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| TIME                    | SESSION  | ROOM                       |
|-------------------------|--|----------------------------|
| <b>Monday, June 10</b>  |  |                            |
| 8:00 – 10:00 AM         | Special Session: Bridge Asset Management [Page 16]   | Woodrow B/C/D              |
| 8:00 – 10:00 AM         | Special Session: Construction [17]   | Annapolis                  |
| 8:00 – 10:00 AM         | Special Session: New Technology [18]   | Woodrow A                  |
| 10:15 AM – 12:15 PM     | Keynote Session [20]   | Cherry Blossom BR          |
| 12:15 – 2:00 PM         | Exhibit Hall Luncheon & Outdoor Exhibits   | Prince George Hall E       |
| 2:00 – 5:30 PM          | Featured State Session: Washington DOT [21]  | Cherry Blossom BR          |
| 2:00 – 4:30 PM          | Proprietary Session [22]   | Woodrow A                  |
| 2:00 – 6:00 PM          | W-1: Practical Approaches and Tools for the Design of Steel Bridges [24]                                   | Magnolia 1                 |
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| 8:00 AM – 12:00 Noon    | Preservation, Part 1 Session [27]  | Woodrow A                  |
| 8:00 AM – 12:00 Noon    | Design, Part 1 Session [29]  | Woodrow B/C/D              |
| 8:00 – 9:00 AM          | W-3: Aesthetic Lighting, Public Art & Community Pride [32]   | Magnolia 1                 |
| 8:00 AM – 12:00 Noon    | W-4: Bridge Information Modeling [32]  | Magnolia 2                 |
| 9:30 AM – 12:00 Noon    | W-5: Bridge Load Rating, Posting, and Permitting [33]  | Magnolia 1                 |
| 10:00 AM – 2:00 PM      | Exhibit Hall Luncheon & Outdoor Exhibits   | Prince George Hall E       |
| 1:00 – 5:00 PM          | IBC Bus Tour of the Arlington Memorial Bridge [10 & 33]  | Outdoors                   |

| TIME                      | SESSION   | ROOM                 |
|---------------------------|---|----------------------|
| 1:30 – 5:00 PM            | Construction, Part 2 / Cable Stayed Session [34]                          | Annapolis            |
| 1:30 – 5:00 PM            | Preservation, Part 2 Session [36]   | Woodrow A            |
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| 1:30 – 3:30 PM            | W-7: Bridge Bearings and Expansion Joints [41]                            | Magnolia 2           |
| 4:00 – 6:00 PM            | W-8: Grouting of Post Tensioned Bridges [41]                              | Magnolia 1           |
| 4:00 – 6:00 PM            | W-9: Construction Challenges of Jointless Bridges in Seismic Regions [41] | Magnolia 2           |
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| <b>Wednesday, June 12</b> |   |                      |
| 7:30–9:00 AM              | Exhibit Hall Breakfast & Outdoor Exhibits                                 | Prince George Hall E |
| 8:00 AM – 12:00 Noon      | Iconic New Bridges Session [43]   | Annapolis            |
| 8:00 AM – 12:00 Noon      | Segmental Concrete/Rail/Transit Session [45]                              | Woodrow A            |
| 8:00 AM – 12:00 Noon      | Special Interest Session [47]   | Woodrow B/C/D        |
| 8:00 AM – 12:00 Noon      | W-10: International Workshop on Emerging Bridge Technologies [49]         | Magnolia 1           |
| 8:00 AM – 12:00 Noon      | W-11: FHWA Bridge Security Design [50]                                    | Magnolia 2           |
| 10:00 AM – 2:00 PM        | Exhibit Hall Luncheon & Outdoor Exhibits                                  | Prince George Hall E |
| 1:30 – 1:30 PM            | Seismic Session [51]  | Annapolis            |
| 1:30 – 3:30 PM            | Inspection & Analysis Session [52]  | Woodrow A            |
| 1:30 – 3:30 PM            | Pedestrian & Special Bridges Session [53]                                 | Woodrow B/C/D        |
| 1:30 – 4:30 PM            | W-12: MASH Implementation of Bridge Railing Systems [55]                  | Magnolia 1           |
| 1:30 – 4:30 PM            | W-13: Bridge Scour Prevention [55]  | Magnolia 2           |

**CHAIRMAN'S WELCOME**

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On behalf of the Engineers' Society of Western Pennsylvania (ESWP) and the Executive Committee of the International Bridge Conference®, we would like to welcome everyone to the 36<sup>th</sup> Annual International Bridge Conference. Once again, we will return to our Nation's Capital and to the wonderful facilities provided at the Gaylord National Resort and Convention Center. This is our fourth year hosting this prestigious conference in the D.C. area. The International Bridge Conference (IBC), is one of the most recognized conferences that provides a plethora of technical papers, workshops, and a wide range of bridge vendor exhibits.



*Stephen G. Shanley, P.E.*

We will start the conference off on Monday morning with three special sessions that include: Construction, New Technology, and Bridge Asset Management. Following these sessions, we will move into our exciting lineup of Keynote speakers that will signal the official start of the conference.

We are honored to have Washington State DOT (WSDOT) as our Featured Agency. WSDOT manages and maintains the transportation infrastructure for the State of Washington. On Monday afternoon, WSDOT will present the Featured Agency Session providing an overview of some of their feature projects and their bridge asset management program. WSDOT is also featured in the exhibit hall. Please stop by their display to learn more about their special projects and their bridge program.

On Tuesday afternoon, we host a site tour of the Arlington Memorial Bridge over the Potomac River. Please make sure you register early to reserve your spot to tour this exciting National Park Service project. Those planning to attend will be picked up in National Harbor and will travel by bus to the construction site. A representative from Kiewit Infrastructure will be the tour representative and will be on hand providing narration at the construction site. You will arrive back at National Harbor in time for Tuesday night's IBC Awards Dinner.

The IBC Awards Committee has reviewed many outstanding nominations this year and selected an impressive group of winners, including Dr. Karl Frank, P.E., recipient of the John J. Roebling Lifetime Achievement Award. We are honored to present this award to Dr. Frank, currently an emeritus professor of Civil Engineering, University of Texas, Austin, USA. Seating at the Awards Dinner and on the Bus Tour is limited, and a separate registration is required for both. Be sure to sign-up early for these annual popular events.

On Wednesday, we have a full day of quality presentations. Be sure to visit the IBC Exhibit Hall one more time for lunch before the show ends! We greatly appreciate the continued support of our exhibitors and plan diligently

to ensure quality time for conference goers to visit and network with our vendors. This year we anticipate having more than 125 exhibitors and the Featured Agency display in our Exhibit Hall, which will provide an excellent venue to network with others from across the bridge community. Our Exhibit Hall will host lunches on Monday, Tuesday, and Wednesday, and an evening reception on Monday. The format will once again enable our attendees to interact with exhibitors and will also allow our exhibitors to attend our technical sessions.

We would like to thank everyone who submitted abstracts from across the United States, and around the world, truly making this an international gathering of bridge experts. We feel these presentations are the heart and soul of the conference. This year, the IBC includes 80 presentations and 13 workshops. We are also excited to incorporate poster sessions this year. The posters will be displayed in a technical session that most closely relates to their topic, providing the opportunity to interact with the presenter on these projects. Another exciting first at the conference at the National Harbo is our outdoor product demonstration area. This provides an opportunity for vendors to display their products in a working environment.

Please join me in thanking the volunteer Executive Committee members, who have worked diligently over the past year to organize an outstanding program of technical presentations, workshops, exhibits and special sessions. We are excited to welcome four new members to our Executive Committee, Frank Russo, Ph.D., P.E.; William Detwiler, P.E., Jennifer Laning, P.E., and Liji Huang, Ph.D. If you have constructive feedback, please let any of the IBC Executive Committee or staff know so we can continue to make this one of the most recognized bridge engineering events in the United States and Internationally.

Next year we will return to where the conference originally started and was a mainstay for 30 years, Pittsburgh, PA. We hope to incorporate all our conference improvements and attendee feedback into the 37<sup>th</sup> International Bridge Conference. We thank you for your participation and we hope you agree that this is a premier conference and we hope to see you in 2020 where the Feature Agency will be Iowa DOT and Raymond Hartle will be the conference chair.

Thanks for joining us at the 36<sup>th</sup> Annual International Bridge Conference!

*Stephen G. Shanley, P.E., is the Director of Allegheny County (PA),  
Department of Public Works*

### WELCOME

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Welcome to the 2019 International Bridge Conference® (IBC), sponsored by the Engineers' Society of Western Pennsylvania (ESWP) — our 36<sup>th</sup> Anniversary Conference! 2019 marks our return to the Gaylord National Resort and Convention Center for our fourth year. Located just outside of our nation's capital, this location is ideally suited for the ever-growing IBC, and is located within walking distance of the Woodrow Wilson Bridge along the Potomac River. We are pleased to honor Washington State Department of Transportation as our Featured State to showcase their bridge program. The 2019 IBC is a three-day event with technical content scheduled across all three days of the IBC.

### LOCAL ATTRACTIONS

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National Harbor is home to more than 150 diverse shops and boutiques and over 30 dining locations. National Harbor's vibrant downtown atmosphere will delight you. Learn more about the attractions at <http://www.nationalharbor.com/>

### REGISTRATION

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Full Registration at the IBC includes admission to the Keynote Session, Featured State Session, all Technical Sessions, Workshops, and Exhibit Hall (including daily Exhibit Hall festivities). One- or Two-Day Registration includes all sessions and Exhibit Hall functions corresponding to the day(s) selected.

As always, the heart of the IBC is the quality technical presentations described in detail in this guide. With so many new events included in the IBC, we hope to provide you with a better understanding of the various offerings for Conference attendees. You will still see the quality technical presentations as offered in all previous IBC's; these are referred to as "Technical Sessions", and include papers grouped into sessions of common subject matter. We also offer for your consideration a number of "Workshops" presented by many of our co-sponsors and other industry-leading groups on an even wider variety of bridge industry subject matter.

Remember: the Bus Tour, IBC Awards Dinner, and conference proceedings require an additional registration fee. Please visit the Conference Registration Desk for details.

### REGISTRATION DESK

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The Conference Registration Desk is located on the Ballroom Level of the Gaylord Resort and is open:

- Monday: 7:00 AM — 6:00 PM
- Tuesday: 7:00 AM — 5:00 PM
- Wednesday: 7:00 AM — 3:00 PM

### MEETING INFORMATION

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All IBC functions (excluding tours) are located in the Gaylord National Resort and Convention Center. Please check individual listings throughout this program for specific locations and times for all technical sessions, workshops and social functions. Events which require tickets will identify the specific location for these functions. Any changes in the program schedule will be posted or announced at the Conference Registration Desk, and pushed thru our new APP.

### BADGE IDENTIFICATION

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Please wear your IBC name badge at all times during the conference; it is your passport to all Conference activities. ESWP has authorized Room Monitors on staff to deny access to anyone not wearing the appropriate badge. As a safety consideration, we suggest that you remove your badge when leaving the Conference.

### AMERICANS WITH DISABILITIES ACT

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The International Bridge Conference® and ESWP support the Americans with Disabilities Act (ADA), which prohibits discrimination against, and promotes public accessibility for those with disabilities. We ask those requiring specific equipment or services as an attendee to contact the Conference Registration Desk.

### THE IBC APP

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Be sure to download the IBC APP to tune in to all of the latest news on the conference. The IBC APP provides more detail than ever before - full program listing, speakers bios, enhanced exhibitor information, up-to-the-minute announcements, attendee messaging, and much more! Download the APP thru Google Play or the App Store.

### EXHIBITS & SPONSORS

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The IBC Exhibit Hall is filled with experts in the bridge industry and represents engineering consultants, designers, constructors, special interest groups, service providers and many others. More than 120 booths will offer attendees many more opportunities to extend their learning experience beyond the technical presentations made during the conference. Also, networking in the Exhibit Hall is enhanced by the breakfast, reception and luncheons presented there and open to all registered attendees.

### IBC BUS TOUR

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Please join us for a tour of the Arlington Memorial Bridge! The 2019 IBC tour will give attendees the opportunity to preview the Arlington Memorial Bridge Rehabilitation project, a National Park Service project being administered by Federal Highway Administration.. The bus tour runs from 1:00 — 5:00 PM — advance reservations required. Check with the IBC staff for availability and other requirements. Some limitations apply.

### PRE-PRINTS AND IBC MERCHANDISE

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Pre-prints for all technical presentations are available at the Merchandise Booth located near the IBC registration Desk. Again this year: purchase a 2 GB flash drive that contains all available pre-prints in .PDF format for only \$30.00. Also, you can find copies of previous years' IBC Proceedings (for \$55 per volume).

### PROCEEDINGS

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Proceedings are an optional order-only purchase and may be ordered in advance or on-site at the IBC for \$30.00. Following the conference, proceedings may be ordered for \$55.00. The official proceedings of the 36<sup>th</sup> Annual International Bridge Conference® will be available in late Summer 2019.

### CELL PHONES AND PAGERS

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As a courtesy to the Speakers and fellow attendees, the IBC requests that all cell phones and other electronic devices be turned off or switched to silent mode in all presentation rooms.

### ABOUT THIS GUIDE

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In an attempt to conserve paper, we have made every attempt to print this guide efficiently, including "uneven" page breaks and truncated descriptions where it exceeds our allowed word count. Please refer to our APP or website for full content. Please note the common use of abbreviations throughout this guide, including:

DOT = Department of Transportation

ft or ' = foot

m = meters

W = Workshop

" = inches

° = degree

### COFFEE STAND

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Thanks to the generosity of our sponsors, complimentary coffee breaks are available at various times throughout the Conference as noted in your Program Guide.

### IBC GIFT ITEMS

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Once again at this year's IBC, you will have the opportunity to purchase the popular IBC neckties, and IBC Golf Shirts. These items are high quality and feature the popular IBC logo. The gift items are located near the Registration Desk, where you can make your purchases throughout the Conference. Please be sure to stop by and shop and check out our newest styles for 2019!

### BRIDGING THE GAP THEATRE

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NEW THIS YEAR! We are pleased to introduce the "Bridging the Gap" theatre to the IBC! Informal presentations on a variety of bridge-related topics given by experts in their field. The informal presentations are 25 minutes in length and start on the half-hour. Check the schedule on Page XX for details.

WANT TO PRESENT? There is still time to sign up for a time slot!



**PDH'S**

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Earn Professional Development Hours (PDHs) by attending the IBC! The Engineers' Society of Western Pennsylvania (ESWP), sponsor of the IBC, is recognized as a Continuing Education Provider by the New York State Board of Professional Licensure and Florida Board of Professional Engineers, as well as many other state licensing boards. As such, your attendance at the IBC will qualify for continuing education credits in these states.

To obtain verification of attendance at the IBC, you must complete an online PDH Request Form to ESWP. Official confirmation from the IBC Offices regarding each attendee's eligibility for PDHs will be sent after the Conference. The online form can be found at [www.eswp.com/bridge](http://www.eswp.com/bridge), or by contacting the Engineers' Society of Western PA, sponsors of the IBC.)

NOTE - For fulfilling continuing education requirements with New York State, attendees are required to sign in-and-out of IBC technical sessions and workshops on the session registry. Registry forms are located at the entrance to any of these sessions. ESWP will not verify your attendance in any session if you do not properly sign this registry!

**IBC EXHIBIT HALL**

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One of the main attractions of the Conference is the IBC Exhibit Hall. As you stroll through the many exhibits, you will be able to explore the latest technologies, products and services the bridge industry has to offer. Additionally, don't forget to participate in our popular "Exhibit Hall Bingo" game for your chance to receive cash prizes, simply by visiting the exhibitors on your bingo card. All registered attendees will receive a bingo card in their registration packet.

The IBC Exhibit Hall is located in EXHIBIT HALL E. You will be able to view the exhibits during the following hours:

- Monday, June 10: 12:15 Noon — 2:00 PM with a strolling luncheon buffet
- Monday, June 10: 5:00 — 7:00 PM with appetizers and bar service
- Tuesday, June 11: 10:00 AM — 2:00 PM with a strolling luncheon buffet
- Wednesday, June 12: 7:30 — 9:00 AM with a continental breakfast
- Wednesday, June 12: 12:00 Noon — 2:00 PM with a strolling luncheon buffet

The IBC will feature a Luncheon Buffet throughout the Exhibit Hall on Monday, Tuesday, and Wednesday; an evening reception on Monday; and breakfast on Wednesday, all open to all registered attendees and registered spouses.

Don't miss the Featured State Exhibit by Washington State DOT located in the Exhibit Hall, open during the IBC Exhibit Hall hours.

NEW THIS YEAR! Our outdoor exhibits can be found just outside of HALL E on the Gaylord Patio. Be sure to visit these displays for active demonstrations during exhibit hall hours.

### IBC SPOUSE PROGRAM

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The IBC Spouse Breakfast will be hosted at the Gaylord National Resort and Convention Center on Monday, June 10 at 10:00 AM. This includes a free continental breakfast and a brief presentation from the Gaylord Hotel. Also, there will be coupons and brochures offered for spouses to take with them. The IBC Spouse Breakfast is an opportunity for spouses to mingle and learn about the various activities they can explore during their stay.

### ATTENDEE REGISTRATION LISTS

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Conference registrations received prior to May 31 have been compiled in the “IBC PRE-REGISTRATION LIST - PART 1 of 2”, and is available to all registered attendees in .PDF format, available to transfer to your flash drive.

An addendum to the registration list, “PART 2 of 2,” will be available Wednesday morning of the conference and reflects those attendees who registered after May 31, or on-site during the conference.

An electronic copy, produced in MS Excel, of the entire Attendee Registration List is available for purchase. The cost is \$25 for IBC Exhibitors, and \$95 for all others, the list will be e-mailed to you following the conference. Please remember that the IBC never provides email addresses as a courtesy to our registered attendees.

### QUESTIONS?

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Loads of additional information is available on our APP, or visit the IBC website ([eswp.com/bridge](http://eswp.com/bridge)). Still have questions? Stop at the IBC registration desk, or ask any of the IBC staff, identified in the “Blue Crew” polo shirts.

### JOIN US AT THE 2020 IBC!

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Join us in 2020 for the International Bridge Conference®, June 7 – 11, 2020 as we return to Pittsburgh, PA at the David L. Lawrence Convention Center. If you are interested in presenting a paper or workshop at the 2020 conference, watch for our “Call for Papers / Workshops” open immediately after the 2019 IBC. Also, promote your firm through the many different sponsorship and exhibit opportunities that are available - don’t miss out and make your reservation early to take full advantage of all promotions!

### GET INVOLVED!

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Interested in presenting a paper, workshop, seminar presentation at a future IBC? The IBC Call For Papers will open immediately following the 2019 Conference, and everyone is welcome to submit an idea for presentation. Visit [www.eswp.com/bridge](http://www.eswp.com/bridge) for more details.

The IBC is planned through the volunteer efforts of these top industry professionals who make up the IBC Executive Committee. The Engineers' Society of Western Pennsylvania (ESWP) extends a sincere thank you to the entire Executive Committee (listed below in alphabetical order) for their efforts in planning this year's conference. A very special thanks goes to the General Chair, Stephen G. Shanley, P.E., for his leadership in planning this years conference.

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### *Platinum Level*



### *Gold Level*



### *Silver Level*



### CO-SPONSORS/MEDIA PARTNERS

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Thanks to our many co-sponsors and media partners, who support the IBC throughout the year!

American Concrete Institute (ACI) [www.concrete.org](http://www.concrete.org)

American Metal Market (AMM) [www.amm.com](http://www.amm.com)

American Society of Highway Engineers  
(ASHE) [www.ashe.pro](http://www.ashe.pro)

Associated Pennsylvania Constructors  
(APC) [www.paconstructors.org](http://www.paconstructors.org)

Deep Foundations Institute (DFI) [www.dfi.org](http://www.dfi.org)

National Council of Structural Engineers Association (NCSEA) [www.ncsea.com](http://www.ncsea.com)

National Steel Bridge Alliance (NSBA) [www.aisc.org/nsba](http://www.aisc.org/nsba)

Pile Driving Contractors Association  
(PDCA) [www.piledrivers.org](http://www.piledrivers.org)

Precast/Prestressed Concrete Institute (PCI) [www.pci.org](http://www.pci.org)

Short Span Steel Bridge Alliance (SSSBA) [www.steel.org](http://www.steel.org)

The International Association of Foundation Drilling  
(ADSC) [www.adsc-iafd.com](http://www.adsc-iafd.com)

Transportation Research Board (TRB) [www.trb.org](http://www.trb.org)

#### Media Partners

ACCESS Magazine [www.uctc.net/access](http://www.uctc.net/access)

Better Roads [www.betterroads.com](http://www.betterroads.com)

Bridge design & engineering [www.bridgeweb.com](http://www.bridgeweb.com)

CoatingsPro Magazine [www.coatingspromag.com](http://www.coatingspromag.com)

Roads & Bridges Magazine [www.roadsbridges.com](http://www.roadsbridges.com)

The Journal of Protective Coatings & Linings and Paintsquare.com (JPCL)  
[www.paintsquare.com](http://www.paintsquare.com)

V1 Media

ZweigWhite, LLC [www.zweigwhite.com](http://www.zweigwhite.com)

The International Bridge Conference® (IBC) Executive Committee, in conjunction with Roads and Bridges Magazine, Covestro LLC, Bridge design and engineering Magazine, and TranSystems, Inc. is pleased to announce the recipients of the 2019 IBC Awards of Distinction. The IBC Awards will be presented in a ceremonial dinner on Tuesday, June 11 during the IBC. Check with the IBC Registration Desk for seating availability. Tickets are required at the entrance. The honorees include:

### **JOHN A. ROEBLING MEDAL**

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Honoring an individual for lifetime achievement in bridge engineering, we are pleased to recognize Dr. Karl Frank, P.E., Professor Emeritus, University of Texas, Austin, TX

### **GEORGE S. RICHARDSON MEDAL**

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Recognizing a single, recent outstanding achievement in bridge engineering, we are pleased to recognize the Sichuan Hejiang Yiqiao Bridge of Yangtze River, located in Hejiang, Luzhou, Sichuan Province, China.

### **GUSTAV LINDENTHAL MEDAL**

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Recognizing an outstanding structure that is also aesthetically and environmentally pleasing, we are pleased to recognize the Xingkang Bridge on Luding Dadu River, located in Zali, Luding, Sichuan Province, China.

### **EUGENE C. FIGG, JR. MEDAL**

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Recognizing a single recent outstanding achievement for bridge engineering, which is considered an icon to the community for which it is designed, we are pleased to recognize the Beechwood Boulevard (Greenfield) Bridge II, located in Pittsburgh, PA.

### **ARTHUR C. HAYDEN MEDAL**

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Recognizing a single recent outstanding achievement in bridge engineering demonstrating vision and innovation in special use bridges, we are pleased to recognize Frances Appleton Pedestrian Bridge, located in Boston, MA.

### **ABBA G. LICHTENSTEIN MEDAL**

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Recognizing a recent outstanding achievement in bridge engineering demonstrating artistic merit and innovation in the restoration and rehabilitation of bridges of historic or engineering significance, we are pleased to recognize the Rehabilitation of the Frankford Avenue Bridge, located in Philadelphia, PA.

### **AWARD OF MERIT**

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The Award of Distinction - Railroad recognizing a recent outstanding achievement in railroad bridge is presented to Portageville Bridge Replacement, located in Portageville, PA

The Award of Distinction - Outstanding Research is presented to SR 99 Tunnel South Access, located in Seattle, WA

### BRIDGE ASSET MANAGEMENT

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*Monday, June 10; 8:00 – 9:30 AM*

*Room: Woodrow B/C/D*

*Chair: Lou Ruzzi, P.E., Pennsylvania DOT, Pittsburgh, PA*

PennDOT will provide an update on its Bridge Asset Management System and how District 11-O's Plan for Each Bridge ties into BAMS. Virginia DOT will discuss how it executes and measures its bridge management program. Florida DOT will discuss current FDOT performance measures, how they compare to FHWA mandated Performance Measures and future enhancements. Finally, FHWA will provide a status of the Transportation Asset Management Plan (TAMP), the initial lessons learned and supporting guidance.

#### 8:00 AM

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**PennDOT District 11-O's Plan for Each Bridge or PLEB**

*Lou Ruzzi, P.E., Pennsylvania DOT, Pittsburgh, PA*

The PLEB is a planning tool which lists the SOW for each bridge for the next 30 years. The work includes three main types -preservation, rehabilitation. and replacement - and is based on previous work performed on the bridge, current condition, rough life cycle costs and without regard to funding limitations. The data provided for the PLEB is fed automatically from the Bridge Management System.

#### 8:30 AM

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**Virginia DOT**

*Adam Matteo, P.E., Virginia DOT, Richmond, VA*

Virginia incorporates a wide variety of factors in the execution of its bridge management program, relying primarily on a set of indices that are used to trigger actions and measure progress. The indices include variables that measure importance, condition-based bridge health, functionality, risk, and action-effectiveness. These factors are used in a multi-objection prioritization process to select projects. Virginia is working to further improve its bridge management system by incorporating additional factors for environment and element damage.

#### 9:00 AM

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**Federal Highway Administration (FHWA)**

*Derek Constable, Federal Highway Administration (FHWA), Washington, D.C.*

This session will provide information on several FHWA bridge management initiatives. It will present the status of Transportation Asset Management Plan (TAMP) development and implementation, the initial lessons learned, and the supporting guidance that is available. It will also present the efforts that are underway to advance the use of bridge management systems in support of TAMP development and implementation.



### CONSTRUCTION

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*Monday, June 10; 8:00 – 10:00 AM*

*Room: Annapolis*

*Chair: Kevin Duris, P.E., Trumbull Corporation, Pittsburgh, PA*

This session includes challenges and innovative construction of four projects. First project describes accelerated methods and materials used for rehabilitation of 2,663', 16 span, four lane Liberty Bridge located in Pittsburgh, PA. Second project includes the challenges of I64 design/build project in Newport News, VA. Those challenges were maintaining active roadways and railway, existing soil conditions, and accelerated schedule to convert a 4-lane interstate to 6 lanes for 6 miles. Third project describes value engineering for a 1,573' long sheetpile retaining wall system for PA Turnpike located in Allegheny County, PA. Fourth project deals with challenges designing and building a bridge abutment for the Frederick Douglass Memorial Bridge. The abutment is wedged between a levee, roadway, 108" diameter force main and a Level 3 Communications Line.

#### 8:00 AM

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##### *Liberty Bridge*

*Nicholas Burdette, P.E., HDR Engineering, Inc, Pittsburgh, PA*

The 2,663', 16-span, four-lane Liberty Bridge rehabilitation included superstructure and stringer replacements, precast and cast-in-place exodermic grid deck, latex modified concrete, rapid set latex concrete, steel repairs, and three-coat painting of the full structure. The 1123', 25-span, three-lane Boulevard of the Allies rehabilitation was concurrent including hydrodemolition, latex modified concrete, dam replacement and three-coat painting of the full structure. Aggressive milestones and restricted working hours required accelerated methods and materials for timely completion.

#### 8:30 AM

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*Interstate 64 Capacity Improvements – Segment I Design-Build in Newport News, VA; Bridges B616 & B617, I64 over Industrial Park Drive and CSX Transportation*

*Robbie Roberts, Shirley Contracting Company, LLC, Lorton, VA; James D. Davidson, P.E., D.B.I.A, Dewberry, Fairfax, VA*

Completed in late 2017, the overall \$100 million design/build Project included the addition of one travel lane and one shoulder in each direction to convert the 4-lane interstate to a 6-lane facility for a distance of 6 miles. Among the numerous structures widened as part of the scope were the bridges carrying I64 over Industrial Park Drive and CSX rail facilities. As an enhancement to our Team's Technical Proposal, Shirley performed the complete replacement of these bridges. Project challenges included maintenance of active roadways and railway, existing soil conditions, overhead power lines and accelerated schedule.

### 9:00 AM

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**Permanent Sheetpile Wall System - Pennsylvania Turnpike, MP 40.84 WB**  
*John Nemmer, Trumbull Corporation, Pittsburgh, PA; Bradley Heigel, P.E., PA Turnpike Commission, Middletown, PA; Mike Sydlík, P.E., Earth Inc, Pittsburgh, PA*

This presentation addresses a 1,573-foot long, permanent, value engineering, sheetpile retaining wall system — constructed in one stage rather than two (no temporary shoring required) — to accommodate embankment/roadway widening of the Pennsylvania Turnpike. It consists of Z-shaped sheetpiles comprising the wall face which are restrained by similarly-shaped sheetpiles serving as vertically-planar, continuous tiebacks, i.e., fins attached to the wall face via three-way connectors which provide resistance to lateral loading acting on the wall system.

### 9:30 AM

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**Challenges of Designing and Building the Frederick Douglass Memorial Bridge Arch Abutment Adjacent to Critical Utilities**

*Errol Williams, PE, District Department of Transportation, Washington, D.C.; Adam Hollon, P.E., South Capitol Bridge Builders, Washington, D.C; Nathan M. Porter, P.E., AECOM, Glen Allen, VA*

The arch span abutment of the new Frederick Douglass Memorial Bridge is wedged between the USCOE levee, Anacostia Drive, and two critical utilities. Thirty six steel pipe piles, 80-feet deep, driven to 1,500-ton capacity are being constructed within a tightly confined space. There are two critical utilities directly adjacent to, and running under, the abutment footing. A 108" diameter force main pumping 1,000,000 gallons of sewage per day, and a Level (3) Communications line. DDOT, SCB and AECOM had to collaborate in order to find the best solutions for constructing the footing while at the same time protecting these critical utilities.

## NEW TECHNOLOGY

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*Monday, June 10; 8:00 — 10:00 AM*

*Room: Woodrow A*

*Chair: Rex L. Pearce, P.E., Virginia DOT, Staunton, VA*

This session involves four 30-minute talks on emerging technologies and how DOT's are piloting or moving forward with using these systems to be more efficient in their daily work tasks. Two of the talks are on DOT's experience with Bridge Information Modeling (Utah and Iowa). The third one involves PennDOT's experience for Phased Array Ultrasonic testing for fabrication shops and inspection of pins on trusses in the field. The final talk involves Vermont (VTRANS) Flood Resilience Planning Tool.

### 8:00 AM

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**Phased Array Ultrasonic Testing**

*Ronald D. Medlock, P.E., High Steel Structures, Lancaster, PA; Nick Shrawder, Pennsylvania DOT, Harrisburg, PA*

While phased array ultrasonic testing (PAUT) is not new, it has gained traction over the years with adoption in various codes, including the AASHTO/

AWS Bridge Welding Code, 2015 edition. This presentation will discuss the possible use of PAUT in lieu of radiographic testing for bridge fabrication and compare PAUT with conventional ultrasonic testing for in service inspection of bridge pins.

### 8:30 AM

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#### BIM for Bridges and Structures efforts in Utah

*Cheryl Hersh Simmons, S.E., Utah DOT, Salt Lake City, UT*

In 2013, the Utah Department of Transportation (UDOT) began investigating methods for Model Based Design and Construction that would better take advantage of the efficiencies afforded by advances in highway design software, construction, and automated machine guidance. In 2018, UDOT advertised its first bridge pilot project using the model as the legal document. This presentation provides an overview of the implementation process, impacts to project delivery, and UDOT's BIM for Bridges and Structures pilot projects.

### 9:00 AM

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#### Building Information Modeling (BIM) for Bridges and Structures: AASHTO COBS Initiative and Iowa DOT Demonstration Project

*Ahmad Abu-Hawash, P.E., Iowa DOT, Ames, IA*

This presentation will discuss the BIM for Bridges and Structures initiative that is being led by AASHTO COBS Technical Committee on Technology and Software (T-19) and the Iowa DOT pilot project. The Iowa DOT I-80/I-380 Interchange project is the first Design-Bid-Build project in the US to utilize a BIM digital model in lieu of traditional plan set.

### 9:30 AM

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#### Vermont's Transportation Flood Resilience Planning Tool

*Roy Schiff, Ph.D., P.E., Milone & MacBroom, Inc., Waterbury, VT*

The Transportation Flood Resilience Planning Tool (TRPT) is a web-based application that identifies bridges, culverts and road embankments that are vulnerable to damage from floods; estimates risk based on roadway criticality; and identifies potential mitigation measures. The TRPT combines river science, hydraulics and transportation planning methods at a watershed scale. Roy will describe the concepts behind the TRPT, discuss its applications and will provide a demonstration.

### KEYNOTE SESSION

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*Monday, June 10; 10:15 AM – 12:15 PM*

*Room: Cherry Blossom Ballroom*

*Conference Chair: Stephen G. Shanley, P.E., Allegheny County Department of Public Works, Pittsburgh, PA*

The Keynote Session is the official start to the 2019 IBC! Conference Chair Stephen G. “Steve” Shanley, P.E. will host the session. Following welcoming remarks, we are pleased to announce the following presenters:



Roger Millar  
Secretary of Transportation,  
Washington State DOT  
Olympia, WA



Greg Andricos, P.E.  
President & COO,  
Wagman Heavy Civil  
York, PA



Aileen Cho  
Senior Editor, Transportation,  
Engineering News-Record (ENR)  
Long Beach, CA



Joey Hartmann  
Director of the Office of Bridges and  
Structures, Office of Infrastructure,  
Federal Highway Administration  
Washington, D.C.

### IBC EXHIBIT HALL LUNCHEON

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*Monday, June 10; 12:15 – 2:00 PM*

*Room: Prince George Exhibit Hall E*

Following the conclusion of the Keynote Session, all registered attendees of the IBC are welcomed to enjoy lunch throughout the Exhibit Hall. Enjoy this first opportunity to visit with the exhibitors and view the outdoor displays, while you network with your fellow attendees.

### FEATURED STATE SESSION: WASHINGTON STATE DOT

*Monday, June 10; 2:00 – 5:30 PM*

*Room: Cherry Blossom Ballroom*

*Chair: Mark Gaines, Washington State DOT, Olympia, WA*

From Fish Passages to Floating Bridges, the structures owned and maintained by the State of Washington are as diverse as the State itself. Our unique inventory includes over 3,000 bridge structures, Ferry terminal structures, and a tunnel running beneath downtown Seattle. We are proud to be on the cutting edge of technology that aids in Accelerated Bridge Construction as well as resiliency during a seismic event. Structures “reign” in Washington State.

#### 2:00 PM

##### WSDOT Fish Passage Program

*Richard Zeldenrust, PE, SE, Structural Design Unit Supervisor*

Washington State is fortunate to have an inland sea and a substantial stream system, with historically large wild salmon populations. Over 100 years of construction on the State Highway System has created fish passage barriers on many of these streams. This presentation will describe the WSDOT Fish Passage Program, and how WSDOT is helping to restore the salmon populations by actively eliminating these barriers from our streams and rivers.

#### 2:30 PM

##### Washington State’s Floating Bridges

*Nicholas T. Rodda, P.E., S.E., Floating Bridge & Special Structures Design Manager, Washington State DOT*

Washington State has been a leader in floating bridge design and construction for nearly 80 years. Our first floating bridge opened in 1940 and since that time our inventory has grown to four. This presentation will cover a brief history of our floating bridges, some of the challenges we have encountered over the years, an overview of some of our latest floating bridge projects and a look at some of our upcoming work.

#### 3:00 PM

##### Innovations in WSDOT Bridge Design and Accelerated Bridge Construction

*Bijan Khaleghi, P.E., S.E., State Bridge Design Engineer, Washington State DOT*

This presentation focuses on recent WSDOT innovations including: 1) The use of super-elastic shape memory alloy and flexible concrete in bridge columns for improved seismic resiliency. 2) The use of Concrete-filled steel tubes in bridge columns and deep foundations. 3) The use of UHPC for connection of newly developed wide flange precast deck girders to accelerate bridge construction and improve long-term performance. 4) Innovations in bridge design and construction meeting the post earthquake functionality requirements.

#### 3:30 PM BREAK

# Monday

## SESSIONS

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### 4:00 PM

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#### DOT Bridge Asset Management — lessons learned

*DeWayne Wilson, P.E., Bridge Asset Management Engineer*

This presentation will provide an overview of WSDOT's Bridge Asset Management 10 year plan and provide some examples of lessons learned. WSDOT has a unique inventory of 3,322 bridges that connect roads over a diverse terrain and climates from the Pacific Ocean in the west thru the Cascade Mountains to the farmlands and rolling hills in the east. The WSDOT bridge network contains a variety of bridge types including floating bridges, Movable bridges, Steel Trusses, Reinforced / Prestress and Postensioned Concrete and timber bridges.

### 4:30 PM

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#### Seismic Risk Analysis of Ferry Terminal Assets

*Jeri Bernstein, P.E., S.E., WSF Structures Management Engineer*

Washington State Ferries is the largest ferry system in the United States and is part of the Washington State Highway system. The Washington State Ferries system is located within a region of faults with high potential for seismic activity. As a result, the seismic risk aspect is highly influential in the planning and prioritization of bridge structure replacement projects. This presentation will explain how seismic risk for the terminal assets are determined.

### 5:00 PM

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#### Digging Deeper into the Alaskan Way Viaduct Replacement Program

*Tim Moore, P.E., S.E., Mega Projects Bridge Manager, Washington State DOT*

The State Route 99 Alaskan Way Viaduct, an elevated concrete structure built in the 1950s and vulnerable to earthquakes, is being replaced with a 1.7-mile tunnel running beneath downtown Seattle. This presentation will focus on the design and construction of the major structural components of the project and the world's largest tunnel boring machine at the time of construction.

## PROPRIETARY SESSION

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*Monday, June 10, 2:00 – 4:30 PM*

*Room: Woodrow A*

*Chair: Rachel Stiffler, Vector Corrosion Technologies, Inc., Canonsburg, PA*

The proprietary session will consist of four presentations. Discussions will center on the following topics:

- Nondestructive testing of high load multirotational bearings and insight into issues encountered while testing
- Information modeling for bridges including data exchanges and 3D bridge design
- Case studies due to scour failure and prevention of future failures
- Incremental launching method for segmental concrete bridges citing overseas case study

### 2:00 PM

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#### IBC 19-1: Automated Reinforcement of Bridges Under a BIM Perspective

*Alexander Mabrich, P.E., MSc, MBA, Bentley Systems, Sunrise, FL*

As a BIM workflow is embraced and software is used for the design and analysis of the bridge structure, project delivery slows down as the reinforcement detailing is mostly a manual drafting process. Usually the process of plans production and 3D modeling generation is not connected resulting in repetitive work with the consequence of losing productivity. The lack of automated 3D software solutions and experienced professional in the upcoming BIM workflow and 3D representation of our structures contribute to the fact...

### 2:30 PM

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#### IBC 19-2: Incremental Launching Method for Çayirköy Bridges

*Francois Pissot, Giulio Maria Scotto, and Julien Erdogan, Freyssinet, Rueil Malmaison, Veuillez Sélectionner, France*

Çayirköy viaduct is part of the Northern Marmara motorway, an alternative road to link the western part of the country to Istanbul via the 3rd Bosphorus Bridge. The 750m long viaduct, made of two carriageways, cross a valley at more than 60m high. This paper gives an overview of the construction methods of this viaduct and focuses on its specificities. The major ones are earthquake loads to be considered during construction and the launching downhill with a - 2.8% slope. The incremental launching method...

### 3:00 PM

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#### IBC 19-4: Case Studies of Bridge Failure due to Scour and Prevention of Future Failures

*Roger Simpson, Ph.D. and Gwibo Byun, Ph.D., AUR, Inc., Blacksburg, VA*

For US bridges over water, 70% are NOT designed to withstand scour, 21000 are currently "scour critical", and 80% of bridge failures are due to scour, often during floods and peak flow events which are becoming more common with climate change (Flint et al., 2017). Lin et al. (2013) examined 36 bridge failures due to scour in terms of structural, hydraulic, and geotechnical conditions. Local scour, channel migration scour, and contraction scour were responsible for 78% of failures. Sadly, many lives...

### 3:30 PM BREAK

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### 4:00 PM

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#### IBC 19-5: Non-Destructive Testing on High Load Multirotational Bearings

*Ronald Watson, R.J. Watson, Inc., Alden, NY*

High Load Multirotational Bearings (HLMRB) provide the critical function of transmitting loads, rotations and movements from the superstructure of a bridge to its substructure without any damage. Most of the owner specifications call for lot testing of these bearings which typically include friction, vertical load, horizontal load and rotation verification. In addition, many states are now requiring long term deterioration rotation testing which can be a long and arduous process. This paper will present the state of the art...

### W-1: PRACTICAL APPROACHES AND TOOLS FOR THE DESIGN OF STEEL BRIDGES

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*Monday, June 10, 2:00 – 6:00 PM*

*Room: Magnolia 1*

*John Dietrick, P.E., S.E., Michael Baker International, Cleveland, OH; Frank Russo, Ph.D., P.E., Michael Baker International, Philadelphia, PA; Brandon Chavel, Ph.D., P.E., National Steel Bridge Alliance (NSBA), Cleveland, OH*

In this workshop, we will address various aspects of steel bridge design and demonstrate practical approaches that incorporate current specifications and industry trends. We will include presentations covering key concepts and steel bridge design theory, as well as hands-on participant exercises and calculation examples. Emphasis will be placed on recent developments in the AASHTO code related to steel bridge design, and participants will obtain valuable examples and instruction on how to approach key elements of steel design.

### W-2: NEW DESIGN STANDARDS AND WORLDWIDE INNOVATIVE APPLICATIONS USING FRP COMPOSITES TO BUILD BRIDGES

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*Monday, June 10, 2:00 – 6:00 PM*

*Room: Magnolia 2*

*John Busel, F.ACI, American Composites Manufacturers Association, Arlington, VA*

This workshop is intended to capture significant FRP composites initiatives on a global scale. We will cover two recently published design guidelines — the new AASHTO LRFD for GFRP Reinforced Concrete, and UK European Bridge Design Specification. Presentations will also cover recent MODOT testing and approval of innovative bridge systems that meets AASHTO requirements, 15+ year durability performance study of FRP rebar, and worldwide examples of bridge installations used in both new and retrofit construction from the US, Europe, Canada, and Australia.

### INTERNATIONAL ATTENDEES WELCOME RECEPTION

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*Monday, June 10; 5:00 – 6:00 PM*

*Room: Exhibit Hall E Foyer*

*Host: Thomas G. Leech, P.E., S.E., Gannett Fleming, Inc., Pittsburgh, PA; M. Myint Lwin, P.E., S.E., Consultant, Olympia, WA*

Please join us for a special “hello” from members of the IBC Executive Committee...open to all international guests!

### IBC EXHIBIT HALL RECEPTION

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*Monday, June 10; 5:00 – 7:00 PM*

*Room: Prince George Exhibit Hall E*

Following the afternoon sessions, all registered attendees of the IBC are welcomed to enjoy a little “R & R” throughout the Exhibit Hall. Enjoy this opportunity to visit with the exhibitors and view the outdoor displays, while you network with your fellow attendees.



### CONSTRUCTION, PART 1 SESSION

*Tuesday, June 11, 8:00 AM – 12:00 Noon*

*Room: Annapolis*

*Chair: William J. (Jay) Rohleder Jr., P.E., S.E., FIGG Bridge Engineers, Inc, Exton, PA*

This Session features exciting and current Construction Practice related topics. These presentations include a short span, shallow steel tub girder bridge field test in Ohio; challenging precast straddle bents over a busy Delaware DOT highway; Walsh Construction applications of ABC projects in North Texas and Boston; construction engineering for an overhead gantry in South Texas, a bascule bridge rehabilitation in Vermont and Florida DOT policies and examples of prefabricated ABC bridges.

#### 8:00 AM

##### IBC 19-6: ABC in Florida - A Practical Look Into Past, Present, and Future FDOT Projects Utilizing ABC Techniques

*Matthew Kosar, P.E. and Thomas Andres, P.E. Florida DOT, Tallahassee, FL; Jeffrey Ger, Ph.D., P.E., Federal Highway Administration, Tallahassee, FL*

FDOT policies centered around ABC applications and the use of prefabricated bridge element system (PBES) components have primarily been based on practical lessons learned from past and present projects. A few of these key projects will be explored, ending with a discussion of anticipated ABC applications for future bridge projects in Florida.

#### 8:30 AM

##### IBC 19-7: Innovative ABC Replacement of a Freight Railroad Bridge in Fort Worth, Texas

*Doug VanSlambrook, The Walsh Group, Chicago, IL; Delynn Burkhalter, Burkhalter Rigging, Inc., Columbus, MS; Josh Crain, P.E., SE, and David Rogowski, P.E., Genesis Structures, Kansas City, MO*

The TEXRail project is a 27-mile, 14-station regional commuter rail line for Fort Worth's "Trinity Metro" transit agency. Linking southwest Fort Worth with Dallas-Fort Worth International Airport (DFWIA), the line affords its riders an alternative to the region's congested roadways, increasing mobility and providing significant environmental benefits. TEXRail operates on portions of Fort Worth and Western Railroad (FWWR), Union Pacific Railroad (UPRR), Trinity Railway Express (TRE) commuter rail, and Dallas Area Rapid Transit (DART)-owned Cotton Belt commuter rail lines and has additional...

#### 9:00 AM

##### IBC 19-8: ABC Replacement of Commonwealth Avenue Bridge in Boston, MA

*Justin Ponting, Walsh Construction Company, Chicago, IL; Josh Crain, P.E., S.E. and David Rogowski, P.E., Genesis Structures, Kansas City, MO*

This project replaces the existing skewed superstructure that carries Commonwealth Avenue and the MBTA Green Line B branch over I-90 (Massachusetts Turnpike) and the MBTA Commuter Rail line. Located in the center of the Boston University Campus serving as the main pedestrian route for students and faculty. This project used ABC methods to restore the spans

# Tuesday

## SESSIONS

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in two outages over 2 years. The first year the eastbound lanes and the Greenline track spans were replaced in a 19-day outage. The second year...

### 9:30 AM BREAK

#### 10:00 AM

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##### IBC 19-9: Field Performance and Rating Evaluation of a Modular Press Brake Formed Steel Tub Girder with a Steel Sandwich Plate Deck

*Karl Barth, Ph.D., Nicole M. Hegele Underwood, and Robert M. Tennant, West Virginia University, Morgantown, WV; Gregory K. Michaelson, Ph.D., Marshall University, Huntington, WV*

This paper and presentation are focused on the field performance of a modular press-brake-formed steel tub girder. The modular press-brake-formed girder is a shallow trapezoidal box girder cold formed using press-brakes from standard mill plate widths and thicknesses. A technical working group within the Steel Market Development Institute's Short Span Steel Bridge Alliance (SSSBA), led by the current authors, was charged with the development of this concept. Research of press-brake-formed steel tub girders has included analyzing the flexural bending capacity using...

#### 10:30 AM

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##### IBC 19-10: A New Perspective of Accelerated Bridge Construction

*Joan Zhong-Brisbois, Ph.D., P.E., Seattle, WA, Daniel Robles, P.E., MBA, IEBC, Edmonds, WA*

This paper applies a novel application of Blockchain Technology to Accelerated Bridge Construction (ABC) techniques to reduce transaction frictions, solve trust and communication challenges in bridge design and construction, reduce disputes, streamline regulatory requirements, and strengthen partnership and empower community involvement. A disciplined approach is taken to expose both the benefits and possible shortcomings of combining these methods while also providing estimates of time, cost, quality, and "social capital" savings on a use case of urban bridge replacement...

#### 11:00 AM

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##### IBC 19-11: Design and Construction of Post-Tensioned Straddle Bents for US 301 over SR 1, New Castle County, Delaware

*Loai El-Gazairly, Ph.D., P.E., Whitman, Requardt & Associates, LLP, Richmond, VA; Paul S. Duemmel, P.E., Whitman, Requardt & Associates, LLP, Baltimore, MD*

Section 1 of DelDOT's US 301 project in New Castle County, Delaware includes the final design of 5.5 miles of limited-access toll highway. The structure design includes 11 new highway bridges, one bridge widening, eight major culverts, three retaining walls, and seven sign structures. One of the most complex design elements of the project is the interchange of the new US 301 with existing SR-1 and US 13. The flyover bridge carrying northbound US 301 over SR-1 includes two precast, post-tensioned...

### 11:30 AM

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#### IBC 19-12: Designing Out Risk: The North Hero-Grand Isle Bridge Replacement Project

*Herbert Protin, P.E., HDR, Newark, NJ*

The North Hero-Grand Isle Drawbridge, a double leaf bascule bridge, is the only working vehicular drawbridge in Vermont and the only highway link between the North Hero and Grand Isle communities. The bridge also provides the only unrestricted vertical clearance passage for east-west marine traffic along Lake Champlain. Originally constructed in 1953, the bridge is unreliable and requires increased maintenance to remain operational. The Vermont Agency of Transportation (VTrans) has no in-house movable bridge design expertise, and selected HDR to provide design services...

### PRESERVATION, PART 1 SESSION

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*Tuesday, June 11, 8:00 AM – 12:00 Noon*

*Room: Woodrow A*

*Chair: Francesco M. Russo, Ph.D., P.E., Michael Baker International, Philadelphia, PA*

Bridge preservation and rehabilitation are explored in a series of presentations. Topics include emergency repair of impact damaged steel girder and truss bridges, suspension bridge cable maintenance and preservation, external FRP repair of prestressed concrete and steel beams and bridge piers, and rehabilitation of the historic Arlington Memorial Bridge. A wide range of bridge types and projects, emergency and planned responses, are all presented in this session.

### 8:00AM

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#### IBC 19-13: South Tenth Street Bridge Rehabilitation

*Stan Nalitz, P.E. and William Confair, P.E., AECOM, Pittsburgh, PA*

The Philip Murray (South Tenth Street) Bridge is a suspension bridge with a main span length of 725 feet. Built in 1933, the structure has a total length of 1,275 feet and links the City of Pittsburgh with its Southside communities. The presentation will discuss methods and testing used to inspect, analyze and develop a strategy for the rehabilitation. AECOM conducted a thorough in-depth inspection, including an internal cable inspection, to accurately identify the exact location extent, overall dimensions, and type...

### 8:30 AM

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#### IBC 19-14: More Than A Bridge - Rehabilitating Arlington Memorial Bridge: Our Capital's Ceremonial Entrance

*Shane Beabes, P.E. and Steve Matty, AECOM, Hunt Valley, MD; Kenneth V. Butler, P.E., AECOM, Glen Allen, VA; Donnie Arant, Kiewit, Hanover, MD; Jonathan Shafer, National Park Service, Washington, D.C.; David M. Marcic, Hardesty & Hanover, Annapolis, MD; Ramnik Satasiya, Joe Fabis, and George Choubah, Federal Highway Administration, Sterling, VA*

Stretching across the Potomac, Arlington Memorial Bridge connects the Lincoln Memorial to the ceremonial entrance of Arlington National Cemetery. Built in 1932, the nearly 2,100-foot-long and 94-foot-wide bridge carries

# Tuesday

## SESSIONS

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six 10-foot-wide travel lanes and two nearly 14-foot-wide shared-use bicycle and pedestrian sidewalks. The bridge was built to complement the neoclassical design of the Nation's Capital and comprises 10 reinforced concrete arches with a double-leaf steel bascule span in its center, the majority of which is dressed in granite ashlar stone. Nearly 85 years after...

### 9:00 AM

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#### IBC 19-15: Collaboration & Innovation in Emergency Response

*Kyle Smith, P.E., S.E., Greenman-Pedersen, Inc., Annapolis Junction, MD; Rod Thornton, P.E., Maryland DOT-State Highway Administration, MD*

On December 6, 2017, a heavily traveled Historic Parker Truss bridge carrying MD 355 over Monocacy River was damaged when a garbage truck struck its overhead members. The end portal frame was severely damaged, and the first two overhead horizontal members were pushed so far out-of-plane that several vertical members of the primary truss were severed. Fortunately, the impact did not lead to a catastrophic failure, but the residual capacity of the bridge was unknown and the route was immediately closed. After...

### 9:30 AM BREAK

### 10:00 AM

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#### IBC 19-16: Application of ABC Techniques in the Travis Spur Rail Bridge Replacement in Staten Island, New York

*Jing Kang, P.E., and Maulik Patel, P.E., SJH Engineering, P.C., Princeton, NJ; Seth Condell, P.E., Parsons Corporation, New York, NY*

Accelerated Bridge Construction (ABC) techniques in design and construction of the rapid, single weekend replacement of Travis Spur Rail Bridge was an integral part of Port Authority of New York and New Jersey's monumental \$1.5B Goethals Bridge Replacement. The new two span thru-girder structure accommodates the widened I-278 with six travel lanes and shoulders. Extensive pre-planning and innovative ABC replacement activities resulted in minimal impacts to the traveling public.

### 10:30 AM

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#### IBC 19-17: Emergency Bridge Repairs During the Winter, Chisago County Rd 10 Over I-35

*Mark Pribula, P.E., Minnesota DOT, Roseville, MN*

This presentation will describe and detail the damage to the bridge, repair process and the engineering design methods employed to repair the structure and return it to service during a Minnesota winter, using the details of Br 13806 over I-35 in Harris, Minnesota on October 19, 2017. The presentation will also show the damage inspection procedures, repair designs and methodology. MnDOT's Metro District was informed that the bridge had been hit by high load (backhoe or crane boom) by the MN State Patrol and...

### 11:00 AM

#### IBC 19-18: Flexura Strengthening of Heavily Corroded Steel Members Using CFRP

*Samuel Sherry and Matthew Hebdon, Virginia Tech, Blacksburg, VA*

With an aging and deteriorating infrastructure potentially being subjected to heavier loads than initially designed for, bridge engineers are increasingly looking for innovative, yet cost effective ways of repairing and maintaining existing bridges. There is particular concern when dealing with heavily corroded steel bridge members. Conventional repair methods can be very costly in terms of labor/material costs, as well as lane closures and effects to traffic. Carbon Fiber Reinforced Polymer (CFRP) laminates are a potential...

### 11:30 AM

#### IBC 19-19: Carbon FRP Jackets for Seismic Strengthening of Bridge Piers - A Case Study

*Ravi Kanitkar, KL Structures, Austin, TX; Alice Fong, Jacobs, Bellevue, WA; Gregg Blaszak, Milliken Infrastructure Solutions, LLC, Spartanburg, SC*

For the design-build seismic retrofit of this existing 3-span bridge, the circular piers needed additional shear strength as well as confinement. The designers initially envisioned the use of welded steel jackets to strengthen the existing piers. The design thickness of the steel jackets was 3/8", which is the minimum required by the FHWA Seismic Retrofitting Manual. The high cost and construction logistics of the steel jackets prompted the designers to look at the use of carbon fiber reinforced polymer (FRP) jackets for the...

### DESIGN, PART 1 SESSION

*Tuesday, June 11, 8:00 AM – 12:00 Noon*

*Room: Woodrow B/C/D*

*Chair: Ronald D. Medlock, P.E., High Steel Structures, LLC, Lancaster, PA*

This session will feature projects and discussions that demonstrate technical advancements and state-of-the-art practices in the design of transportation structures, including bridges and sign structures.

### 8:00 AM

#### IBC 19-20: Iowa City Gateway: Park Road Bridge

*Natalie McCombs, P.E., S.E., and Sarah Larson, P.E., HNTB, Kansas City, MO*

Dubuque Street and Park Road are key transportation links providing access to Iowa City's business district. The Park Road bridge provides a connection from Dubuque Street to the University of Iowa campus and the new Hancher Auditorium. This area has a history of flooding that results in frequent road closures. This project is part of a master plan to address the impacts of regional flooding and provide enhancements to the transportation corridor. Key goals included reducing closures due to flooding, improving user ...



*2008 Flood Conditions*

### 8:30 AM

#### IBC 19-21: Evaluation of Fabrication Effects for a Lift Bridge Steel Orthotropic Deck

*Sougata Roy, Ph.D., Rutgers, The State University of New Jersey, Piscataway, PA; Soham Mukherjee, AECOM, Mechanicsburg, PA; Ronald Medlock, P.E., High Steel Structures, LLC, Lancaster, PA*

One of the major challenges to increased implementation of orthotropic bridge decks is the relatively high initial cost owing to intensive fabrication and tolerances, which is mandated to achieve the desired fatigue resistance of the various welded connections in the deck. Significant debate exists among the bridge engineering community regarding the extent and necessity of such stringent fabrication practices, as limited research suggests that adequate fatigue resistance of orthotropic deck connections could be...

### 9:00 AM

#### IBC 19-22: Centennial Bridge - A New Connection to the Historic Cabrillo Bridge in Balboa Park

*Anthony Sanchez, PhD, P.E., Patrick Chang, and Jason Hong, Moffatt & Nichol, San Diego, CA*

The Cabrillo Bridge, and many historic buildings at Balboa Park, were built in 1915 for the California-Panama Exposition to celebrate the opening of the Panama Canal. Over a hundred years later, the City of San Diego and the Plaza de Panama Committee, a philanthropic organization headed by Qualcomm founder Irwin Jacobs, is planning 80 million dollars of improvements for the park. A major feature is the "Centennial Bridge", a new connection to the historic Cabrillo Bridge, which will allow the...

### 9:30 AM BREAK

### 10:00 AM

#### IBC 19-23: Steel Bridge Member Resistance — AASHTO Compared to Other International Codes

*Terry Cakebread, BSc, Ceng., MICE, LS, New York, NY; Steve Rhodes, Beng., MSc., Ceng., MICE, LS, Kingston-Upon-Thames, Surrey United Kingdom*

This paper considers a truss bridge, where member resistance calculations have been performed to AASHTO 7th and 8th editions, Canadian Bridge Design standard CSA S6-14, Eurocode EN1993-2:2006 and Australian code AS4100-1998. Why are such different utilizations determined from each Code, when using the same loading regime? Why are some members disallowed, in certain Codes, merely on the basis of dimensions? Which Codes are more or less conservative? Which of the AASHTO articles seem most ...

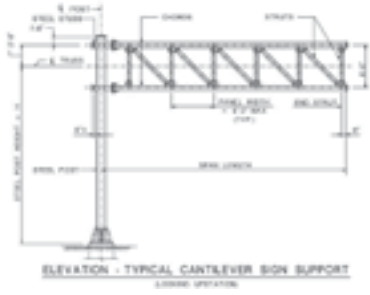
### 10:30 AM

#### IBC 19-24: NJDOT Sign Structure LRFD Design Standard Upgrades

*George Zimmer, Rama Krishnagiri, P.E., and Steve Esposito, P.E., WSP USA, Lawrenceville, NJ; Eddy Germain, P.E., and Xiaohua "Hannah" Cheng, P.E. and Kimberly Sharp, New Jersey DOT, Ewing Township, NJ*

NJDOT tasked WSP with updating their Sign Structure Standard Drawings

and associated Design Manuals to comply with the 2015 AASHTO LRFD Specifications including the 2017 Interim Revisions. This was the first time that NJDOT sign structures would be designed by LRFD. A



*Standard Cantilever Sign Structure*

key component of this upgrade was the 130

MPH design wind speed for all new sign structures, which created an increase in wind pressure over the previously utilized 80 MPH design wind speed/pressure. This significant increase in wind...

### 11:00 AM

#### IBC 19-25: Effects of Stiffness, Creep, and Shrinkage on RC Arch Bridges

*Leon Lung-Yang Lai, Ph.D., P.E., S.E., Specialty Engineering, Inc., Bristol, PA; Kamlesh Ashar, Pennsylvania Department of Transportation, Allentown, PA*

This paper reviews and compares the stiffness, creep, and shrinkage criteria in the ACI codes, AASHTO specifications, and Eurocodes. Development of the Axial force-Moment-Rotation relationship to determine the rotational stiffness of an arch member under axial force is discussed and is applied to an existing reinforced concrete arch bridge. The results show that those effects may not be ignored for evaluating the load carrying capacity of this bridge type.

### 11:30 AM

#### IBC 19-26: Measurement and Use of Pile Set-Up in Design and Construction of the I-480 Valley View Bridge

*Randy Thomas and Charles Winter, P.E., D.G.E., Jacobs, Milwaukee, WI; William Banik, Walsh Construction, Crown Point, IN*

The I-480 Valley View Bridge project includes the design and construction of a 4150-foot long, 200-foot tall, 15-span, steel girder interstate highway bridge over the Cuyahoga River Valley near Cleveland, Ohio. The project is being delivered by the Walsh Design-Build Team for the Ohio Department of Transportation, with Walsh Construction as the general contractor, and Jacobs (formerly CH2M) as the lead designer. Driven pile foundations are an important component of the project and are being used to support 11...

### W-3: AESTHETIC LIGHTING, PUBLIC ART & COMMUNITY PRIDE: A UNIQUE COLLABORATION FOR LIGHTING A TOLEDO LANDMARK

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*Tuesday, June 11, 8:00 – 9:00 AM*

*Room: Magnolia 1*

*Faith Baum, HLB Lighting Design, New York, NY*

The glass-enclosed tower of Veterans Glass City Skyway became an instant symbol of Toledo and the centerpiece of ODOT's bridge portfolio when it opened in 2007 and again when the lighting system was updated in 2018. This workshop will review the unique collaboration between ODOT, the design team and local artists to develop lighting content for the tower, including everything from football team colors to translating the visions of six artists into light.

### W-4: BRIDGE INFORMATION MODELING

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*Tuesday, June 11, 8:00 AM – 12:00 Noon*

*Room: Magnolia 2*

*Moderator: John C. Dietrick, P.E., S.E. Michael Baker International, Cleveland, OH*

#### Part 1. BIM for Bridges: An Integrated Approach from Design to Construction

*Alexander Mabrich, P.E., Bentley Systems, Sunrise, FL*

As more contractors and government organizations require the use of BIM methodologies for their upcoming projects, Bentley is proposing the use of an integrated approach that covers the planning, design and further construction operations. This integrated approach represented in a federated 3D model guarantees the flow of information without any format translation with its subsequent possibility of losing valuable or critical information.

#### Part 2. BIM for Better Bridge Design and Construction

*Douglas Dunrud, P.E., WSP, Sacramento, CA*

Bridge design and construction is undergoing a paradigm Shift: to transition from putting information on electronic pieces of paper to putting information in 3D models and extracting construction documents from the models. These model-centric principles will provide accurate, fast, and dynamic bridge design and construction techniques that will dramatically improve productivity.

#### Part 3. Modeling, Design and Analysis of Segmental Bridges from a BIM Perspective

*Alexander Mabrich, P.E., MSC, MBA, Bentley Systems, Sunrise, FL*

As owners required projects to be done using a BIM methodology, modelers, designers, detailers and contractors resort to multiple solutions to achieve a true BIM project. Most of the times, these solutions are disconnected and a lot of rework needs to be done when going from one phase of the project to the next one, Bentley Systems will show how their integrated solutions can take a segmental bridge for the early stages of modeling, to design, detailing



and construction planning using a standard format avoiding risky export and import file format operations.

### Part 4. BIM for on-Budget Bridge Megaprojects

*Mia Keay, Frank Holz, David Loughery, and Amy Patt, Allplan Inc, West Chester, PA*

This part will present the benefits and challenges of using 3D information modeling techniques for linear infrastructure megaprojects. We will delve into some of the common objections to using 3D BIM modeling such as: the learning curve, structural detailing, conflict detection, and collaboration. And finally, we will discuss technology solutions and best practices to solve the problems which cause megaprojects to be delayed and go over-budget.

### W-5: BRIDGE LOAD RATING, POSTING, AND PERMITTING: TODAY AND TOMORROW

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*Tuesday, June 11, 9:30 AM – 12:00 Noon*

*Room: Magnolia 1*

*Lubin Gao, Ph.D., P.E. and Tuonglinh Warren, P.E., Federal Highway Administration, Washington, D.C.; Amal Azzam, Ph.D., P.E., District DOT, Washington, D.C.; John Kattell, P.E., US Forest Service, Washington, D.C., and Krisha Kennelly, Michael Baker International, Moon Township, PA*

Besides regulatory mandate, bridge load rating provides a critical piece of information for making management and operational decisions. When moving toward compliance, bridge owners have unique challenges and obstacles. They have to strike balance between their agency priorities, mitigating risks and preserving their assets. This Workshop is intended to provide awareness to bridge engineers and asset managers and it is expected that the attendees will gain knowledge of historical background, state of practice, and future direction.

### IBC EXHIBIT HALL LUNCHEON

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*Tuesday, June 11; 10:00 AM – 2:00 PM*

*Room: Prince George Exhibit Hall E*

Following the morning sessions, all registered attendees of the IBC are welcome to enjoy lunch throughout the Exhibit Hall at 12:00 Noon. Enjoy another opportunity to visit with the exhibitors and view the outdoor displays, while you network with your fellow attendees.

### IBC BRIDGE TOUR

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*Tuesday, June 11; 1:00 – 5:00 PM*

Please join us for a tour of the Arlington Memorial Bridge! The 2019 IBC tour will give attendees the opportunity to preview the Arlington Memorial Bridge Rehabilitation project, a National Park Service project being administered by Federal Highway Administration.

SAFETY FIRST! To participate in this construction site tour, there are a few things that will be required.

- Boots

# Tuesday

## SESSIONS

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- Sleeves (long or short). Tank tops are not permitted.
- Hard Hat
- Safety Glasses
- Type 2 or 3 Vest

A limited supply of PPE will be available upon request.

Additionally, all participants will be required to sign a separate release form.

\* The bus will depart The Gaylord National Resort and Convention Center at 1:00 PM, arriving to the project site at 1:30 PM. The bus will depart the project site at 4:30 PM and arrive back at The Gaylord National Resort and Convention Center at 5:00 PM. \*All timing is subject to change.

The tour will consist of a considerable amount of walking on an active construction site so, please be prepared to walk. The tour will kick off with a brief project introduction and overview, which will be presented by the Kiewit Construction team and Federal Highway Administration in the Kiewit Field Office. We will then begin the guided walking tour on the Arlington Memorial Bridge.

The tour is limited - please check with the IBC Registration Desk for availability!

## CONSTRUCTION, PART 2/CABLE STAYED

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*Tuesday, June 11, 1:30 – 5:00 PM*

*Room: Annapolis*

*Chair: Brian M. Kozy, Ph.D., P.E., Federal Highway Administration (FHWA), Washington, D.C.*

Delivery of complex projects such as arch and cable stayed bridges affords the opportunity for engineers and owners to think outside the box, push the envelope, and advance the state of the practice. This session covers a number of complex bridge projects where new methods were used in contracting, design, construction, aesthetic treatment, or inspection.

### 1:30 PM

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#### **IBC 19-27: Contractor Manager/General Contractor (CMGC) Delivery of a Tied Steel Arch Bridge Re-Decking**

*Jonathan Eberle, P.E., AECOM, Mechanicsburg, PA; John Milius, AECOM, Philadelphia, PA; Paul Kettleson, Minnesota DOT, Oakdale, MN; Steve Kaldenbach, Kraemer North America, Burnsville, MN*

The use of an alternate delivery method allowed the rehabilitation and re-decking of the Smith Avenue Bridge (High Bridge) to be designed and constructed under an accelerated schedule. The Minnesota Department of Transportation (MnDOT) elected to use the Construction Manager/General Contractor (CMGC) alternate delivery method for this project with the rehabilitation design completed by AECOM and the construction completed by Kraemer North America. The High Bridge, which spans the Mississippi River in St. Paul, Minnesota, consists of 3 continuous tied steel arch main ...

### 2:00 PM

#### IBC 19-28: NEXT beam bridges for 100 plus year service life

*Jianwei Huang Ph.D., P.E., Southern Illinois University Edwardsville, Edwardsville, IL*

The Prestressed/Precast Concrete Institute (PCI) Northeast recently developed a novel bridge beam section called the northeast extreme tee (NEXT) beam, which provides several advantages over the traditional I-shaped and adjacent box beams. The use of NEXT beams can accelerate bridge construction process by saving time on beam erection; meanwhile, the top flange of the NEXT beam can act as formwork for the cast-in-place reinforced concrete (RC) deck, saving time and cost on building/stripping the deck concrete...

### 2:30 PM

#### IBC 19-29: Curtis Creek Bridge Rehabilitation CMAR

*Donald Marinelli, P.E., Hardesty & Hanover, Annapolis, MD; William Pines, P.E., Maryland Transportation Authority, Baltimore, MD*

MDTA Procurement and H&H worked to develop the bid documents to set the qualifications and requirements for evaluating and selecting a Construction Manager (CM). Innovation was needed in developing the contractual documents that incorporated the technical challenges associated with the movable bridge rehabilitation, and allow for advanced design and procurement of long lead time items for specialty mechanical and electrical items. H&H and the CM developed phased construction strategies to maintain vessel and vehicular traffic on I-695 during the rehabilitation. Benefits ...

### 3:00 PM BREAK

### 3:30 PM

#### IBC 19-31: A Beacon of Coastal Beauty — Inspired by Community Vision

*William Johnson, IV, P.E., S.E., Figg Bridge Engineers, Inc., Exton, PA*

The Harbor Bridge project was developed by the Texas Department of Transportation to maximize mobility and connectivity; enhance port access and marine navigation; facilitate hurricane evacuation; enhance economic opportunity; and improve safety by replacing the existing bridge and surrounding roadways. The new US 181 Harbor Bridge includes concrete box girders for a 7,535' long, high-level approach bridge superstructure with 180' typical spans, a 3,295' long cable stayed main span superstructure unit with a cable stay tower height of 538'-2" and 205' vertical...

### 4:00 PM

#### IBC 19-32: Design & Construction of the Shimla Cable Stayed Bridge

*Lucas Wise, CPEng. And Mithun Mohan, Systra - International Bridge Technologies, Jumeirah Lakes Towers, Dubai United Arab Emirates*

The new Shimla Bypass cable stayed bridge forms part of the 27 km four lane development of the proposed Shoghi — Shimla - Dhalli bypass of National Highway 22 in the northern state of Himachal Pradesh, India. The 586m long bridge is located at the foothills of the Himalayan range at an elevation of 2,000m above sea level. The bridge is subjected to several

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complex site constraints, both geographical and environmental, in-particular ground accelerations over 1.0g and high wind loads that are affected...

### 4:30 PM

#### IBC 19-33: Suspender Cable Inspection Using Advanced Robotic Technology at Arrigoni Bridge

*Muhammad Asif Iqbal, P.E., LEED Green Associate and Aslam Siddiqui, P.E., AI Engineers, Inc., Middletown, CT; Doug Thaler, P.E., Infrastructure Preservation Corporation, Washington, DC; Gregory Funk, P.E., Connecticut DOT, Newington, CT*

This paper covers the suspender cable inspection using advanced robotic technology RopeScan® and determining the actual tension forces of the suspension cables under deadload condition using Laser Vibrometer at Arrigoni Bridge 00524 without any interference to the traffic and minimal inconvenience to the traveling public. The Arrigoni Bridge is a thirty (30) span steel through arch structure carrying Route 66 over Route 9, the Providence and Worcester Railroad and the Connecticut River between Middletown and...

### PRESERVATION, PART 2 SESSION

*Tuesday, June 11, 1:30 – 5:00 PM*

*Room: Woodrow A*

*Chair: Gary Runco, P.E., P.S., Virginia DOT, Fairfax, VA*

From old Steel Trusses built in 1815 to a new replacement bridge, this 2nd, Preservation 2, session focuses on preserving the actual structure or the context sensitive setting of an old bridge. Participants will learn a little bit of everything as it relates to analysis methods, choice of materials and construction methods. Both small (200') and large (2400') bridges are included as well as those fabricated from timber, stone, steel and concrete.

### 1:30 PM

#### IBC 19-34: Rehabilitation of an Historic Phoenix Column Truss Bridge Due to Vehicular Collision

*John Baumgardner, P.E., HDR, Inc., Plymouth Meeting, PA; Monica Harrower, Henry Berman, P.E. and Din Abazi, P.E., Pennsylvania DOT, King of Prussia, PA*



*Damaged Bridge*

The Ross Fording Road Bridge, built in 1885, is

an historic single span Phoenix column pony truss connecting picturesque farming communities in Chester and Lancaster Counties. Following a vehicular impact to the bridge, PennDOT District 6-0 mobilized an emergency response and significant resources to save this bridge from complete collapse. The subsequent rehabilitation project was developed to restore the function of the bridge, protect the structure from future vehicle impacts and preserve the historic integrity...

### 2:00 PM

#### IBC 19-35: Lightweight Superstructure Replacement of the Bridge Carrying Baltimore Harbor Tunnel Thruway Over Patapsco River Flats

*Shilpa Kodkani, P.E., Christine Szympruch, P.E. and Robert Healy, P.E., Rummel Klepper and Kahl, Baltimore, MD; William Pines, P.E., Maryland Transportation Authority, Nottingham, MD; Joseph Hoffmann, P.E., McLean Contracting Company, Glen Burnie, MD*

The Patapsco Flats Bridge is located on the Maryland Transportation Authority's Baltimore Harbor Tunnel Facility and carries I-895 over Patapsco River Flats. The dual bridge was built in 1957 and is 2380' long with 42 simple spans in each bridge. The existing bridge superstructure was in poor condition. RK&K evaluated various superstructure rehabilitation and replacement options. The design team's goal was to create a durable superstructure and reduce the number of joints while using the existing substructure. ...

### 2:30 PM

#### IBC 19-36: Adams Avenue Historic Arch Structure Rehabilitation

*Christopher Bentz, P.E. and Ronald Krolick, P.E., Alfred Benesch and Company, Pottsville, PA; Monica Harrower, Din Abazi, P.E. and Henry Berman, Pennsylvania DOT, King of Prussia, PA*

The scope of work was to rehabilitate the three-span stone masonry arch bridge which carries Adams Avenue (SR 1002) over Tacony Creek. The bridge was built circa 1815 and reconstructed in 1901 and 1942 and is listed in the National Register of Historic Places. This bridge features variations commonly found on other Pennsylvania Stone Arch bridges. The arched section is recessed, piers are pyramidal in shape; the parapet wall is constructed...

### 3:00 PM BREAK

### 3:30 PM

#### IBC 19-37: Design and Construction of Blenheim Covered Bridge

*Sean James, P.E. and Josif Bicja, P.E., Hoyle, Tanner & Associates, Inc., Manchester, NH*

The Old Blenheim Bridge was a single-span, double-barrel Long Truss wooden covered bridge built in 1855 located in North Blenheim, NY and destroyed by flooding of Tropical Storm Irene in 2011. The Long Truss was patented in 1830 by US Army Engineer Col. Stephen Long and is considered to be the first intentionally prestressed truss bridge. This paper will detail the analysis, design and construction of the replacement bridge. The... replacement bridge, constructed in 2018, is one of the longest single-span ...

### 4:00 PM

#### IBC 19-38: Retrofitting the Burlington-Bristol Bridge

*Danielle Schroeder, EIT, Jesse Gormley, P.E., ENV SP and John Prader, Ph.D., P.E., Pennoni, Philadelphia, PA*

The Burlington-Bristol Bridge, a moveable (vertical-lift) truss bridge that crosses the Delaware River from Burlington County, NJ, to Bristol Township, PA, is operated by the Burlington County Bridge Commission and was first

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opened to traffic in 1931. The structure and mechanical equipment have undergone modifications, rehabilitation, and maintenance since opening but are primarily original. However, a complete repainting had not occurred for over 30 years due to the presence of lead-based paint. Cleaning the steel ...

### 4:30 PM

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#### IBC 19-39: Jacques Cartier Bridge — Challenges in Wind Rehabilitation Work of an Old Steel Truss Bridge

*Stoyan Stoyanoff, Ph.D., P.Eng., ing., RWDI, Bromont, Quebec Canada; Sylvie Boulanger, ing., P.Eng. Ph.D., JCCBI, Longueuil, Quebec Canada; Steve Zhu, COWI North America, North Vancouver, BC Canada*

The Jacques Cartier Bridge is one of the most important bridges in Montreal, Canada. It was opened to traffic in 1930, being ever busier and today about 100,000 vehicles per day are passing over the Saint Lawrence River. Due to its sound design and excellent maintenance, this bridge is in remarkably good structural health today and plans were put forth to extend its life to 150 years. Notwithstanding its good overall condition, the initial survey ...

### 5:00 PM

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#### IBC 19-40: Multiaxial Fatigue Life Assessment of a Vertical-Lift Bridge Connection using Strain Rosette Data

*Sofia Puerto Tchemodanova and Masoud Sanayei, Tufts University, Medford, MA; Erin Santini Bell, University of New Hampshire, Durham, NH*

Fatigue-induced damage is one of the most common types of damage experienced by civil engineering structures subjected to cyclic loading such as bridges and roller-coasters. Similar techniques for the estimation of remaining fatigue life can be used in both highway bridges and roller-coaster connections because of the similarities of these structures in term of structural and environmental demand as well as maintenance procedures. A framework for the analysis of multiaxial fatigue damage using strain rosettes installed on welded connections is proposed....

## DESIGN, PART 2 SESSION

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*Tuesday, June 11, 1:30 – 5:30 PM*

*Room: Woodrow B/C/D*

*Chair: Matthew A. Bunner, P.E., HDR Engineering, Weirton, WV*

Our “Design 2” Session has an exciting and diverse collection of presentations on interesting projects from across the country and across the Atlantic. Our eclectic mix includes topics ranging from MASH-compliant barrier gate design for bridges, to historical and research discussions, to various project challenges. Each presents a complex issue that had to be addressed to facilitate the design of various components of both steel and concrete bridge types.

### 1:30 PM

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#### IBC 19-41: Virginia Adjacent Member Connections (VAMC) for Prestressed Concrete Box Beams and Voids Slabs

*Junyi Meng, Ph.D., P.E., Virginia DOT, Richmond, VA*

Shear keys are a critical element in prestressed concrete box beams and slabs. The primary function of the shear keys is to hold the prestressed concrete members together and transfer live loads. Failure or loss of effectiveness of the shear keys is a nationwide issue. VDOT, working closely with Virginia Tech, developed an innovative connection for prestressed concrete members. The connection is reinforced and filled with Very High Performance Concrete (VHPC). Several bridge designs using the connection are presented.

### 2:00 PM

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#### IBC 19-42: Replacing a Historic Welded Steel Rigid Frame Bridge

*Rebekah Gaudreau, P.E., WSP USA, Eliot, ME; Adam Stockin, WSP USA Inc, Manchester, NH; Joe Adams, New Hampshire DOT, NH*

The existing 216' long, 3-span continuous welded steel frame structure over I-93 was built in 1962. Though this bridge was in good condition due to its high profile standing on the historic bridge register, it needed to be replaced because of the much-needed widening of the interstate. This presentation focuses on the replacement bridge which had to emulate the aesthetics of the existing structure.

### 2:30 PM

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#### IBC 19-43: Evolution of Bolt and Rivet Shear Strength in Steel Structures

*Raymond Tide, D.Sc., S.E., and Douglas Crampton, Wiss, Janney, Elstner Associates, Inc., Northbrook, IL*

The shear strength of connections (bolt or rivet) is dependent upon the material properties of both the connector and the connected gusset plates. Historical theoretical and empirical solutions were developed to address this issue. Based on extensive and available connection test data, a re-evaluation allowed a revision to the empirical procedure, in either allowable stress (ASD) or ultimate strength (LRFD) format. The proposed revised procedure is presented.

### 3:00 PM BREAK

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### 3:30 PM

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#### IBC 19-44: Advantages of Fully Bonded Permanent Top Strands in Precast/Prestressed Concrete Bridge Girders

*Richard Pickings, P.E., BridgeSight Inc., South Lake Tahoe, CA; Richard Brice, P.E., Washington State DOT, Olympia, WA*

The control of concrete stresses near the ends of precast/prestressed concrete bridge girders is a critical element of flexural design. Large pre-compression forces due to eccentrically placed prestressing strands can cause tension overstress at the top face of the girder. Traditional strategies for controlling girder end stresses add time and cost to fabrication processes. A safer, and more cost effective strategy is presented.

### 4:00 PM

#### IBC 19-45: Detailing for Precast Elements Under High Seismicity in the Sound Transit Northgate Link Extension

*Justin Clark, P.E. and Yakov Polyakov, P.E., SE, WSP USA, Seattle, WA*

The 2,500-ft long aerial guideway and elevated station within the Sound Transit Northgate Link light rail extension is comprised of multiple cantilever and straddle bents to carry the precast concrete tub girder guideway over a four-lane roadway twice. The high seismicity and geometric constraints of the project area, coupled with the complex details required to frame precast members into cast-in-place (CIP) elements, forced the design team to creatively solve these challenges to meet project needs.

### 4:30 PM

#### IBC 19-46: 3D Simulation Testing of Resistance Barrier Gates

*Rama Krishnagiri, P.E. and Steven Esposito, P.E., WSP USA, Lawrenceville, NJ; Michael Abrahams, P.E., WSP USA, New York, NY; Steven Harlackner, P.E., Hardesty & Hanover, New Haven, CT; John Longworth, New Jersey DOT, Trenton, NJ*

The team was challenged to design resistance barrier gates for a movable bridge to comply with the 2015 AASHTO Manual for Assessing Safety Hardware (MASH), sustain Test Level -2, improve time of operation, and provide an infinite fatigue life in an aggressive coastal environment with design wind gust speeds of 125 mph. This paper presents site specific challenges addressed in an accelerated timeframe.

### 5:00 PM

#### IBC 19-47: Reduced Partial Factors for Load Assessment in UK Assessment Standards

*Chris Hendy, FEng, MA CEng FICE Eur Ing, Atkins SNC-Lavalin, Epsom, United Kingdom*

Design standards are based upon a range of input variables for resistance, action and modelling. The distribution type and parameters for each determine the partial factors appropriate to achieve a defined reliability level over a specified reference period. This paper presents a study investigating appropriate reduced partial factors to be applied through UK assessment standards, including case studies.

## W-6: BrIM APPLICATIONS BEYOND DESIGN ENGINEERING

*Tuesday, June 11, 2019; 1:30 – 3:30 PM*

*Room: Magnolia 1*

*Ivan Liu, P.E. and Jerry Pfuntner, P.E., S.E. FINLEY Engineering Group, Tallahassee, FL*

The objective of this workshop is to provide a greater understanding of FINLEY's use of BrIM, touching on aspects from both steel and concrete case studies. Further, this workshop will provide attendees with a comprehensive overview of a successful implementation of Bridge Integration Modeling (BrIM). It will further the understanding as to how FINLEY utilizes BrIM in the



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planning, design, and construction process. Additionally, it will demonstrate the great benefits that FINLEY has gained through this approach.

### W-7: EXPERIENCES IN THE PERFORMANCE OF BRIDGE BEARINGS AND EXPANSION JOINTS USED FOR HIGHWAY BRIDGES

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*Tuesday, June 11, 1:30 – 3:30 PM*

*Room: Magnolia 2*

*Bijan Khaleghi, Washington State DOT, Olympia, WA*

Domestic Scan 17-03, Experiences in the Performance of Bridge Bearings and Expansion Joints Used for Highway Bridges was initiated to facilitate the exchange of recent ideas and best practices for Bridge Bearings and Expansion Joints, and included design, performance evaluation, maintenance and repair/reconstruction. Discussions involved staff from design, construction, maintenance and operations of state and other transportation agencies. Details for various bridge types (i.e. materials, span arrangements, geometry) and sizes were examined. The workshop offers lessons learned ...

### W-8: GROUTING OF POST TENSIONED BRIDGES, A HISTORICAL PERSPECTIVE

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*Tuesday, June 11, 4:00 – 6:00 PM*

*Room: Magnolia 1*

*Randall Poston, Ph.D., P.E., S.E., NAE, Pivot Engineers, Austin, TX; Gregg A Freeby, ASBI, Buda, TX; Miroslav F. Vejvoda, Post Tensioning Institute (PTI), Farmington Hills, MI; Andy Mish, P.E. Modjeski and Masters, Littleton, CO*

The Workshop is intended to provide a comprehensive presentation of the development of grouting methods currently used to protect Post Tensioning systems in Concrete Bridges. Information on best practices, technical resources available to designers, design advantages of bonded, cementitious grout, review of the performance of the system, lessons learned and project experiences will be presented. Attendees will obtain a better understanding of the technology and how it can be successfully used in future projects.

### W-9: INNOVATION IN DESIGN AND CONSTRUCTION CHALLENGES OF JOINTLESS BRIDGES IN SEISMIC REGIONS – FROM RESEARCH TO IMPLEMENTATION

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*Tuesday, June 11, 4:00 – 6:00 PM*

*Room: Magnolia 2*

*Dr. Phil Yen, International Association of Bridge Earthquake Engineering (IABEE), Centreville, VA; Bijan Khaleghi, Washington State DOT, Olympia, WA*

Jointless bridges are constructed to work integrally with intermediate piers and abutments. Movements due to creep, shrinkage and temperature changes are accommodated by using flexible Bearings or foundation and through incorporating relief joints at the ends of the approach slabs. Advantages of jointless bridges include reduced maintenance costs, improved structural integrity, reliability and redundancy, improved long-term

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serviceability, improved riding surface, and reduced initial cost. In recent times, jointless bridges have been built in seismically sensitive areas. This workshop ...

### IBC AWARDS DINNER

*Tuesday, June 11; 5:30 –7:30 PM*

*Room: Cherry Blossom Ballroom*

*Host: Thomas G. Leech, P.E., S.E., Gannett Fleming, Inc., Pittsburgh, PA*

Each year the IBC Executive Committee recognizes excellence in bridge design and engineering through the IBC Awards Program. This special dinner is held to honor those selected for the 2019 Awards. Advance reservations are required for this ticketed dinner — please check with the IBC Registration Desk for availability.



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# Wednesday

## SESSIONS

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### IBC EXHIBIT HALL BREAKFAST

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*Wednesday, June 12; 7:30 – 9:00 AM*

*Room: Prince George Exhibit Hall E*

Start your Wednesday off right with a visit to the IBC Exhibit Hall for our continental breakfast and coffee break! Open to all attendees! Wednesday morning sessions start at 8:00 AM, giving all attendees an early opportunity to visit the Exhibit Hall.

### ICONIC NEW BRIDGES SESSION

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*Wednesday, June 12, 8:00 AM – 12:00 Noon*

*Room: Annapolis*

*Chair: Kenneth J. Wright, P.E., HDR Inc., Pittsburgh, PA*

Iconic Bridges make a statement about the communities where they are located, becoming an integral part of the community fabric. Such bridges often pose design and construction challenges in order to make the statement desired by the community. This session highlights two high-profile projects that are certainly iconic. Both design and construction challenges are highlighted, providing ideas that may inform thinking on the development of other local but less visible projects.

#### 8:00 AM

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##### IBC 19-48: Owner Objectives and Delivery Method for the New Samuel De Champlain Bridge Corridor Project

*Guy Mailhot, P.Eng., M.Eng., Infrastructure Canada, Montreal, QC, Canada*

A rapidly deteriorating condition of the existing Champlain Bridge in Montreal, led the Government of Canada to accelerate its replacement and ultimately award a \$3.98 billion CDN contract to Signature on the Saint Lawrence Group to deliver a new replacement crossing. Entailing a 3.4 km long structure over the St. Lawrence River with some 193,000 m<sup>2</sup> of new deck construction, the works represent one of the largest infrastructure projects currently underway in North America and will produce Canada's ...

#### 8:30 AM

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##### IBC 19-49: The New Samuel De Champlain Bridge – Performance and Design Criteria

*Marwan Nader, Ph.D., P.E., T.Y. Lin International, San Francisco, CA*

The New Champlain Bridge is one of the highest profile infrastructure projects in North America due to its economic importance to the region, the premature deterioration of the existing structure, and its visibility from throughout the metropolitan area. The NBSL is comprised of three bridges: a 529m signature span comprised of a asymmetric cable-stayed bridge with a main span of 240m; a 762m East Approach with a maximum span of 109m; and 2,044m West Approach with a typical span of 80.4m. This paper...

#### 9:00 AM

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##### IBC 19-50: Design of the Cable-Stayed Bridge Signature Span of the New Samuel De Champlain Bridge

*Marwan Nader, Ph.D., P.E., T.Y. Lin International, San Francisco, CA*

The cable-stayed bridge of the New Champlain Bridge Project is a signature crossing. The asymmetrical structure features a 124m back span and a

# Wednesday

## SESSIONS

240m main span. The 160m-high, single-pylon consists of a tuning-fork configuration of twin masts. Inclined concrete tower legs and “W”-shaped steel pier caps supporting the deck define the unique aesthetics of this bridge. The focus of this paper is to describe the bridge including a discussion of the superstructure, main span tower, supporting piers and cable-stay ...

### 9:30 AM

#### IBC 19-51: Technical Challenges in Design of the Approach Viaducts of the New Samuel De Champlain Bridge

*Zachary McGain, P.Eng., P.E., SYSTRA - IBT, Laval, QC; Sevak Demirdjian, SNC Lavalin, Quebec, Canada*

The New Champlain Bridge is an iconic structure, being delivered on an extremely fast-tracked schedule. Add to that numerous limitations on construction activities arising from the sensitive river environment, difficult climatic conditions, and concerns over existing regional infrastructure. Finally, throw in strict visual quality requirements to achieve a pre-published architectural concept. This paper discusses how the above conditions guided decision making and design concepts for the approach structures and specific design challenges encountered while meeting the expectations...

### 10:00 AM BREAK

### 10:30 AM

#### IBC 19-52: Innovative Construction Means and Methods for the New Samuel De Champlain Bridge

*Jeff Rogerson, P.Eng. and Gonzalo Osborne, P.Eng., P.E., PMP, Flatiron Construction Corporation, Ile-de-Sœurs (Verdun), QC Canada*

Signature on the Saint Lawrence Construction (SSLC), a consortium comprised of SNC-Lavalin Inc., Flatiron Constructors Canada, Dragados and EBC, is mandated to build the New Champlain Bridge Corridor Project (NCBCP). Significant challenges include: Construction schedule: The Bridge must be in service by December 2018. The Seaway traffic must be maintained during the main span's construction. This paper discusses among others, the following innovative construction methods used for the New Champlain Bridge (NCB): A custom-built gantry for the installation of the precast ...

### 11:00 AM

#### IBC 19-53: Creation of an Elegant and Iconic New Frederick Douglass Memorial Bridge

*Kenneth V. Butler, P.E., AECOM, Glen Allen, VA; Delmar D. Lytle and Richard W. Kenney, District DOT, Washington, DC; Eric Hayes, South Capitol Bridgebuilders, Washington, DC*

The existing Frederick Douglass Memorial Bridge, one of the District's busiest commuter gateways, is 70-years old and past its service life. South Capitol Street was a primary corridor in Major Pierre L'Enfant's 1791 Plan of the City of Washington, which developed South, East and North Capitol streets to extend directly from the U.S. Capitol, and become prominent gateways to the Monumental Core. Underscoring this historic plan, DDOT and the Design Build team were tasked with creating a new bridge design...

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### 11:30 AM

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#### IBC 19-54: Design and Erection Analysis of the New Frederick Douglass Memorial Bridge

*Nathan M. Porter, P.E. and Eric T. Nelson, AECOM, Glen Allen, VA*

This presentation will focus on the technical aspects of designing a signature arch bridge. The 540-foot long multiple arch spans have many challenges technically including: stability of parallel unbraced arches; geometric control of variable depth hexagonal arches 7 to 14 feet deep; thermal movement of 3 sequential arches; critical steel arch base connections into post-tensioned concrete v-piers; use of cable-stay technology to support the superstructure including accommodation of rotation and translation; 1800-ton capacity steel pipe piles; complex substructure shapes and water line footings...

### SEGMENTAL CONCRETE/RAIL/TRANSIT SESSION

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*Wednesday, June 12, 8:00 AM – 12:00 Noon*

*Room: Woodrow A*

*Chair: Jennifer C. Laning, P.E., Pennoni, Baltimore, MD*

This session highlights some of the latest signature projects in segmental concrete bridge design and the latest knowledge and developing expertise for rail structures. Featured are overviews on unique segmental concrete bridge projects from the United States, India and Turkey, as well as discussions of design and preservation challenges for railroad bridge structures that will interest owners, analysts, designers and constructors.

### 8:00 AM

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#### IBC 19-55: Landmark Extradose Bridge on the Ganges River

*Morgan Trowland, P.Eng., McElhanney Consulting Services, Vancouver, BC Canada; David Jeakle, McElhanney Consulting Services, Tampa, FL*

The upcoming Sultanganj Bridge will feature the largest extradose spans in India and will form an iconic landmark at a significant cultural site on the revered Ganges River. This \$300M crossing will provide much needed transport links to accelerate development in a remote region of Bihar, a north eastern state of India home to over 100 million people. The 2 mile, 30 span structure features 5110ft of extradose spans: a precast segmental superstructure assisted by a single plane of stay cables on ...

### 8:30 AM

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#### IBC 19-56: Design and Construction of a Modern Concrete Segmental Bridge

*John Dvorak, P.E., CBI and Ken Heil, P.E., Figg Bridge Engineers, Inc., Englewood, CO*

The new Cline Avenue Bridge over the Indiana Harbor and Ship Canal in East Chicago, Indiana is under construction. The previous bridge was closed in 2009 and removed by Indiana DOT due to deficiencies. The new elevated expressway bridge is being accomplished with 100% private funding and will reconnect the 3.5-mile gap of State Road 912 between Calumet and Michigan Avenues. It is part of the state highway system and provides a vital link to important commercial industries and employment centers ...

# Wednesday

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### 9:00 AM

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#### IBC 19-57: Design of Ihsaniye Viaduct of Northern Marmara Motorway

*Julien Erdogan, Francois Pissot, Giulio-Maria Scotto, Michal Ambor, and Umut Aldatmaz, Freyssinet, Rueil Malmaison, Veuillez Sélectionner, France*

Ihsaniye viaduct is a key link to Istanbul New Airport, one of tomorrow's megastructure. The viaduct, initially designed as a pre-tensioned I girders bridge, with 45m span, pier heights up to 37m and large foundations, is 860m long. Freyssinet offered an alternative optimized design based on post-tensioned concrete box girder together with incremental launching method (ILM) with 66m span, making this project outstanding in terms of maximum launching span without temporary support. This construction method also facilitates crossing of two existing highways placed ...

### 9:30 AM

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#### IBC 19-58: Study of Rail Break Gap on Bridges: Finite Element Analysis, Modification of Gap Formula and Parametric Investigation

*Hamid Omran, Ph.D., P.Eng. and Cari Smit, P.Eng., Stantec, Calgary, AB Canada*

Design of railway bridges supporting continuously welded rails requires an accurate estimation of the gap at possible rail break. The estimated rail gap shall be smaller than the allowable values to avoid derailment. A literature review revealed the inaccuracy of the existing gap formulas. The authors developed a nonlinear 2D Finite Element (FE) model of the rail structure and validated it against the available analytical approaches for ballast tracks. This study further employed the FE model to estimate the rail break gap ...

### 10:00 AM BREAK

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### 10:30 AM

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#### IBC 19-59: Design of a Concrete Tied-Arch Bridge for California High-Speed Rail Requirements: Use of Vertical Hangers vs Inclined Hangers

*Ebadollah Honarvar, Ph.D., P.E., Martin Kendall, P.E., and Suhail Albhaisi, Ph.D., P.E., Jacobs, New York, NY*

When use of steel is unfavorable, a concrete tied arch bridge is a feasible and cost-effective structural system to support high-speed rails spanning a relatively long distance over existing features on the ground while providing minimum horizontal and vertical clearance requirements. In this paper, a systematic study was carried out to optimize the structural performance and design of a complex 236 ft long single span concrete tied arch bridge by investigating the effect of hanger configuration on the bridge ....

### 11:00 AM

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#### IBC 19-60: Myrtle Avenue Bridge: The Accelerated Replacement of the New York City Transit Bridge

*Arjuna Ranasinghe, Ph.D., P.E., S.E., PP, Mohamad Feteiha, P.E. and Lauren Weber, P.E., Jacobs Engineering, New York, NY*

The Myrtle Avenue Bridge also known as the Fresh Pond Bridge replacement is one of the few such undertakings by the New York City Transit in its history. The existing bridge superstructure had three - 52' span through-girders and

# Wednesday

## SESSIONS

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carried two tracks of the MTA Subway M Line over New York and Atlantic Railway. This was replaced with a bridge having three - 67' span through-girders. The substructure of the existing bridge had gravity ...

### 11:30 AM

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**IBC 19-61: Behavior of Eyebars on a 110-year Old Truss Railroad Bridge**  
*David Jacobs, P.E., F.ASCE and Ramesh Malla, Ph.D., University of Connecticut, Storrs, CT*

From the mid-1800s until the early 1900s, eyebars were commonly used as tension members in steel truss railroad bridges. Eyebars were favored by structural designers of the period because they a) were easy to fabricate, b) faster to erect than other shapes, and c) minimized secondary stresses by allowing freer rotation at joints. The objective of this research was to gain a better understanding of the effects of excessive wear on the eyebars and connecting pins due to age of very old truss railroad ...

### SPECIAL INTEREST SESSION

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*Wednesday, June 12, 8:00 AM – 12:00 Noon*

*Room: Woodrow B/C/D*

*Chair: John C. Dietrick, P.E., S.E., Michael Baker International, Cleveland, OH*

This session will deal with a variety of special topics related to bridge design, construction and rehabilitation. The presentations will include discussions of unique bridge types ranging from covered bridges to cable-supported extradosed bridges. Presentations will also discuss new approaches to evaluating extreme loading conditions such as seismic loads and vessel impact, as well as unique solutions including accelerated bridge techniques to address difficult construction challenges.

### 8:00 AM

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**IBC 19-62: Low-Cycle Fatigue Cracking of Delaware DOT BR 1-501: A Case Study**

*James Bellenoit, P.E., AECOM, Mechanicsburg, PA*

Major rehabilitation of the multi-span Newport Viaduct (DelDOT BR 1-501) was initiated in 2010 and substantially complete in 2015. Phased construction was used to maintain two lanes of traffic northbound and southbound at all times. Throughout the various stages, traffic was temporarily shifted onto the outside shoulders of the structure to facilitate construction across the width of the bridge. Normal traffic patterns were restored on the bridge in the summer of 2014. During an NBIS inspection in March 2015, several...

### 8:30 AM

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**IBC 19-63: Implementation for Design of Bridges to Resist Dynamic Barge Impact Loads**

*Michael Davidson, Ph.D., P.E., Henry Bollmann, and Gary Consolazio, University of Florida, Gainesville, FL*

Bridges spanning navigable waterways are designed to resist vessel collision loading, including loads generated during barge impact events. While

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## SESSIONS

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design provisions have promoted improved assessments of bridge structures (e.g., risk assessment, computation of nonlinear response), the existing design approach involves static characterizations of vessel collision load and bridge response. However, 15 years of Florida Department of Transportation research on barge-bridge impacts have shown that: (1) impact load and bridge response are dynamic; and, (2) incorporating dynamic effects can ...

### 9:00 AM

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#### IBC 19-64: Bridge Foundations: Constructability Considerations in the Design and Selection Process

*Steve Fung, P.E., Schnabel Engineering, Baltimore, MD*

Bridge foundations are designed based on the AASHTO LRFD Design Specifications, 7th Edition, 2014. The specifications provide design guidelines for the design of different foundation elements, however, the selection of the appropriate foundation type for support of the bridge structure is ultimately the responsibility of the designer. The selection of the appropriate foundation type is typically based on one or more of the following factors: The magnitude and type of foundation loads, The subsurface conditions at... Urban fill, High groundwater, Soft compressible soils, Available space/Site constraints, Karst/Sinkholes, and Scour.

### 9:30 AM

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#### IBC 19-65: Poplar Street Bridge Slide

*Gregory Kuntz, P.E., HDR, St. Louis, MO; Stacy McMillian, P.E., Missouri DOT — Bridge Division, Jefferson City, MO*

The Poplar Street Bridge is a five span (300'-500'-600'-500'-265') 2165' long structure which carries I-64, I-55 and I-70 over the Mississippi River in downtown St. Louis and connects Missouri and Illinois. The bridge is actually twin Eastbound and Westbound Structures carrying 4 lanes of traffic each and consisting of two variable depth steel box girders (25' max. depth) with an orthotropic steel deck on a shared substructure. The Missouri Department of Transportation hired HDR to provide the following improvements ...

### 10:00 AM BREAK

### 10:30 AM

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#### IBC 19-66: Bringing the Past to Life: Historic Glendale Bridge Restored and Repurposed

*Anthony Steffee, P.E., Mead & Hunt, Inc., Lexington, SC*

By rehabilitating its framework and restoring the bridge to its historical charm, Mead & Hunt gave the Glendale steel truss pedestrian bridge new life and provided safe, reliable access over Lawson's Fork Creek. The existing 292-foot-long, three-span steel truss bridge was constructed in the 1930s and taken out of vehicular service in 1978 and given to Spartanburg County, after which, it was left to decay. Though this structure serves as a focal point in the counties trails system, the existing bridge had deteriorated to the ...



### 11:00 AM

#### IBC 19-67: Frances Appleton Pedestrian Bridge Design and Construction

*Miguel Rosales, AIA, Rosales + Partners, Boston, MA*

The Frances Appleton Pedestrian Bridge is an innovative steel 225' arch bridge with curvilinear approaches located along the Charles River in downtown Boston, MA. The presentation and paper will explain the



*View of the Frances Appleton Pedestrian Bridge with Longfellow Bridge in background.*

aesthetic design and engineering goals that guided the construction process and completion of the project. The bridge is the first ADA accessible 14' wide bridge to the Esplanade a historic waterfront park along the most important river in the city. An overall architectural theme was used which included...

### 11:30 AM

#### IBC 19-68: Village Covered Bridge (Friendship Bridge) Adaptive Reuse

*James Hall, Jr., P.E. and Robert Durfee, P.E., Dubios and King, Bedford, NH*

In 2014, the NHDOT advised the Town of Wentworth that the pedestrian crossing (1909 steel truss bridge) over the Baker River in the Village of Wentworth was beyond rehabilitation and would be closed to pedestrian use and removed. The closure required school children to travel on an unprotected shoulder to the bus stop on a 0.5-mile detour. The existing truss bridge had provided protected pedestrian access from the Historic Village to the school bus stop. The NHDOT estimated the cost of rehabilitating ...

### W-10: INTERNATIONAL WORKSHOP ON EMERGING BRIDGE TECHNOLOGIES

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*Wednesday, June 12, 8:00 AM – 12:00 Noon*

*M. Myint Lwin, P.E., S.E., Consultant, Olympia, WA; Thomas G. Leech, P.E., S.E., Gannett Fleming, Inc., Pittsburgh, PA; Ronald D. Medlock, P.E., High Steel Structures, Lancaster, PA*

The main objective of this workshop is to invite speakers from the U.S., China and other Countries to share their experiences with emerging bridge technologies in innovative bridge design, construction, inspection, maintenance and preservation for improving the safety, durability, and economy of highway/railway bridges and tunnels. There will be time for attendees to ask questions after each presentation. After all the presentations are completed, there will be an "Open Forum" for general discussion of topics presented and other issues of interest to the participants. Attendees of this IBC workshop will be able to gain broad understanding of emerging bridge technologies that will positively impact bridges of tomorrow.

#### Sustainable Bridge Design for Durability, Inspectability and Maintainability

*Qi Ye, Consultant, NJ; Mike Venuto, Delaware River Port Authority, DE*

# Wednesday

## SESSIONS

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### Shape Memory Alloy & Engineered Cementitious Composite Material Research & Development for Seismic Applications

*M. Saiid Saiidi Ph.D., P.E., Prof, University of Nevada in Reno, Reno, NV*

### Challenges and Solutions in the Design and Construction of the Humen No. 2 Suspension Bridge Across the Mouth of the Pearl River

*Yanbing Li, Guangdong Highway Construction, China*

### Zinc Thermal Spray for Corrosion Protection Bridges in Norway

*Ole Knudsen, SINTEF, Norway; Martin Gagne, International Zinc Association*

### Bridge Foundation Real Time Scour Monitoring System

*Yung-Bin Lin, National Center for Research on Earthquake Engineering, Taipei, Taiwan*

### Structural and Cost Advantages of Innovative Concrete Filled Steel Tubular Large Arch and Truss Bridges

*ingmin Mou, Design and Research Institute, China*

### Open Forum

## W-11: FHWA BRIDGE SECURITY DESIGN MANUAL: OVERVIEW, APPLICATION, AND BEYOND

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*Wednesday, June 12, 8:00 AM – 12:00 Noon*

*Room: Magnolia 2*

*Eric Sammarco, Ph.D., P.E., Protection Engineering Consultants, LLC, Austin, TX*

Physical security of highway bridges is a critical national issue that is not consistently addressed in industry. The U.S. Federal Highway Administration (FHWA) recently teamed with industry and academia to develop the FHWA Bridge Security Design Manual (Manual). During this workshop, the Manual authors and FHWA personnel will provide an overview of the Manual as well as state-of-the-practice in bridge security, industry best practices, resiliency-based design strategies, and future R&D needs.

## IBC EXHIBIT HALL LUNCHEON

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*Wednesday, June 12; 12:00 Noon – 2:00 PM*

*Room: Prince George Exhibit Hall E*

Join us for lunch and a final opportunity to visit with the exhibitors of IBC! Following the conclusion of the morning sessions, all registered attendees of the IBC are welcomed to enjoy lunch throughout the Exhibit Hall. Enjoy this last opportunity to visit with the exhibitors and view the outdoor displays, while you network with your fellow attendees.

# Wednesday

## SESSIONS

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### SEISMIC SESSION

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*Wednesday, June 12, 1:30 – 3:30 PM*

*Room: Annapolis*

*Chair: M. Patrick Kane, P.E., Greenman Pederson, Inc., Pittsburgh, PA*

This Session presents three research studies and one bridge design. First are live load responses on seismic modelling of a simply-supported bridge. Second is mass redistribution in the superstructure of irregular bridges to address seismic response. Third is seismic loading and design for concrete filled steel tubes. Finally, is a seismic design for a bridge with integral abutment piles.

#### 1:30 PM

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##### IBC 19-69: Novel Approach towards Improving the Seismic Response of Irregular Bridges: Tuned Structures

*Samantha Chaudhari and Max Stephens, University of Pittsburgh, Pittsburgh, PA*

Irregular bridge structures (e.g. bridges with large skew or bent-to-bent stiffness irregularities) are susceptible to greater damage from seismic loading due to increased displacement demands resulting from torsional effects. Current codes governing the design of bridges recognize the vulnerability of these structures, and impose stricter standards to improve performance, however these provisions have not always been effective in controlling deformations and reducing damage. To improve the seismic performance of irregular bridge structures, this research is focused ...

#### 2:00 PM

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##### IBC 19-70: Repair of CFST Bridge Columns Subjected to Seismic Loading

*James Bumstead and Max Stephens, University of Pittsburgh, Pittsburgh, PA*

Concrete filled steel tubes (CFST) are frequently more efficient and economical than conventional reinforced concrete (RC) and/or structural steel in highway bridge construction. Recent research has resulted in practical and structurally robust connections between CFST columns and precast concrete sub and superstructure elements to facilitate accelerated bridge construction in moderate and high seismic regions. One such connection, referred to as the embedded ring (ER) connection, is a fully restrained, full-strength moment resisting connection which relies on an annular ring, ...

#### 2:30 PM

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##### IBC 19-71: Seismic Design of Integral Abutment Bridge

*Mohamed Zawam, Trevor Small, and Xiaocen Jia, WSP Canada Inc., Oakville, ON Canada*

This paper discusses challenges associated with the design of Highway 401 underpass at 3rd line road, Bainsville, Ontario. The superstructure was an integral abutment type structure with cast-in-place reinforced concrete deck composite with five (5) precast prestressed concrete NU 1600 girders. The integral abutments were founded on steel H-piles driven to bedrock. The piers comprise a reinforced concrete bent supported by two circular columns. The seismic design was according to the new provisions in CHBDC 2014. ...

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# Wednesday

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### 3:00 PM

#### IBC 19-72: Preliminary Analytical Study of Live Load Effect on Seismic Responses of Simply Supported Bridge

*Cunyu Cui and Professor Yan Xu, Tongji University, Shanghai, Shanghai China*

With the massive transport infrastructure projects developed nationwide in China in recent years, large numbers of viaducts were constructed. The chance when vehicles are crossing a viaduct while an earthquake happening is considerably higher than the past, especially in the urban areas with increasing congestion. However, despite live load may or may not be included in bridge seismic design according to current codes, the realistic effect of live load on bridge seismic response is still unclear, especially ...

### INSPECTION & ANALYSIS SESSION

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*Wednesday, June 12, 1:30 – 3:30 PM*

*Room: Woodrow A*

*Chair: Raymond A. Hartle, P.E., GAI Consultants, Inc., Cranberry Township, PA*

Join us for a look at several leading-edge bridge safety inspection and analysis efforts in our industry. This session will provide exposure to the worlds of drone inspection and underwater inspection through 3D sonar visualization, as experienced by the FHWA Minnesota Division and Minnesota DOT respectively. Also covered is the application of the FHWA “TOMIE” Manual for tunnel inspection and perimeter geologic mapping of a two-mile long tunnel in Arizona. This session will wrap-up with an example analysis and load rating of a 3-span continuous open spandrel concrete arch bridge in Virginia using 3D refined analysis to properly apply AASHTO criteria.

### 1:30 PM

#### IBC 19-73: A New View for Bridge Inspectors

*Joe Campbell, P.E., M.S.C.E., FHWA - MN, St Paul, MN*

This presentation is based on the work the FHWA Minnesota Division has been working on to advance the opportunity for Local Program Agency’s and their use of drones to supplement bridge inspections. The MN Division focus has been on recreational/affordable drone options that could be tools for the Team Leaders and inspection staff. This work has led to the identification of a cost effective drone system that can be readily purchased for around \$3,000. This work also identified, how first person vision goggles, an accessory...

### 2:00 PM

#### IBC 19-74: Seeing beyond the Surface - Underwater Visualization using 3D Sonar

*Nicole Bartelt, P.E., Minnesota DOT, Oakdale, MN; Barritt Lovelace, Collins Engineers, St. Paul, MN*

How can you adequately inspect and maintain things that are hard to see? Bridge inspectors often have to find out what lies beneath the surface of rivers. Typically, we turn to professional divers to provide information about what’s underwater. But diving inspections don’t always deliver precise information about bridge damage, debris and riverbed topography. To overcome these limitations MnDOT has incorporated innovative 3D sonar

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equipment to provide detailed underwater imaging. Thanks to this inspection technology, we now have a way to see previously hidden riverbed floors ...

### 2:30 PM

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#### IBC 19-75: Inspection of the Glen Canyon Dam Access Tunnel in Page, Arizona

*Steve Brandon, P.E., P.G., Schnabel Engineering Inc., Sterling, VA; Matthew Koziol, Schnabel Engineering Inc., Dallas, TX; Lee Renegar, Underground Support Services, LLC, Dallas, TX*

The Glen Canyon Dam Tunnel, owned by the Bureau of Reclamation (USBR), is a two mile long, 24-ft high, and 22-ft wide horseshoe shaped tunnel; the project is located in Page, Arizona. The tunnel was completed in 1958 and was driven through massive Navajo Sandstone by the drill-and-blast method. The tunnel has limited access and is used by the USBR on a daily basis to access the power plant at the base of the dam, summertime ...

### 3:00 PM

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#### IBC 19-76: A Refined Analysis Method for Load Rating a Spandrel Arch Bridge

*Khatereh Vaghefi, Ph.D., P.E., Shiwei Luo, and Alireza Hedayati, WSP USA, Herndon, VA*

For bridges with complex geometry that do not fall in the AASHTO criteria for live load distribution factor calculations, traditional analysis tools cannot be used to directly rate the structure. Load rating of complex bridges often requires investigations through 3D refined analysis or load testing. This paper will present a methodology to accurately define load rating of an open spandrel arch bridge with three continuous units in Virginia. The bridge was built in 1942 and consists of multiple continuous spans with high...

## PEDESTRIAN & SPECIAL BRIDGES SESSION

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*Wednesday, June 12, 1:30 – 3:30 PM*

*Room: Woodrow B/C/D*

*Chair: William Detwiler, P.E., T.Y. Lin International, Coral Gables, FL*

Ever wonder what makes a bridge iconic? Explore the context sensitive design strategies deployed for the 2nd Street Bridge over the Shoal Creek in Austin, TX and the type selection process that lead to this gleaming structural solution. Not crazy about vibrating pedestrian bridges? Learn how pedestrian induced vibrations can be mitigated before construction through parametric analysis or after through the use of novel tuned mass dampers on several projects throughout North America. Prefabricated temporary bridges not giving you enough load capacity? Check out how precast bulb tee beams provided a temporary solution for moving 1.5 million cubic yards of dirt and rock and saved one contractor a heap of cash.

# Wednesday

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1:30 PM

### IBC 19-77: Dynamic Analysis Evaluating Human Induced Vibrations in a Lightweight Suspension Bridge

*Martin Hudecek, Ph.D., E.I.T., Stantec Consulting Ltd., Victoria, BC Canada; Eduardo Arellano, P.Eng., Stantec Consulting Ltd., Kamloops, BC Canada*

In lightweight slender bridges, human induced vibrations can result in significant discomfort and yet compromise structural integrity if frequency of passing load, represented by walking or running pedestrians, synchronizes with the natural frequency of the bridge. This paper discusses a method of advanced dynamic analysis considering human induced vibrations in a suspension bridge. The method is demonstrated on the Bear River Siphon Suspension Bridge situated south of Grass Valley, CA. Predicted structural response is compared with the actual response obtained...

2:00 PM

### IBC 19-78: Heavy Haul Adjacent Bulb Tee Bridge

*Aaron Craig, P.E., P. Joseph Lehman, Inc., Duncansville, PA; Russell Dickson, P.E., Pennstress, Roaring Spring, PA*

This paper details the challenges faced and solutions developed in design, fabrication, and construction of a contractor's temporary bridge used by off-road heavy haul trucks over 4 traffic lanes on S.R. 0015



Bridge Inspection

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Union County, Pennsylvania. Through its 8-month life, more than 1 million cubic yards of dirt crossed this 140' single span. Construction was completed in less than 15 days, primarily during nighttime traffic shutdowns. This project demonstrates collaborative efforts between the contractor, fabricator, and ...

2:30 PM

### IBC 19-79: Pedestrian Bridges and Walkways — Controlling Vibration Through Tuned Mass Damper Design

*Pierre-Oliver Dallaire, M.A.Sc., ING, Trevor Haskett and Shayne Love, RWDI, Guelph, ON Canada*

Pedestrian bridges are often unique, lightweight and flexible. As such they are susceptible to vibrations from wind, seismic and from pedestrians themselves. This paper focuses on the pedestrian-induced vibrations which result from pedestrians walking across a bridge. RWDI studies performed on many pedestrian bridges include prediction of the force, simulation of the bridge response and the design and installation of tuned mass dampers (TMDs) to mitigate vibrations. RWDI has developed custom time domain routines ...

# Wednesday

## SESSIONS

**3:00 PM**

### IBC 19-80: Design and Construction of the 2nd Street Bridge - Austin, Texas

*Robert Anderson, P.E., S.E. and Trevor Kirkpatrick, P.E., AECOM, Tampa, FL*

As part of the revitalization of a decommissioned water treatment plant site in down town Austin, Texas, the new 2nd Street Bridge provides a vital link for vehicles and pedestrians over Shoal Creek between the new city library to the west and residential/retail areas to the east. The new bridge is designed, proportioned and detailed to offer an elegant solution to connect the two sides of the 2nd Street over Shoal Creek with an iconic structure ...



*Completed 2nd Street Bridge*

### W-12: MOVING FORWARD FOR MASH IMPLEMENTATION OF BRIDGE RAILING SYSTEMS - RESEARCH AND PRACTICE

*Wednesday, June 12, 1:30 – 4:30 PM*

*Room: Magnolia 1*

*Xiaohua Cheng, New Jersey DOT, Trenton, NJ; Richard W. Dunne, P.E., Rutgers, The State University of New Jersey, Piscataway, NJ, Robert Bielenberg and Scott Rosenbaugh, University of Nebraska, Lincoln, NE; William Williams, Texas A&M Transportation Institute, College Station, TX; Malcolm H. Ray and Christine E. Carrigan, Roadsafte LLC, Canton, ME*

The Workshop objective is 1) to provide comprehensive information on policy guidance and practice of MASH implementation for bridge railing in the wake of 2016 AASHTO/FHWA Joint Implementation Agreement for MASH; 2) to provide opportunity for DOTs, researchers and bridge practitioners to exchange information in this topic; 3) to ensure bridges are designed to protect both highway bridge and vehicle drivers.

### W-13: BRIDGE SCOUR PREVENTION

*Wednesday, June 12, 1:30 – 4:30 PM*

*Room: Magnolia 2*

*Roger Simpson, Ph.D., AUR, Inc., Blacksburg, VA*

Bridge failures from scour can occur quickly during peak flood events, so the Physics of Scour need to be understood and applied in cost-effective permanent Scouring-Vortex-Preventing Bridge Designs for all flow speeds, rather than statistical correlations with large uncertainties. Specific examples of Bridge Failures Due to Scour and government Regulations on Designing for Scour will be briefly reviewed. Designing to Prevent Bridge Scour During Extreme Events keeps high speed flow away from scourable surfaces.

# Bridging the Gap

## THEATRE PRESENTATIONS

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NEW THIS YEAR! We are pleased to introduce the “Bridging the Gap” theatre to the IBC! These informal presentations on a variety of bridge-related topics are given by experts in their field. The informal presentations are 25 minutes in length and start on the half-hour. Check the schedule below for details on times and topics. WANT TO PRESENT? There is still time to sign up for a time slot!

### Tuesday, June 11

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#### 9:30 AM

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##### *Turkey’s Best-kept-secret*

*Yunus Alp, Cimtast Steel, Bursa, Turkey*

In the last decade, world’s Top 5 longest suspension bridge ranking has changed with 2 new landmarks over Marmara Sea in the north-west Turkey. Izmit Bay Crossing (Osmangazi) Bridge, being the 4th longest, was opened to traffic in 2016; and 1915 Canakkale Bridge, to be the 1st longest in the world, is currently under construction. Cimtast Steel, an AISC certified fabricator, and the fabricator of choice in both projects is here to share their story.

### Tuesday, June 11

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#### 2:30 PM

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##### *Trusted Source Of Fast And Professional Answer for Bridge Engineering*

*Dilara Akdoganbulut, BridgeWiz, Ankara, Turkey*

BridgeWIZ is an engineering and consultancy company that provides design consultancy, construction supervision, monitoring & self-learning services in bridge engineering. BridgeWIZ is a company that conducts model analyzes, nonlinear structural solutions, construction phase controls, site visits, condition assessment, load test & data collection, etc. and is also an R&D company that makes software for bridge engineers. BridgeWIZ also attaches importance to volunteering projects and supports such works financially and morally.

### Wednesday, June 12

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#### 7:30 AM

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##### *Bridge Aesthetics and Interdisciplinary Collaboration*

This presentation will explore case studies of creating iconic bridges beloved by their communities. Our discussion will address:

- Approaching aesthetics as an interdisciplinary design process.
- Leveraging sketching and iterative models to hone a concept.
- Embracing community engagement to achieve desired outcomes.

*Donald MacDonald and Eric Birkhauser, Donald MacDonald Architects LLP, San Francisco, CA*



# Bridging the Gap

THEATRE PRESENTATIONS

**Wednesday, June 12**

**8:00 AM**

## *Aesthetic Bridge Lighting Technology and Application*

Disruptive changes in lighting technology have allowed owners, designers and communities to consider the nighttime appearance of their structures in ways that were unfathomable just a few years ago. HLB Lighting Design will provide an overview of these technologies and the opportunities they have opened up for creating iconic, postcard images of all types of bridges, in a wide variety of environments and contexts, in communities across the U.S. *Faith Baum, HLB Lighting Design, New York, NY*

**Wednesday, June 12**

**9:00 AM**

## *A Brief History on the use of X-Ray Diffraction on Bridges and Structures*

X-Ray Diffraction (XRD) has been widely used on bridges in the USA since the early 1990s. The most early use of the XRD technique to measure the dead load on eyebars of the Williamsburg and George Washington in NYC as part of a demonstration. The system allows the user to determine component dead load stress as well as live load stress. Typical components are eyebars and trusses.

*Charles Sheridan, Proto Manufacturing Ltd., Oldcastle, Ontario*



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# Outdoor

## EXHIBITS AND DEMONSTRATIONS

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**NEW THIS YEAR!** In addition to the exhibits in HALL E, please visit our outdoor exhibits and demonstrations. Located on the outdoor patio just outside of HALL E, our outdoor exhibits and demonstrations are open at all times during Exhibit Hall hours, weather permitting. Please note that some demonstrations are conducted on a specific schedule, while other displays are open continuously.

### Anderson UnderBridge

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Anderson UnderBridge — We get you UnderBridge for any reason!

Come out and see one of our truck-mounted hydra platforms and how easy, safe, and efficient it is to get UnderBridge for any reason whether to inspect, repair, paint, or access utilities under a bridge. Fast deployment in a single traffic lane, 180 degree platform rotation with a hydrostatic, self-propelled drive. Save time, energy and expenses when you purchase or rent from Anderson.

### R.J. Watson

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The Silicoflex Joint Sealing System was developed as a direct response to bridge owners asking for a higher quality, longer lasting, more universal joint sealing system. The Silicoflex system consists of an extruded preformed silicone gland, or inverted “v”, a single component locking adhesive, and two part primer providing a tremendously strong bond to the joint header. Silicoflex has garnered approvals from bridge owners all over the world for both new and rehab construction with installations that have been performing for well over 20 years on major highways across the US. Please join R.J. Watson for a demonstration at 12:15 PM on Monday, 10:00 AM on Tuesday, and 8:00 AM on Wednesday, to see how quick and easy this system is to install.

### Sixense

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Sixense will have its UScan nondestructive tool at the 2019 outdoor demo space. UScan is a tool developed and co-patented with IFSTAR laboratory. It evaluates the existence of broken wires inside a tensioned cable anchorage, facilitating the maintenance strategy for the structure. Used on more than 100,000 wires to date, UScan sends Ultrasonic guided waves into each individual wire of a strand end and provides a detailed instant picture of the anchorage's condition.

### Stronghold Coating Systems-

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We will show how easy it is to apply the new Bridge Bearing material MM 1018. This comes in two versions depending on the bearing or expansion joint area. The paste version is usable when the gap can be opened and after applying MM 1018 the gap can be set at its distance. The liquid version is usable where the gap is small and opening it is not possible. Then with some modifications MM 1018 can be injected into the gap area. Both materials have over a 1,000 applications and give a non-corrosive gap material that will last for years of service.

# Outdoor

## EXHIBITS AND DEMONSTRATIONS

### TyBot LLC

TyBot®, the award-winning autonomous rebar-tying robot, is demonstrating each day of the IBC at the top of every hour, during exhibit hall hours! Come witness how this new product can transform your bridge deck installation. Domestic and international media has already come to know that robotics are available to the construction industry today. Learn about how robots can assist your company in dealing with labor shortages, and worker injury, while increasing your overall productivity. Our staff is on site to answer any questions you have. Seeing is believing.

### Vector Corrosion Technologies Inc.

Vector Corrosion Technologies Inc. will be demonstrating the use of non-destructive testing and evaluation equipment as well as the installation of corrosion protection systems used to extend the service life of corroding bridges and post-tensioned tendons.

Question the ordinary  
*Imagine the extraordinary*  
Create the enduring

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- NBIS Bridge Inspections
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- Geotechnical Analysis and Foundation Design

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# Exhibit Hall

## PRINCE GEORGE HALL E, LOWER LEVEL

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The IBC Exhibit Hall is the place to be for attendees and exhibitors! The IBC Exhibit Hall is located in Prince George Hall E of the Gaylord's Convention Center, on the lower level. Thanks to all of our returning and new exhibitors for making the exhibit hall a "sold out" event! In addition to the many vendor exhibits, the IBC Exhibit Hall hosts the luncheons during the conference on Monday, Tuesday, and Wednesday, and Monday evening reception, as well as coffee & danish breakfast on Wednesday. All registered attendees are welcome to enjoy these events during the IBC. Please stop by and visit with our many exhibitors while enjoying your lunch and receptions.

The IBC Exhibit Hall is open:

- Monday, June 10: 12:00 Noon — 2:00 PM. with a strolling luncheon buffet.
- Monday, June 10: 5:00 — 7:00 PM with appetizers and bar service.
- Tuesday, June 11: 10:00 AM — 2:00 PM with a strolling luncheon buffet at 12:00 Noon.
- Wednesday, June 12: 7:30 — 9:00 AM with a continental breakfast.
- Wednesday, June 12: 12:00 Noon — 2:00 PM with a strolling luncheon buffet.

Below, you will find a numerical listing by booth number of all exhibitors, followed by an alphabetical listing with contact information and company description (NOTE: Where company description is truncated, you can view the full content on the IBC APP.) This listing contains all exhibitors as of May 24, 2019.

|             |  |
|-------------|--|
| 100         | Eriksson Technologies                          |
| 101/200     | CBSI   |
| 102         | Vector Corrosion Technologies Inc.             |
| 103         | JENSEN HUGHES                                  |
| 104         | HRV Conformance Verification Associates, Inc.  |
| 105         | Precast / Prestressed Concrete Institute (PCI) |
| 106         | AECOM  |
| 107         | D.S. Brown                                     |
| 110/112     | Cimtas Steel                                   |
| 111         | WireCo WorldGroup                              |
| 113         | Bureau Veritas North America                   |
| 114/116/118 | BrandSafway                                    |
| 115         | Evonik Corporation                             |
| 117         | OpenBrIM Platform                              |
| 119         | Viathor, Inc.                                  |
| 122         | Headed Reinforcement Corporation               |
| 123         | DYWIDAG-Systems International                  |
| 124         | Jenik Group                                    |
| 125         | A. Morton Thomas and Associates, Inc.          |
| 126         | Allplan, Inc.                                  |
| 127         | Iowa DOT                                       |

# Exhibit Hall

PRINCE GEORGE HALL E, LOWER LEVEL

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|         |  |
|---------|--|
| 128/130 | China Railway Hi-Tech Industry Corporation Limited     |
| 129     | Carl Stahl DecorCable                                  |
| 131     | Allen Engineering Corporation                          |
| 134     | MAX USA CORP.  |
| 135/234 | FATZER AG Wire Ropes                                   |
| 136     | Harcon Corporation                                     |
| 137     | RWDI   |
| 201/203 | Michael Baker International                            |
| 202     | Watson Bowman Acme                                     |
| 204     | Klaas Coatings (North America) LLC                     |
| 205     | Pennoni  |
| 206     | NANOKOTE North America, Inc.                           |
| 207     | MDX Software   |
| 210     | Figg Bridge Engineers, Inc.                            |
| 211     | National Steel Bridge Alliance (NSBA)                  |
| 212     | Freyssinet, Inc.                                       |
| 213     | Scougal Rubber   |
| 214     | Anderson UnderBridge                                   |
| 215     | St. Louis Screw & Bolt                                 |
| 216     | Short Span Steel Bridge Alliance (SSSBA)               |
| 217     | Deep Foundations Institute (DFI)                       |
| 218     | MMFX Technologies, a CMC company                       |
| 219     | Fugro Loadtest   |
| 222     | Campbell Scientific Inc.                               |
| 223     | U.S. Bridge  |
| 224     | Informed Infrastructure                                |
| 225     | McDermott Light & Signal                               |
| 226     | BridgeWiz International Engineering and Consulting     |
| 227     | Lifting Gear Hire                                      |
| 228/230 | Survey Equipment Services, Inc.                        |
| 229     | Roads & Bridges  |
| 231     | Phoenix National Laboratories                          |
| 235     | Wagners CFT - USA                                      |
| 236     | EXP  |
| 300     | Buzzi Unicem USA                                       |
| 301     | Acrow Bridge   |
| 302     | Euclid Chemical Company                                |
| 303/305 | Computers & Structures, Inc.                           |
| 304     | Bridge Grid Flooring Manufacturers Association (BGFMA) |
| 306     | Hilman Rollers   |
| 307     | Stalite Lightweight Aggregate                          |
| 310     | AUR, Inc.  |
| 311     | LUSAS  |
| 312     | Contractors Materials Company                          |
| 313     | Epoxy Interest Group (EIG) of CRSI                     |
| 314     | Coastal Precast Systems                                |
| 315     | MISTRAS  |
| 316     | Echem Consultants LLC                                  |
| 317     | International Road Dynamics                            |
| 318     | WSP USA  |
| 319     | mageba USA   |

# Exhibit Hall

PRINCE GEORGE HALL E, LOWER LEVEL

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|         |   |
|---------|---|
| 322     | Perryman Company                                      |
| 323     | GWY LLC   |
| 324     | Tideland, a Xylem brand                               |
| 325     | Keystone Aerial Surveys, Inc.                         |
| 326     | Bridge design & engineering                           |
| 327     | Shanghai Zhenhua Heavy Industries Company Ltd. (ZPMC) |
| 328     | Quinn Consulting Services, Inc.                       |
| 329     | BridgeSight Inc.                                      |
| 330     | SOFiSTiK AG   |
| 331     | Safespan Platform Systems, Inc.                       |
| 334     | Canary Systems, Inc.                                  |
| 335     | NEXCO-West USA  |
| 337     | PRECASTEEL LLC  |
| 400     | LARSA, Inc.   |
| 401     | Sika Corporation                                      |
| 402     | Greenman-Pedersen, Inc. (GPI)                         |
| 403     | EMSEAL Joint Systems, LTD.                            |
| 404     | R.J. Watson, Inc.                                     |
| 405/407 | American Composites Manufacturers Association (ACMA)  |
| 406     | Reinforced Earth Company, The                         |
| 410     | Salit Specialty Rebar                                 |
| 412     | Sixense   |
| 414     | CTS Cement Manufacturing Corporation                  |
| 415     | All Access Rigging Co.                                |
| 416     | Resensys LLC  |
| 417     | Marine Solutions, Inc.                                |
| 418     | Stronghold Coating Systems, Ltd.                      |
| 419     | T.Y. Lin International                                |
| 422     | Bentley Systems                                       |
| 424     | Nucor Skyline   |
| 426     | Nucor   |
| 428     | Terex Bid-Well  |
| 430     | STV   |
| 434     | Durisol Noise Barrier Systems                         |

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# Exhibitors

## ALPHABETICAL LISTING

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### A. Morton Thomas and Associates, Inc.

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Booth #: 125

Contact: Kyle Rankin, P.E., CBI

Phone: 717-795-4666

E-mail: [krankin@amtengineering.com](mailto:krankin@amtengineering.com)

Website: [www.amtengineering.com](http://www.amtengineering.com)

AMT is a 100% employee-owned multidisciplinary firm with a track record of over 60 years of success providing wide-ranging transportation engineering, surveying, environmental, landscape architecture and construction engineering inspection services. With a staff of more than 525 employees, AMT offers far-reaching expertise and a commitment to delivering successful projects to our clients. Each of our 20 offices across the Mid-Atlantic and Southeast regions fosters a highly supportive and collaborative environment. As an active and socially responsible organization, we pride ourselves .....

### Acrow Bridge

---

Booth #: 301

Contact: Eugene Sobecki

Phone: (973) 244-0080

E-mail: [esobecki@acrow.com](mailto:esobecki@acrow.com)

Website: [www.acrow.com](http://www.acrow.com)

A full-service design and engineering firm, Acrow Bridge specializes in prefabricated modular steel bridging solutions for permanent, temporary and emergency use. For more than half a century, Acrow has supplied tens of thousands of bridges to urban and rural locations all over the world to help customers build strong and sustainable transportation infrastructure.

### AECOM

---

Booth #: 106

Contact: Mary Ellen Grainger / Shane Beabes

Phone: 804-290-7920 / 410-375-2183

Fax: 804-515-8308

E-mail: [maryellen.grainger@aecom.com](mailto:maryellen.grainger@aecom.com)

Website: [www.aecom.com](http://www.aecom.com)

About AECOM - AECOM is built to deliver a better world. We design, build, finance and operate critical infrastructure assets for governments, businesses and organizations. As a fully integrated firm, we connect knowledge and experience across our global network of experts to help clients solve their most complex challenges. From high-performance buildings and infrastructure, to resilient communities and environments, to stable and secure nations, our work is transformative, differentiated and vital. A Fortune 500 firm, ....

### All Access Rigging Co.

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Booth #: 415

Contact: Amy Guzma

Phone: 412-877-9660

Fax: 866-491-2140

E-mail: [amy@allaccessrigging.com](mailto:amy@allaccessrigging.com)

Website: [www.allaccessrigging.com](http://www.allaccessrigging.com)

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federal and state guidelines as defined within the MUTCD. We specialize in engineered cable rigging & bridge washing services. We also offer safety boat services. We have provided support services to some of the most challenging bridges. We have 3 strategic locations, in Aliquippa, PA and Waterbury, CT and Chester MD.

### Allen Engineering Corporation

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Booth #: 131

Contact: Mark Conte

Phone: 216-469-0005

E-mail: [mark.conte@alleneng.com](mailto:mark.conte@alleneng.com)

Website: [www.alleneng.com](http://www.alleneng.com)

Allen Engineering is a Design & Manufacturing Firm that builds Concrete Paving Equipment for Bridge Decks, Highways, Roadways and Airport Runways & Taxiways. This includes a Polyester Concrete Overlay Slip-Form Paver, as well as, a Special Light Rail Paver for Light Rail Transit Projects. Located in Paragould, Arkansas, our industry leading line of paving products, including the Bridge Deck Finishers & Triple Roller Tube Pavers are used throughout the world.



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### Allplan, Inc.

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Booth #: 126

Contact: David Loughery

Phone: 215-527-1449

E-mail: [dloughery@allplan.com](mailto:dloughery@allplan.com)

Website: [www.allplan.com](http://www.allplan.com)

ALLPLAN is a leading vendor of openBIM solutions for structural and civil engineers. A key subsidiary of the Nemetschek Group and based in the Philadelphia area, we offer our customers innovative tools for the design, implementation and operation of complex civil engineering and infrastructure projects. Our software facilitates efficient collaboration, and ensures that all project members can work together in a smooth and integrated workflow.

Allplan has been used to design and construct many award-winning, signature bridges internationally, such as the Tamina Bridge in Switzerland and the Queensferry Crossing in the UK. Our solutions are used by over 240,000 engineers, contractors, and BIM managers in 52 countries around the world.

### American Composites Manufacturers Association (ACMA)

---

Booth #: 405/407

Contact: John P. Busel

Phone: 914-961-8007

Fax: 914-961-8004

E-mail: [jbusel@acmanet.org](mailto:jbusel@acmanet.org)

Website: [www.acmanet.org](http://www.acmanet.org)

ACMA is the world's largest composites trade association. The Transportation Structures Council and FRP Rebar Manufacturers Council serve to inform and educate engineers on FRP composites used in infrastructure applications.

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### Anderson UnderBridge

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Booth #: 214

Contact: Chrissy Catoe

Phone: 803-366-8195

E-mail: [chrissy@inspectabridge.com](mailto:chrissy@inspectabridge.com)

Website: [www.inspectabridge.com](http://www.inspectabridge.com)

Anderson UnderBridge makes, sells, and rents UnderBridge access equipment. We get you UnderBridge for Any Reason.

# Exhibitors

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### AUR, Inc.

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Booth #: 310

Contact: Roger L. Simpson

Phone: 540-961-3005

Fax: 866-223-8673

E-mail: [rogersimpson@aurinc.com](mailto:rogersimpson@aurinc.com)

Website: [www.noscour.com](http://www.noscour.com)

Scour of bridge piers and abutments is a common cause of bridge failure over water. AUR, Inc. analyzes the scour and designs and manufactures PROVEN streamlined scour-vortex-preventing products (scAUR and VorGAUR) for PERMANENT and cost-effective scour prevention of bridge pier and abutment local and contraction scour. Products for retrofits of existing bridges and new bridges are available ([www.NoScour.com](http://www.NoScour.com)). This permanent solution costs less than 10% of temporary scour countermeasures over the life of a bridge.

### Bentley Systems

---

Booth #: 422

Contact: Alex Mabrich

Phone: 954-343-9334

E-mail: [alex.mabrich@bentley.com](mailto:alex.mabrich@bentley.com)

Website: [www.bentley.com](http://www.bentley.com)

Bentley Systems is the leading global provider of software solutions to engineers, architects, geospatial professionals, constructors, and owner-operators for the design, construction, and operations of infrastructure. Bentley employs more than 3,500 colleagues, generates annual revenues of \$700 million in 170 countries, and has invested more than \$1 billion in research, development, and acquisitions since 2012. [www.bentley.com](http://www.bentley.com)

### BrandSafway

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Booth #: 114/116/118

Contact: Heather Shugarman

Phone: 518-381-6000

E-mail: [HShugarman@brandsafway.com](mailto:HShugarman@brandsafway.com)

Website: [www.brandsafway.com](http://www.brandsafway.com)

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### Bridge design & engineering

---

Booth #: 326

Contact: Lisa Bentley

Phone: +44 (0) 207 973 4698

E-mail: [l.bentley@hgluk.com](mailto:l.bentley@hgluk.com)

Website: [www.bridgeweb.com](http://www.bridgeweb.com)

Exclusively dedicated to the international bridge industry, Bridge design & engineering (Bd&e) is a high quality, visually stunning quarterly magazine

# Exhibitors

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offering bridge professionals details of latest innovations, technical features, interviews, & project reports. Bd&e also provides a high quality website [www.bridgeweb.com](http://www.bridgeweb.com), a regular e newsletter, annual directory of suppliers, and special supplements that cover different aspects of the industry. If you finance, plan, design, build, maintain, operate or own a bridge, you need Bd&e.

### Bridge Grid Flooring Manufacturers Association (BGFMA)

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Booth #: 304

Contact: Phil Gase

Phone: 419-257-3561

E-mail: [bgfma@bgfma.org](mailto:bgfma@bgfma.org)

Website: [www.bgfma.org](http://www.bgfma.org)

The Bridge Grid Flooring Manufacturers Association (BGFMA) industry group is comprised of companies that fabricate steel grid deck systems for bridges and other companies with an interest in this market. Building on the near 100-year service history of concrete filled grid systems, this expanded professional organization is focused on the reliable development and application of welded open grid, grid reinforced concrete, and Exodermic® bridge decks to meet the demands of the engineering community and traveling public.

### BridgeSight Inc.

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Booth #: 329

Contact: Richard Pickings

Phone: 877-441-0346

E-mail: [rdp@bridgesight.com](mailto:rdp@bridgesight.com)

Website: <http://www.bridgesight.com>

BridgeSight Software, founded 1997, provides software solutions and engineering services to bridge engineers through products, consulting, training, and support. The free, open-source, program PGSuper is the world's most utilized, most capable, precast bridge design software. BridgeSight provides customized Professional versions of PGSuper and PGSplice at a fraction of the cost of commercial alternatives.

### BridgeWiz International Engineering and Consulting

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Booth #: 226

Contact: Dilara Akdoğanbulut

Phone: 533-548-0894

E-mail: [dilara@bridgewiz.com](mailto:dilara@bridgewiz.com)

Website: [www.bridgewiz.com/](http://www.bridgewiz.com/)

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### Bureau Veritas North America

---

Booth #: 113

Contact: Scott Mason

Phone: 847-436-5830

E-mail: [scott.mason@bureauveritas.com](mailto:scott.mason@bureauveritas.com)

Website: [www.us.bureauveritas.com](http://www.us.bureauveritas.com)

Bureau Veritas is the largest and most qualified Inspection Agency in operation today and is proudly serving many DOT's, Turnpike Authorities, transportation engineering firms and railroad companies. We provide clients with tailored solutions to meet their specific requirements through QA/QC inspection, coating inspections, NDT and staff augmentation through

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### Buzzi Unicem USA

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Booth #: 110

Contact: William Krupa

Phone: 484-264-2141

Fax: 610-882-0421

E-mail: [william.krupa@buzziunicemusa.com](mailto:william.krupa@buzziunicemusa.com)

Website: [www.buzziunicemusa.com](http://www.buzziunicemusa.com)

Buzzi Unicem USA is one of the worlds larger cement manufacturers. We are the only U.S. manufacturer of CSA cement for use in the design of rapid setting roadway and bridge repair products. We also manufacture various types of Portland cement, masonry cement and oil well cement. Our specialty product line of rapid setting products include Ulti-Pave3, Utility Fill One Step, and Ulti-Grout for rapid repairs of bridges and roadways.

### Campbell Scientific Inc.

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Booth #: 222

Contact: Michelle Tuttle

Phone: 435-227-9658

E-mail: [michelle@campbellsci.com](mailto:michelle@campbellsci.com)

Website: [www.campbellsci.com](http://www.campbellsci.com)

Engineered structures are a matter of daily life. As expectations, demands, and uses of these structures increase, Campbell Scientific equipment is used to monitor performance, safety, and evaluate the effects of unexpected factors like ship impacts, vehicle super loads, weather related stresses, and unforeseen acts of nature. Using patented VSPECT technology in high speed and large channel count applications, Campbell Scientific measurement systems are keeping structures safe worldwide.

### Canary Systems, Inc.

---

Booth #: 334

Contact: Sarah El Giffin

Phone: 603-526-9800

E-mail: [sarah@canarysystems.com](mailto:sarah@canarysystems.com)

Website: [www.canarysystems.com](http://www.canarysystems.com)

Canary Systems provides information systems designed to utilize state-of-the-art technology with applications spanning hardware, software, database development, instrumentation, and more. Canary Systems has developed ground-breaking 3D capabilities for our MLSuite® platform, making structural, environmental, and geotechnical monitoring and risk management more accessible than ever. The browser-based solution combines monitoring data into an interface accessible anywhere in near real-time. With the large number of monitoring technologies necessary, a single integrated platform is essential.

# Exhibitors

## ALPHABETICAL LISTING

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### Carl Stahl DecorCable

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Booth #: 129

Contact: Patrick Kelly

Phone: 312-474-1100

Fax: 312-474-1789

E-mail: [sales@decorable.com](mailto:sales@decorable.com)

Website: [www.decorable.com](http://www.decorable.com)

Carl Stahl DécorCable offers a comprehensive range of cable, rod, and mesh systems for architectural, structural and design applications. Our products include X-TEND® Stainless Steel Cable Mesh and I-SYS® Stainless Steel Cables, Rods and Hardware. Part of the global Carl Stahl Group, we are uniquely able to furnish the resources necessary for a successful project, no matter what its complexity or location. Specialized design services including tensile engineering, statics, and 3-D modeling are available.

### CBSI

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Booth #: 101/200

Contact: Jerry V. Clodfelter

Phone: 713-675-1180

Fax: 713-675-1140

E-mail: [jvclodfelter@cbsii.com](mailto:jvclodfelter@cbsii.com)

Website: [www.cbsiusa.com](http://www.cbsiusa.com)

CBSI is the definitive resource for engineering matters relating to cable-supported structures. In addition to consulting services, CBSI personnel design, contract for, storehouse, and supply both custom and standard bridge strands, ropes and related structural sockets, casting and forgings. We are driven by a determination to provide each client with the finest products and services available today. We know the excellence of our work is our most important asset.

### China Railway Hi-Tech Industry Corporation Co., Limited

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Booth #: 128/130

Contact: Hua Ershi

Phone: 86 13971049217

Fax: 86 10 52265888

E-mail: [791259683@qq.com](mailto:791259683@qq.com)

Website: [www.crhic.cn](http://www.crhic.cn)

CRHIC is affiliated with CREC-a Fortune Global 500 company. It is a A-share listed company (SH.600528) With its business covering R&D, design, manufacture, installation and technical services of steel bridges, railway turnouts, tunneling equipment, large railway construction equipment and new rail transit, CRHIC is included into the national team in China's steel bridge manufacturing and installation industry. CRHIC, are leading companies in the manufacture and installation of steel bridges, domestic market share reaching 60%, and built over 40 large steel bridges for 15 overseas countries.

# Exhibitors

## ALPHABETICAL LISTING

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### Cimtas Steel

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Cimtas Steel

Booth #: 110/112

Contact: Efe Alisan

Phone: +90-555-892-5288

E-mail: ealisan@cimtas.com

Website: www.cimtas.com

Cimtas is a leading provider of integrated engineering, procurement, welded fabrication, assembly and installation solutions for top-tier global customers. Cimtas has the vision to be the best-in-class and preferred partner on worldwide basis for demanding projects in Construction, Power, Oil, Gas, and Chemicals industries. Incorporated in 1973 as a fully owned subsidiary of ENKA, Cimtas consists of 5 companies, four in Turkey and one in China with an aggregated annual fabrication capacity of 230,000 tons.

### Coastal Precast Systems

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Booth #: 314

Contact: Kristen Neal

Phone: 757-545-5215

E-mail: kneal@cpsprecast.com

Website: <http://www.cpsprecast.com>

Coastal Precast Systems provides high quality precast for highway, rail, and marine construction. The owners of Coastal Precast Systems have over 70 years of experience in the precast concrete industry. CPS has multiple patents, and prides itself on its innovative.

### Computers & Structures, Inc.

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Booth #: 303/305

Contact: Miriam Storch

Phone: 510-649-2248

Fax: 510-649-2299

E-mail: sales@csi-america.com

Website: <https://www.csi-america.com/>

Founded in 1975, Computers and Structures, Inc. (CSI) is recognized globally as the pioneering leader in software tools for structural and earthquake engineering. Software from CSI is used by thousands of engineering firms in over 160 countries for the design of major projects. CSI's software is backed by more than four decades of research and development, making it the trusted choice of sophisticated design professionals everywhere.

### Contractors Materials Company

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Booth #: 312

Contact: Dave Friedman

Phone: 513-719-0112

E-mail: dfriedman@cmcmi.com

Website: www.cmcmi.com

Contractors Materials Company is located in Cincinnati, OH and is a 112-year-old company specializing in the supply & fabrication of concrete reinforcement products for the construction industry. Contractors Materials Company has the most modern technology and equipment with the ability to produce continuous Stainless Steel Rebar lengths of #3 - #11 rebar up to 60' as well as fabricate to your project design. We pride ourselves on being the premier fabricator and supplier of Stainless Steel Reinforcement in North America.

# Exhibitors

## ALPHABETICAL LISTING

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### Creative Design Resolutions, Inc.

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Booth #: 237/336

Contact: Brandy Spears

Phone: 240-350-6830

E-mail: [b.spears@creativedesignresolutions.com](mailto:b.spears@creativedesignresolutions.com)

Website: [www.creativedesignresolutions.com](http://www.creativedesignresolutions.com)

Visit us in booth 237 & 336 to learn more!

### CTS Cement Manufacturing Corporation

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Booth #: 414

Contact: Chris Davis

Phone: 973-568-3134

E-mail: [info@ctscement.com](mailto:info@ctscement.com)

Website: [www.ctscement.com](http://www.ctscement.com)

CTS manufactures Rapid Set® cement and Type K shrinkage compensating cement (SCC). Rapid Set allows bridge deck overlays to be completed faster, with higher quality, long-term performance than Portland cement concrete. SCC has been used in over 800 bridge decks with reduced permeability, excellent durability and little to no cracks.

### D.S. Brown

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Booth #: 107

Contact: Chris Youngless

Phone: 419-257-3561

E-mail: [cyoungless@dsbrown.com](mailto:cyoungless@dsbrown.com)

Website: [www.dsbrown.com](http://www.dsbrown.com)

D.S. Brown, located in North Baltimore, OH, is a manufacturer of infrastructure construction products. Product offerings include Steelflex® Modular, Strip Seal and Delcrete® Expansion Joint Systems, Versiflex HLMR, Disc and Elastomeric Bearing Assemblies, SEP Seismic Isolation Bearings, Delastic® Preformed Neoprene Compression Seals, and specialty products such as our Cableguard Elastomeric Wrap and Deckguard® Waterproofing Membrane. Our high-quality engineered products are available worldwide for new construction and rehabilitation of bridges, highways, airfields, pavements, and parking structures.

### Deep Foundations Institute (DFI)

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Booth #: 217

Contact: Alexandra Damon

Phone: 973-423-4030

E-mail: [adamon@dfi.org](mailto:adamon@dfi.org)

Website: [www.dfi.org](http://www.dfi.org)

DFI is an international association of contractors, engineers, manufacturers, suppliers, academics and owners in the deep foundations industry. Our multidisciplinary membership creates a consensus voice and a common vision for continual improvement in the planning, design and construction of deep foundations and excavations. We bring together members through networking, education, communication and collaboration. With our members, we promote the advancement of the deep foundations industry through technical committees, educational programs and conferences, publication of guides and specifications, a peer-reviewed journal, a flagship magazine, research, government relations and outreach.



# Exhibitors

## ALPHABETICAL LISTING

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### Durisol Noise Barrier Systems

Booth #: 434

Contact: Michael H Pruden

Phone: 909-615-2037

Fax: 850-665-0143

E-mail: michael.pruden@durisol.com

Website: www.durisol.com

Pioneer of absorptive noise barrier technology with 44 million square feet installed in North America since 1977. We also offer transparent noise barriers with an available TL-4 crash tested system, which is approved by the FHWA. We provide in house design services and products to suite all needs for our customers.

### DYWIDAG-Systems International

Booth #: 123

Contact: Mike Meder

Phone: 878-313-3126

E-mail: mike.meder@dsiamerica.com

Website: www.dsiamerica.com

DSI has over 150 years leading the industry for manufacture, supply and installation of specialized construction materials and superior engineered systems for post-tensioning, reinforcing, stay-cables, formwork accessories and geotechnical systems. DSI has specialized knowledge and training to provide jobsite technical assistance, structural repair/strengthening, value-engineering and DYNA Force sensors and load monitoring. Visit our booth and ask about our GRADE 100 THREADBAR and advantages of high-strength reinforcement!

### Echem Consultants LLC

Booth #: 316

Contact: Stacey Loughran

Phone: 845-215-4370

E-mail: sloughran@e2chem.com

Website: www.e2chem.com

Echem Consultants LLC (WBE, DBE, & SBE certified) is a material science consultancy whose primary focus is understanding material durability of the built environment. Echem assists engineers, architects, and owners with diagnostics, repair, and monitoring of existing structures as well as advice on material selection, design and quality assurance for new construction.

### EMSEAL Joint Systems, LTD.

Booth #: 403

Contact: Andy Castillo

Phone: 508-330-7900

E-mail: acastillo@emseal.com

Website: www.emseal.com/bridge

Expansion Joints and Construction Sealants: Expansion joint covers and sealants for the built environment. Waterproof, fire rated, trafficable, sound attenuating, insulating, air, wind, seismic, and watertight, building and bridge expansion joints and precompressed hybrid sealant. A Sika Company.

# Exhibitors

## ALPHABETICAL LISTING

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### Epoxy Interest Group (EIG) of CRSI

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Booth #: 313

Contact: Jim Riemenschneider

Phone: 651-592-9598

E-mail: [jaremo69@yahoo.com](mailto:jaremo69@yahoo.com)

Website: [www.epoxyinterestgroup.org/](http://www.epoxyinterestgroup.org/)

EIG is a independent group within the Concrete Reinforcing Steel Institute. The mission of our group is to promote the use of epoxy coated reinforcing steel as a corrosion protection system for reinforcing steel, bar supports and Welded Wire Reinforcement.

### Eriksson Technologies

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Booth #: 100

Contact: Molly Dicken

Phone: 813-989-3317

E-mail: [dicken@lrfd.com](mailto:dicken@lrfd.com)

Website: <https://www.eriktech.com/>

Eriksson Technologies, Inc, a nationally recognized, award-winning specialty structural engineering firm, we are based in Tampa Florida, with a branch office in Denver, Colorado. Our work includes commercial, transportation and industrial structure. One of our principal focus' and expertise is in the precast/prestressed concrete industry. Specific structures within this industry include bridges, piers, wharfs, parking garages, office and industrial buildings.

### Euclid Chemical Company

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Booth #: 302

Contact: Steve Scarpinato

Phone: 216-531-9222

Fax: 216-531-9596

E-mail: [sscarpinato@euclidchemical.com](mailto:sscarpinato@euclidchemical.com)

Website: [www.euclidchemical.com](http://www.euclidchemical.com)

For more than a century, The Euclid Chemical Company has served the global building market with a full line of quality products for the concrete and masonry construction industry. Euclid Chemical designs and manufactures and distributes worldwide a complete line of admixtures, concrete fibers, curing and sealing compounds, structural grouts, epoxy adhesives, floor hardeners and toppings, joint fillers, industrial and architectural coatings, decorative color/stains/stamps, and a comprehensive selection of restoration materials.

### Evonik Corporation

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Booth #: 115

Contact: Peter DeNicola

Phone: 732-981-5462

Fax: 732-981-5275

E-mail: [peter.denicola@evonik.com](mailto:peter.denicola@evonik.com)

Website: [www.protectosil.com/protectosil](http://www.protectosil.com/protectosil)

Evonik manufactures Protectosil® Building Protection Products, a globally recognized brand in water repellents, corrosion inhibitors, graffiti control and surface protection products. Protectosil® products have been protecting structures for over 40 years and are manufactured at our ISO 9001 and 14001 certified production facilities. The steel-reinforced concrete structures of bridges can corrode and rust over time, leading to expensive repairs. Protectosil® products increase the service life of bridges and reduce maintenance costs of steel reinforced concrete.

# Exhibitors

## ALPHABETICAL LISTING

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### EXP

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Booth #: 236

Contact: Amir Arab

Phone: +1.202.812.0922

E-mail: [amir.arab@exp.com](mailto:amir.arab@exp.com)

Website: <https://www.exp.com/>

EXP provides engineering, architecture, design and consulting services to the world's built and natural environments. EXP has over 3,200 professionals in 90 offices providing engineering services around the world. Ranked #28 in the Top 500 Design Firms by ENR, EXP is consistently recognized by our clients for the quality of our services. We have been the recipient of more than 200 awards in the last 10 years, including more than 50 for our infrastructure projects.

### FATZER AG Wire Ropes

---

Booth #: 135/234

Contact: Alexander Strauch

Phone: +41 71 466 81 11

E-mail: [Alexander.Strauch@fatzer.com](mailto:Alexander.Strauch@fatzer.com)

Website: [www.fatzer.com](http://www.fatzer.com)

FATZER specializes in the development, manufacture and global distribution of high-quality steel wire ropes for structural applications, ropeways, mining industries, winches and other applications. With a long history of meeting specific market needs, FATZER is recognized as a leading rope manufacturer.

### Figg Bridge Engineers, Inc.

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Booth #: 210

Contact: Erika Hango

Phone: 850-224-7400

Fax: 850-224-4683

E-mail: [ehango@figgbridge.com](mailto:ehango@figgbridge.com)

Website: [www.figgbridge.com](http://www.figgbridge.com)

FIGG bridges have received over 400 awards for communities across the U.S. These landmarks are created with respect for the natural and built environment and aesthetically capture a community's sense of place. Each bridge reflects the technology of the time with sustainable and cost-effective solutions. Services include design, construction engineering and inspection, construction quality control, construction management, inspections, and maintenance. The FIGG Team is passionate about bridges to serve people and enhance the local economy.

### Freyssinet, Inc.

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Booth #: 212

Contact: Michael Louis

Phone: 703-378-2500

E-mail: [contact@freyssinetusa.com](mailto:contact@freyssinetusa.com)

Website: [www.freyssinetusa.com](http://www.freyssinetusa.com)

Freyssinet, Inc. has been at the forefront of providing specialized civil engineering technology, material supply and installation for projects large and small in the United States for over 20 years. Originally a specialist in post-tensioning, Freyssinet, Inc. has successfully expanded its portfolio of products and services into stay cables, structural cables, bearings, joints seismic devices, repair, protection and strengthening of structures.

# Exhibitors

## ALPHABETICAL LISTING

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### Fugro Loadtest

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Booth #: 219

Contact: Bubba Knight

Phone: 850-260-5528

E-mail: [w.knight@loadtest.com](mailto:w.knight@loadtest.com)

Website: [www.loadtest.com](http://www.loadtest.com)

Fugro Loadtest removes deep foundation uncertainty by establishing confidence, reliability, efficiency and economy through advanced deep foundation analysis, quality control and testing. We pioneered bi-directional load testing with the original patented, friction-free, tilt-tolerant Osterberg Cell® (O-Cell®) which provides premier design calibration testing of bored piles, drilled shafts and other deep foundation elements. We improve construction quality with SoniCaliper® real-time excavation inspection, confirm placed concrete construction quality with Cross-Hole Sonic logging and Thermal Integrity Profiling (TIP) and verify production foundation ...

### Greenman-Pedersen, Inc. (GPI)

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Booth #: 402

Contact: Laurie Couillard

Phone: 978-570-2988

Fax: 978-658-3044

E-mail: [lcouillard@gpinet.com](mailto:lcouillard@gpinet.com)

Website: [www.gpinet.com](http://www.gpinet.com)

Founded in 1966, GPI is a leading engineering consulting firm that specializes in the innovative design and construction of transportation infrastructure and building projects. Our experts provide comprehensive engineering, design, planning and construction management services to a wide variety of government agencies, municipalities, institutions, industries, corporations, private organizations and developers.

### GWY LLC

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Booth #: 323

Contact: Heath Mitchell

Phone: 888-838-6500

Fax: 603-547-3801

E-mail: [info@gwyinc.com](mailto:info@gwyinc.com)

Website: [www.gwyinc.com](http://www.gwyinc.com)

GWY has been a global leader in bolt fastening tools since 1975. Combining our experience with Tone's quality wrench manufacturing, our custom designed Turn of Nut Series wrenches meet the high standards of the federal government for structural fastening. GWY also carries TC wrenches and torque wrenches plus repair services, rentals, and spare parts for all the wrenches we sell plus some discontinued models. Our goal is absolute accuracy for any bolt fastening project.

# Exhibitors

## ALPHABETICAL LISTING

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### Harcon Corporation

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Booth #: 136

Contact: Jesse Stoltzfus

Phone: 717-687-9294

Fax: 717-687-9296

E-mail: [jesse@harconcorp.com](mailto:jesse@harconcorp.com)

Website: [www.harconcorp.com](http://www.harconcorp.com)

Harcon provides bridge access services for bridge analysis and maintenance to meet the National Bridge Inspection Standards and ensure public safety. Stop by our booth and discover how Harcon's unique methods and exceptional equipment are changing the way America inspects bridges. Visit us online and see our equipment in action at [harconcorp.com](http://harconcorp.com).

### Headed Reinforcement Corporation

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Booth #: 122

Contact: Robbie Hall

Phone: 678-333-4450

E-mail: [robbie.hall@hrc-usa.com](mailto:robbie.hall@hrc-usa.com)

Website: [www.hrc-usa.com](http://www.hrc-usa.com)

High Performance Reinforcement Products for Structural Integrity and Constructability

### Hilman Rollers

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Booth #: 306

Contact: Scudder Stewart

Phone: (732) 462-6277

E-mail: [ssewart@hilmanrollers.com](mailto:ssewart@hilmanrollers.com)

Website: [www.hilmanrollers.com](http://www.hilmanrollers.com)

Hilman Rollers are an essential component for bridge construction projects. They have proven their value in rapid bridge replacements, launching bridge segments, launching entire spans, as travelers for gantries; as well as being used in casting yards to move heavy segments. Hilman Rollers move the Heavyweights!

### HRV Conformance Verification Associates, Inc.

---

Booth #: 104

Contact: Betsy Wehner

Phone: 412-299-2000

Fax: 412-299-2007

E-mail: [bwehner@hrvinc.com](mailto:bwehner@hrvinc.com)

Website: [www.hrvinc.com](http://www.hrvinc.com)

HRV ... Leading experts in steel and concrete fabrication QA/QC inspection, construction management/construction inspection, and coatings inspection for transportation and civil infrastructure projects, worldwide. Our resume on large, complex projects includes the new Governor Mario M. Cuomo Bridge (Tappan Zee), the Goethals Bridge, and the Verrazano-Narrows Bridge. We are Quality. Assured.

# Exhibitors

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### Informed Infrastructure

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Booth #: 224

Contact: Kevin Carmody

Phone: 312-771-9818

E-mail: [kcarmody@v1-media.com](mailto:kcarmody@v1-media.com)

Website: <https://informedinfrastructure.com/>

The tools, products, and technologies for improved project delivery are evolving rapidly. You need the news and information about successful model-based design, engineering, performance simulation and ongoing monitoring for improved maintenance. INFORMED INFRASTRUCTURE addresses the markets of water/wastewater, storm water, transportation, energy, structures, erosion control and land development. Choose to receive our print and/or digital magazine, and open your in-box to our weekly e-news and video alerts.

### International Road Dynamics

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Booth #: 317

Contact: Tom Der

Phone: 306-653-6600

E-mail: [info@irdinc.com](mailto:info@irdinc.com)

Website: [www.irdinc.com](http://www.irdinc.com)

IRD (International Road Dynamics Inc.) is a multi-discipline, technology company with the expertise to integrate complementary ITS (Intelligent Transportation Systems) technologies into systems designed to solve unique and challenging transportation problems. IRD is the one source company that can offer multi-systems solutions by integrating a number of different technologies to the desired functionality.

### Iowa DOT

---

Booth #: 127

Contact: Ahmad Abu-Hawash

Phone: 515-239-1393

Fax: 515-239-1978

E-mail: [ahmad.abu-hawash@iowadot.us](mailto:ahmad.abu-hawash@iowadot.us)

Website: [www.iowadot.gov](http://www.iowadot.gov)

The Iowa Department of Transportation is a group of about 2,800 dedicated Iowans who advocate for and deliver a modern transportation system that provides pathways for the social and economic vitality of Iowa. We'll help get you where you need to go safely, efficiently, and conveniently.

### Jenik Group

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Booth #: 124

Contact: Sylvain Hubert

Phone: 800-889-4573

E-mail: [shubert@jenikgroup.com](mailto:shubert@jenikgroup.com)

Website: [www.jenikgroup.com](http://www.jenikgroup.com)

Jenik was founded in 1984 in Montreal, Canada. We specialize in Sales & Rentals of Under Bridge Work Access Platforms and Bucket Trucks suitable for all types of work relating to bridge inspection, construction, repair, and maintenance in Canada for over 15 years and now expanding operations in the United States. Our rental fleet includes Jenik, Barin, Moog, Hydra Platform and Aspen Aerials. Our equipment complies with ANSI Standards. Our professional team will assist you in meeting your under bridge...

# Exhibitors

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### JENSEN HUGHES

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Booth #: 103

Contact: Marjorie Lynch

Phone: 862-202-9272

E-mail: [mlynch@jensenhughes.com](mailto:mlynch@jensenhughes.com)

Website: [www.jensenhughes.com](http://www.jensenhughes.com)

Jensen Hughes provides consulting services for a range of clients before, during, and after the construction of concrete structures. Our team members' backgrounds include civil engineering, chemistry, materials science, and structural engineering. We solve complex problems related to concrete constituents, cementitious materials, concrete, testing procedures, and construction practices. Our staff provides expert petrographic services, laboratory testing, materials and durability consulting, and structural evaluation and repair design.

### Keystone Aerial Surveys, Inc.

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Booth #: 325

Contact: David Day

Phone: 215-677-3119

E-mail: [dday@kasurveys.com](mailto:dday@kasurveys.com)

Website: [www.kasurveys.com](http://www.kasurveys.com)

Keystone is an industry leader in the safe and legal use of Unmanned Aerial Systems (UAS) as an inspection and mapping tool. Under FAA Part 107 rules, Keystone is using fixed-wing aircraft and vertical takeoff and landing (VTOL) systems to flexibly and efficiently acquire data for inspection of bridges and infrastructure, GIS and mapping in the Northeast and around the country.

### Klaas Coatings (North America) LLC

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Booth #: 204

Contact: Richard Taylor

Phone: 866-317-3633

Fax: 214-363-8422

E-mail: [info@klaascoatings-northamerica.com](mailto:info@klaascoatings-northamerica.com)

Website: [www.klaascoatings-northamerica.com](http://www.klaascoatings-northamerica.com)

North American manufacturer Si-Rex03 Silicone Resin Emulsion Paint (SREP) coating system for concrete and masonry substrates. Water repellent yet highly breathable coating for protection integrity to extend infrastructure service life. Proven coating system with excellent resistance to, and durability against, weathering and UV exposure in all climatic conditions including freeze/thaw. Inorganic pigments for optimal fade resistance and wide range of color choices. Approved Product with Colorado, New York State, Pennsylvania, Texas, West Virginia DOTs and Authorities....

### LARSA, Inc.

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Booth #: 400

Contact: John Horner

Phone: 1-800-LARSA-01

Fax: 631-454-5252

E-mail: [info@larsa4d.com](mailto:info@larsa4d.com)

Website: [www.larsa4d.com](http://www.larsa4d.com)

LARSA 4D BRIDGE SERIES is developed by engineers for engineers, and is informed three-decades of experience working closely with our clients to provide the most trusted software for bridges. Extensively used for the

# Exhibitors

## ALPHABETICAL LISTING

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analysis and design of steel girder, precast, segmental, and cable-supported bridges, LARSA 4D's Staged Construction Analysis integrates 3D nonlinearity and "4D" time-effects providing a solid basis for advanced projects. Visit our booth to learn about LARSA's next generation of BIM-ready products.

### Lifting Gear Hire

---

Booth #: 227

Contact: Brooke Artus

Phone: 800-878-7305

E-mail: [brooke.artus@rentlgh.com](mailto:brooke.artus@rentlgh.com)

Website: [www.rentlgh.com](http://www.rentlgh.com)

Lifting Gear Hire (LGH) is the largest single organization devoted exclusively to providing lifting and rigging equipment for rental and sale in North America. Through over 20 locations in North America and Europe, and supported by over 50 local Rental Representatives, LGH provides for rent or sale: hoisting, pulling, jacking and rigging equipment to meet virtually every conceivable lifting or moving need.

### LUSAS

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Booth #: 311

Contact: Terry Cakebread

Phone: 646-732-7774

E-mail: [terry.cakebread@lusas.com](mailto:terry.cakebread@lusas.com)

Website: [www.lusas.com](http://www.lusas.com)

Use LUSAS Bridge design and analysis software for frequency, seismic, dynamic, nonlinear, buckling, fatigue, creep modeling, heat of hydration, prestress / post-tensioning and staged construction of all bridge types. A vehicle load optimization facility simplifies worst-case traffic loading patterns. Steel frame design to AASHTO and other codes. Extensive results processing and visualization facilities.

### mageba USA

---

Booth #: 319

Contact: Tiago Destefani

Phone: 508-250-2656

Fax: 212-644-3339

E-mail: [tdestefani@magebausa.com](mailto:tdestefani@magebausa.com)

Website: <https://www.magebausa.com/>

mageba is a globally present specialist and manufacturer of high-end structural bearings, expansion joints as well as seismic protection and structural health monitoring systems. Our products provides technically superior and cost-efficient solutions for new construction and rehabilitation of infrastructure and building projects. Since its foundation in 1963 mageba has equipped well over 20,000 structures with its sustainable and reliable solutions.



# Exhibitors

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### Marine Solutions, Inc.

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Booth #: 417

Contact: Amanda Schindhelm

Phone: 443-484-4100

Fax: 859-554-4100

E-mail: [aschindhelm@msimarinolutions.com](mailto:aschindhelm@msimarinolutions.com)

Website: [www.MSImarinesolutions.com](http://www.MSImarinesolutions.com)

Marine Solutions is a specialized construction and engineering firm focused on building and maintaining waterfront, hydraulic, navigation, and bridge structures. We are a certified small, woman-owned, disadvantaged business enterprise (WBE/DBE) and are fully insured for general, marine and professional liability. Our headquarters are in Kentucky with offices in Maryland, New Jersey, New York, and Ohio. We offer our services throughout the United States and our valued clients included federal, state and municipal agencies, architectural and engineering firms, construction companies, and industrial entities.

### MAX USA CORP.

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Booth #: 134

Contact: Denene Williams

Phone: 800-223-4293

E-mail: [dwilliams@maxusacorp.com](mailto:dwilliams@maxusacorp.com)

Website: [www.maxusacorp.com](http://www.maxusacorp.com)

MAX developed the World's First battery-powered rebar tying tool. Since then MAX Rebar Tying Tools have revolutionized rebar tying all around the world. MAX has continued improving rebar tying technology, which led to the invention of the Twintier RB441T, a dual wire feeding rebar tier. The latest technology allows 4,000 ties per charge while delivering just the right amount of wire for added productivity and cost savings. These innovative features make the Twintier the best and most innovative and efficient rebar...

### MDX Software

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Booth #: 207

Contact: Chris Douty

Phone: 573-446-3221

Fax: 573-446-3278

E-mail: [athompson@mdxsoftware.com](mailto:athompson@mdxsoftware.com)

Website: [www.mdxsoftware.com](http://www.mdxsoftware.com)

MDX Software Curved & Straight Steel Bridge Design & Rating is in use by many top design firms and DOTs to design and rate steel girder bridges for compliance with LRFD, LRFR, LFD, and ASD AASHTO Specifications.

### McDermott Light & Signal

---

Booth #: 225

Contact: Daniel Motie

Phone: 718-456-3606

E-mail: [Daniel@mcdermottlight.com](mailto:Daniel@mcdermottlight.com)

Website: [www.mcdermottlight.com](http://www.mcdermottlight.com)

McDermott Light and Signal delivers a wide array of rugged lighting solutions which includes all types of Marine Navigation Lights such as: Solar Marine Lights, Barge Navigation Lights, Tugboat Lights, Buoy Lights, Dredge Lights, Buoys, Marine LED Lights, Barge Solar Lights, Marker Lights, Anchor Lights, Solar Navigation Lights and many other Marine Navigation Lights.

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### Michael Baker International

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Booth #: 201/203

Contact: Christie Fleming

Phone: 330-554-3924

E-mail: [christie.fleming@mbakerintl.com](mailto:christie.fleming@mbakerintl.com)

Website: [www.mbakerial.com](http://www.mbakerial.com)

Michael Baker International is a leading provider of bridge engineering and consulting services, with more than 300 bridge professionals providing design, inspection, analysis, rehabilitation, training, software development, and construction management for bridges of all types and complexities. Bridge engineering has been a core service provided by the company over its nearly 80-year existence. Michael Baker's more than 3,000 employees across nearly 100 locations are committed to a culture of innovation, collaboration and technological advancement to help solve challenges for clients and communities throughout the country.

### MISTRAS

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Booth #: 315

Contact: Sales Department

Phone: 609-716-4000

E-mail: [sales@mistrasgroup.com](mailto:sales@mistrasgroup.com)

Website: [www.mistrasgroup.com](http://www.mistrasgroup.com)

MISTRAS Group (NYSE: MG) is the one of the largest and most experienced non-destructive testing (NDT) and structural health monitoring (SHM) companies in the world. We are a OneSource provider of asset protection products, systems, and services, including Acoustic Emission (AE) inspections and real-time monitoring solutions. We offer rope access for reaching inaccessible bridge parts and maintenance services, so structures remain operating safely. To learn more, visit us at Booth #315. | [www.mistrasgroup.com/who-we-help/industries/infrastructure/bridges/](http://www.mistrasgroup.com/who-we-help/industries/infrastructure/bridges/)

### MMFX Technologies, a CMC company

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Booth #: 218

Contact: Lee Johnson

Phone: 480-396-7124

E-mail: [lee.johnson@cmc.com](mailto:lee.johnson@cmc.com)

Website: [www.cmc.com/chromx](http://www.cmc.com/chromx)

ChromX rebar is a high strength, corrosion resistant rebar available from coast to coast. ChromX provides faster project delivery time, lower construction costs, lower life-cycle cost and extended project life.

### NANOKOTE North America, Inc.

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Booth #: 206

Contact: Simon King / Lindon Goodson

Phone: 972-469-4788

Fax: 469-716-4016

E-mail: [info@nanokote.com](mailto:info@nanokote.com)

Website: [www.nanokote.com](http://www.nanokote.com)

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### National Steel Bridge Alliance (NSBA)

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Booth #: 211

Contact: Jeff Carlson

Phone: 720-440-3011

E-mail: [carlson@aisc.org](mailto:carlson@aisc.org)

Website: [www.steelbridges.org](http://www.steelbridges.org)

The National Steel Bridge Alliance (NSBA), a division of the American Institute of Steel Construction (AISC) is a national, not-for-profit organization dedicated to the advancement of steel bridge design and construction. The NSBA functions as the voice of the bridge fabricators and steel mills while also partnering with the bridge design and construction community. The NSBA's partners include the American Association of State Highway and Transportation (AASHTO), Federal Highway Administration (FHWA), state departments of transportation (DOTs), design consultant, contractors, and academia.

### NEXCO-West USA

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Booth #: 335

Contact: Rei Huttunen

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E-mail: [marketing@w-nexco-usa.com](mailto:marketing@w-nexco-usa.com)

Website: <https://w-nexco-usa.com/imagingasaferfuture/exhibitorprofile.html>

NEXCO-West USA is a structural inspection company that utilizes HD visual imagery (HDI) and infrared thermography (IRT) to detect, map, and classify deficiencies within structures. NEXCO's technology provides a safer, more effective means of gathering data in the field compared to traditional inspection methods. Our featured technologies include: Deck-Top Scanning System (DTSS), Automatic Camera System (ACS), and a Tunnel Scanning System (TSS). We also possess proprietary software that can stitch and detect structural deficiencies.

### Nucor

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Booth #: 426/424

Contact: Emily Parris

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E-mail: [emily.parris@nucorskyline.com](mailto:emily.parris@nucorskyline.com)

Website: [www.nucor.com](http://www.nucor.com)

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### OpenBrIM Platform

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Booth #: 117

Contact: Ali Koc

Phone: 212-991-8956

E-mail: [info@openbrim.org](mailto:info@openbrim.org)

Website: [www.openbrim.org](http://www.openbrim.org)

OpenBrIM Platform provides cloud-based, all-inclusive, collaborative information modeling software designed to seamlessly integrate with your everyday work-flow. OpenBrIM Platform includes fully parametric detailed 3D modeling, advanced 3D finite element analysis, powerful structural design modules, 2D/3D drawing generation, mapping, inspection management, health monitoring, document management and more... OpenBrIM offers a truly integrated, enterprise level Information Modeling (BIM/BrIM) platform for the AEC industry.

### Pennoni

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Booth #: 205

Contact: Danielle M Bruce

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E-mail: [dbruce@pennoni.com](mailto:dbruce@pennoni.com)

Website: [www.pennoni.com](http://www.pennoni.com)

Pennoni is a multidisciplinary consulting engineering firm founded more than five decades ago providing services that help communities and private sector clients alike navigate the ever-changing technological advancements available and learn how best to integrate "smart" solutions into today's built environment. Across all market sectors, Pennoni works with project owners, end users, stakeholders, and teaming partners to develop solutions that truly make Pennoni "Partners For What's Possible"

### Perryman Company

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Booth #: 322

Contact: Jill Adkins

Phone: 724-746-9390

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E-mail: [jadkins@perrymanco.com](mailto:jadkins@perrymanco.com)

Website: [www.perrymanco.com](http://www.perrymanco.com)

Perryman Company is a vertically integrated producer of specialty titanium products. Our operations include melting, forging, and fabrication to finished products. Perryman supplies and services customers in the aerospace, medical, infrastructure, consumer, recreation, and 3D printing/additive manufacturing markets worldwide. Perryman Company is headquartered in Houston, Pennsylvania. Company offices are located in Philadelphia, Los Angeles, London, Zurich, Tokyo, and Xi'an.

### Phoenix National Laboratories

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Booth #: 231

Contact: Alex Zuran

Phone: 602-431-8887

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E-mail: [alexiii@pnltest.com](mailto:alexiii@pnltest.com)

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### Precast / Prestressed Concrete Institute (PCI)

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Booth #: 105

Contact: William Nickas

Phone: 850-510-8621

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E-mail: [wnickas@pci.org](mailto:wnickas@pci.org)

Website: [www.pci.org](http://www.pci.org)

PCI develops, maintains and disseminates the Body of Knowledge for the precast/prestressed concrete structures industry. PCI provides technical resources, certification, and education, as well as conducts industry events, R&D, and more.

### PRECASTEEL LLC

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Booth #: 337

Contact: Gary Dinmore

Phone: 914-319-7779

E-mail: [gdinmore@precasteel.com](mailto:gdinmore@precasteel.com)

Website: [www.precasteel.com](http://www.precasteel.com)

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### Quinn Consulting Services, Inc.

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Booth #: 328

Contact: Erin Merkin

Phone: 703-818-0721

Fax: 703-818-9392

E-mail: [qcs@quinn-consulting.com](mailto:qcs@quinn-consulting.com)

Website: [www.quinn-consulting.com](http://www.quinn-consulting.com)

Quinn Consulting Services Incorporated (QCS, Inc.) is a 100% woman-owned and certified Disadvantaged Business Enterprise (DBE) firm that offers Consultant Engineering, Inspection, Construction Management, NACE Inspection, UAV/Drone and Design-Build/P3 Quality Assurance and Quality Control (QA/QC) services to federal, state, municipal and private clients.



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### R.J. Watson, Inc.

Booth #: 404

Contact: Marc Stafford

Phone: 716-901-7020

Fax: 716-901-7015

E-mail: [mdstafford@rjwatson.com](mailto:mdstafford@rjwatson.com)

Website: [www.rjwatson.com](http://www.rjwatson.com)

R. J. Watson designs, manufactures, and markets high load multirotational disc bearings, seismic isolation bearings, bridge expansion joints, spray-applied waterproofing membranes, noise mitigation products, bridge monitoring systems, FRP strengthening and corrosion mitigation systems.

### Reinforced Earth Company, The

Booth #: 406

Contact: Paul Hollis

Phone: 800-446-5700

E-mail: [fsaunders@reinforcedearth.com](mailto:fsaunders@reinforcedearth.com)

Website: [www.reinforcedearth.com](http://www.reinforcedearth.com)

The Reinforced Earth Company (RECo) has completed over 45,000 MSE precast retaining wall structures in the US, building a reputation for engineering excellence, architectural creativity, and an unyielding focus on quality. With over 45 years of experience, RECo brings structural, geotechnical and economic value to projects. Reinforced Earth® Mechanically Stabilized Earth (MSE) walls are economical gravity structures having high strength, a limited footprint, the flexibility to distribute loads evenly, and a wide variety of creative architectural finishes.

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### Resensys LLC

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Booth #: 416

Contact: Mehdi Kalantari

Phone: 301-405-9108

E-mail: mehdi@resensys.com

Website: www.resensys.com

Resensys offers a range of wireless structural monitoring solutions based on its award winning wireless sensor network technology, known as SenSpot. The wireless SenSpot sensors provide a versatile platform for remote monitoring of structural quantities such as strain (stress), vibration, tilt, inclination, displacement, temperature, and humidity. SenSpot sensors provide reliable tools to measure overstrain, metal fatigue, movement and stability of foundation, as well as monitoring vibration. Currently, Resensys's SenSpots are the world's most energy efficient wireless monitoring...

### Roads & Bridges

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Booth #: 229

Contact: Brandon Williamson

Phone: 847-391-1000

Fax: 847-390-0408

E-mail: bwilliamson@sgcmail.com

Website: www.roadsbridges.com

As the leading monthly trade publication for the transportation construction market, Roads & Bridges reaches 60,000 engineers, contractors, DOTs and other public officials (local, county, state & federal).

### RWDI

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Booth #: 137

Contact: Dawn Porcellato

Phone: 519-823-1311

Fax: 519-823-1316

E-mail: dawn.porcellato@rwdi.com

Website: www.rwdi.com

RWDI is a global leader in wind studies for bridges and buildings. With global wind tunnel facilities and experienced, interdisciplinary teams of bridge-aerodynamics specialists, RWDI collaborates with international project teams to deliver innovative solutions that enhance design objectives and boost efficiency. RWDI has tested many of the world's iconic cable-stayed bridges in its wind tunnels.

### Safespan Platform Systems, Inc.

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Booth #: 331

Contact: David Malcolm

Phone: 716-694-1100

E-mail: smarton@safespan.com

Website: www.safespan.com

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### Salit Specialty Rebar

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Booth #: 410

Contact: Kevin Cornell

Phone: 716-299-1990

E-mail: [kcornell@stainlessrebar.com](mailto:kcornell@stainlessrebar.com)

Website: [www.stainlessrebar.com](http://www.stainlessrebar.com)

Salit Specialty Rebar is North America's leading distributor and fabricator of Stainless Steel Reinforcing. In addition to rebar Salit Specialty also stocks and distributes Stainless Steel Welded Wire Mesh, Stainless Steel mechanical couplers, and Stainless Steel Tie Wire. Salit Specialty Rebar is a CRSI Certified Stainless Steel Rebar fabricator

### Scougal Rubber

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Booth #: 213

Contact: Scott Nelson

Phone Number: 775-284-8500

Fax Number: 775-284-8501

Email: [sales@scougalrubber.com](mailto:sales@scougalrubber.com)

Website: [www.scougalrubber.com](http://www.scougalrubber.com)

Manufacturer of elastomeric bridge bearing pads, bearing assemblies, PTFE slide assemblies, and custom molded rubber parts

### Shanghai Zhenhua Heavy Industries Company Ltd. (ZPMC)

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Booth #: 327

Contact: Erin Shen

Phone: 0086 21 31192618

Fax: 0086 21 58399555

E-mail: [shenxiaocun@zpmc.com](mailto:shenxiaocun@zpmc.com)

Website: [www.zpmc.com](http://www.zpmc.com)

ZPMC is a famous heavy-duty equipment manufacturer with 10 production bases located near Shanghai with total area of 6,670,000 square meters and 10 kilometers coastline. ZPMC is capable to produce various heavy-duty steel structure and can deliver by our own fleets.

### Short Span Steel Bridge Alliance (SSSBA)

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Booth #: 216

Contact: Rich Tavoletti

Phone: 412-458-5822

E-mail: [rtavoletti@steel.org](mailto:rtavoletti@steel.org)

Website: [www.shortspansteelbridges.org](http://www.shortspansteelbridges.org)

The Short Span Steel Bridge Alliance (SSSBA) is a group of bridge and buried soil structure industry leaders who have joined together to provide educational information on the design and construction of short span steel bridges in installations up to 140 feet in length. Visit [www.shortspansteelbridges.org](http://www.shortspansteelbridges.org) for more information. Visit [www.espan140.com](http://www.espan140.com) for our free online preliminary design software.



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### Sika Corporation

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Booth #: 401

Contact: Aamer Syed

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E-mail: [syed.aamer@us.sika.com](mailto:syed.aamer@us.sika.com)

Website: [www.usa.sika.com](http://www.usa.sika.com)

Sika Corporation, Lyndhurst NJ, is a technology leader with over 100 years of experience in concrete materials and restoration technology. Sika's innovative product line includes concrete admixtures, sealants, adhesives, corrosion inhibitors, specialty mortars, epoxy resins, structural strengthening systems, grouts, anchoring adhesives, overlays, industrial flooring, waterproofing, roofing systems, protective coatings and wood floor adhesive systems and installation products. Full service sales and technical offices support our customers nationwide.

### Sixense

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Booth #: 412

Contact: Stephen Schorn

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E-mail: [stephen.schorn@sixense-group.com](mailto:stephen.schorn@sixense-group.com)

Website: [www.sixense-group.com/en](http://www.sixense-group.com/en)

Sixense provides distinct tools that improve knowledge of infrastructure condition through asset management software, sensor technology and instrumentation, and nondestructive testing. Our integrated solutions unify inspection and monitoring data to optimize infrastructure management and decisions. ScanPrint® software optimizes bridge inspections and management of any infrastructure. EverSense® systems are turnkey instrumentation used for monitoring a single bridge to infrastructure networks. EverScan® is a unique portfolio of nondestructive measurement methods focusing on cable & post tensioned structures.

### SOFiSTiK AG

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Booth #: 330

Contact: Andrés v. Breyman

Phone: +49 911 399010

E-mail: [marketing@sofistik.de](mailto:marketing@sofistik.de)

Website: [www.sofistik.com](http://www.sofistik.com)

SOFiSTiK is Europe's leading software developer for analysis, design and detailing of building and infrastructure projects worldwide. Today, employing more than 70 people, we are one of the leading software developers for Finite Element Software in the construction industry, as well as for integrated detailing software based on Autodesk AutoCAD and Revit. SOFiSTiK's subsidiary and Authorized Training Center BiMOTiON provides training and consulting for all aspects of implementing BIM workflows.

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### St. Louis Screw & Bolt

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Booth #: 215

Contact: Joseph Howard

Phone: 800-237-7059

E-mail: slhoward@stlouisscrewbolt.com

Website: www.stlouisscrewbolt.com

St. Louis Screw & Bolt is one of the longest operating bolt manufacturers in the United States and, in fact, the world. SLSB specializes in HEX HEAD BOLTS in A325 & A490 type I, III Hot Dip Galvanized, Mechanically Galvanized, Weathering and Plain Finish

### Stalite Lightweight Aggregate

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Booth #: 307

Contact: Ken Harmon

Phone: 704-232-0160

Fax: 704-642-1572

E-mail: kharmon@stalite.com

Website: www.stalite.com

Carolina Stalite Company manufactures high performance, high strength lightweight aggregate for use in structural concrete, geotechnical, and other applications. Concrete produced with Stalite lightweight aggregate offers design flexibility and substantial cost savings by providing less dead load, longer spans, better fire ratings, thinner sections, smaller size structural members, less reinforcing steel, and lower foundation costs. Stalite also provides internal curing allowing more complete hydration resulting in reduced autogenous shrinkage, reduced early age cracking,

### Stronghold Coating Systems, Ltd.

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Booth #: 418

Contact: Larry F Grimenstein

Phone: 937-704-4020

Fax: 513-834-7003

E-mail: strongholdone@cs.com

Website: www.strongholdone.com

Stronghold is a veteran owned company that does R&D development to make special polymeric material for different types of applications. MM 1018 is a new load bearing material to North America that is being manufactured in the USA. It has been used thru out Europe for bridges, rail systems, windmills and even buildings.

### STV

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Booth #: 430

Contact: Michael Good, P.E., PMP®

Phone: 410-281-2918

Fax: 410-298-2794

E-mail: james.good@stvinc.com

Website: www.stvinc.com

STV is a nationwide leader in providing construction management, engineering, architectural, planning, and environmental services for transportation systems, infrastructure, buildings, energy and other facilities. Founded more than 100 years ago, STV is 100 percent employee-owned.

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### Survey Equipment Services, Inc.

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Booth #: 228/230

Contact: Survey Equipment Services

Phone: 832-978-8418

E-mail: [acraig@ses-services.com](mailto:acraig@ses-services.com)

Website: [www.ses-services.com](http://www.ses-services.com)

Survey Equipment Services provide turnkey Marine Construction and Dredging Equipment and Software Solutions. Trimble Marine Construction (TMC) Software TMC and Trimble sensors support a range of marine construction workflows including: Dredging - Cutter Suction Dredger, Bucket Dredger, Backhoe/Excavator Dredger, Grab/Clamshell Dredger Placement-Rock Dumping and Placement, Caisson Placement, Block Placement using Wire crane or Excavator, Vertical and Raked pile placement Hydrographic survey - Single beam hydrographic survey, Multibeam hydrographic survey, Block Placement using Wire crane or Excavator, Vertical and Raked pile ...

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Phone: 585-512-2007

E-mail: [robert.radley@tylin.com](mailto:robert.radley@tylin.com)

Website: [www.tylin.com](http://www.tylin.com)

T.Y. Lin International (TYLI) is a full-service, professional engineering firm focused on the planning, design, and construction of infrastructure solutions for public and private clients worldwide. The firm is an internationally recognized pioneer in solving the most difficult engineering challenges. Headquartered in San Francisco, California for over 60 years, TYLI has more than 50 offices and 2,500 professionals throughout the Americas and Asia. TYLI has a strong presence in the North East and Mid-Atlantic states with offices located in...

### Terex Bid-Well

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Booth #: 428

Contact: Timothy P. Rubalcaba

Phone: 812-320-1130

E-mail: [timothy.rubalcaba@terex.com](mailto:timothy.rubalcaba@terex.com)

Website: [www.terex.com/concrete](http://www.terex.com/concrete)

Development and manufacture of a complete line of versatile and specialized concrete paving machines for the heavy and highway construction market. The Terex Bid-Well full line of automatic concrete roller pavers include bridge deck pavers and overlay machines, airport, road and street pavers, concrete placers, texturing/curing machines, specialized paver/trimmer for slopes and canal paving, along with work bridges that meet any job requirement. For more information on Terex Bid-Well call 605-987-2603.

### Tideland, a Xylem brand

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Booth #: 324

Contact: Austin Bennett

Phone: 713-425-1441

E-mail: [austin.bennett@xylem.com](mailto:austin.bennett@xylem.com)

Website: <http://www.tidelandsignal.com/>

For over 60 years, Tideland Signal has been a leader and innovator in Aids to Navigation, offering quality products, exceptional engineering solutions, and onsite support when needed most. Our cutting-edge AtoNs (lanterns, buoys, and AIS units) are utilized throughout the world in oil rigs, ports & harbors, and bridges. All of our AtoNs come in a wide range of uses and applications for any project.

### U.S. Bridge

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Booth #: 223

Contact: Dan Rogovin

Phone: 740-421-9338

E-mail: [drogovin@usbridge.com](mailto:drogovin@usbridge.com)

Website: [www.usbridge.com](http://www.usbridge.com)

U.S. Bridge designs, engineers and fabricates permanent and temporary vehicular steel bridges for the global infrastructure marketplace.

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### Vector Corrosion Technologies Inc.

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Booth #: 102

Contact: Eric Williams

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E-mail: [lisav@vector-corrosion.com](mailto:lisav@vector-corrosion.com)

Website: [www.vector-corrosion.com](http://www.vector-corrosion.com)

Vector is a global leader in preserving concrete structures. With over 50 years of industry experience, our innovative, cost-effective concrete repair and cathodic protection technologies are developed and installed by dedicated professionals who adhere to the highest standards of safety and service.

Vector's concrete preservation specialists receive extensive training and are committed to solving your unique structural and corrosion challenges. We build long-term relationships with our clients in North America and abroad by delivering innovative solutions that extend the life of structures.

### Viathor, Inc.

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Booth #: 119

Contact: Clark Verkler

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E-mail: [vinfo@viathor.com](mailto:vinfo@viathor.com)

Website: [www.viathor.com](http://www.viathor.com)

Viathor, Inc. is dedicated to the development of top quality, user friendly, bridge design and analysis software. VBent is a fully interactive substructure design tool for pier caps, columns and footings, for both non-integral and integral (monolithic) piers. VBent can read PAPIER input files, and has been approved and accepted for use by PennDOT. VBridge is a superstructure design program for reinforced or cast-in-place post-tensioned concrete bridges. VBridge can compute live and other loads for any bridge...

### Wagners CFT - USA

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Booth #: 235

Contact: Dennis Higgins

Phone: 307-752-0870

E-mail: [dennis.higgins@wagnerscft.com](mailto:dennis.higgins@wagnerscft.com)

Website: [www.wagnerscft.com](http://www.wagnerscft.com)

Wagners CFT (Composite Fibre Technologies) LLC. manufacture a range of structural fibreglass sections that they fabricate into "U" and "I" Beams for use in small to medium Road Bridges. The High Strength, Chemical Inert and Non Corrosive Beams provide the answer for bridges in aggressive alkaline or salt water locations or where salting of the road surfaces during the winter is a requirement for the environment. Due to reduced dead loads it is Ideal for construction in remote locations and areas that are difficult to work in where light weight machinery for installation works best.

### Watson Bowman Acme

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Booth #: 202

Contact: Steve Pabst

Phone: 716-691-7566

E-mail: [steve.pabst@basf.com](mailto:steve.pabst@basf.com)

Website: [wbacorp.com](http://wbacorp.com)

Watson Bowman Acme, a BASF Construction Chemicals business, provides comprehensive expansion joint solutions for the Bridge and Highway market. We offer a growing range of high performance products and systems to

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### WireCo WorldGroup

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Booth #: 111

Contact: Richard Humiston

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E-mail: richardhumiston@wireco.com

Website: www.wireco.com

WireCo Structures designs, develops, and manufactures real-world, hard-working solutions for bridges and structures. Fabricated to meet demanding requirements, wire rope support and suspender cables have been proven to stand the test of time even in the world's toughest applications. WireCo Structures produces Full Locked Coil Rope and Spiral Strand, both Galvanised and Galfan coated Structural Strand and Structural Bridge Rope, Stay Cable Strand and Prestressing Concrete Strand.

### WSP USA

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Booth #: 318

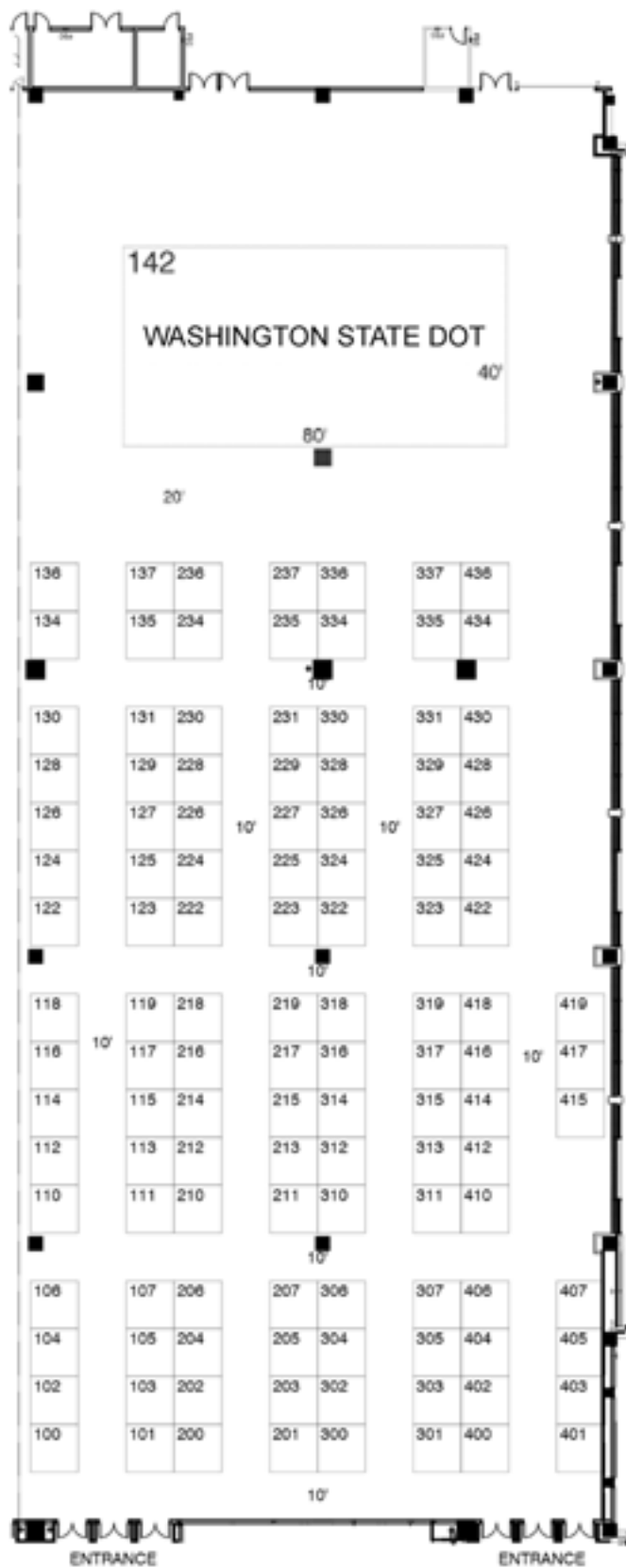
Contact: Susan Wynn

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WSP USA provides a full range of services for bridges—from feasibility studies and environmental permitting, through preliminary and final design, to construction management, inspections and rehabilitation. The firm has extensive experience with all types of bridges, in both steel and concrete, including movable, floating, cable-stayed, arch, truss, segmental, suspension, and girder. WSP offers specialized expertise—such as seismic retrofit and rehabilitation design—in addition to overall program management on behalf of an owner.



# Notes