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**ASCE Illinois Section**

# News

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## Design Consideration for Railroad Bridges

*By Ahmad Hammad, PhD, PE, SE and Hussam Alkhatib*

There are a number of basic differences between railroad and highway bridges. The objective of this article is to discuss these differences in general and introduce some aspects for the design of railroad bridges. For railroad bridge design, construction, and inspection standards; the AREMA Manual for Railway Engineering (1) is mainly used. Simple-span structures are the preferred option for railroad bridges over continuous structures which are desired for typical highway bridges.

**"In railroad bridges; the deck can be designed as an open deck system, a ballasted deck or direct fixation deck."**

In terms of loading on the bridge; the ratio of live load to dead load is much higher for a railroad bridge than it is for a highway bridge. This is significant because it can lead to serviceability issues such as fatigue and deflection control governing designs rather than strength, which is the case of a typical

highway bridge design. Also, design impact load on railroad bridges is higher.

Most bridges can be divided into three basic components; Deck, Superstructure and Substructure. The deck's main function is to transfer the live load and dead load of the deck to other bridge components. In railroad bridges, the deck can be designed as an open deck system, a ballasted deck or direct fixation deck. In open deck systems the dead load is significantly less; however, dynamic effects are higher. A typical open deck system weighs approximately 600 pounds per linear feet (plf) and a ballasted deck system weighs approximately 4800 plf. Direct fixation decks are less commonly used, however they could result in much less weight and total height of the bridge deck due to elimination of the ties and ballast.

The superstructure's main function is to transfer the live load and dead load to the substructure. Just like in highway  
(continued on page 7)

## President's Notes

Thera Baldauf, P.E.



**G**reetings and happy holidays! I am honored to begin my term as president of the Illinois Section of the American Society of Civil Engineers. I would like to thank our Past-President, Mike MacKinnon, for his leadership this past year. With his continued dedication and hard work, the Illinois Section has grown in membership and continues to remain a premier representation of civil engineers in Illinois.

We had another amazing turnout for our annual dinner this past October, with over 380 in attendance and for the first time the event was sold out more than 2 weeks in advance! The Adler Planetarium was a great and unique venue for our dinner this year. I would like to congratulate all of the award winners and thank the numerous Illinois Section volunteers that made this event successful. Planning for next year's venue is already underway and feedback received on this past year's event will be taken into careful consideration as next year's "Dinner Gala" will be the grand finale to the Section's Centennial year.

The Illinois Section, Younger Member Group and the Institute Chapters are giving a special kickoff to the holiday season by hosting a Joint Holiday Party on Thursday, December 17 at the Ovie Bar and Grill. Come and enjoy a great time networking with your fellow engineers and don't forget your unwrapped toy for **Toys for Tots!**

This coming year is a symbolic year for the Illinois Section and a rare opportunity to recognize and celebrate the legendary feats of our local civil engineering history. The Illinois Section Centennial Committee has several events in the works, starting with the Winterfest Networking Event this coming January.

The Illinois Section is also honored to have two major events occurring within our Region. This coming January 15-16, the 3, 6, and 7 Multi Regional Leadership Conference will be held in Chicago. The Illinois Section Sustainability Committee is hosting its Annual Envision Accreditation Training Workshop on Thursday, January 14 as part of the MLRC. Additionally, the Younger Member Group has graciously volunteered to host the CRYMC Awards Reception on Friday, January 15. For those interested in attending, sign up is available for both events on the Section website.

The Illinois Institute of Technology will be hosting the 2016 Great Lakes Competition this coming April where students from over 18 universities will participate in competitions including the Steel Bridge and Concrete Canoe. The IIT ASCE Student Chapter is currently looking for volunteers to judge several of these competitions. Call for volunteers will be advertised in upcoming e-blasts for those interested in volunteering.  
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## ASCE Illinois Section News

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# Is the Engineering Industry Old-Fashioned?

By Anne Marie Jensen, P.E., M.B.A.

**M**y response to this question with no hesitation is YES! I have close to weekly conversations with friends in the industry that live all over the states that struggle with the issue of work-life balance. We are now in a day of age where we are constantly synced with technology and social media, juggling a slew of obligations between work, family, friends, and volunteer activities while trying to stay balanced. In my mind, the balance of work and life is difficult to achieve in the engineering industry.

## **Evolving society versus stagnant work environment**

Our society is constantly evolving; so why hasn't the engineering industry evolved with it? I envision the engineering industry over a decade ago as being male dominated, where the husband dedicates most of his time to work while his wife is at home fulfilling her domestic duties, i.e. child care, cooking, laundry, etc. Now we are in a society where it is not rare for both the husband and wife to work full-time and share the household obligations. But have the demands at work and the workplace environment changed to account for this transforming society?



Some industries and companies have recognized this transformation and adapted to societal changes and to employees' increased obligations beyond work. Research has shown how recruiting and retaining high performance employees can be contributed to employers providing a flexible work schedule and emphasizing a work-life balance. A company can have work-life benefits in place, but it is only effective if it is incorporated into the company's culture and the underlying notions

## **Hurdles of balancing work and life**

of working longer hours to advance are eliminated. If the work culture doesn't change to support these benefits, employees will still feel the stresses of juggling work and personal obligations and consequently may choose a job that does support work-life balance in order to be relieved of these stresses.

Work-life balance results in happy and more productive employees and increases company morale and collaboration. As a by-product, employees feel impelled to deliver and stay with their company. Overall company costs are then reduced by investing less in candidate recruitment and therefore cutting human resources and training costs associated with hiring new employees. Retention rates will never be at zero percent, but companies with work-life benefits will see a greater pool of top talent candidates.

## **Advantages of work-life benefits for employees and employers**

In addition to employee loyalty and company morale, work-life balance also incorporates wellness, which reduces health care costs for companies. A sedentary lifestyle is detrimental to one's health and engineers tend to exemplify this lifestyle with working through lunch and putting in long hours. Work-life balance improves employees' health and lifestyle habits. Reducing employees' health care costs alone is a great benefit for a company with health care industry costs only on the rise.

On the one hand I see the benefit of working similar hours as other team members, but there are ways to accommodate coworkers' (continued on page 7)

# Local Agency Legislative / State Budget Update – State of Illinois

By Michelle A. Lipinski, P.E.

**A**s the State of Illinois continues to operate without a budget, local agencies are dealing with the ramifications of losing State funding. The following article summarizes a discussion on the subject with the **Director of Transportation of Kane County, Mr. Carl Schoedel, P.E.**

In general, the lack of a state budget affects anything that would normally be budgeted, which is almost everything. Certain types of monies are still flowing, including Federal dollars for ongoing projects. The rest of the payments and distributions are not. The hardest hit are probably the social service agencies who rely almost completely on State funding for their operations. But even within the Civil Engineering industry, the budget crisis is beginning to be significant.

## Local government perspective:

- All Counties, Cities, Villages, Township Road Districts in the State of Illinois are affected by the lack of Motor Fuel Tax (MFT).
- The **19.0 cents/gallon** on Gasoline and the **additional 2.5 cents/gallon** on Diesel fuel is the source of MFT funding, which is collected by the state and then distributed to local agencies by formula.

- The **state is collecting** these dollars even though a budget has not passed
- Because of the lack of a budget and appropriation, **none of these dollars have been distributed to local governments** since July 1 - the start of the State Fiscal Year.
- Roughly 46% of the Motor Fuel Tax (or about **\$560 million annually**) is designed to go to local agencies.

## Kane County Example:

In the case of Kane County, MFT accounts for roughly \$6.25 Million of revenue annually. As of November 2015, about \$2.5 million should have arrived from Springfield, but has not. **Director of Transportation, Carl Schoedel says, "It's not a crisis for Kane County...at least not yet."** That is because Kane County was operating with a balance in the MFT fund and has several other fund sources available to it. However, the longer the budget impasse goes on, the greater the impact is. Mr. Schoedel also noted that smaller agencies, particularly Township Road Districts, are using MFT for operating expenses. Some of these highway agencies are uncertain about funding 2016 projects and some are concerned about funding ongoing operations.

## Legislation Highlight - "House Bill" HB 4305

Among other appropriations, this bill **"Makes appropriations to the Department of Transportation from the Motor Fuel Tax Fund for specified payments to local governments."**

This bill passed the House the week of November 8, but is being held in House until the Senate can address it. The industry understands that the Governor is generally supportive of HB 4305, but may be interested in addressing several additional issues in the context of the bill. Meanwhile, the Senate is not scheduled to return to session until January, so that is most likely the soonest we'd see movement on that front. Or any other legislation, for that matter.

For more information on Illinois legislation, please go to:

<http://www.ilga.gov/legislation/>

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# 99<sup>th</sup> Annual Dinner Meeting Highlights

by Karen C. Chou, Ph.D., P.E., F.ASCE and Megan McDonald, P.E., M.ASCE

With the view of the Chicago skyline, Lake Michigan, and Navy Pier in the backdrop, the Illinois Section ASCE kicked off its Centennial celebration at the 99<sup>th</sup> Annual Award Dinner at Adler Planetarium on the evening of Wednesday, October 21, 2015. Despite the Cubs playing the Mets for the National League Championship, it was at capacity attendance with 390 members, students, and guests. The Planetarium opened its exhibits to all the attendees during the

cocktail hour prior to the dinner.

The evening was guest emceed by Phil Schwarz, meteorologist for ABC 7 Weekend News and Sunday Morning News since 1995. Mr. Schwarz began his career as a weathercaster in his hometown of Flint, MI, where he was the weekend meteorologist for WJRT-TV, the local ABC affiliate (1984-1989). He also owned a forecasting service at the time. From Flint, Mr. Schwarz was the weekend meteorologist at KSTP-TV in St. Paul, MN, and

weeknight meteorologist for WNYW-TV in New York City. Mr. Schwarz earned his B.S. Degree in Meteorology from Pennsylvania State University in 1983. He holds the American Meteorological Society Seal of Approval, and volunteers as an assistant coach for Youth Hockey.

After dinner, Mr. Schwarz spoke on his favorite subject weather forecast and his love for forecasting. Following Mr. (continued on page 6)



# 99<sup>th</sup> Annual Dinner Meeting Highlights

(continued from page 5)



Schwarz's presentation, the Section honored 18 Life Members and recognized all the volunteers who worked hard throughout the year by serving on various committees, technical groups, and the Board. The IL Section ASCE Board is composed of President, Past President, President-Elect, Secretary, Treasurer, 6 directors who serve a staggered 2-year term, and chairs of each technical group. Governor Darren Olson swore in the 2015-16 Board and President Thera Baldauf outlined the many activities planned for the Section's Centennial celebration. The highlight of the evening was the presentation of award recipients, outstanding civil

engineering achievements, sustainable civil engineering project, and Engineers Without Borders (EWB) project grants for 2015.

The Awards Committee



received a total of 18 nominations in 10 categories from members throughout the Section. There were many outstanding nominations, and the Awards Committee wishes to thank all those that participated in the process! The Awards Selection Committee includes a member from each Technical Group or Institute, and two representatives from the Illinois Section Board of Directors. All the winners presented tonight were chosen by a vote of the Selection Committee. After the Committee selected the award recipients, a vote of the Illinois Section Board was required to ratify the Committee's selections.  
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## Is the Engineering Industry Old-Fashioned?

(continued from page 3)

schedules. I am also not condoning missing client deadlines or producing subpar work to achieve a work-life balance. There is still an obligation to meet clients' expectations and deliver on time and quality work. It is inevitable to work long hours from time to time to meet these demands, but it shouldn't be constant. Employees should recognize and appreciate this benefit and in turn deliver to make the company successful.

Furthermore, a company investing in work-life benefits alone won't recruit and retain top talent; they must also invest in career development and training to continue the growth of the employee.

To circle back to my question in the headline of this article, I believe there is opportunity for the engineering industry to emerge from an old-fashion work environment and provide a work-

life balance. Our generation views work-life balance to be more advantageous than a bump in pay or a promotion if it results in sacrificing our health, hobbies, family or friends. Work-life balance is a win-win for everyone in the engineering industry.

*Anne Marie Jensen, P.E., M.B.A. is an engineer in transportation and is chair for IL-ASCE Transportation & Development Institute.*

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## Local Agency Legislative / State Budget Update – State of Illinois

(continued from page 4)

**Many smaller agencies use MFT for basic operating expenses, including payroll, resurfacing programs, and purchase of rock salt for ice control.**

Ultimately, if there is a State budget and if the MFT is distributed as expected, the impacts will be mitigated. The concern moving forward is that these historical commitments do not materialize for whatever reason.

*Carl Schoedel, P.E. is the Director of Transportation for Kane County*

*Michelle Lipinski, P.E. is the owner of Rubino Engineering, Inc. and current Urban Planning and Development Group Chair.*

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## Design Consideration for Railroad Bridges

(continued from page 1)

bridges there are numerous types of superstructures as part of railroad bridges. Perhaps the best way to list these types would be by the span length. We can categorize span lengths into three types; short medium and long. For short spans up to 16 feet, the type of superstructure to be considered

in the design of railroad bridges could typically be timber stringers, concrete slabs or rolled steel beams. For short spans up to 32 feet, the type of superstructure to be considered in design could typically be conventional and prestressed concrete box girders and beams or rolled steel beams.

For short spans up to 50 feet, the type of superstructure to be considered in design could typically be prestressed concrete box girders and beams, rolled steel beams, or deck and through girders. Medium spans can be considered with a span length in (continued on page 8)

# Design Consideration for Railroad Bridges

(continued from page 7)

**“Chapter 8 of the AREMA Manual provides extensive guidelines and provisions for subsurface investigation to aid in the design of the substructure units of railroad bridges.”**

the range of 80 to 125 feet. For medium span length, the type of superstructure to be considered in design could typically be prestressed concrete beams, or deck and through plate girders. For span lengths longer than 125 feet, the type of superstructure to be considered in design could typically be deck and through trusses which can be simple, cantilever or arches.

The substructure mainly comprises of foundations

supporting the abutments and piers. The substructure’s main purpose is to transfer the miscellaneous forces and loads on the bridge to the underlying soil. Like in any structure, an investigation of the underlying soil and geologic conditions is needed before the design of the substructure. Chapter 8 of the AREMA Manual provides extensive guidelines and provisions for subsurface investigation to aid in the design of the substructure units of railroad bridges.

According to the AREMA Manual, railroad bridges shall be designed and proportioned for the following loads and forces;

- (1) Dead load
- (2) Live load
- (3) Impact load
- (4) Wind Forces

- (5) Centrifugal Force
- (6) Forces from continuous welded rail
- (7) Other lateral forces
- (8) Longitudinal forces
- (9) Earthquake forces

Similar to any structure; **dead loads** are an estimate of the structure’s permanent loads. Unit weight values found in table 15-1-5 of the AREMA Manual are used for estimating these dead loads for railroad bridges design. For **live load** consideration, the AREMA Manual recommends live load in pound per axle and uniform trailing load for each track is the Cooper E 80 load or the Alternate Live Load on 4 axles, whichever produces the greater stresses. Section 1.3.3 of the AREMA Manual shows a figure for each load type. See Figure 1.  
(continued on 10)

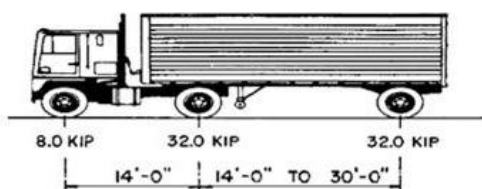


Figure 3.6.1.2.2-1—Characteristics of the Design Truck



AASHTO LRFD Vehicular live loading, designated HL-93, on the highway bridges. (2)

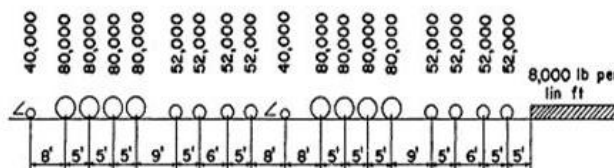


Figure 15-1-2. Cooper E 80 Load

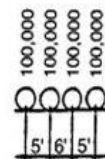


Figure 15-1-3. Alternate Live Load on 4 Axles

AREMA recommended live load in lb per axle and uniform trailing load for railroad bridges.

Figure 1. Showing the different live loading for highway bridges vs railroad bridges.



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# Design Consideration for Railroad Bridges

(continued from page 8)

**Impact load** is defined as the dynamic amplification of the live-load effects on the bridge caused by the movement of the train across the span. Formulas for calculation of impact are included in Chapters 8 and 15 of the AREMA Manual. Steel design procedure allows reduction of the calculated impact for ballast deck structures to approximately 90%. Different values for impact from steam and diesel locomotives are used. The AREMA Manual specifies **Wind force** as the force on the structure due to wind action on the bridge and train. Wind loading produces a horizontal force and an overturning moment. On the train, the lateral wind force shall be taken at 300 plf applied normal to the train on one track at a distance of 8 feet above top of rail. **Centrifugal force** is the force

**“In general, and due to how railroad bridges are constructed and train operation guidelines post-seismic events, railroad bridges performed well in seismic events.”**

a train moving along a curve exerts on a constraining object (track and supporting structure) which acts away from the center of rotation. Centrifugal force is applied horizontally through a point 8 feet above the top of rail.

**Lateral Loads from equipment** are loads applied to the structure as a result of routine train passage, excluding centrifugal force. This load is largely due to the nosing (the tendency of the train to bear laterally against the rails as it travels down the track) and hunting action of the train as it traverses the bridge. Lateral force manifests itself as horizontal forces on specified bridge members including lateral bracing members, flanges of longitudinal girders or stringers without a bracing system, and to the chords of truss spans. A single moving concentrated lateral force equal to one-quarter of the weight of the heaviest axle of the specified live load, without impact, shall be applied at the base of rail in either direction and at any point along the span. **Longitudinal forces** (from live loads) are typically produced from starting or stopping trains (acceleration or deceleration) on the bridge. These forces can be applied in either longitudinal direction and are transmitted through the rails and distributed into the supporting structure. Section 1.3.12 of the AREMA Manual prescribes the equations for determining these longitudinal forces for E-80 loading. For design loads other than E-80, these forces shall be scaled proportionally. Chapter 9 of the AREMA Manual covers in details the **Earthquake Forces** and seismic loads. In general, and due to how railroad bridges are

constructed and train operation guidelines post-seismic events, railroad bridges performed well in seismic events.

While there might be other design considerations for railroad bridges by local agencies that own the railroad bridge, the design, construction and inspection standards of railroad bridges are found in the AREMA Manual. The AREMA Manual is an annual publication released every April and only the latest edition is valid.

## References

1. AREMA, *Manual for Railway Engineering*, American Railway Engineering and Maintenance-of-Way Association, Lanham, Md, USA, 2015
2. AASHTO, *LRFD Bridge Design Specifications*, American Association of State Highway and Transportation Officials, Washington, DC, USA, 7th edition, 2014.

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# 99<sup>th</sup> Annual Dinner Meeting Highlights

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## CITIZEN ENGINEER OF THE YEAR

**Tom Nagle, P.E.**



Tom Nagle has always believed in giving back to the community because of all the help he's received along the way from others. Tom feels lucky to be working at Robinson Engineering because the culture at the Company is to give back not only to the communities in which they work in, but to anyone whose needs align with the company's mission, talents and interests.

Tom leads the Toys for Tots toy drive at Christmas and has participated every year in multiple charity events such as coat drives, food drives and helping less fortunate residents with flood proofing improvements such as installing rain gardens and delivering rain barrels. Working through his church, he has also built a home for Habitat for Humanity and has run the Chicago Marathon for the Leukemia and Lymphoma Society to raise funds to fight blood-related childhood cancers. He feels one of his most rewarding community involvement endeavors to date was the

integration of students and teachers from a nearby grade school into one of his projects.

Tom also promotes his profession by talking about the importance of giving back and community involvement at various state and national conferences. He is also on the AWWA Outreach Committee that is tasked with educating the public on the importance of public water and is the scholarship chairman for multiple water organizations with the goal of enabling younger students to benefit from higher education and to allow the water operators and public works employees to attend conferences and seminars they normally could not afford.

## YOUNG GOVERNMENT CIVIL ENGINEER OF THE YEAR

**Kristin Rehg, P.E.**



Kristin Rehg is a Project Manager with the City of Evanston Utilities Department, which operates the second largest water treatment and supply system in Illinois. Her

work includes water/sewer cost of service analysis for Evanston's retail and wholesale customers, capital improvement planning, design and project management for public improvement projects, and public outreach and education initiatives on water conservation and infrastructure issues.

Prior to joining the City of Evanston, Kristin worked for nine years as an engineering consultant, focusing on planning and design for water and wastewater systems and treatment facilities, as well as water and sewer rate analysis and capital project financing.

Kristin earned a B.S. in Environmental Engineering from Northwestern University in 2003 and is a licensed professional engineer in Illinois. She is an active member of the American Water Works Association, serving on several committees at the state and national levels. Kristin is also a member of the American Public Works Association and the Water Environment Federation.

## GOVERNMENT CIVIL ENGINEER OF THE YEAR

**Peter E. Harmet, P.E.**



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# 99<sup>th</sup> Annual Dinner Meeting Highlights

(continued from page 12)

Pete has been employed with the Illinois Department of Transportation for over 29 years, beginning as a summer intern and later as a full time employee after receiving his Bachelors of Science Degree in Civil Engineering from Bradley University in 1986.

Pete has been the Bureau Chief of Programming in IDOT's Chicago area office since 2006, and leads a staff of over 70 engineers, technicians and consultants. The Bureau is responsible for planning and programming highway projects on the 3,000 mile state system in the Chicago area. Over the course of his career, Pete has led project teams during the planning phase for many challenging projects, including the Elgin-O'Hare expressway, the I-290 reconstruction, and Willow Road in Northfield.

Pete is married, has three children, enjoys biking, reading, and listening to 80's music, which is a source of constant teasing by his family. He's also a long time Cubs fan, which means he is extraordinarily patient.

## YOUNG CIVIL ENGINEER OF THE YEAR

**Matthew J. Huffman, P.E.**



Matthew Huffman, P.E. is a Project Manager at Christopher B. Burke Engineering, Ltd. (CBBEL) with nearly ten years of experience. His engineering career started at CBBEL as an intern in 2001. Matthew attended the University of Illinois at Chicago (UIC) and received a Bachelor of Science in Civil Engineering in 2006. Upon graduation, Matthew accepted a position at CBBEL with the Phase I Engineering Department, where he currently serves today. In 2010 he received a Master of Science in Project Management from Northwestern University. Matthew's work focuses on federally funded Phase I transportation projects for clients throughout the Chicagoland area.

Matthew has been involved with ASCE since serving as the Student Chapter President at UIC. Upon graduation, Matthew joined the Transportation Group and was Chair of the Group in 2012. Subsequently, he was involved with the Illinois Section serving as Director. He has been a member of the UIC Civil Engineering Professional Advisory Council (CEPAC) since 2008 and has enjoyed staying involved with UIC's Civil & Materials Engineering Department. For the past four years, Matthew has served on his 326-unit Condominium Association Board of Directors and held the position of President for the last two years. Under Matthew's direction, the condominium recently underwent a \$3.8 million dollar capital improvement roof and façade project.

Matthew currently lives in the West Loop neighborhood of Chicago with his very understanding wife Dana, newborn daughter Evelyn, and loyal Labrador, Eddie.

## CIVIL ENGINEER OF THE YEAR

**David J. Morrill, P.E., S.E.**



David Morrill's 35-year tenure at Alfred Benesch & Company encompasses leadership on countless structural and civil engineering assignments, in addition to his work fostering the talents of the Structural Group in Illinois. When David assumed the role of Structural Group Manager in 1995, the group consisted of less than 10 engineers. As he approaches retirement, the group's size has nearly tripled, utilizing the talents of 28 professionals ranging from junior staff to seasoned project managers.

Many projects led by Mr. Morrill have garnered national accolades for their innovative design  
(continued on page 14)

# 99<sup>th</sup> Annual Dinner Meeting Highlights

(continued from page 13)

solutions in the face of challenging issues. His veteran knowledge of the structural behavior of numerous bridge types has consistently resulted in outstanding engineering solutions on major regional projects, including the Wabash River Bridge in Mt. Carmel, Illinois; I-74 over the Mississippi River in the Quad Cities (IL/IA); and the I-74 Corridor Reconstruction in Peoria, Illinois.

Mr. Morrill's positive impact spans far beyond his desk at Benesch – he has made major contributions to countless community groups and projects. As Building Committee Chairman of the First Baptist Church of Downers Grove, Mr. Morrill coordinated all the planning, development of design, drawings and construction and the fundraising, distribution of the funds, and solicitation of loans for a 19,000 sq. ft. facility – entirely on volunteered time. He also served as Trustee of the Downers Grove Sanitary District for 10 years.

Mr. Morrill's career exemplifies civil engineering excellence and leadership, as well as mentorship and selfless giving back to his community.

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- Water Distribution
- Land Surveying

From transportation, to water distribution, to storm water management, TEG utilizes our strong group of highly motivated and enthusiastic engineers and technicians to take on challenging projects and deliver award winning results. Our approach to projects is to develop specific strategies and teaming

arrangements to best fulfill our clients' needs for each project engagement while providing our trademark level of outstanding client service, responsiveness, and commitment. Our professional and practical approach to planning, design, and construction engineering ensures project success, client satisfaction, and stakeholder support.

## OUTSTANDING CIVIL ENGINEERING ACHIEVEMENT – UNDER \$10 MILLION

**Village of Niles Stormwater  
Relief Basins Project**



In response to the disastrous flood of September 2008, the Village of Niles developed a detailed and comprehensive stormwater program. Several priority projects were identified and the Village initiated design and construction to provide flood risk reduction for residents through detention and improved drainage infrastructure. These improvements were unique because the Village worked closely with Our Lady of Ransom Parish and the Archdiocese of Chicago to utilize portions of their properties to implement these community projects. These projects involve the construction of two stormwater relief basins (continued on page 16)



Project: Runway 10R-28L, commissioned Oct. 15, 2015  
Chicago O'Hare International Airport  
Role: Lead Designer of ORD LLC joint venture

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# 99<sup>th</sup> Annual Dinner Meeting Highlights

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providing approximately 15 acre-feet of storage and associated infrastructure improvements to effectively manage stormwater during larger storm events. The projects included significant stakeholder coordination to develop solutions that are practical for stormwater while maintaining functional use of the property for day-to-day activities.

The Village of Niles and the Our Lady of Ransom Parish worked with Hey and Associates to develop a plan that would provide mutual benefits for both parties. The improvements fulfill multiple purposes such as improving the safety and welfare of the neighborhood from flooding while providing improved aesthetics and amenities for the Church.

Hey and Associates used several tools to build stakeholder and public support including modeling software to help visualize existing neighborhood flooding and the proposed flood reduction. Hey and Associates also prepared visual renderings of the project to illustrate the proposed improvements. Rather than seeing basic plan view schematics, colored renderings showing perspective, plan and cross section views helped stakeholders understand the proposed project scope.

## **OUTSTANDING CIVIL ENGINEERING ACHIEVEMENT – BETWEEN \$10 AND \$25 MILLION**

### **Fullerton Parkway Bridge & Pedestrian Underpass at Lincoln Park Lagoon: A 21<sup>st</sup> Century Enhancement to the Gateway and Heart of Lincoln Park**



The replacement and reconfiguration of the Fullerton Parkway Bridge and Pedestrian Underpass at Lincoln Park Lagoon had several unique challenges:

- The project's spectacular setting includes Lincoln Park Zoo, Diversey Harbor / South Lagoon, North Pond and Peggy Notebaert Nature Museum
- Heavy pedestrian/bicyclist traffic both north/south and east/west
- Heavy congestion on Fullerton Parkway limited by Lake Shore Drive
- A pathway and underpass profile below the water-table that is within 50 ft of Lincoln Park Lagoon

The Chicago Department of Transportation, in connection with the Chicago Park District, wanted enhanced infrastructure for motorists, pedestrians and recreational users. The design addressed the significant challenges while serving the needs of the local residents of this very congested corridor, and fans of the Lakefront, Lincoln Park and the other local attractions.

Features of the project include an aesthetic bridge replacement; an enhanced, well-lit underground ped-way; architecturally enhanced retaining walls, newly configured ADA compliant ramps connecting east-west and north-south pedestrian and bicycle traffic; and enhanced vehicle operations on Fullerton Parkway between Canon Drive and Lake Shore Drive.

The replacement of the historic Fullerton Parkway Bridge and Pedestrian Underpass brought aesthetic and functional improvements to the Lincoln Park Community that will be appreciated by local residents and visitors alike for many years. The reconstruction of the fatigued bridge and underpass with historically sensitive structures using high-end materials and innovative construction techniques has garnered the 2015 Outstanding Civil Engineering Achievement Award for projects having a total construction cost between \$10-\$25 Million.  
(continued on page 17)

# 99<sup>th</sup> Annual Dinner Meeting Highlights

(continued from page 16)

## **OUTSTANDING CIVIL ENGINEERING ACHIEVEMENT – OVER \$25 MILLION The 606/Bloomingdale Trail**



Opened to the public in June 2015, Chicago's newest multi-purpose park and trail system is The 606/Bloomingdale Trail. Built on the former right-of-way of the Chicago Milwaukee St. Paul & Pacific Railroad, the 2.67-mile-long elevated Bloomingdale Trail connects the six ground-level parks of The 606. The \$95 million renovation project included rehabilitation of thirty-eight viaducts, two new viaduct structures, repairs to thirty-seven retained embankment sections, the addition of thirteen trail access points incorporating ADA guidelines, and two new parks. The project also relocated an unused rail bridge from the eastern end of the trail to a new position approximately one mile west of its original location.

With frequent access points, elevation above city traffic, and a park environment, The 606 enhances the social and economic vitality of the neighborhoods it links, creating a new way to enjoy

life in Chicago, and making it easier and safer to travel by foot or bicycle. Early 20th century infrastructure was repurposed to address 21st century needs: connecting communities, improving access to bicycle networks, enhancing ecological performance, and creating a new urban experience.

Collins Engineers, Inc. provided Phase II design for the The 606/Bloomingdale Trail. The multi-disciplinary team led by Collins included subconsultants Michael Van Valkenburgh Associates (MVVA) and Frances Whitehead. MVVA served as the landscape and urban design architect; Frances Whitehead served as the lead artist.

## **SUSTAINABILITY IN CIVIL ENGINEERING ACHIEVEMENT AWARD Lawrence Avenue Streetscape (Western Avenue to Clark Street)**



Rebalancing the roadway back toward pedestrians, bicyclists and greenspace was the focus of the Chicago Department of Transportation Division of Project Development, Livable Streets Program's roadway and

streetscape improvements to 1.1 miles of Lawrence Avenue; from Western Ave to Clark Street. A "road diet" trimmed the 4 existing lanes down to 3 vehicle lanes (a single lane in each direction with a center continuous left-turn lane), in order to provide designated eastbound/ westbound bike lanes and additional sidewalk and parkway area.

The road diet reduces pedestrian crossing distance/difficulty and allows left turning vehicles their own space. 8300 sq ft of new permeable surface was added within the improvement footprint (bioswales, tree grates and permeable pavers, and landscaped medians). 37 corner and mid-block bioswales capture/clean the first flush wet weather events. Nearly 200 trees were planted in expanded tree pits topped with permeable paver parkways and linked via root paths. Street lighting is more energy efficient and dark sky compliant.

This innovative complete streets project met social and environmental sustainability goals including; mode-share, complete streets, stormwater runoff reduction, urban heat island reduction, safety improvements, traffic flow improvements, street light pollution reduction, greenspace recapture, and increased urban forestry. The design is in-line with, and pre-dates the City's Sustainable Urban Infrastructure Guidelines (2013). (continued on page 18)

# 99<sup>th</sup> Annual Dinner Meeting Highlights

(continued from page 17)

## EWB PROJECT GRANTS FOR 2015

Our Project Grant Program awards funding to local EWB project teams in the Spring and Fall each year. It is with great pleasure that the Section awards our Fall grants to these deserving project teams.



The winner of the \$1000 University Chapter Project Grant is Northwestern University, for their Water Distribution Project in Kimuka, Kenya. This community currently gets most of their limited water supply from contaminated pools of standing water that are shared with cattle. The EWB team has made two trips to this community so far and has already installed a public tapstand and water tank, and extended a pipeline into the community. They have also forged a strategic partnership with the NGO “My Chosen Vessels” to ensure their project’s success. Their next trip is scheduled for this December and will focus on developing a long-term plan with the community to implement and maintain a stable water distribution system.



The winner of the \$1000 Professional Chapter Project Grant is the Chicagoland Professional Chapter’s Water Supply Project in Los Alas, El Salvador. This community is situated in the hilly northern department of Chalatenango. This remote location has prevented capital investments in infrastructure, leaving residents without clean water for several weeks at a time. Resorting to contaminated water sources has subjected families to water-borne diseases and other health issues. The EWB team plans to implement a gravity-fed water distribution system that will bring a stable supply of clean water down to the community from high in the hills. The team traveled to the site earlier this year to assess the situation with the local development council, called an ADESCO. They have also made a strategic partnership with the local NGO Solidar Suiza and they have established a funding partnership with the Rotary Club of San Salvador. They plan to return to Los Alas in March 2016 to continue their assessment, and again in November 2016 to begin construction.

## ASCE Illinois Section would like to thank our 2015 Annual Dinner Sponsors:

**Gold Sponsors:** CBBEL, Northwestern University, Benesch, Thomas Engineering Group, Michael Baker International

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**Copper Sponsors:** ASCE Geo Institute, Trotter & Associates, Lin Engineering, Ltd, ACEC-Illinois, Hey & Associates, Terracon, Geosyntec, Clark Dietz, Inc., Rubino Engineering Inc., ASCE EWRI

*Karen C. Chou, Ph.D., P.E., F.ASCE is Assistant Chair and Clinical Professor of Civil and Environmental Engineering at Northwestern University; she is faculty advisor of Northwestern ASCE Student Chapter, chair of the Awards Committee and former Director of the ASCE Illinois Section*

*Megan McDonald, P.E., M.ASCE is a transportation engineer with TranSystems. She is also co-chair of the Awards Committee, Director to 2016, and Newsletter Editor/Communications Chair for the ASCE Illinois Section.*



*Congratulations, David!*



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**December 2015**

In an effort to inform Illinois Section members of the discussions at the monthly Board meetings, the Section Secretary contributes this quarterly article to the newsletter. Any questions or comments on the Board activities are welcome by contacting John Lazzara, at [John.Lazzara@hdrinc.com](mailto:John.Lazzara@hdrinc.com).

### ■ **Treasurer's Report**

▲ A treasurer's report was presented at the September, October, and November meetings. All reports were approved with no changes. The FY2015/2016 Budget was approved at the September meeting.

### ■ **Group Reports**

Groups presented a written report outlining previous and current month's activities.

### ▲ **Annual Dinner/Awards**

**Update** – The Annual Awards Dinner was held on October 21st at the Adler Planetarium with ABC Meteorologist Phil Schwarz as the emcee and a capacity crowd of nearly 400 people in attendance. Nominations for awards included 18 submittals and awards were given out in 10 categories.

### ▲ **IIT Great Lakes Student**

**Conference (GLSC)** – The GLSC will be held April 14-16, 2016 with approximately 18 universities participating. The GLSC will be looking for judges for various competitions.

▲ **2016 Multi Region Leadership Conference (MRLC)** – The MRLC will be held January 15-16, 2016 and an Envision sustainability training session is being planned immediately prior to the conference. A free K-12 STEM outreach workshop will also be held then.

▲ **New Institute** – The Illinois Section is looking into starting a Utility Engineering and Surveying Institute.

▲ **Student Outreach** – The Student Outreach and Student Chapter Committees are combining.

▲ **Sustainability Committee** – The Sustainability Committee is developing a long-term strategy to increase awareness and outreach. They will be creating an information portal for industry resources and contacting active local agencies to identify opportunities to incorporate sustainable practices into their projects.

▲ **Engineers Without Borders (EWB)** – A new domestic project, Community Engineering Corporation is being established and EWB will be looking to partner with the Illinois Section on future events.

▲ **Golf Outing** – 53 people attended the event at the White Pines Golf Course this year. The event generated about \$3,000 for scholarships.

▲ **Membership Grants** – A new ASCE program was created to assist with membership activities. The Illinois Section applied for and was awarded a 2015 Student Transition Activity (STAY) Grant.

▲ **100<sup>th</sup> Anniversary Committee** – The Governor issued a proclamation in honor of the Illinois Section's Centennial Anniversary. A fall scavenger hunt was held on October 8, 2015 as a kickoff to the Centennial Celebration. Several other events are planned for the coming year including a winter event in Rosemont and an architectural boat tour on August 12, 2016.

▲ **Additional Notes** – The Illinois Section will be reaching out to engineers working for public agencies and highlight the benefits of joining ASCE and becoming involved in association activities.

The Illinois Section Board Meetings are held every first Monday of every month with the exception of holidays. The next board meeting is scheduled for December 7, 2015 at 5:30pm at HNTB office located at One S. Wacker Drive, Suite 900, Chicago. Please note the new meeting location. Future meetings will be held on January 4, February 1, and March 7.

*By John Lazzara  
John.Lazzara@hdrinc.com*



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## Illinois Section

## Activities

### ASCE IL Section YMG

#### *Dinner Meeting*

Topic: Precast Deck Panels with UHPC Joints

Speaker: David Liu, P.E., S.E., Ph.D.

Date: Wednesday, December 16

Time: 5:30 pm – 7:00 pm

Place: Transystems

222 S. Riverside Plaza  
Suite 610  
Chicago, IL

Cost: \$20, Free for Students

RSVP: <https://www.123signup.com/register?id=psycg> by  
Tuesday, 12/15

### ASCE IL Section YMG & Institute Chapters

#### *Joint Holiday Party*

Date: Thursday, December 17

Time: 5:30pm - 8:30pm

Place: Ovie Bar & Grill

120 N. Canal St.,  
Chicago, IL 60661

[Holiday Party Flyer](#)

### ASCE IL Section Committee on Sustainability

#### *ENVISION® SP Credential Training Workshop*

Date: Thursday, January 14

Time: 8:30 am – 4:30 pm

Place: University of Chicago's  
Gleacher Center  
450 N. Cityfront Plaza Dr.  
Chicago, IL 60611

PDHs: 6.0 PDHs awarded to participants

Register: <https://www.123signup.com/register?id=yndym>

Questions: Stan Walczynski  
swalczynski@usg.com or  
(312) 436-6351

[Workshop Flyer](#)

### ASCE IL Section YMG

#### *CRYMC: Awards Reception*

Date: Friday, January 15

Time: 6:00 pm – 10:00 pm

Place: Willis Tower  
233 S. Wacker Drive  
Chicago, IL 60606

### OTHER ACTIVITIES

#### ASCE Great Lakes Student Conference

Date: April 14-16, 2016

Place: Illinois Institute of  
Technology

To volunteer to judge a competition please contact Aaron Grudowski at [agrudows@hawk.iit.edu](mailto:agrudows@hawk.iit.edu) or (708) 334-2272.

Website: <http://www.glsc2016.org/>

[Event Flyer](#)

**For all Section, Group and Committee events, check out the Section website at:**

[www.isasce.org/web/section/calendar.html](http://www.isasce.org/web/section/calendar.html)

## President's Notes

(continued from page 2)

The Centennial Committee is also working on a History Heritage Page that will include articles from the Illinois Section Book created for the 150<sup>th</sup> Anniversary of ASCE National as well as more recent projects, post 2001. The History Heritage page will also provide updates on Centennial events and Centennial sponsors. The Illinois Section will continue to leverage its 2014 report card to remind our legislators and other stakeholders the need and importance of funding infrastructure projects and will

continue to foster its existing alliances with other professional organizations in the coming year.

We will continue our outreach efforts with Pre-College and College students emphasizing the importance of math and science as well as exposing them to our vocation of civil engineering. Volunteer opportunities will be available for student outreach activities and other events and will be advertised in upcoming newsletters and e-blasts.

Thank you for the opportunity to serve as the president of the Illinois Section, and I look forward to working with all of you in the upcoming year. If you are interested in getting more involved with the Section, please feel free to reach out to me. We are always in need of one more willing volunteer.