and strategies for monitoring construction-induced vibrations.

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

# Classifieds