

## Route 128 Add-A-Lane Project Stormwater Mitigation

by Adel M. Shahin, PE, Project Manager, and Marc R. Caufield, PE, Senior Engineer, Green International Affiliates, Inc.

One of the larger MassDOT projects to occur over the past several years has been the Route 128 (I-95) Add-A-Lane project. The project was broken up into several design contracts that included adding an additional travel lane in both directions, as well as widening bridges and modifying interchanges to accommodate the additional travel lanes. One of the bigger challenges of the project was mitigating the stormwater impacts from such a large linear project. Green International served as a sub-consultant to the Louis Berger Group for the I-95/I-93 (Route 128) Bridge IV Contract. The project area for this contract extends 3.5 miles along Route 128 from the Westwood-Dedham town line northwards into Needham, ending just north of the MBCR Needham Commuter Rail line overpass. The project area includes the highway twin-bridge crossing over the Charles River and several important interchanges with other state roads.

A conceptual scheme for storm drains and stormwater management facilities was prepared in the late 1990's for the project EIR. It employed deep-sump catch basins and



Numerous BMP's were required for the Add-A-Lane project to mitigate stormwater impacts from additional impervious area.

detention basins for stormwater treatment, and the detention basins would also control peak runoff rates generated by the expansion of highway pavement.

Two regulatory changes occurred in the decade since approval of the FEIR that required modifications to the conceptual design scheme. One change was the development of the 2008 revisions to the Massachusetts Stormwater

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## President's Report

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



By now you've likely heard that the Massachusetts Legislature will be taking up transportation funding this year. This is long overdue since the Transportation Infrastructure Commission released their report in 2007 citing a 20-year projected funding gap of \$18 – \$20 Billion. That said, civil engineers need to make sure that lawmakers don't focus solely on transportation infrastructure this year without considering other aspects of infrastructure that are an integral part of our transportation systems,

such as water, sewer, drain, energy, and telecommunication systems. In other words, we don't want to fix all the roads without fixing the pipes and conduits beneath them also. Fortunately, there are strong indications that a comprehensive infrastructure funding package will be discussed on Beacon Hill in 2013. Governor Patrick presented a revenue plan that proposes dedicated funding for both transportation and water infrastructure through a re-purposed state sales tax. The Legislature will certainly weigh in on this new revenue proposal. The fact that the Governor is citing infrastructure

## UPCOMING EVENTS

**Committee on Sustainability and Engineering Management Group Workshop** February 19

**Younger Member Group Billiards Tournament and Networking Event** February 21

**Construction Group Event** February 27

**SEI Boston Chapter Event** February 28

**Infrastructure Group Course** March 12 – 15

**ASCE and BSCES Managing the Design Process Seminar** March 21 – 22

**Construction Group Event** March 27

**2013 Thomas R. Camp Lecture** April 8

**Further Details Inside**

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(along with education) as one of the most critical investment needs in the Commonwealth is encouraging and we as civil engineers need to always be ready to speak up about the need for increased infrastructure investment.

Further helping the infrastructure investment cause this year will be the release of ASCE's 2013 Report Card on America's Infrastructure on March 19th. BSCES will have a press release ready to coincide with ASCE's release that will highlight our *Raising the Grade in Massachusetts*

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**Route 128 Add-A-Lane Project Stormwater Mitigation**

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Management Standards, which changed the pollutant removal ratings of many Best Management Practices (BMPs) set forth in the superseded 1997 Massachusetts Stormwater Management Policy. The 2008 Stormwater Management Standards also set forth more restrictive criteria to be met at sites where BMPs are proposed, and require more rigorous examination of soils at proposed BMP sites before approvals of BMPs may be issued.

The second regulatory change was the approval of the Total Maximum Daily Load (TMDL) for Nutrients (i.e. Total Phosphorus) in the Lower Charles River Basin by the U.S. Environmental Protection Agency in the summer of 2007. The 2008 State Stormwater Standards include a specific directive under Standard No. 4 (Total Suspended Solids removal from Stormwater) that stormwater systems discharging into water bodies with approved TMDLs must implement BMP's that are consistent with the requirements of the TMDL. The BMP selections from the EIR conceptual planning for stormwater management would not have effectively addressed the Total Phosphorus (TP) TMDL.

In order to design stormwater treatment components that complied with the new regulatory changes, Green evaluated and upgraded the BMP's from the project EIR. A screening process was implemented to evaluate applicable BMPs in light of the following:

- Physical constraints of the project area
- TP TMDL in effect for the Lower Charles River watershed
- Proximity of several developed areas in the Towns of Westwood and Dedham
- Requirements of the Stormwater Management Standards

Field investigations were conducted to establish subsurface conditions at 50 BMP sites distributed

between the three towns. Evaluations for 36 potential leaching catch basin sites found only six suitable sites. Unsuitable sites were eliminated for reasons including shallow bedrock, high groundwater, or insufficient distance to steep slopes. Potential sites for 12 infiltration basins also were investigated, and six suitable sites were confirmed. Sites evaluated for extended dry detention basins also were confirmed. The subsurface investigations confirmed that nearly 30 BMP's could be successfully integrated into the proposed drainage facilities serving the upgraded highway:

The total project-wide recharge volume as calculated using procedures from the DEP Stormwater Handbook amounts to 14,200 cubic feet. The project's infiltration basins and leaching catch basins will provide a total of 27,600 cubic feet of recharge volume into groundwater. The provided recharge volume will be double the required project-wide recharge volume of 14,200 cubic feet. The MassDEP makes the presumption that a project that meets the recharge requirement of the State Stormwater Standards complies with the TP TMDL.

The project was required to achieve 80% removal of TSS from all areas that are not redevelopment, and achieve the best practicable degree of treatment for redeveloped areas. Straightforward calculations of TSS removal were not possible because runoff from new pavement and existing pavement will be blended. But calculations for project areas tributary to treatment trains with high overall TSS removal rates (those above 72%, a total of 21 acres) indicate that, for an area substantially greater than the additional impervious area from Add-A-Lane roadways, a removal rate of 83.3% is attained. This is substantially greater than the 17 acres of additional pavement from the Add-A-Lane Project.



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## A Porous Pavement Retrofit at Hurd Field, Arlington, MA

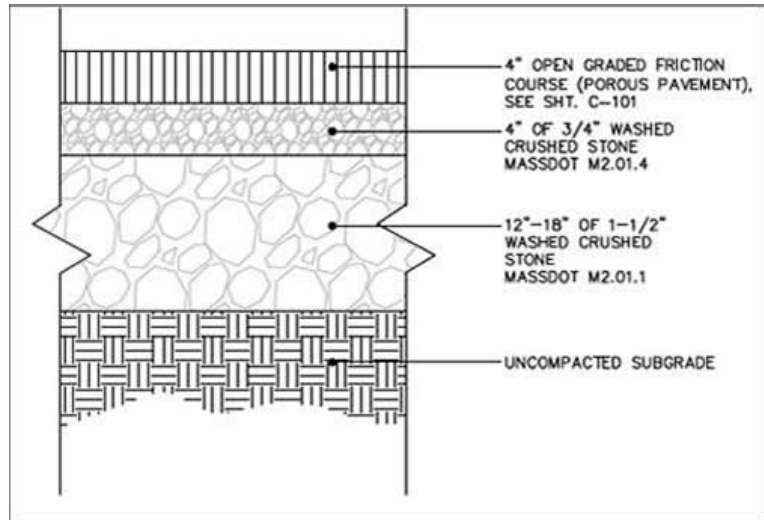
by Matthew Shuman, PE, Assistant Town Engineer, Town of Winchester

Porous pavement is a stormwater Best Management Practice (BMP) that has become increasingly popular in recent years. In contrast to traditional pavement, porous pavement consists of a permeable surface course—referred to as an open-graded friction course (OGFC) – underlain by a larger-diameter crushed stone sub-base. Stormwater runoff percolates through the porous pavement and is treated and stored in the crushed-stone sub-base before infiltrating into the ground. The stormwater benefits of porous pavement include increased groundwater recharge, total and peak runoff volume control and mitigation, and treatment of stormwater pollutants. From a practical standpoint, the use of porous pavement can reduce the need for costly piped stormwater management systems and other structural BMPs, and in geographically-constrained urban settings, porous pavement retains much-needed parking lot functionality.

Despite being used more frequently in recent years, a number of questions remain regarding the efficacy, longevity, and cost effectiveness of porous pavement. To address questions about this technology, the Environmental Protection Agency (EPA) recently funded an education and outreach project to reconstruct a traditional parking lot using porous pavement. After considering a number of locations, the EPA partnered with the Town of Arlington, Massachusetts at the Town’s “Hurd Field” parking lot.

There were a couple of technical considerations that made Hurd Field a good candidate for porous pavement. Perhaps most importantly, test pits performed at the site indicated that the underlying soils consisted of well-drained sands. Secondly, the parking area received light traffic with lower relative vehicular loads—higher traffic areas are generally not good candidates for porous pavement. Also, there were few utilities in the parking lot, which made excavation of the BMP sub-base easier; and the simple, open layout of the lot helped to simplify construction and asphalt installation.

Porous pavement asphalt designs differ based on site specific circumstances. Information available from the University of New Hampshire Stormwater Center’s “UNHSC Design Specifications for Porous Asphalt Pavement and Infiltration Beds” was used to inform the design process. A typical porous pavement cross-section consists of, from the bottom up:



Cross section view of porous pavement and underlying substrate used at Hurd Field.

- An uncompact sub-grade to maximize the infiltration rate of the soil;
- A non-woven geotextile fabric, which prevents the migration of fine material from the sub-grade into the stone recharge bed;
- A 12-inch thick reservoir course consisting of clean, single-size crushed large stone with about 40 percent voids. The reservoir course serves as a structural layer and also temporarily stores stormwater as it infiltrates into the soil below;
- A 4-inch thick stabilizing course or “choker course” consisting of a clean single-size crushed stone smaller than the stone in the recharge bed to stabilize the surface for paving equipment; and
- An open-graded friction course (the porous pavement) contains interconnected voids that allow stormwater to flow through the pavement into the stone recharge bed.

This design is usually modified based on the hydrologic nature of the site soils. For example, the depth of the reservoir course may be modified to provide additional storage for larger design storms. If sub-surface soils have high infiltration rates, an additional filter sand layer may be added to enhance water quality treatment. On the other hand, if soils have low infiltration rates, underdrains can be added and connected to a drainage system, so that water quality treatment is still achieved.

At Hurd Field, the sub-surface soil investigations indicated that the location was conducive to infiltration. In fact, based on an analysis of

precipitation events between 1948 and 2004, it was shown that the selected porous pavement design would achieve 100-percent infiltration of precipitation, due to the high infiltration rate combined with the storage provided in the voids of the reservoir course. Several modifications were made to the typical design, such as omitting the filter fabric and varying the depth of the reservoir course to maintain a level and horizontal interface between the stone and sub-grade (see cross-section above).

Specification of the OGFC materials is also an important design consideration, as its composition may vary unless specified in advance of production. An OGFC containing polymer as a binder (OGFC polymer) is generally considered to produce the highest quality and most resilient asphalt product, but production of OGFC polymer is reportedly more difficult and the cost premium may be 1.3 to 1.5 times the cost of ordinary asphalt. Consequently, to reduce costs and ease production requirements, asphalt plants are experimenting within guidelines with their own versions of OGFC using various binders and recycled materials. These plants are reporting good results for OGFC manufactured with fiber binder, where the fiber is essentially a recycled paper (typ., newspaper) feedstock. The fiber binder may be employed along with recycled asphalt products (“RAP”). Fiber-based OGFC has reportedly been used successfully. However, the longevity of fiber-based OGFC has not been

## A Porous Pavement Retrofit

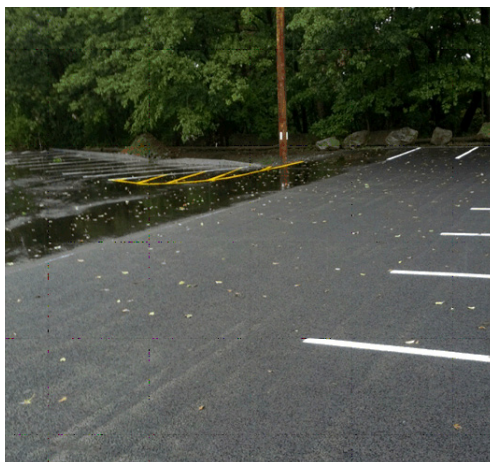
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substantiated; OGFC polymer is considered more resilient and reliable. Because this was an EPA outreach and education project, it was important to ensure production of an OGFC polymer consistent with UNHSC Specifications.

In addition, because of the complexity associated with establishing optimal mix conditions, production of OGFC by an asphalt plant should ideally be overseen by an experienced quality control plant engineer. Adequate quality assurance/quality control is considered indispensable: experience informs that the actual versus theoretical performance of porous asphalt is highly dependent upon careful attention to details associated with OGFC production and installation. Quality assurance for a porous asphalt project should consider, at a minimum, OGFC mix selection and criteria including binder content and “draindown,” and sub-base and OGFC compaction. “Draindown” refers to a condition where the OGFC binder, due to improper viscosity and composition, ‘drains down’ from the OGFC forming an impervious layer on the choker course.

Construction at Hurd Field included removing the existing pavement, excavating and removing sub-soils to the elevation of the bottom of the crushed stone, placing and grading the crushed stone layers to elevation benchmarks, and then installing the porous pavement in two “lifts.” Several issues came up during construction. Existing pavement thicknesses were inconsistent and greater than anticipated; in some areas, pavement was about 8 to 10-inches thick, on average. Also, despite the overall favorable soil conditions, a number of large cobbles, stones, and boulders were encountered during removal of the sub-soils. Underneath some areas of the parking lot, shallower native materials were encountered that appeared to be less permeable than the deeper sub-soils. To address this issue, three interceptor infiltration trenches were excavated and back-filled with 1.5-inch washed, crushed coarse aggregate to ensure hydraulic connection with the highly permeable soils below.

Long term operation and maintenance of the lot will be the responsibility of the Town of Arlington. Winter sanding is not allowed due to the possibility of the clogging the pavement. Because the porous pavement will infiltrate snowmelt and therefore there will be no refreezing, it is anticipated that only 25-percent of the typical chloride deicing treatment will be required. The lot will be swept four times per year. Sweeping must be performed with an air or



*This picture shows the difference between the traditional pavement (top left) and the porous pavement (bottom right).*

vacuum assisted sweeper; broom sweepers cannot be used because redistribution of finer particles will clog the porous asphalt.

To date, this project has shed insight on a number of aspects of porous asphalt BMP construction, including the following (among others):

- Cost will be a major factor in implementing porous pavement. The unit price of the porous pavement, installed, is about twice the price of standard bituminous concrete pavement. For retrofits such as Hurd Field, costs are further increased due to the need to remove and dispose of the existing pavement. Practitioners

should compare such costs, however, with the cost savings provided by stormwater infrastructure offsets.

- Site selection is critical to ensure soil conditions and site hydrology are well understood, and logistics such as the presence of utilities and the layout of the proposed porous asphalt are simplified to the extent possible. Additional engineering may be required to support porous pavement BMPs, including permeability characterization of sub-base materials and/or hydraulic modeling, particularly when such BMPs are used as part of a stormwater management system.
- The OGFC production and installation should be carefully considered and managed with appropriate quality assurance measures taken to ensure a final installed product.
- Practitioners should understand and comply with all applicable federal, state and local regulatory requirements.
- Until porous asphalt receives a more routine acceptance and track record, potential barriers to implementation will include practitioner skepticism, cost, complexity, and uncertainties about longer-term performance.

Additional information about the project, including site plans and construction photos, can be found at the [EPA's website](#), as well as the [Town of Arlington website](#).

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## Cape Cod Canal — Soon to be 100 Years Old!

by Clay Schofield, PE, Transportation Engineer, Cape Cod Commission and BSCES Senior Vice President

Growing up on Cape Cod, the Cape Cod Canal and bridges were a welcome sign we were home from the many OTB (over the bridge) trips I made with my parents and coming home from college. The Canal is also where vacations begin for the many visitors to Cape Cod.

The Cape Cod Canal is designated by ASCE as a Historic Civil Engineering Landmark. This designation is given to projects that illustrate the creativity and innovative spirit of civil engineers. The Canal was a dream that started with Miles Standish of the Plymouth Colony. He proposed a man-made canal separating Cape Cod from Massachusetts' mainland to create more efficient trade routes between the Plymouth settlers in the north and the Native Americans and Dutch in the south. During the American Revolution, building a Cape Cod Canal was considered again in order to avoid British harbor blockades and the potential routes were surveyed several times including by George Washington in 1776. Going into the nineteenth century, many plans were made, but none succeeded.

In 1717, an early version of the Canal called Jeremiah's Gutter was created in Orleans which was very shallow and only accommodated up to twenty-ton boats (when the tides were just right). Jeremiah's Gutter remained active until the late 1800s. Technology advanced enough to finally build the Cape Cod Canal and the waterway was opened on July 29, 1914 as a private toll way. The project was initiated by financier August Belmont Jr. and the Boston, Cape Cod and New York Canal Company that had obtained a charter to build the Canal. To oversee and design the project, Belmont hired, as chief engineer, William Barclay Parsons, who founded the firm that became Parsons Brinckerhoff. Parsons chose a route that connected and widened the Manomet and Scusset Rivers.

The canal crossings included three bridges; two twin cantilever draw bridges for the highways and a bascule railroad bridge. There was also free passenger ferry service across the Canal provided by the Canal Company in Bourne. The highway bridges had a 41-foot clearance which allowed small craft to pass underneath without raising the deck. The railroad bridge had only 12 feet of clearance which was problematic and all three bridges, when open, provided 140 feet for vessels compared to the present 420 foot bridge openings with 135 feet of vertical clearance.



*Digging the Cape Cod Canal. A steam shovel at work below sea level in the Collins Farm Cut*



*Dredge working in a strong current, July 1914 (Photographs courtesy of the Sandwich Glass Museum)*



*Early photograph of the Cape Cod Canal (Photograph courtesy of the US Army Corps of Engineers)*

Initially, the Canal could only accommodate vessels with a draft of less than 15 feet. Two years of dredging resulted in the accommodation of larger vessels with a draft of up to 25 feet resulting in a total of 4,634 vessel trips in 1916. This level of traffic, however, was not sufficient to satisfy the Canal investors and, in the end, the original Canal was a financial failure.

The federal government first took over the Canal during World War I when German submarines off Cape Cod became a threat to American vessels. The Canal was returned to private ownership until March of 1928 when the Army Corps of Engineers (ACOE) took over the Canal under the Rivers and Harbors Act of 1927. The existing Canal was purchased for \$11.4 million at that time.

The ACOE removed the \$16 toll and began a \$21 million program to widen and deepen the Canal. One significant operational issue was the bridges whose spans were normally kept closed. Vessels had to wait for the bridges to open and this was made difficult for the waiting boats by the extreme currents in the Canal. Since the drawbridges could only be crossed when there was no marine traffic, automobiles going to and

from Cape Cod also experienced delays. Addressing the delay issues was a priority and the bridge replacement projects provided many much needed Public Works Administration (PWA) jobs during the depression. The current Bourne, Sagamore, and railroad bridges were opened in 1935. The work to widen the canal continued and the current 480 foot width and 32 foot depth (mean low water) were realized in 1940. The Bourne Bridge won the American Institute of Steel Construction's Class "A" Award of Merit as the "Most Beautiful Steel Bridge" in 1934.

Today, the approximately 20,000 annual users, including over 10 million tons of freight, traverse the 11 mile canal annually and save about 140 miles by not using the route around Cape Cod. More than 35 million vehicles pass over the two highway bridges annually. Service roads on both sides of the Canal provide access for fishing and are heavily used by bicyclists and walkers. Current bicycle and pedestrian planning studies are exploring connecting the Canal recreational paths with the Cape Cod Rail Trail that goes to Wellfleet, the Shining Sea

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## Cape Cod Canal

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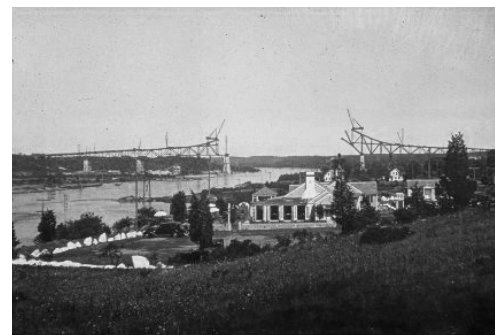
Bikeway that goes to Woods Hole, and the 788 mile off-Cape Bay State Greenway network.

Other planning initiatives include a comprehensive look at the future of the Canal area and the bridges that are approaching 80 years old and are considered “functionally obsolete” due to the ten foot wide lanes. Currently this study has \$1 million in funding identified in the recent Massachusetts Transportation Bond Bill and discussions on the scope have been ongoing since 2004. The BSCES Transportation Technical Group is currently developing a program on the future of the Canal area and the bridges to be held at the ACOE Canal Visitor’s Center in Sandwich, tentatively, on June 13, 2013. Details will be provided in the May Newsletter and on the BSCES website.

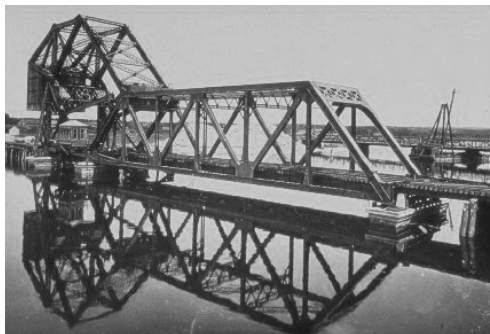
*All photographs on this page courtesy of the US Army Corps of Engineers*



Original Bourne Bridge



Current Bourne Bridge under construction



Original railroad Bascule Bridge



Sagamore Bridge under construction in 1934

## Governor Deval Patrick Signs Dam Safety Bill into Law

*by Ellen White, PE, Senior Project Manager, Jacobs Engineering and Co-Chair, BSCES Government Affairs and Professional Practice Committee*

On January 10, Governor Deval Patrick signed into law a bill that creates a loan and grant program to facilitate the repair of dams in poor condition and removal of unneeded ones. In addition to dams, the bill will help pay for repairs to seawalls, revetments, and jetties. The program does not have a recurring funding source but it will start with \$17 million in funds paid years ago to the state Treasury by about eight cities and towns that repaid drinking water loans. The monies have sat in a trust because they were not authorized to be used for other purposes.

There are 2,892 dams in Massachusetts, 85 percent of which no longer serve their original purpose and many of which are in poor condition. The Auditor of the Commonwealth of Massachusetts issued a report in January 2011 which outlined the severity of the problem. The report identified 100 relatively large dams rated in unsafe or poor condition that had the potential to cause loss of human life or significant property or infrastructure damage in the event of a dam failure. The

owners of 75 of these 100 critical dams did not have emergency action plans to ensure a reasoned approach to evacuation of neighborhoods situated in potential harm’s way. The report recommended that emergency action plans and funding mechanisms be established to address these problems.

Many of us remember the severe weather conditions in 2005 that jeopardized the integrity of some dams. There were widespread evacuations in Taunton when the deteriorating wooden Whittenton Pond Dam nearly failed. The dam was eventually replaced by a stone spillway and work is ongoing to remove unnecessary dams from the Mill River in Taunton. The Commonwealth is also facing increased risks from more intense and frequent storms such as Hurricanes Irene and Sandy. The new law, An Act Further Regulating Dam Safety, Repair and Removal (H.4557), provides a funding mechanism aimed at improving the safety of communities that have vulnerable dams and coastal infrastructure. In addition to infrastructure repair, the funds will also be used to remove dams

to help restore rivers and streams to their natural condition while removing safety hazards.

Passage of the bill was pushed forward in the legislature by House Representatives James Cantwell and Brian Dempsey, and through the Senate by Senator Marc Pacheco of Taunton, the original author of the legislation. The Dam Safety Alliance, a coalition of several organizations, was instrumental in ensuring that the legislation received the needed attention from legislators and constituents. This coalition included BSCES, ACEC-MA, the Nature Conservancy, Massachusetts Municipal Association, Massachusetts Association of Conservation Commissions, Mass Rivers Alliance, Mass Association of Conservation Commissions, Mass Water Works Association, and Mass Audubon. BSCES was particularly instrumental by leading a targeted campaign. BSCES members who lived in communities that contained critical dams were contacted and encouraged to write to their legislators to urge passage of the bill. Passage of this legislation is a great success for our cities and towns as well as for the engineering community.

## ASCE Environmental and Water Resources Institute Boston Chapter

by Edward Whatley, PE, Project Manager, VHB/Vanasse Hangen Brustlin, Inc. and EWRI Boston Chapter Chair

The ASCE Environmental and Water Resources Institute Boston Chapter brings together members from both the public and private sectors to discuss and promote a wide range of environmental engineering topics including hydraulics, drinking water supply, wastewater, hazardous waste, hydrology, and stormwater. Topics relevant to our group meetings are diverse and the breadth of experience of our members always provides for valuable discussion.

The mission of EWRI is to “provide for the technical, educational and professional needs of its members, and to serve the public in the use, conservation, and protection of natural resources and in the enhancement of human well-being.” EWRI publishes several ASCE engineering journals (Environmental, Hydraulics, Hydrologic, Irrigation & Drainage, Water Resources Planning and Hazardous, Toxic & Radioactive Waste Management) and holds an annual national conference. Additional information on the national chapter is available at [www.asce.org/ewri](http://www.asce.org/ewri).

EWRI is pleased to announce the 2013 Thomas R. Camp Lecture speaker, water resources scientist, Wendy Graham, PhD. The Thomas R. Camp Fund was established in 1978 by a donation from the Directors at Camp Dresser & McKee, Inc. and income from the fund is used to support annual lectures addressing recent developments or research in the environmental engineering field. Dr. Graham will be presenting results of a three-dimensional surface water-groundwater-land surface hydrologic modeling study in a large karst basin in Northern Florida. Wendy is a Carl S. Swisher Environmental Scholar in Water Resources and Director of the University of Florida Water Institute. She conducts research in the areas of coupled hydrologic-water quality-ecosystem modeling;

water resources evaluation and remediation; evaluation of impacts of agricultural production on surface and groundwater quality; and development of hydrologic indicators of ecosystem status. As Director of the UF Water Institute, Wendy is responsible for establishing, conducting and evaluating research, education and outreach programs conducted under the auspices of the Water Institute. Wendy will speak at a dinner lecture at the Revere Hotel / Boston Common in Boston on Monday, April 8, 2013 (see the insert included at the end of this newsletter for registration details).

EWRI is working with the Land Development Group on the development of a three-part continuing education series on stormwater management system design. The two-hour courses will focus on providing engineers and public officials with the tools needed to begin practicing stormwater management planning and design. The three major topics are hydrologic modeling, hydraulic modeling and selection and design of stormwater BMP's. Short courses are being developed and will be presented by experts in the field.

Two of our meetings over the past year were held at Merrimack College and they were hosted by the ASCE Student Chapter and the participants of the Merrimack Hope for Haiti project. The student group presented their goals including assisting one small town with the development of a safe drinking water supply within the context of the economic constraints of the region. We invited Thomas Baron, former MWRA water supply director of operation, to speak about the considerations in developing large-scale drinking water supplies. EWRI group member Travis Watters was able to provide timely information relating to the challenges of practicing engineering in a highly remote

location based on his ongoing experience developing rural water and wastewater solutions in Liberia. We received an update on the students' June trip and their ongoing efforts to develop viable solutions that can be implemented in future trips. The connection with Merrimack's students has been enriching for our members.

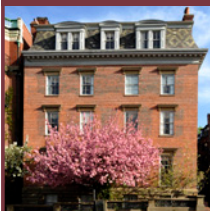
EWRI is looking forward to reviewing applications for the 2013 Jonathan B. Golden Fund Scholarship. The Jonathan B. Golden Fund was established in 2002 through donations to honor the memory of Jon Golden, a dedicated wastewater engineer who made significant contributions to the environmental engineering profession. The \$5,000 scholarship will be awarded to a graduate student who is pursuing a career in environmental engineering.

EWRI meets on a bi-monthly basis to discuss industry related topics and coordinate events that are of interest to the engineering community. We look forward to meeting anyone who is interested in joining our group or participating in EWRI events. Please call me at 617/924-1770 or email me at [ewhatley@vhb.com](mailto:ewhatley@vhb.com) for information on upcoming meetings and activities.

### Call for Papers

*Civil Engineering Practice*, the Journal of BSCES welcomes papers for review and publication. We are looking for papers on topics in all areas of civil engineering that while comprehensive in scope, remain readily understandable to the non-specialist. For general guidelines for submittal of papers, visit [www.cepractice.org/cepauth](http://www.cepractice.org/cepauth) on the web. You may also submit your contribution to James Lambrechts at [lambrechtsj@wit.edu](mailto:lambrechtsj@wit.edu).

#### The Aldrich Conference Center— where history and technology meet on Beacon Hill...



Two blocks from the State House and overlooking Boston Common, the newly refurbished Aldrich Conference Center is the perfect venue for your next event. This historic building accommodates private functions, business meetings, and receptions for up to 75.

For information or reservations, contact Rich Keenan, Conference Center Manager at 617/305-4110 or [rkeenan@engineers.org](mailto:rkeenan@engineers.org)

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## Recent News and Updates

### \$5,000 SGH Scholarship Applications are being Accepted

The Principals of Simpson Gumpertz & Heger Inc. (SGH) established the Simpson Gumpertz & Heger Scholarship with BSCES to encourage undergraduate college students who strive for excellence and aspire to a career in civil engineering. In 2013, the scholarship amount will be \$5,000 in the form of a check presented to the scholarship winner. The recipient of the scholarship will be announced at BSCES Student Night 2013 which is tentatively scheduled for Tuesday, March 26, 2013. All undergraduate-level civil engineering majors who are members of an ASCE Student Chapter or Club in Massachusetts, have completed a minimum of two-and-one-half years of a four-year program (or the equivalent portion of a five-year or part-time program), and expect to complete their undergraduate degree in May 2013 or later are eligible to apply for this scholarship.

Applications will be judged with equal weight given to professional presentation in the letter of introduction and résumé, quality of the ideas expressed and clarity of the communication demonstrated in the one-page essay, and capabilities reflected in college/university transcript(s). An essay question is included with the application. A three-person committee consisting of two representatives of BSCES and one Principal of SGH will review applications.

The deadline for applications is 5:00 PM on Wednesday, March 13, 2013. Please see the insert at the end of this newsletter for more information.

### Ernest A. Herzog Award Papers Submission Deadline is April 5

This is a reminder that the deadline for submitting a paper for consideration as the winner of the 2013 Ernest A. Herzog Award is Friday, April 5, 2013. Award applicants are asked to submit a paper that identifies an infrastructure project, innovation, or idea in which the author was actively involved in as an owner, advocate, engineer, or end-user. The paper must address specific benefits to current professional practices, lifestyle, and/or sustainability through the application of existing or innovative technologies or methods. Please see the insert at the end of this newsletter for more information.

### BSCES News

In an effort to provide the best value to our membership, BSCES is currently reviewing and evaluating the events and programs we offer. Additionally, we have formed a Program Committee that will be responsible for development of BSCES' technical training programs. The committee will focus on developing half-day to multi-day technical workshops. These programs are intended to augment the typical technical group lunch/dinner meetings. You should have received an invitation to

participate in a survey. If you have not already taken the survey, we ask that you help us by providing your input. Your feedback will allow us to tailor programs that best suit the needs of the membership. Those that complete the survey will be entered into a drawing for one of two \$50 gift cards.

UMass-Dartmouth is this year's host of the New England Regional ASCE Concrete Canoe Competition to be held on April 26-27, 2013. The ASCE Concrete Canoe Competition, an event sponsored by the American Society of Civil Engineers and other local engineering firms, is an annual conference which brings together all of the ASCE Student Chapters from civil engineering programs throughout the states of New England. The top two teams will be invited to compete at the National Championship June 20-22, 2013 at the University of Illinois at Urbana-Champaign, Urbana, IL. The competition gives ASCE members a chance to gain valuable hands-on experience by designing and building a concrete canoe. The UMass Dartmouth student chapter (led by Lauren Underwood) is hard at working planning the event and recruiting judges. Hosting the competition is a very expensive undertaking. BSCES is contributing to the event and we ask that you or your company consider a financial contribution to the ASCE conference. Your gift will subsidize the cost of equipment rentals, plaques and awards, facility rental, and registration packets.

MIT is this year's host of the New England Regional ASCE Steel Bridge Competition to be held on April 19-20, 2013. It is expected that over 300 students representing 14 schools from throughout New England will be participating. To help defer the costs of hosting such a large event, the MIT ASCE Student Chapter (led by Leoni Garbis) is soliciting sponsorship. BSCES is contributing to the event and companies are strongly encouraged to help sponsor the event. Benefits of sponsorship include admission to competition events, company logos displayed on the conference t-shirts, flyers, programs and on the website, as well as a booth on Saturday, April 20th with access to the undergraduate and graduate students who attend the competition and an opportunity to promote your company. Please contact MIT directly with any questions at [MITSteelBridgeRegionals2013@mit.edu](mailto:MITSteelBridgeRegionals2013@mit.edu). Support of this event is a great way to give back to our profession. Events like these making a lasting impression on the civil engineering students and provide fun-filled memories that last a lifetime.

Like blogs? ASCE has a wide variety of blogs covering every aspect of civil engineering. These commentaries offer thought provoking discussions about today's issues. Take a few minutes to browse the site and offer comments.

The Society of Hispanic Professional Engineers (SHPE) will be holding a Regional Conference in Boston on March 7-9, 2013. About 30% of the SHPE members from this region are civil engineering students. The conference theme is "Creating the next generation of Latino leaders in engineering and science." The leadership theme is focused on enabling and encouraging SHPE members to be leaders in their universities, companies and communities. In particular, SHPE Boston ties the leadership in the community to educational outreach activities that inspire middle and high school students to consider pursuing STEM educational fields, and engineering and science as a career. More information is available at their website and Facebook page.

Congratulations go out to BSCES Past President Judy Nitsch, the founding principal of Nitsch Engineering, for her election to president-elect of Commercial Real Estate Women (CREW) Network at their annual Convention & Marketplace. CREW Network is the industry's leading advocate for the advancement of women in commercial real estate.

I have always held the belief that civil engineers can do anything. On January 21st at the Presidential Inauguration, Richard Blanco added to the list of civil engineering accomplishments. This 44 year old carries the distinction as the first civil engineer with a PE license to write and deliver the Inaugural poem "One Today" at the swearing-in of President Barack Obama and Vice President Joseph Biden. Blanco is in good company as his predecessors have included noted poets Robert Frost and Maya Angelou.

I never thought I would catch up in emerging civil engineering technology while thumbing through *Spirit* magazine on a Southwest Airline flight. However, the article title "Firmer Pavement" caught my eye. The article provided a brief summary of a study conducted by MIT Professor Franz-Josef Ulm and PhD student Mehdi Akbarian on the potential savings that could be realized from the construction of "stiffer" roads.

Did you know that BSCES is "connected"? As the forms of communication continue to expand, BSCES is trying to keep up with all of the social media outlets. Follow, like, connect, and subscribe to BSCES on Twitter, Facebook, LinkedIn, and YouTube. These sites, in addition to the BSCES homepage, will provide information on upcoming events and highlight BSCES accomplishments.

As a volunteer based organization, BSCES relies heavily on the time, effort, and financial support of individuals and companies within the civil engineering industry. I would like to thank you for your time and dedication. As always, please feel free to contact me if you have any thoughts as to how we can better serve you.



## Key Ingredients for Successful Bridge and Tunnel Inspection Programs (Part 2)

by Reed M. Brockman, PE, Senior Structural Engineer/Coordinating Inspection Team Leader, AECOM

*Editor's Note: This is part two of a two-part article on bridge and tunnel inspection program management. Part one, which described the nature of bridge inspection and the aspects of this work that invigorate inspectors, appeared in the January 2013 BSCESNews. [Click here to view that issue of BSCESNews.](#) This article examines AECOM's strategy for addressing the professional development needs of its bridge inspectors.*

Every organization that employs bridge inspectors has its own approach to ensuring these employees are well trained, motivated and effective in carrying out their duties. This article will examine how the firm AECOM approaches this task. Within AECOM, a company employing more than 45,000 people, inspection is considered among its most important services.

There are five primary points within the AECOM strategy:

1. *Give inspectors access to gain knowledge and skill.* There are many training requirements for inspectors. Of course, AECOM inspectors all get their required certifications: OSHA training, National Highway Institute inspection courses, confined space training, fall protection training, and the various safety trainings required by the railroads and other authorities. For AECOM inspectors, the level of training is taken up a notch. In the Boston office, inspectors take CPR/first aid training, plus the Boston office holds regular lunch-and-learn sessions, and the staff is encouraged to take ASCE courses, attend BSCES offerings, or take other trainings. AECOM has a corporate partnership with ASCE, so attending any webinar is as simple as joining in. The AECOM inspectors also take an active role with the BSCES and help put together local courses. Inspection team members also participate in many BSCES activities, including the outreach program. Running programs for schools is a great way to improve personal leadership skills as well as a key component in developing better communication skills. The staff is highly encouraged to write articles and attend conferences, as well.
2. *Discuss career paths with the engineer/inspectors to assure satisfaction and growth.* The AECOM inspection program places a high value on a strong mentor-mentee relationship. While trainings are great for gaining knowledge, there is no better way to gain wisdom than learning from the collective team experience. It is through this unique team relationship that the

philosophy of the team is fostered. Mentors do not just grow magically. A broad range of experience is needed. Not only at AECOM, but at most of the area organizations, it becomes readily evident that, even though there are only nominal requirements to become a team leader, the team leaders for the most part have experience far exceeding the minimum. The knowledge and experience of a team leader must be broad, and that knowledge must be proactively imparted to the inspectors. In addition, to sustain the mentor-mentee cycle, inspectors must experience more aspects of civil engineering over their career than only inspection. The sense of career path and growth cannot be underestimated; it is critical that younger crew members have security and gain confidence, and it is equally important that the more experienced team leaders feel the need to stay on top of their game.

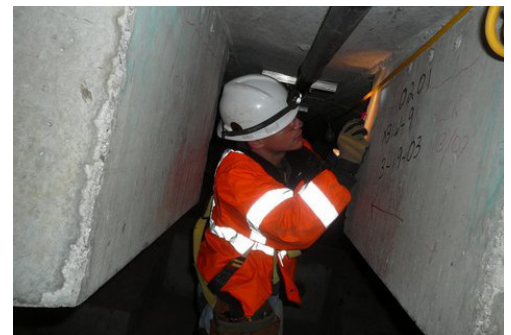
3. *Assure that the team leaders maintain their technical focus.* Allowing team members to take on tasks that are sometimes performed by the team leader, such as arranging access equipment, maintaining schedules and budgets, and generating progress reports, are just a few of the tasks that can be delegated, with proper guidance and supervision. Having a technically focused team leader helps assure that the team develops sharp inspection skills, that the team leader has a full grasp of the status of each structure inspected, and that the team has a sense of priority in completing work. On one particular contract in AECOM's Boston office, the overall manager keeps to general staffing and oversight issues, allowing the technical inspection lead to work side-by-side with an administrative lead, both as deputy managers. The administrative deputy manager also serves as a team member, but in lieu of participating in the writing of the reports, the main responsibilities are the oversight of the permitting issues, the access equipment expenses, the invoices, progress reports, and final quality review of the reports. There is something very significant in this: each of the team members are allowed to do the work that they enjoy the most, and all feel that they play a major role in the program.
4. *Collectively embrace a rigorous quality control and quality assurance program.* AECOM is an ISO 9001 certified organization, and the inspection program holds to the rigorous program prescribed through it. Our teams not only embrace the program but take even



An AECOM inspection crew under a viaduct in Boston



Rich Matson inspecting the Chain Bridge in Newburyport



AJ Cardini of AECOM inside of a segmental concrete box girder in Boston

greater measures to assure that the reports are completely understandable and that important issues are given appropriate stress. Open conversations about how to best present observations, when done in a positive and constructive manner, make every team member want to be their best and take deeper pride in their work.

5. *Foster a true sense of teamwork.* The AECOM inspectors look forward to work each day, and when emergency inspections arise, our crew is there in a heartbeat. There is a common sense of mission. The inspectors have the peace of mind one gets in knowing their co-workers truly care, and that their fellow team members want them to grow. We know that a broad knowledge of the engineering world is

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## Massachusetts Infrastructure Investment Coalition Releases Stormwater Report

by Danielle Spicer, PE, LEED AP, Project Manager, Green International Affiliates, Inc.

The Massachusetts Infrastructure Investment Coalition (MIIC), of which BSCES is a founding member, will soon release a new Infrastructure Status Report entitled “Massachusetts Stormwater Infrastructure.” The MIIC Stormwater report outlines the cost ramifications associated with the 2010 EPA regulations found in the Draft Massachusetts Small MS4 General Permits (“the Draft Permits”) for stormwater management. Final Draft Permits and public comment are anticipated in early 2013.

In 2003, the Environmental Protection Agency (EPA) issued the Municipal Separated Storm Sewer Systems (MS4) permit to municipalities in order to address nutrient pollution to receiving waters, which required compliance from 255 cities and towns in Massachusetts. Currently, nutrient pollution is addressed through the 2003 EPA National Pollutant Discharge Elimination System (NPDES) Phase II stormwater permit. This permit requires municipalities to address basic stormwater management needs, such as implementing bylaws and ordinances to regulate illicit connections and addressing uncontrolled runoff during and after construction. In 2010, EPA issued a Draft MS4 General Permit that has significant requirements for reducing nutrient pollutants in stormwater. These requirements will have high cost implications to the communities and present a number of challenges. Some of the challenges outlined in the status report are as follows:

- **Data Requirements:** The Draft Permits require an enormous quantity of data gathering. Much of this information is required in the first two years in order to perform the analyses required to meet the permit milestones. *Even though some communities have well-established GIS, the data requirement alone could consume the better part of the five-year permit cycle.*
- **Compliance Timeline:** Similar to the compilation and analysis of data, the many milestones described in the Draft Permit may be feasible individually, but when compounded into a five-year permit term, they cannot realistically be met. *The requirements should be reduced to a list of achievable goals in a five-year period, so communities can achieve compliance.*
- **Floor Drain Inspections:** Identifying and determining the outlet of every floor drain in every municipal building within one year of the effective date of the permit is a cumbersome requirement. In older cities, plumbing plans are not available for many municipal buildings,

and extensive investigations would be required. *Communities should be allowed to inspect buildings at a reasonable rate per year to comply with this requirement.*

- **Catch Basin Inspection and Cleaning:** Catch basin cleaning requirements have varied throughout iterations of draft permits from cleaning once every two years to monitoring sediment levels and cleaning when needed. Experience with drainage system operations and maintenance suggests that cleaning catch basins at a specified interval is more realistic than performing monitoring and select cleaning. *Communities should have the option of setting up cleaning on a regular schedule rather than performing inspections.*
- **Pollutant Reduction Requirements:** Reductions in phosphorus, nitrogen, bacteria and/or other pollutants, depending on what watershed a community is in, are proposed to meet water quality standards. *Communities are concerned that even the best efforts may result in failure to comply, and they fear the associated consequences if additional appropriate BMPs cannot be implemented in a timely and cost-effective manner.*
- **Proposed Outfall Sampling:** The new permit requires sampling 25 percent of each community’s outfalls each year during both dry and wet weather. While it is encouraging to see that work done previously can be counted toward sampling requirements and that the majority of analysis can be performed using field instruments, the monitoring of 25 percent of outfalls per year will be cumbersome and costly compared to the environmental benefits. *A more realistic monitoring program would be 10 percent of outfalls per year beginning with the outfalls in areas most likely to exceed water quality standards.*

The new regulations will require municipalities to develop new funding mechanisms in order to meet the requirements. Not only are communities facing rising costs and decreased revenue, but it is predicated that the regulations will only continue to increase over the next decade thereby increasing the costs furthermore for stormwater management.

The costs associated with stormwater infrastructure were documented last year by The Water Infrastructure Finance Commission (WIFC), headed by State Senator Jamie Eldridge and State Representative Carolyn Dykema. The WIFC released its [report](#) on February 7, 2012.

The WIFC highlights the challenges communities’ face with meeting stormwater requirements and proposed a “road map” with multiple solutions to address water-related utilities. The solutions that are noted in the WIFC report are:

1. Raise revenues
2. Operate our water, clean water, and stormwater utilities more efficiently
3. Assist towns in retiring their debt
4. Address the issue of affordability
5. Promote environmental sustainability
6. Promote innovation
7. Continue the work of the commission and
8. Educate the public

The Commonwealth is facing many challenges, as it “needs to catch up with the rehabilitation of aging infrastructure, meet the challenges of environmental regulation, invest in a sustained asset management program, and integrate our infrastructure to be more energy efficient and more environmentally sustainable.” While these challenges may seem daunting, the alternative of doing nothing is even more dismal. BSCES has joined a coalition of engineering, environmental and municipal associations that is working to assist the WIFC in the implementation of their recommendations in the most economically sustainable manner. BSCES will keep our members updated over the course of the year on any water infrastructure legislation that is proposed as a result of the WIFC report.

## Bridge / Tunnel Inspection

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essential, and we work together to allow members to gain other engineering experience, and welcome back team members as they gain experiences. There is a quaint, underutilized word that sums up the relationship amongst the crew: friendship. On the whole, within each inspection team, each member is involved in every part of the process, and decisions involving schedules and assignments are internal to the team. This allows for flexibility and encourages true cooperation.

This article is written as a tribute to the hard-working inspectors everywhere, and especially to the team members at AECOM. Inspectors work hard daily to keep the world safe and it is very rare to hear even a squeak of public appreciation. Thank you to all the dedicated inspectors for being true stewards of our infrastructure!

## Engineers Week — New England 2013: February 28th and March 1st

by Aleece D'Onofrio, PE, Senior Engineer, Fay, Spofford & Thorndike (FST)

Engineers Week, founded by the National Society of Professional Engineers in 1951 is one of the nation's oldest professional outreach programs, and it is still prominent today. The National Engineers Week Foundation is a recognized association consisting of over 100 corporations, government agencies, engineering, education and cultural societies all with the same goal in mind—**raising engineering awareness**. One of the goals of Engineers Week is getting teachers, parents and students to recognize the significance of a technical background. Gaining a background consisting of an advanced math and science education will encourage America's youth to pursue a career in engineering. Engineers Week 2013 will be celebrated nationally February 17th through 23rd.

Engineers Week—New England is associated with the National Foundation but will be taking place on February 28th and March 1st in downtown Boston at the Courtyard Marriott Downtown/Tremont. Boston Engineers Week is a two-day event packed with activities for both youth and professionals in an effort to showcase the engineering industry.

### Thursday, February 28, 2013

Thursday, February 28th, begins with engineering activities for students from Girls Inc. of Lynn, MA. Approximately 20–30 students have been invited to participate in design challenges and activities from 1:00 to 3:00 PM. Following the activities, from 3:00 to 4:00 PM, they will be escorted in small groups over to the career fair.

At 3:00 PM there will be a workshop entitled “Launching your Career with Multi-Media Interactions,” which is presented by Bridget Aureli, co-op advisor at Wentworth Institute of Technology and former corporate recruiter. During her 45-minute presentation Bridget will discuss email, LinkedIn, applicant tracking systems, and social media professionalism and interaction in launching and managing your career.

At 4:00 PM the Career Fair will open up to the public and engineering students. Local participating companies will utilize tabletop displays and will be available to answer questions and provide information about their firms. Over 20 companies are registered and expected to participate. Additionally, BSCES members will be present to discuss membership benefits, as these societies offer opportunities for volunteer leadership, networking and professional development.

### Friday, March 1, 2013

Friday, March 1st, kicks off with a Reception and Outreach Fair. It focuses on engineering outreach and community service to increase interest in these non-profit organizations. Attendees will be able to meet the sponsors of Engineers Week.

From 12:00 to 2:00 PM the Annual Luncheon and Awards Program will take place. The awards and scholarships presented at the Luncheon include:

- **New England Achievement Award**—The 2013 recipient is Dr. Karen Panetta, Professor of Computer and Electrical Engineering from Tufts University.
- **Engineers Week New England Scholarship**—This \$5,000 scholarship is awarded to a student pursuing an education in engineering. Applications just closed, so you'll have to attend the luncheon to find out who the 2013 recipient is!
- **New England Regional Future City Competition Awards**—The Regional Future City Competition was held on January 26, 2013 at the Northeastern University Curry Student Center and Blackman Hall. Students are assigned the task of designing a computer city using Sim City Software, building a scale model of a portion of the city, writing an essay describing their city and presenting their city to a panel of Judges. This year, Boy Scout Troop 68 from Farmington, CT will be representing New England in the national finals. Congratulations to Team Hansen Grove's 8th grade students, Omar Ahmad, Spencer Buzdon, and Allen Haugh; Educator, Urooj Ahmad; and Mentor, Mohammad “Asif” Iqba from AI Engineers (CT Office).

- **Model Bridge Competition Awards**—The Model Bridge Competition will be held on February 2, 2013 at the Northeastern University Curry Student Center. Students will construct a bridge out of Poly-Panel Foam Board, manila folders, and Loctite Power Grab adhesive following a set of specifications. Similar to the 2012 Competition, the point of loading will not be announced until the bridges are on the judges table on the day of the 2013 Competition.

- **MathCounts Competition Awards**—The Metro Chapter Mathcounts Competition will also be held on February 2, 2013 at Melrose Veterans Memorial Middle School. Middle school students within the Metro district will compete in this annual math competition. The competition consists of both written and oral rounds with both individual and team components. The winning team and individual will move onto the State Competition, which will be held in March.

### Thursday, February 21, 2013

During National Engineers Week, the BSCES Younger Member Group (YMG) will host their annual Networking event and Billiards Tournament at Boston Beer Works on Canal Street in Boston. This event encourages professionals and college students to come out and socialize with local members in the engineering field. Remember the Grand Prize is Red Sox Tickets! [Click here](#) to register now.

[Click here](#) for additional information on Engineers Week—New England events or for online registration. For additional information on volunteer opportunities associated with Engineers Week and other upcoming outreach events, contact Reed Brockman at [reed.brockman@acem.com](mailto:reed.brockman@acem.com).

## Become a BSCESNews Contributor

Would you like to contribute to an award winning ASCE section newsletter? The BSCES Newsletter Editorial Board is seeking members who are willing to write articles for publication in *BSCESNews* or 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 April 2013 issue of the newsletter for example, will highlight the BSCES Public Awareness & Outreach Committee and Younger Member Group and feature one or more articles on the theme of community service. 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 Newsletter Editorial Board Chair David Manugian at [dmanugian@ashlandmass.com](mailto:dmanugian@ashlandmass.com) or BSCES Association Manager Rich Keenan at [rkeenan@engineers.org](mailto:rkeenan@engineers.org).

## President's Report

*continued from page 1*

initiative. We will be working hard to make sure that we attract local media outlets to pick up our story. Although I have not seen the ASCE report card, my guess is that grades will still be poor and that the finding gap will have increased even further since 2009. One major difference with this year's report card is that ASCE will highlight infrastructure successes (possibly even some local examples) to ensure that the message is not all doom and gloom. While we still have an infrastructure funding gap in Massachusetts, there have been a number of high profile success stories (like MassDOT's Fast 14 and the Boston Harbor cleanup) that can serve as models for the rest of the country.

On the student outreach front, the BSCES Board of Government held its January board meeting at UMass Lowell (UML). Our meeting was graciously hosted by the UML ASCE Student Chapter. The UML student chapter has grown significantly under the leadership of Cassandra Piorkowski and Lisa Juan. The enthusiasm and professionalism of this group was evident from their presentation on the

activities they're involved with, like the ASCE concrete canoe contest and the work they do with the Lawrence Family Development Charter School in Lawrence. The ASCE UML Student Chapter made me proud to be an alumnus of the University of Lowell. We will have our April Executive Committee meeting at UMass Dartmouth and hope to have similar interaction with the ASCE student chapter there. We will also be meeting with members of our newly formed Southeast Massachusetts Committee at the April meeting. Led by Azu Etoniru, this committee is comprised of BSCES members in the region who are planning local meetings and initiatives.

Two important sustainability programs are taking place in February. On February 5th, MassDOT presented and discussed their agency-wide "GreenDOT" initiative at a lunch event sponsored by the BSCES Transportation Group and Committee on Sustainability. On February 19th, a half-day workshop highlighting the Institute for Sustainable Infrastructure and the new Envision™ rating tool

sponsored by the BSCES Committee on Sustainability and the Engineering Management Group will be held at Harvard University.

The theme of this month's newsletter is Water Infrastructure and our featured group is the ASCE Environmental and Water Resources Institute (EWRI) Boston Chapter. Be sure to see the lead article regarding the stormwater mitigation approach used on the MassDOT Route 128 Add-A-Lane project by Adel Shahin, PE and Marc Caufield, PE of Green International (this month's corporate sponsor) and the article on page 7 about EWRI Boston by Ed Whatley, PE of VHB/Vanasse Hangen Brustlin, Inc., EWRI Boston's current chair.

Last but not least, ASCE recently announced the New Faces of Civil Engineering—College Edition and we are proud to say that two of them are from our ASCE Student Chapters: Jessica Boakye from the University of Massachusetts, Amherst and Margaret (Maggie) Jacques from Merrimack College. Way to go Jess and Maggie!

## Upcoming Events

**For more information and to register for events, please visit [www.bsces.org](http://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.*

### **Committee on Sustainability and Engineering Management Group Event**

**Tuesday, February 19, 2013**

Harvard Graduate School of Design

48 Quincy Street, Boston

12:00 PM Registration

12:15 – 5:00 PM Workshop

#### **Sustainable Infrastructure Planning and Design Using the Envision™ Rating System**

*Bill Bertera, Executive Director of the Institute for Sustainable Infrastructure (ISI)*

*Anthony Kane, Rating System Research Director, Zofnass Program for Sustainable Infrastructure*

Join local and national sustainability leaders to learn how you can incorporate the principles of sustainability into your next civil engineering project. Sustainable planning and design means much more than "green" infrastructure and energy efficiency. This workshop will demonstrate how the Envision rating tool can be used to plan for long term resiliency of civil infrastructure against natural hazards and climate change,

alternative project delivery methods, optimization of community benefit and other sustainable elements of design and construction.

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

### **Younger Member Group Event**

**Thursday, February 21, 2013**

Boston Beer Works

112 Canal Street, Boston

5:30 PM Registration

6:00 PM the Tournament Begins

#### **National Engineers Week Networking Event and Billiards Tournament**

The BSCES Younger Members Group invites you to come celebrate Engineers Week at their Annual National Engineers Week Networking Event. The National Engineers Week Foundation is dedicated to ensuring a diverse and well-educated future engineering workforce by increasing understanding of engineering and technology careers. Engineers Week raises public awareness and

appreciation of engineers' contributions to society. The networking event will celebrate Engineers Week and continue the Younger Member Group's annual tradition of hosting a billiards tournament.

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

### **Construction Group Event**

**Wednesday, February 27, 2013**

Revere Hotel / Boston Common

200 Stuart Street, Boston

5:30 PM Social/Registration

6:30 PM Dinner; 7:30 PM Presentation

#### **New Orleans Inner Harbor Navigation Canal (IHNC) Hurricane and Storm Damage Risk Reduction System**

*Gerald Doton, Director Engineering, Shaw Environmental, Inc.*

During Hurricane Katrina, a surge entered the confluence of the Mississippi River Gulf Outlet and the Gulf Intracoastal Waterway overtopping

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## Upcoming Events *(continued from page 12)*

and collapsing a 4,000-foot-long section of floodwall along the Industrial Canal, causing widespread flooding in New Orleans and surrounding areas. Shaw was responsible for project management, design and construction of a system that will provide 100-year storm protection to the city of New Orleans, LA. This presentation will examine the Inner Harbor Navigation Canal (IHNC) Surge Barrier Project. Located at Lake Borgne just west of the city, it is the largest design-build civil works project ever undertaken by the US Army Corps of Engineers.

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

### Structural Engineering Institute Boston Chapter Event

**Thursday, February 28, 2013**

Arup

955 Massachusetts Avenue, Cambridge

11:30 AM Social/Registration

12:00 PM Lunch

12:30 – 1:30 PM Presentation

### Engineering an Icon: Structural Design of the Marina Bay Sands Integrated Resort, Singapore

*Patrick McCafferty, PE, LEED AP,*

*Associate Principal, Arup*

This luncheon presentation will examine the 38-acre Marina Bay Sands Integrated Resort. Unrivalled in scale, complexity, and speed of execution, the \$6B, 10Mft<sup>2</sup> resort features three 55-story, 2,560-room luxury hotel towers topped by a 2.5 acre rooftop park—the world's

largest public cantilever. The project also incorporates two glass pavilions rising from the bay, a 1.3Mft<sup>2</sup> convention center; two 2,000-seat performance theatres, a museum, and over 1Mft<sup>2</sup> of casino, retail, and restaurant space. The ambitious architecture, difficult site, and relentless schedule required creative engineering solutions on multiple fronts. Arup's Boston-based team led the global design effort from the initial competition through advanced design stages, transitioning to the firm's Singapore team during construction.

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

### Infrastructure Group Course

**Tuesday – Friday, March 12 – 15, 2013**

MassDOT District 3 Main Office

403 Belmont Street, Worcester

Tuesday through Thursday 8:00 AM – 4:30 PM

Friday 8:00 AM – 2:00 PM

**FHWA-NHI-130078**

### Fracture Critical Inspection Techniques for Steel Bridges

The course curriculum reflects current practices and addresses new and emerging technologies available to bridge inspectors. In addition, the course includes exemplary training and hands-on workshops for popular types of nondestructive evaluation (NDE) equipment and a case study for the penetration of an inspection plan for a fracture critical bridge.

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

### ASCE and BSCES Sponsored Seminar

**Thursday and Friday, March 21 – 22, 2013**

Hyatt Regency Cambridge

575 Memorial Drive, Cambridge

Thursday and Friday 8:30 AM – 4:30 PM

### Managing the Design Process: Keeping on Schedule, within Budget, and Selecting the Right Resources

*Lonny Simonian, PE, PMP and Thomas M.*

*Korman, PE, PLS, M.ASCE*

This seminar will provide participants with the knowledge and skills necessary to effectively manage the design process and prepare construction documents. Specific time- and cost-management skills, as well as quality- and assurance-control techniques, will be presented, enabling design engineers, engineering consultants, and civil service professionals to produce cost-effective construction documents for building and civil infrastructure projects.

*Click here for further details including how to register to attend this course and pay by credit card online.*

### Construction Group Event

**Wednesday March 27, 2013**

Revere Hotel / Boston Common

200 Stuart Street, Boston

5:30 PM Social/Registration

6:30 PM Dinner

7:30 PM Presentation

### MBTA Green Line Extension

*Mary Ainsley, GLX Senior Director of Design and Construction, MBTA*

*Michael J. McBride, PE, Sr. VP PM/CM GLX Program Manager, HDR/Gilbane Team*

MassDOT and the MBTA are proposing to extend the MBTA Green Line from a relocated Lechmere Station in East Cambridge to Union Square in Somerville and College Avenue in Medford. This program's featured presenters will discuss this proposed service consisting of two distinct branches: a "mainline" branch which will operate within the existing right-of-way for the MBTA Lowell Line, beginning at a relocated Lechmere Station in Cambridge and traveling north to Medford; and a branch line operating within the existing right-of-way for the MBTA Fitchburg Line to Union Square in Somerville.

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

Engineers Week  
New England  
ANNUAL AWARDS LUNCHEON 2013

FRIDAY, March 1, 2013 11:30am – 2:00pm

Join us in awarding the New England Achievement Award, Engineers Week Scholarship and the Model Bridge, Future City and MATHCOUNTS Competition Awards !!!

Courtyard Boston Downtown/Tremont  
275 Tremont Street

\$90 Individual  
\$800 Table of 10

NEW ENGLAND ACHIEVEMENT AWARD WINNER  
Dr. Karen Panetta  
Professor of Electrical and Computer Engineering, Tufts University

DEADLINE FOR REGISTRATION: Feb 17th - REGISTER ONLINE:  
www.engineers.org

## Upcoming Events *(continued from page 13)*

### 2013 Thomas R. Camp Lecture

*Sponsored by the Environmental & Water Resources Institute Boston Chapter*

**Monday, April 8, 2013**

Revere Hotel / Boston Common  
200 Stuart Street, Boston

5:30 PM Registration and Reception

6:30 PM Dinner

7:15 PM Presentation

### Geologic and Climatic Controls on Streamflow Generation Processes in a Complex Eogenetic Karst Basin

*Dr. Wendy D. Graham, Director, University of Florida Water Institute*

Water resources champion, Wendy Graham will present the results of a 3D surface water-groundwater-land surface hydrologic modeling study that used ParFlow.CLM to evaluate the interacting geologic, climatic and vegetative controls on streamflow generation processes and spatiotemporal water budget components over a large, complex eogenetic karst basin in North Central Florida. The ParFlow.CLM model

presented here represents a baseline scenario that provides a strong basis to quantitatively predict the impacts of major changes in land use, water use and climate on stores, fluxes, flowpaths and travel times of water in the basin.

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

### Save the Date

**Thursday, March 28**

### Lowell Local Protection Project (LPP)— Navigating the Post-Katrina Levee Safety Environment

Sponsored by the BSCES Geo-Institute and ASCE COPRI Boston Chapter

**Presented by:**

Michael L. Bachand, PE, Levee Safety Program Manager, USACE New England District and James S. Drake, PE, Associate, CDM Smith

*See the Insert at the end of this newsletter for further details.*

### Mark Your Calendar

**Wednesday, April 17**

### Francis M. Keville Annual Dinner

Joint Meeting of the Transportation and Construction Groups

**Revere Hotel / Boston Common**

*Look for further details in future issues of BSCESNews.*

### Save the Date

**Tuesday – Thursday, May 21 – 23**

**FHWA-NHI-130053**

### Bridge Inspection Refresher Training

Sponsored by BSCES Infrastructure Group

*Look for further details in future issues of BSCESNews.*

## Classifieds



## Helical Drilling

Geotechnical Design/Builders

Helical Drilling is seeking a **Structural / Geotechnical Engineer** to support our earth retention, grouted micropiles and grouting specialties. The candidate should have design and or construction experience in these areas, as well as experience in drilling of small diameter holes.

The applicant needs to have a propensity for being organized, able to manage multiple concurrent projects and be willing to learn new concepts.

Please send your resume to Rimas Veitas at [Rimas@helicaldrilling.com](mailto:Rimas@helicaldrilling.com).

Please visit our website [www.helicaldrilling.com](http://www.helicaldrilling.com).



Linea 5 is seeking a **Structural Engineer** to join our Structural Design Group in Boston. We are an architectural and engineering design office that specializes in renovation and adaptive reuse of existing buildings. The candidate shall have a minimum Bachelor's degree in Structural Engineering and three years or more of design or construction experience in the building renovation field. Experience with utilizing Auto CAD software in structural applications required and Revit experience strongly desired.

We are seeking candidates that have an interest in the broader applications of structural design, including historic materials and systems, forensic investigations, existing condition assessments and building envelope design. The position includes responsibility for full project cycle involvement, from initial investigation through design and construction.

Please send your resume with cover letter to Jennifer Brown at [jobs@linea5.com](mailto:jobs@linea5.com). For additional information on Linea 5, please visit our website at [www.Linea5.com](http://www.Linea5.com).



*Committee on Sustainability &  
Engineering Management Group*

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Tuesday, February 19, 2013

## **Sustainable Infrastructure Planning and Design Using the Envision™ Rating System**

**Bill Bertera, Executive Director**

**Institute for Sustainable Infrastructure**

**Anthony Kane, Rating System Research Director**

**Zofnass Program for Sustainable Infrastructure, Harvard University**

**Harvard Graduate School of Design, Gund Hall, Room 112 (Stubbins Room),**

**48 Quincy Street, Cambridge, MA**

**12:00 PM Registration; 12:15 – 5:00 PM Workshop**

**\$100 Members, \$150 Non-Members**

**This workshop is limited to 30 participants – please register early!**

Join local and national sustainability leaders to learn how you can incorporate the principles of sustainability into your next civil engineering project. Sustainable planning and design means much more than “green” infrastructure and energy efficiency. This workshop will demonstrate how the Envision™ rating tool can be used to plan for long term resiliency of civil infrastructure against natural hazards and climate change, alternative project delivery methods, optimization of community benefit, and other sustainable elements of design and construction. The workshop includes an introduction to the Envision™ rating system and a guided tour of the tool’s sustainability criteria and scoring system. Diverse case studies will follow to demonstrate how the tool rates certain design and construction elements. These examples will illustrate the broad range of sustainable components that can be incorporated into projects.

### **Registration Deadline: Thursday, February 14, 2013**

**Information/Registration:** Register to attend this meeting and pay by credit card online at <http://bit.ly/EMGEvent02192013>. 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. You can also register for this event by mail or email. To do so, download and complete a BSCES Event Registration Form available at [http://www.bsces.org/bsces/file/BSCSEventRegForm\(1\).pdf](http://www.bsces.org/bsces/file/BSCSEventRegForm(1).pdf). Then mail or email this form with payment, to BSCES, The Engineering Center, One Walnut Street, Boston, MA 02108 or [bscesreg@engineers.org](mailto:bscesreg@engineers.org), respectively. Cancellations received after February 12, 2013 and no-shows will be billed.

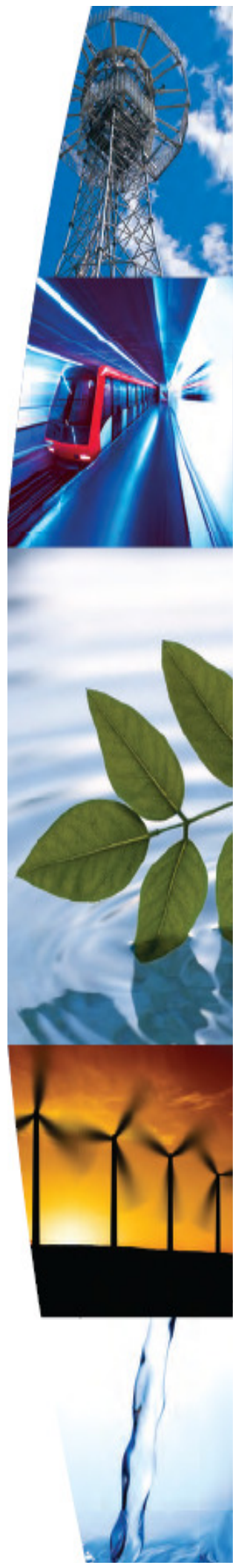
## **Sustainable Infrastructure Planning and Design Using the Envision™ Rating System**

**Tuesday, February 19, 2013**

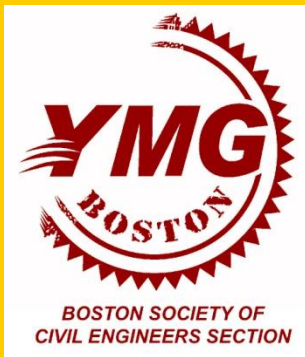
Harvard Graduate School of Design, Gund Hall, Room 112 (Stubbins Room)  
48 Quincy Street, Boston

### **AGENDA**

- 12:00–12:15** Arrival and Registration
- 12:15–12:30** Welcome  
Moderator: Melissa Carter, BSCES Committee on Sustainability
- 12:30–1:15** Keynote Speaker:  
*An Infrastructure We Can Live With*  
Bill Bertera, Executive Director of the Institute for Sustainable Infrastructure (ISI)
- 1:15–2:15** *Using the Envision™ Sustainable Infrastructure Rating System*  
Anthony Kane, Rating System Research Director for the Zofnass Program for Sustainable Infrastructure at Harvard
- 2:15–2:30** Break
- 2:30–4:15** Envision™ Rating Case Studies:
- Boston Complete Streets: Peabody Square, Dorchester*  
Patrick Hoey, Boston Transportation Department, and Stephen Farr, Nitsch Engineering
- Regional Wastewater Management Plan*  
Paul Niedzwiecki, Executive Director, Cape Cod Commission
- 4:15-4:45** *How can Envision™ be used to shape the future of Infrastructure Engineering?*
- A Panel Discussion:
- Bill Bertera, ISI
  - Anthony Kane, Zofnass Program
  - Patrick Hoey, Boston Transportation Department
  - Stephen Farr, Nitsch Engineering
  - Paul Niedzwiecki, Cape Cod Commission
  - Peter Richardson, BSCES President
- 4:45–5:00** Workshop Close, PDH Certificate Distribution







Please join us during National Engineers Week!

# Annual Networking & Billiards Tournament

Thursday, February 21, 2013

6PM-9PM (registration: 5:30PM-6PM)

## Cost:

Students \$15, Members \$20, Non-Members \$25  
Includes free appetizers and a cash bar.

## Online Registration Deadline:

February 19, 2013

**Grand Prize: 4 Red Sox Tickets for 1<sup>st</sup> place team  
Plus prizes for 2<sup>nd</sup> and 3<sup>rd</sup> place winners!**

**Boston Beer Works**

**112 Canal Street**

**Boston, MA 02114**

*(near North Station)*

Register to attend this event and pay by credit card online at <http://bit.ly/YMGEvent022113>. 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. You can also register for this event by mail or email. To do so, download and complete a BSCES Event Registration Form available at <http://bit.ly/BSCESRegForm> and follow the submission instructions. For more information, please contact Chris Broyles at [bscesyva@gmail.com](mailto:bscesyva@gmail.com) or 781-221-1061.

## Current Platinum Sponsors:



Please contact BSCES YMG  
([bscesyvmg@gmail.com](mailto:bscesyvmg@gmail.com)) if your  
firm is interested in sponsoring  
future events.

Wednesday, February 27, 2013

## **New Orleans Inner Harbor Navigation Canal (IHNC) Hurricane and Storm Damage Risk Reduction System**

**Gerald Doton**

**Director of Engineering, Shaw Environmental, Inc.**

**Revere Hotel/Boston Common, 200 Stuart Street, Boston, MA 02116  
(formerly the Radisson Hotel)**

**5:30 PM Social/Registration; 6:30 PM Dinner; 7:30 PM Presentation**

**\$70 Members, \$80 Non-Members, \$60 Public Sector Members,  
\$70 Public Sector Non-Members, \$50 Student Members and Senior Members (65+)**

The recent impact of Hurricane Sandy on New York City has exposed the city's vulnerability to a storm surge entering the harbor and rivers. During Hurricane Katrina, a surge entered the confluence of the Mississippi River Gulf Outlet and the Gulf Intracoastal Waterway overtopping and collapsing a 4,000-foot-long section of floodwall along the Industrial Canal, causing widespread flooding in New Orleans and surrounding areas.

Shaw was responsible for project management, design and construction of a system that will provide 100-year storm protection to the city of New Orleans, LA. Located at Lake Borgne just west of the city, the Inner Harbor Navigation Canal (IHNC) Surge Barrier Project is the largest design-build civil works project ever undertaken by the US Army Corps of Engineers. Through our collaboration with the Corps, IHNC will establish a 10,000-foot long, 26-foot high barrier and two flood gates to block hurricane storm surge from entering the canal in New Orleans.

The surge barrier is constructed of 1,284 concrete cylinder piles that are 66 inches in diameter, 144 feet long and driven to 130 feet deep and 248 feet long steel battered piles that will support the construction of the two-mile floodwall.

The IHNC project's magnitude, complexity and schedule gained recognition by the Deep Foundations Institute 2011 "Outstanding Project Award" by the ENR 2011 "Best of the Best."

### **Registration Deadline: Friday, February 22, 2013**

**Information/Registration:** Register to attend this meeting and pay by credit card online <http://bit.ly/BSCESConstGrp02-27-13>. 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. You can also register for this event by mail or email. To do so, download and complete a BSCES Event Registration Form available at [http://www.bsces.org/bsces/file/BSCSEventRegForm\(1\).pdf](http://www.bsces.org/bsces/file/BSCSEventRegForm(1).pdf). Then mail or email this form with payment, to BSCES, The Engineering Center, One Walnut Street, Boston, MA 02108 or [bscesreg@engineers.org](mailto:bscesreg@engineers.org), respectively. Cancellations received after February 22, 2013 and no-shows will be billed.

Thursday, February 28, 2013

## **Engineering an Icon: Structural Design of the Marina Bay Sands Integrated Resort, Singapore**

**Patrick McCafferty, PE, LEED AP**  
**Associate Principal, Arup**

**Arup, 955 Massachusetts Avenue, Cambridge, MA 02139**

**11:30 AM Social/Registration; 12:00 PM Lunch; 12:30-1:30 PM Presentation**

**\$20 Members, \$25 Non-Members, \$20 Public Sector Employees**

**\$15 Student Members and Senior Members (65+)**

This luncheon presentation will examine the 38-acre Marina Bay Sands Integrated Resort. Unrivaled in scale, complexity, and speed of execution, the \$6B, 10Mft<sup>2</sup> resort features three 55-story, 2,560-room luxury hotel towers topped by a 2.5 acre rooftop park – the world’s largest public cantilever. The project also incorporates two glass pavilions rising from the bay, a 1.3Mft<sup>2</sup> convention center; two 2,000-seat performance theatres, a museum, and over 1Mft<sup>2</sup> of casino, retail, and restaurant space. The ambitious architecture, difficult site, and relentless schedule required creative engineering solutions on multiple fronts. Arup’s Boston-based team led the global design effort from the initial competition through advanced design stages, transitioning to the firm’s Singapore team during construction.

Patrick McCafferty leads Arup’s Structural Group in Boston and received undergraduate and graduate degrees in civil and structural engineering from Cornell University. Mr. McCafferty was named by *Consulting Specifying Engineer Magazine* as among the top 40-under-40 building engineers in the country and is a lecturer in Harvard University’s Graduate School of Design. In 2011, Mr. McCafferty was named to the Editorial Board of *ArchitectureBoston Magazine*.

### **Registration Deadline: Friday, February 22, 2013**

**Information/Registration:** This program is limited to 40 participants. Registrations will be accepted on a first-come, first-serve reservation basis. Register to attend this meeting and pay by credit card online <http://bit.ly/022813SEIevent>. 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. You can also register for this event by mail or email. To do so, download and complete a BSCES Event Registration Form available at <http://bit.ly/BSCESRegForm>. Then mail or email this form with payment, to BSCES, The Engineering Center, One Walnut Street, Boston, MA 02108 or [bscesreg@engineers.org](mailto:bscesreg@engineers.org), respectively. Cancellations received after February 22, 2013 and no-shows will be billed.



Tuesday, March 12, 2013 – Friday, March 15, 2013

**FHWA-NHI-130078**  
**Fracture Critical Inspection Techniques for Steel Bridges**

**MassDOT District 3 Main Office, 403 Belmont Street, Worcester, MA**  
**Tuesday through Thursday 8:00AM – 4:30PM**  
**Friday 8:00AM – 2:00PM**

**\$1,200 BSCES Members; \$1,300 Non-Members**

**Registration fee includes course materials, continental breakfast, and lunch.**

The curriculum for this course reflects current practices and addresses new and emerging technologies available to bridge inspectors. In addition, the course includes exemplary training and hands-on workshops for popular types of nondestructive evaluation (NDE) equipment and a case study for the penetration of an inspection plan for a fracture critical bridge.

The first day of the course focuses on the concept of fracture critical members (FCMs), FCM identification, failure mechanics, fatigue in metal, and an overview of NDE methods. Day two provides demonstration sessions and hands-on applications of NDE techniques for dye penetrant, magnetic particle testing, Eddy current, and ultrasonic testing. Days three and four emphasize inspection procedures and reporting for common FCMs, including problematic details, I-girders, floor beams, trusses, box girders, pin and hanger assemblies, arch ties, eyebars, and cross girders/pier caps. A case study of the preparation of an inspection plan of a fracture critical bridge closes out the presentation. The course includes daily participant assignments.

**Registration Deadline: Thursday, February 28, 2013**

**Information/Registration:** This program is limited to 30 participants. Individuals who attempt to register after the course is closed will be added to a waiting list. Reservations will be accepted on a first-come, first-served, paid reservation basis. Payment must be received with registration to secure a slot. Register to attend this meeting and pay by credit card online at <http://bit.ly/NHICourse03122013>. 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. You can also register for this event by mail or email. To do so, download and complete a BSCES Event Registration Form available at [http://www.bsces.org/bsces/file/BSCSEventRegForm\(1\).pdf](http://www.bsces.org/bsces/file/BSCSEventRegForm(1).pdf). Then mail or email this form with payment, to BSCES, The Engineering Center, One Walnut Street, Boston, MA 02108 or [bscesreg@engineers.org](mailto:bscesreg@engineers.org), respectively. Cancellations received after February 28, 2013 and no-shows will be billed.

Wednesday, March 27, 2013

## **MBTA Green Line Extension**

**Mary Ainsley**

**GLX Senior Director of Design and Construction**

**MBTA**

**Michael J. McBride, PE**

**Sr. VP PM/CM GLX Program Manager**

**HDR/Gilbane Team**

**Revere Hotel/Boston Common, 200 Stuart Street, Boston, MA 02116**

**5:30 PM Social/Registration; 6:30 PM Dinner; 7:30 PM Presentation**

**\$70 Members, \$80 Non-Members**

**\$60 Public Sector Members, \$70 Public Sector Non-Members**

**\$50 Student Members and Senior Members (65+)**

This presentation will examine the [Massachusetts Department of Transportation \(MassDOT\)](#) and the [Massachusetts Bay Transportation Authority \(MBTA\)](#) proposal to extend the MBTA Green Line from a relocated Lechmere Station in East Cambridge to Union Square in Somerville and College Avenue in Medford. While proposals to extend public transit service north from Lechmere date back many decades, the current phase of planning began in 2005 with the completion of MBTA's *Beyond Lechmere Northwest Corridor Study* Major Investment Study/Alternatives Analysis. Planning has been underway since.

The proposed service consists of two distinct branches: a "mainline" branch which will operate within the existing right-of-way for the MBTA Lowell Line, beginning at a relocated Lechmere Station in Cambridge and traveling north to Medford; and a branch line operating within the existing right-of-way for the MBTA Fitchburg Line to Union Square in Somerville. There will be seven new stations constructed as part of the project, including the relocated Lechmere Station. A vehicle storage and maintenance facility will also be constructed. In addition to the infrastructure needs of the project, MassDOT will prepare final engineering for the proposed extension of the Somerville Community Path between Lowell Street and Inner Belt Road in Somerville. Once completed, trains will operate every five to six minutes in the peak periods, providing fast and efficient service to downtown Boston.

### **Registration Deadline: Friday, March 22, 2013**

**Information/Registration:** Register to attend this meeting and pay by credit card online <http://bit.ly/BSCESConstGrp03-27-13>. 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. You can also register for this event by mail or email. To do so, download and complete a BSCES Event Registration Form available at [http://www.bsces.org/bsces/file/BSCSEventRegForm\(1\).pdf](http://www.bsces.org/bsces/file/BSCSEventRegForm(1).pdf). Then mail or email this form with payment, to BSCES, The Engineering Center, One Walnut Street, Boston, MA 02108 or [bscesreg@engineers.org](mailto:bscesreg@engineers.org), respectively. Cancellations received after March 22, 2013 and no-shows will be billed.

Thursday, March 28, 2013

## **Lowell Local Protection Project (LPP) - Navigating the Post-Katrina Levee Safety Environment**



**Michael L. Bachand, PE, Levee Safety Manager,  
USACE New England District  
James S. Drake, PE, Associate, CDM Smith**

**Revere Hotel Boston Common, 200 Stuart Street, Boston, MA  
5:30 PM Social/Registration; 6:30 PM Dinner; 7:30 PM Presentation**

**\$70 Members, \$80 Non-Members  
\$60 Public Sector Members, \$70 Public Sector Non-Members  
\$50 Student Members, \$55 Senior Members (65+)**

The city of Lowell, MA, owns and operates the Lowell LPP that was originally designed and constructed by the United States Army Corps of Engineers (USACE) in the early 1940s in response to local catastrophic flooding. In 2007, the USACE identified three LPP deficiencies, including excessive brush, an inoperable seepage collector system and an inoperable flood pumping station, causing the Federal Emergency Management Agency (FEMA) to remove the Lowell LPP from the 2010 Flood Insurance Rate Maps. This resulted in the areas that were previously "protected" by the Lowell LPP being shown within a flood zone and requiring flood insurance. Lowell began working directly with USACE to resolve the deficiencies. This presentation will present an overview of the system, deficiencies, and improvements performed by the city to correct the deficiencies to-date to return the LPP to "active" status in accordance with the Post-Katrina levee safety environment.

### **Registration Deadline: Friday, March 22, 2013**

**Information/Registration:** Register to attend this meeting and pay by credit card online at <http://bit.ly/GeoInst032813>. 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 or if you have difficulties registering online call 617/227-5551. You can also register for this event by mail or email. To do so, download and complete a BSCES Event Registration Form available at [http://www.bsces.org/bsces/file/BSCSEEventRegForm\(1\).pdf](http://www.bsces.org/bsces/file/BSCSEEventRegForm(1).pdf). Then mail or email this form with payment, to BSCES, The Engineering Center, One Walnut Street, Boston, MA 02108 or [bscesreg@engineers.org](mailto:bscesreg@engineers.org), respectively. Cancellations received after March 22 and no-shows will be billed.

Monday, April 8, 2013

**2013 Thomas R. Camp Lecture**  
**Geologic and Climatic Controls on Streamflow Generation  
Processes in a Complex Eogenetic Karst Basin**

**Dr. Wendy D. Graham**  
**Director, University of Florida Water Institute**

Revere Hotel / Boston Common, 200 Stuart Street, Boston, MA  
5:30 PM Registration and Reception; 6:30 PM Dinner; 7:15 PM Presentation

**\$70 Members, \$80 Non-Members**  
**\$60 Public Sector Members, \$70 Public Sector Non-Members**  
**\$50 Student Members, \$55 Senior Members (65+)**

Water resources champion, Wendy Graham will present the results of a 3D surface water-groundwater-land surface hydrologic modeling study that used ParFlow.CLM to evaluate the interacting geologic, climatic and vegetative controls on streamflow generation processes and spatiotemporal water budget components over a large, complex eogenetic karst basin in North Central Florida. In addition to accurately reproducing observed streamflow and groundwater elevations, model predictions of surface-groundwater contributions over space and time closely matched estimates from mixing models that use observed specific conductivity differences among surface and subsurface water sources throughout the domain. The presented results of this study underscore the usefulness of combining end member mixing model results with integrated hydrologic models to improve quantitative, predictive understanding of surface water – groundwater flow dynamics within large complex watersheds, and to indicate where additional field measurements may be necessary to refine geologic heterogeneity and to improve numerical model predictions.

The ParFlow.CLM model presented here represents a baseline scenario that provides a strong basis to quantitatively predict the impacts of major changes in land use, water use and climate on stores, fluxes, flowpaths and travel times of water in the basin. These predictions are essential to inform holistic land and water resource planning in the region in order to provide reliable water supply for human uses as well as environmental flows that are protective of aquatic ecosystems.

**Registration Deadline: Wednesday, April 3, 2013**

**Information/Registration:** Register to attend this meeting and pay by credit card online at <http://bit.ly/EWRlevent040813>. 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. You can also register for this event by mail or email. To do so, download and complete a BSCES Event Registration Form available at <http://bit.ly/BSCESRegForm>. Then mail or email this form with payment, to BSCES, The Engineering Center, One Walnut Street, Boston, MA 02108 or [bscesreg@engineers.org](mailto:bscesreg@engineers.org), respectively. Cancellations received after April 3, 2013 and no-shows will be billed.



January 2013

## **Announcement of the 2013 \$5,000 Simpson Gumpertz & Heger Scholarship**

### **To Prospective Applicants:**

The Principals of Simpson Gumpertz & Heger Inc. (SGH) have established the Simpson Gumpertz & Heger Scholarship with the Boston Society of Civil Engineers Section/American Society of Civil Engineers (BSCES) to encourage undergraduate college students who strive for excellence and who aspire to a career in civil engineering. It has been our experience as a firm and as individuals that the field of civil engineering provides technically challenging assignments while offering an opportunity to make a significant contribution to society.

SGH supports the civil engineering profession and wishes to encourage gifted students in the pursuit of their careers. We welcome your participation in this scholarship opportunity.

### **What is the Simpson Gumpertz & Heger Scholarship?**

SGH established this scholarship with BSCES to encourage students in the pursuit of civil engineering as a profession. In 2013, the scholarship amount will be **\$5,000** in the form of a check presented to the scholarship winner.

### **Who may apply?**

All undergraduate-level civil engineering majors who are members of an ASCE Student Chapter or Club in Massachusetts, have completed a minimum of two-and-one-half years of a four-year program (or the equivalent portion of a five-year or part-time program), and expect to complete their undergraduate degree in May 2013 or later are eligible to apply for this scholarship.

### **Review of the Application**

Applications will be judged with equal weight given to three categories: professional presentation in the letter of introduction and resume, quality of ideas expressed and clarity of communication demonstrated in the one-page essay, and capabilities reflected in college/university transcript(s).

A three-person committee consisting of two representatives of BSCES and one Principal of SGH will judge applications. Decisions of the committee will be final. Leading candidates may be asked to meet with members of the review committee. BSCES reserves the option of publishing applicants' essays in *BSCES News* and/or *Civil Engineering Practice*.

### **Presentation of the Award**

The recipient of the scholarship will be announced at the 2013 BSCES Student Night. The award recipient will be notified in advance of the meeting and will be invited to attend Student Night as a guest of SGH.



## **Simpson Gumpertz & Heger Scholarship 2013 APPLICATION**

### **How to apply**

Students interested in applying for the Simpson Gumpertz & Heger Scholarship are asked to submit the following:

- A one-page letter introducing the applicant and summarizing their qualifications.
- A resume demonstrating the applicant's academic record, professional employment (in engineering or related fields), other employment, professional activities (membership and participation in professional organizations such as ASCE, SWE, EWB, etc.), and personal items of interest.
- A one-page essay demonstrating the applicant's writing ability and expressing original thought. The topic for the 2013 essay is the following:

Civil engineering projects shape the communities in which they are built. Some of these projects become symbols of those communities, appearing in backgrounds of TV news reports, company logos, city seals, coffee mugs, or souvenirs.

Choose an important civil engineering-related project from a community you have visited and evaluate how this project shaped the community, impacted the citizens, and whether it has met, not met, or exceeded expectations of the time when it was built. What makes or made the project an *important* part of the community? Some examples may include a landmark structure in a town, a piece of infrastructure that influenced the growth of the community, or a local project that is personally important to you.

- Official college and/or university transcript(s).

### **Send applications to:**

Simpson Gumpertz & Heger Scholarship Committee  
Boston Society of Civil Engineers Section/ASCE  
The Engineering Center  
One Walnut Street  
Boston, MA 02108-3616

Applications can be submitted by hard copy to the address above or e-mailed (PDF format) to Brent Bass at [bjbass@sgh.com](mailto:bjbass@sgh.com) with the subject "SGH Scholarship". Applications must be received by 5:00 PM on Wednesday, March 13, 2013. If submitting electronically, a hard copy application must follow and shall be received at the above address no later than 5:00 PM on Friday, March 15, 2013. Applications will not be returned.

### **For more information, please contact:**

Brent Bass  
Simpson Gumpertz & Heger Inc.  
781-907-9000 or [bjbass@sgh.com](mailto:bjbass@sgh.com)

## **2013 ERNEST A. HERZOG AWARD CALL FOR PAPERS**

### **BACKGROUND**

Ernest A. Herzog was a nationally recognized civil engineer. During his career, he served a term as president of the Boston Society of Civil Engineers Section and was also a fellow of the American Society of Civil Engineers (1987).

Mr. Herzog began his career with Spencer, White and Prentis at the atomic energy facility in Oak Ridge, Tennessee. After World War II, he transferred to a Boston-based firm named Chas. T. Main Inc. Eventually, Mr Herzog joined the firm of Alonzo B. Reed Inc. where he progressed into the highest role of president and remained in that role for 20 years thereafter.

While in the transportation field, Mr. Herzog was actively involved in the design and construction of the monorail used at the 1962 Seattle World's Fair. This monorail, which is still in use today, has served as the prototype for several other monorail systems including those at Disney Land in Anaheim, California, Disney World in Orlando, Florida, and one in Tokyo, Japan. In fact, Mr. Herzog was a strong and persistent advocate of a monorail system to serve Boston's south shore communities to relieve the traffic congestion on the Southeast Expressway.

In 1973, Mr. Herzog co-founded Herzog-Hart, a full-service engineering firm that specializes in the design and construction of research and production facilities for the pharmaceutical and process industries.

Mr. Herzog was well known for his generous support of and encouragement to young college students and young professionals just at the onset of their careers. He lectured at Tufts University, Dartmouth College, University of Massachusetts, and Northeastern University. He also wrote and published numerous papers, particularly concerning the effects of transportation systems on society.

In memory of Mr. Herzog's commendable career achievements, the Ernest A. Herzog Award was established to promote an awareness of and to recognize innovative improvements to infrastructure.

### **PAPER GUIDELINES**

Submitted papers shall present an infrastructure project, innovation, or idea in which the author was actively involved in as an owner, advocate, engineer, or end-user. The paper must be well written and address specific benefits to current professional practices, lifestyle, and/or sustainability through the application of existing or innovative technologies or methods. Areas of application may include design, construction, operation, maintenance, management or financing of infrastructure components or systems.

### **RULES**

- A.** The paper should be original and not be less than 2,000 words and not more than 6,000 words. The paper should clearly describe the project, innovation, or idea and highlight benefits to the current engineering and construction practices. Graphic material including

photographs should be included to highlight specific areas of the project. The paper may have been previously published in a journal.

- B.** 3 copies of the papers shall be submitted to:  
BSCES/ASCE  
The Engineering Center  
One Walnut Street  
Boston, Massachusetts 02108-3616  
Attn: Infrastructure Group,  
Herzog Award Committee

An electronic copy should also be sent to [paul.savard@jacobs.com](mailto:paul.savard@jacobs.com)  
Deadline for submittal: **April 5, 2013.**

- C.** The recipient may be invited to give a short presentation on the paper at the BSCES Infrastructure Group Online Bridge Design Contest Awards Celebration on May 9, 2013. Original papers may be submitted (with authors permission) for publication in the semi-annual BSCES Journal and for BSCES Annual Awards (celebrated in September 2013).

## REVIEWERS

The BSCES Infrastructure Group Herzog Award Competition Subcommittee.

## EVALUATION CRITERIA

Topics for the papers shall be related to one or more of the fifteen infrastructure systems defined in ASCE's infrastructure report card (see <http://www.infrastructurereportcard.org/>). Papers are evaluated by the reviewers on the basis of the following criteria:

- A.** Technical writing; organization, graphics, grammar, and technical accuracy (30%)
- B.** Benefits to the current design, construction, operation, maintenance, or financing practices of infrastructure (20%)
- C.** Innovation; uniqueness of concepts (10%),
- D.** Benefits to lifestyle of the general public or other end-users (20%)
- E.** Sustainability, life-cycle cost benefits, or cost effectiveness (20%)

## AWARD

The award presentation will be made at the BSCES Infrastructure Group Online Bridge Design Contest Awards Celebration on Thursday, May 9, 2013. The recipient will receive a \$1,000 award and a memorable plaque.

## THE BSCES INFRASTRUCTURE GROUP

Infrastructure is defined as all existing public and publicly regulated facilities necessary to support social and economic need including, but not limited to, the following: roads and highways, bridges, railroads, mass transit, airports, navigable waterways, energy and water supply and distribution systems, wastewater collection and treatment systems, stormwater collection systems, dams and flood control facilities, solid waste disposal systems, parks, electric facilities, natural gas facilities, communications systems and schools. The BSCES infrastructure group has the mission of spreading awareness of infrastructure within and beyond the engineer community. Anyone wishing to join the Infrastructure Group should contact our chair Salim Ayas ([salim.ayas@yahoo.com](mailto:salim.ayas@yahoo.com)). Meetings are held monthly.