The 28th Annual International Bridge Conference®
Bridges Without Borders
June 5-8, 2011
David L. Lawrence Convention Center
Pittsburgh, PA USA

CONFERENCE PROGRAM GUIDE

Sponsored by:
Engineers’ Society of Western Pennsylvania

American Road & Transportation Builders Association
The 28th Annual International Bridge Conference®

Technical Sessions

ABC ........................................................................................................... 38
Construction ............................................................................................... 46
Design, Part 1 ............................................................................................ 17
Design, Part 2 ............................................................................................ 36
Drilled Foundations .................................................................................... 19
Featured Country Session ............................................................................ 12
Innovative Concepts .................................................................................... 29
Instrumentation/Inspection ............................................................................ 40
Keynote Session ............................................................................................ 9
Long Span Bridges, Part 1 ........................................................................... 22
Long Span Bridges, Part 2 ........................................................................... 28
Proprietary Session .................................................................................... 14
Poster Session ............................................................................................ 52
Rail ........................................................................................................... 47
Rehabilitation ............................................................................................. 20
Research/Evaluation .................................................................................... 31
Trendy Topics Session ................................................................................. 49

Workshops

W-1: Your Vision...Your Reality/Innovative Financing & the Project Team .......... 14
W-2: FRP Composites Hybrid Systems ........................................................ 15
W-3: National Bridge Industry Workshop: ................................................... 25
W-4: Structural Health Monitoring of Bridges - Technologies and Practice ...... 26
W-5: Society for Protective Coatings Coatings ............................................ 26
W-6: Fundamentals of Bridge Benefit and Life Cycle Cost Analysis ............... 34
W-8: Workzone Safety Workshop, Part 1 .................................................... 34
W-9: Next Beams ....................................................................................... 35
W-8: Workzone Safety Workshop (part 2) .................................................... 42
W-10: SHRP 2 for the International Bridge Community ............................... 43
W-11 (Part 1): Automated Rebar Detailing .................................................. 44
W-12: Lightweight Aggregate in Concrete for Bridges (Part 1) ...................... 44
W-13: A Practitioner’s Guide to Bridge Painting .......................................... 45
W-12: Lightweight Aggregate in Concrete for Bridges (Part 2) ...................... 50

Seminars

Hoover Dam Bypass Bridge ......................................................................... 25
FWHA/AASHTO Tunnel Scan Seminar ...................................................... 33
Geothermal Energy Pile ............................................................................. 42
Bridge Inspection and Management .......................................................... 50

Additional Content

Awards Reception ....................................................................................... 35
Exhibitor Information ................................................................................... 54
General Information .................................................................................... 2
Mini-Theater Presentations ......................................................................... 53
GENERAL INFORMATION

WELCOME TO THE 28TH ANNUAL INTERNATIONAL BRIDGE CONFERENCE®

Please read the following general information to learn about many of the new features of the IBC! With our return to the David L. Lawrence Convention Center (DLLCC), we have the opportunity to offer many new and exciting elements to the Conference, and many new improvements from the 2010 IBC. As always, Conference personnel (found at the Registration Desk) and IBC Executive Committee Members (look for their ribbons!) can be an additional valuable source of information.

REGISTRATION DESK

The Conference Registration Desk is located in HALL A of the DLLCC, on the riverside of the convention center. The hours of operation are:

- Sunday, June 5: 5:00 - 7:00 PM
- Monday, June 6: 7:00 AM - 7:00 PM
- Tuesday, June 7: 7:00 AM - 5:00 PM
- Wednesday, June 8: 7:00 AM - 1:30 PM

REGISTRATION AND ADMISSION

Full Registration includes admission to the Keynote Session, Featured Agency Session, daily Technical Sessions, Workshops, IBC Exhibit Hall, Monday evening Exhibitors Party, and the Monday and Wednesday Exhibit Hall Buffet Luncheon. One-Day Registration includes the Technical Sessions, Workshops and IBC Exhibit Hall and corresponding exhibit function for that day only.

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. Again, we are offering several “Seminars” that are educational programs for continued training. 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. Lastly, many of these same groups have coordinated their “Committee Meetings” during the dates of IBC; some of which are open to all conference registrants.

Remember: Seminars, Tours the IBC Awards Receptions, and Conference Proceedings require an additional registration fee. Please visit the Conference Registration Desk for details.

BADGE IDENTIFICATION

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 do suggest that you remove your badge when leaving the Conference.

MEETING INFORMATION

IBC functions are located in the DLLCC. Please check individual listings throughout this program for specific locations and times for all technical sessions, seminars and social functions. Events which require tickets will also identify the specific location for these functions. Any changes in the program schedule will be posted or announced at the Conference Registration Desk.
GENERAL INFORMATION

evening from 5:00-7:00 P.M. throughout the Exhibit Hall. All registered attendees will receive one ticket redeemable for a beverage at the reception. (Additional tickets can be purchased at the Conference Registration Desk.)

HOST HOTEL INFORMATION

Enjoy the luxury and convenience of the IBC Headquarters Hotel, the Westin Convention Center Hotel. The Westin is Pittsburgh’s newest and most elegant hotel. Linked to the DCLCC via Skybridge, or by an easy outdoor walk across Penn Avenue. Hotel reservations can be made by contacting the Westin Convention Center Hotel directly at 412-281-3700.

Westin Convention Center Hotel
1000 Penn Avenue
Pittsburgh, Pennsylvania 15222
412-281-3700

PRE-PRINTS AND IBC MERCHANDISE

Pre-prints for all technical presentations are available at the Pre-Print area located just inside of the Exhibit Hall near the Conference Registration Desk. Pre-prints can be purchased for just $3.00 per copy.

Again this year: purchase a 1 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).

The Pre-Print Booth will be open:
- Monday: 9:00 A.M. - 6:00 P.M.
- Tuesday: 8:30 A.M. - 5:00 P.M.
- Wednesday: 8:30 A.M. - 1:30 P.M.

IBC GIFT ITEMS

Once again at this year’s IBC, you will have the opportunity to purchase IBC Golf Shirts, T-shirts, and Hats. These items are high quality and feature the popular IBC logo. The Gift Item Table is located near the Pre-print desk on Concourse A, just inside of Hall A, where you can make your purchases throughout the Conference until Wednesday at 1:30 PM. Please be sure to stop by and shop before Wednesday and check out our newest styles for the 2011 IBC!

PROCEEDINGS

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 28th Annual International Bridge Conference® will be available on CD in late Summer 2011 and mailed to you at that time.

COFFEE STAND

Complimentary coffee breaks are available at various times throughout the Conference as noted in your Program Guide. Most breaks are presented in the Exhibit Hall. In addition, a coffee kiosk will offer beverages for purchase at various times during the conference. The Kiosk will be located outside of Hall A.

PDH’S

Earn Professional Development Hours (PDHs) by attending the IBC!

The Engineers’ Society of Western Pennsylvania (ESWP), sponsor of the IBC, has been 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.

To obtain verification of attendance at the IBC from the ESWP, you must request a PDH Confirmation Letter. Official confirmation from the IBC Offices regarding each attendee’s eligibility for PDHs will be mailed after the conference. Attendees who checked the “PDH Letter Requested” box on your Registration Form will automatically receive a Verification Letter that must be returned to ESWP. (PDH Letters can be requested at the Conference Registration Desk 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, workshops or seminars on the session registry. Registry forms are located at the entrance to any of these sessions. Please note that ESWP is unable to verify your attendance in any session if you do not properly sign this registry!

PARKING

The Westin Convention Center Hotel does have its own parking facility, and valet parking is available for an additional cost of $22 per day. Simply pull up to the front door of the hotel to utilize this service. Parking at the David L. Lawrence Convention Center is also available. Self parking lots are in the immediate vicinity. Maps are available online at http://www.pittsburghcc.com/cc/Directions/Parking.aspx

AMERICANS WITH DISABILITIES ACT

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 ESWP Conference Department at 412-261-0710, ext. 11 and advise us of any such requirements in advance.

LOOKING AHEAD!

Interested in presenting a paper, workshop, seminar or mini-theatre presentation at a future IBC? The IBC Call For Papers will open immediately following the 2011 Conference, and everyone is welcome to submit an idea for presentation. Visit www.eswp.com/bridge for more details.

JOIN US AT THE 2012 IBC!

June 10-13, 2012, David L. Lawrence Convention Center, Pittsburgh, PA
GENERAL INFORMATION

IBC EXECUTIVE COMMITTEE

The Engineers’ Society of Western Pennsylvania wishes to extend it’s thanks and gratitude to the following members for their dedication to the planning on the 2011 International Bridge Conference®. (*denotes Honorary Member)

General Chair
Thomas J. Vena, P.E.
A&A Consultants Inc.

Education & Student Awards Chair
Michael J. Alterio
Alpha Structures Inc.

Keynote/Featured Agency Chair
Carl Angeloff, P.E.
Bayer Material Science, LLC

Budget/Rules Chair
Victor E. Bertolina, P.E.*
SAI Consulting Engineers, Inc.

Education & Student Awards Chair
Calvin Boring Jr.
Trumbull Corporation

Enrico T. Bruschi, P.E.
AECOM

Matthew A. Bunner, P.E.
HDR Engineering, Inc.

Jeffrey J. Campbell, P.E.
Michael Baker Jr., Inc.

Budget/Rules Chair
Richard Connors, P.E.
Bureau Veritas North America, Inc.

James Dwyer*
Advanced Rail Management Corp.

Dr. James Garrett, Jr., Ph.D.
Carnegie Mellon University

John F. Graham, Jr., P.E.*
OSMOS USA

Education & Student Awards Chair
Dr. Kent Harries, Ph.D., FACI, P.Eng.
University of Pittsburgh

Donald W. Herbert, P.E.
Pennsylvania Dept. of Transportation

Magazine Chair
George M. Horas, P.E.
alfred benesch & company

Tours Chair
Donald Killmeyer, Jr., P.E.
ms consultants, inc.

Eric S. Klene, PCS
KTA-Tator, Inc.

Awards & Magazine Chair
Thomas G. Leech, P.E., S.E.
Gannett Fleming, Inc.

M. Myint Lwin, P.E., S.E.
Federal Highway Administration

Thomas P. Macioce, P.E.
Pennsylvania Dept. of Transportation

James R. Madara, P.E., L.S.
Gannett Fleming, Inc & ARTBA

Herbert M. Mandel, P.E.*
GAI Consultants, Inc.

Technical Program Chair
Matthew P. McTish, P.E.
McTish, Kunkel & Associates

Construction & Co-Meetings Chair
Ronald D. Medlock, P.E.
High Steel Structures, Inc.

Gerald J. Pitzer, P.E.
Consultant

Workshops & Seminars Chair
Gary Runco, P.E.
Borton-Lawson

Helena Russell
Bridge design & engineering

Louis J. Ruzzi, P.E.
Pennsylvania Dept. of Transportation

Conference Manager
Cori Stellfox
Engineers’ Society of Western PA

Exhibits/Co-Sponsors Chair
Rachel Stiffler
Vector Corrosion Technologies

David Teorsky
Engineers’ Society of Western PA

Lisle E. Williams, P.E., PLS*
Consultant

Strategic Planning Chair
Kenneth J. Wright, P.E.
HDR Engineering, Inc.

Emeritus Members:
Joel Abrams, Ph.D.
Consultant

Reidar Bjorhovde,
Ph.D., P.E.
The Bjorhovde Group

Dr. Arthur W. Hedgren,
Jr., Ph.D., P.E.
Consultant

O’Donnell Consulting Engineers, Inc.

2940 South Park Road
Bethel Park, PA 15102
Phone: (412) 835-5007
Fax: (412) 835-5017
www.odonnellconsulting.com
28th Annual International Bridge Conference®

GENERAL INFORMATION

MEDIA PARTNERS
Bridge design & engineering: ................................. www.bridgeweb.com
Coatings Pro Magazine: ........................................... www.gobridges.com
Concrete Construction (Media Partner) .............. www.concreteconstruction.net
The Journal of Protective Coatings and Linings and Paintsquare.com:
................................................................. www.paintsquare.com
Rebuilding America’s Infrastructure: .................... www.gobridges.com
Roads & Bridges Magazine: ................................. www.roadsbridges.com

CO-SPONSORS
American Concrete Institute (ACI)...................... www.concrete.org
American Society of Highway Engineers (ASHE) .... www.highwayengineers.org
Canadian Society for Civil Engineering (CSCE)........ www.csce.ca
Central Atlantic Bridge Associates.................. www.caba-bridges.org
Federal Highway Administration (FHWA).............. www.fhwa.dot.gov
National Steel Bridge Alliance ....................... www.steelbridges.org
Short Span Steel Bridge Alliance (SSSBA) ............. www.shortspansteelbridges.org

The 28th Annual International Bridge Conference® will kick off with the Keynote Session, featuring leaders of the bridge industry from around the world. This annual kick-off to the IBC will be led by Thomas J. Vena, P.E., Chair of the 2011 Conference. Scheduled topics and speakers include:
• “AASHTO/FHWA Update” Malcolm T. Kerley, P.E., AASHTO, Richmond, VA and M. Myint Lwin, P.E., S.E., Director, Office of Bridge Technology (HIBT), Federal Highway Administration, Washington, DC
• “The Future of High Speed Rail in North America” - Al Engel, Vice-President of Amtrak
• “America’s Infrastructure Report Card” - Andrew Herrmann, P.E., ASCE President, Washington, DC
• “50 Years of Bridge Building” - Bob Luffy, former CEO, American Bridge, Pittsburgh, PA
• “Overview and Policy of KOREA Bridge” - Hyeong-Ryeol KIM, Ph.D., P.E., Director General, Road Policy Bureau, Ministry of Land, Transport and Maritime Affairs (MLTM), Republic of Korea

KEYNOTE BIO BRIEFS:

MALCOLM KERLEY, P.E.
AASHTO, RICHMOND, VA

Malcolm T. Kerley (Mal) is a 1971 graduate of the Virginia Military Institute and received his Masters Degree in Civil Engineering from the University of Virginia in 1973.

During his forty years with the Virginia Department of Transportation (VDOT), he worked in several areas of VDOT’s Structure and Bridge Program mainly involved in the design and development of new structural plans. From 1992-2002, he served as State Structure and Bridge Engineer where he was responsible for the design, construction, inspection and maintenance of the Department’s 20,000 structures. He was promoted in July 2002 to his present position where he is responsible for the engineering aspects of the Department, including overseeing the pre-construction design activities of four divisions within VDOT. A registered professional engineer in Virginia, Mal is actively involved in various committees within the transportation industry, represents Virginia on the AASHTO Standing Committee on Highways, and is Chair of the AASHTO Subcommittee on Bridges and Structures.

M. MYINT LWIN, P.E., S.E.,
DIRECTOR, OFFICE OF BRIDGE TECHNOLOGY (HIBT),
FEDERAL HIGHWAY ADMINISTRATION

Myint Lwin is the Director of the Office of Bridge Technology with the Federal Highway Administration (FHWA). As Director of the Office of Bridge Technology, his responsibilities include: providing national guidance in the design and construction of major and unusual bridges and tunnels, developing national bridge program and
engineering policies; initiating system and process improvements to continually improve the quality and safety of bridges and structures; and providing technical and program direction for the Highway Bridge Replacement and Rehabilitation Program. Prior to his appointment in Washington, D.C., Mr. Lwin was the Structural Design Engineer at the FHWA Resource Center in San Francisco. Before joining FHWA in January 2000, he was the State Bridge and Structures Engineer, Office of Bridges and Structures, Washington State Department of Transportation. Mr. Lwin received his BSCE from the University of Rangoon, Burma, and his MSCE degree from the University of Washington, Seattle. He is a registered Professional Engineer in Civil and Structural Engineering.

ANDREW WILLIAM HERRMANN, P.E., S.E.C.B,
ASCE PRESIDENT, WASHINGTON, DC

Andrew Herrman is a 1973 alumnus of Valparaiso University graduating with his Bachelors of Science in Civil Engineering. He received his Masters of Science in Civil Engineering at Polytechnic Institute of NEW York, NY. Andrew has worked at Hardesty & Hanover, LLP since the beginning of his career. He has held positions such as structural detailer, structural engineer, project engineer, associate engineer, partner, managing partner, and principal. He holds his Professional Engineer license in 29 states. Actively involved in ASCE for over 30 years, he is the President of the organization. He is the recipient of several ASCE awards including the President’s Medal (2009), New Jersey Section “Excellence in Management Award” (2008), Lower Hudson Branch “John B. Jervis Award” (Engineer of the Year) (2008), and Metropolitan Section “Thomas C. Kavanagh Service Award” (2007). Outside of professional work and ASCE, he is actively involved in the community as well as participating in two The History Channel’s documentaries. In his free time, he enjoys fishing, cross country skiing, enjoying time with his wife, Linda, two daughters, Christina and Leslie, as well as his grandchildren.

AL ENGEL,
VICE PRESIDENT OF AMTRAK, WASHINGTON, DC

Al Engel has more than 40 years of experience in the rail transportation business and over that time has been active in the study, advocacy and development of high-speed rail projects, including equipment procurement and infrastructure work on the Northeast Corridor in advance of the launch of Amtrak high-speed Acela Express service.

Prior to joining AECOM in 2009, Mr. Engel worked as a financial advisor with Morgan Stanley from 2006 to 2009. From 1991 to 2006, he was president and CEO of SYSTRA Consulting, a consulting firm affiliated with Societe Nationale des Chemins de Fer Francais (SNCF), the French national railway and Paris Metro specializing in rail transportation and public transit planning and engineering, including high-speed rail projects.

From 1985 to 1989, he served as president and CEO of LS Transit Systems, Inc., the company he launched which was later renamed SYSTRA Consulting. One of his several key consulting roles included the California High-Speed Rail Authority Implementation Plan.

From 1989 to 1990, he served as president and COO of Atlantic Track and Turnout Company, a steel product fabricator and distributor specializing in rail and track accessories. From 1978 to 1985 he headed the infrastructure engineering unit of Gibbs & Hill, the firm which serviced the Pennsylvania Railroad and later Amtrak on its electric traction engineering needs.

Mr. Engel spent the first decade of his professional life with General Electric holding various positions in the Locomotive Department including the management of the domestic electric locomotive business unit.

He currently serves on the American Public Transportation Association (APTA) board of directors and has served on several working committees of APTA and other industry associations. He was chairman of the High-Speed Rail Association from 1994 to 1995 and has won numerous awards for his leadership in public transportation advocacy.

Mr. Engel earned his Bachelor of Science degree in Electrical Engineering from Pennsylvania State University in 1968 and holds professional engineer licenses in New Jersey, New York, and Pennsylvania.

ROBERT J. LUFFY,
FORMER CEO, AMERICAN BRIDGE, PITTSBURGH, PA

Robert H. Luffy has made a significant and positive mark in the construction industry through his accomplishments within major civil engineering construction. During his 17 years as president and chief operating officer (CEO) of American Bridge, Luffy engineered a resurgence of the company followed by sustained growth and operating success.

During his tenure AB has constructed numerous internationally recognized bridge projects, including the reconstruction of the Williamsburg Bridge in New York City, the 25th of April Bridge in Lisbon, Portugal, the Lions Gate Bridge in Vancouver, British Columbia, the new Woodrow Wilson Bridge in Washington, DC, the currently in-process Self-Anchored-Suspension Span of the San Francisco Oakland Bay Bridge in California, among many others. He also began the successful foray into heavy marine construction that has seen the company become one of the largest in that field in the United States, completing major port and naval projects along the eastern and western seaboads, the Caribbean, and the inland waterway system.

Luffy received his Bachelor of Science degree in Civil Engineering in 1972 and a Masters of Business Administration degree in 1979, both from the University of Pittsburgh. He is a Registered Professional Engineer in the state of Pennsylvania.

Luffy is a member of the American Society of Civil Engineers, the American Society of Highway Engineers, the University Of Pittsburgh School of Engineering Visitors and the Construction Industry Round Table. He also remains active within the civic community of Pittsburgh, where he served as Chairman of the Pittsburgh Zoo for five years and well as a board member, and former chairman of the Boys and Girls Clubs of Western Pennsyl- vania. Having served as first lieutenant in the U.S. Army Special Forces in Vietnam, Luffy is actively involved in the Vietnam Veterans Leadership Program where he was named Veteran of the Year in 1990.

Now residing in the city of Pittsburgh, Pennsylvania, Robert plans to continue being actively involved in the engineering industry and enjoy his retirement years with his wife Debbie and their five children, Jake, Cole, Tyler, Sarah and Sam.

HYEONG-RYEOL KIM, PH. D, P.E.,
DIRECTOR GENERAL FOR ROAD POLICY,MINISTRY OF LAND, TRANSPORT AND MARITIME AFFAIRS(MLTM)

Hyoeong-Ryeol Kim is the Director-General for Road Policy of the Ministry of Land, Transport and Maritime Affairs of the Republic of Korea. As Director-General for Road Policy, his responsibilities include establishment of road master plans, construction and
maintenance of expressway and national highway, construction of traffic congested roads in the metropolitan areas, execution of R&D in the road sector, planning and implementation of PPP projects in the road sector, maintenance of bridges and tunnels, establishment and implementation of intelligent transport system (ITS) plans.

He has been working at the Ministry of Land, Transport and Maritime Affairs since 1986 and served as Director of the Road Policy Division in 2009 and a spokesman in 2010.

He holds a Bachelor’s degree and a Master’s degree of Civil Engineering from Yonsei University and a Doctor’s degree in Civil Engineering from University of Tokyo.

### FEATURED COUNTRY SESSION

<table>
<thead>
<tr>
<th>Time:</th>
<th>1:30-5:00 PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room:</td>
<td>Ball Room B</td>
</tr>
</tbody>
</table>

Learn more about the bridge program of the 2011 IBC Featured Country, the Republic of Korea, with sessions and speakers that include:

- **The National Bridge Policy focused on Unified Remote Monitoring System and Seismic Retrofit Program** — Ungjin NA, Director, Ph.D., P.E., ITS & Road Environmental Division, Ministry of Land, Transport and Maritime Affairs (MLTM), Republic of Korea
- **Recent Major Bridges in Korea** — Dong-Ho CHOI, Ph.D., Professor, Hanyang University, Rep. of Korea; Hyun-Moo KOH, Ph.D. Professor, Seoul National University, Rep. of Korea; Young Suk PARK, Ph.D. Professor, Myong Ji University, Rep. of Korea; Woo-jong KIM, Ph.D. DM Engineering, Co., Ltd., Rep. of Korea
- **R&D Activities of Bridges in Korea** — Youngseong Harry KOO, P.E, Director, Korea Institute of Construction & Transportation Technology Evaluation and Planning (KICTEP), Rep. of Korea; Byung-Suk KIM, Korea Institute of Construction Technology (KICT), Rep. of Korea
- **Incheon Bridge, New link to Incheon International Airport** — Duk Ki IM, P.E., General Manager, Samsung C&T Corporation, Rep. of Korea
- **Mokpo Bridge: Design and Construction** — Young-Jun Hong, General Manager, GS Engineering & Construction, Co., Ltd., Rep. of Korea
- **Yeongduk 1st Bridge: Design and Construction of Cable-stayed Bridge** — Seung-rok LEE, Ph.D., P.E., Vice President, POSCO Engineering & Construction, Co., Ltd., Rep. of Korea
- **Introduction to Marine-Crossing Bridges** — Jaber Causeway, Ulsan Harbor, and Geoguem Bridge — Eu-Kyeong CHO, Ph.D, P.E., General Manager, Hyundai Engineering & Construction, Co., Ltd., Rep. of Korea
- **Innovative and Aesthetic Challenges in Suspension Bridges** — Jae-Hong KIM, P.E., General Manager, Daelim Industrial Co., Ltd., Rep. of Korea
- **Busan Geoje Fixed Link** — Dong-Keun KIM, P.E., Vice President, SK Engineering & Construction, Co., Ltd., Rep. of Korea
- **Incheon Bridge, New link to Incheon International Airport** — Duk Ki IM, P.E., General Manager, Samsung C&T Corporation, Rep. of Korea
- **Mokpo Bridge: Design and Construction** — Young-Jun Hong, General Manager, GS Engineering & Construction, Co., Ltd., Rep. of Korea
- **Yeongduk 1st Bridge: Design and Construction of Cable-stayed Bridge** — Seung-rok LEE, Ph.D., P.E., Vice President, POSCO Engineering & Construction, Co., Ltd., Rep. of Korea
- **Introduction to Marine-Crossing Bridges** — Jaber Causeway, Ulsan Harbor, and Geoguem Bridge — Eu-Kyeong CHO, Ph.D, P.E., General Manager, Hyundai Engineering & Construction, Co., Ltd., Rep. of Korea
- **Innovative and Aesthetic Challenges in Suspension Bridges** — Jae-Hong KIM, P.E., General Manager, Daelim Industrial Co., Ltd., Rep. of Korea
- **Busan Geoje Fixed Link** — Dong-Keun KIM, P.E., Vice President, SK Engineering & Construction, Co., Ltd., Rep. of Korea
- **Incheon Bridge, New link to Incheon International Airport** — Duk Ki IM, P.E., General Manager, Samsung C&T Corporation, Rep. of Korea
- **Mokpo Bridge: Design and Construction** — Young-Jun Hong, General Manager, GS Engineering & Construction, Co., Ltd., Rep. of Korea
- **Yeongduk 1st Bridge: Design and Construction of Cable-stayed Bridge** — Seung-rok LEE, Ph.D., P.E., Vice President, POSCO Engineering & Construction, Co., Ltd., Rep. of Korea
- **Introduction to Marine-Crossing Bridges** — Jaber Causeway, Ulsan Harbor, and Geoguem Bridge — Eu-Kyeong CHO, Ph.D, P.E., General Manager, Hyundai Engineering & Construction, Co., Ltd., Rep. of Korea
- **Innovative and Aesthetic Challenges in Suspension Bridges** — Jae-Hong KIM, P.E., General Manager, Daelim Industrial Co., Ltd., Rep. of Korea
- **Busan Geoje Fixed Link** — Dong-Keun KIM, P.E., Vice President, SK Engineering & Construction, Co., Ltd., Rep. of Korea

The Engineers’ Society of Western Pennsylvania (ESWP) is the primary sponsor for the IBC. The conference is assembled by the volunteer efforts of the IBC Executive Committee, which is composed of bridge owners, designers, constructors, manufacturers, suppliers and educators. The IBC Executive Committee, along with the ESWP staff, has spent many hours developing an outstanding program. Our objective is to always provide the attendee with the highest quality and practical value that is available.

We are honored to have The Republic of South Korea as our “featured country.” This year’s featured country session will include a keynote lecture by the Director General for Road Policies of Korean Government, a state-of-the-art presentation on specific bridges in or near completion in 2011, and the special exhibition featuring the vibrant activities of Korean construction technology and industry.

The IBC Exhibit Hall is planned similarly to the 2010 Exhibit Hall with some upgrades to make your experience even better and more productive. We have enhanced networking opportunities for all the attendees, the Technical Sessions will be located in theatres within the Exhibit Hall itself, allowing plenty of time for exhibitors and conference attendees to interact between sessions, coffee breaks and lunchtimes. We encourage you to take the time to visit with them.

We will also offer Seminars, Workshops and Special Interest Sessions to keep you current with the latest technology advancements in the world of bridge engineering. We will again offer our annual Bus Tour on Tuesday afternoon, and will highlight current bridge construction projects in the Pittsburgh area.

For those of you attending the IBC for the first time, we trust that you will find the Conference a rewarding and exciting educational experience, as have many thousands before you.

For those who have attended the IBC previously, we hope to make this Conference truly profitable and memorable for you. We greatly appreciate your attendance and your contributions to the bridge profession; together we all make a difference. Thank you!

---

Thomas J. Vena, P.E. is the General Chair of the 2011 International Bridge Conference®. Mr. Vena is the Vice President of Operations for A&A Consultants Inc.
MONDAY'S SESSIONS

PROPRIETARY SESSION

Time: 1:30-5:00 P.M.
Room: Theater 1
Chair: Rachel Stiffler, Vector Corrosion Technologies, McMurray, PA

11-01 1:30 PM

A NEW ORTHOTROPIC STEEL BRIDGE DECK FOR MULTIPLE LONGITUDINAL GIRDER BRIDGES

Richard Vincent, Canam Group Inc. (Structal Bridge Division), Boucherville, QC Canada

An orthotropic bridge deck acting compositely with longitudinal steel girders is presented. The stiffened deck plate is prefabricated in wide and long panels and assembled with minimum field welding. The deck accommodates roadway crowns and curves. Designed for long life, a low weight and accelerated construction in mind, including shop applied wearing surfaces for immediate trafficking. Deck provides opportunities for rehabilitation of concrete decks and widening of existing bridges without altering abutments or piers.

11-02 1:55 PM

NON-DESTRUCTIVE EVALUATION OF BRIDGE CABLES AND STRANDS USING THE MAGNETIC MAIN FLUX METHOD (MMFM)

Masamichi Sugahara, Tokyo Rope MFG. CO., LTD, Chuo-ku, Tokyo, Japan

In recent years, lots of examples of corrosion in cables have been reported. We have developed a non-destructive evaluation technology (MMFM) that can be utilized to assess the condition of cables. MMFM is based on straightforward principle that when ferromagnetic material is magnetized, the magnitude of the resultant magnetic flux is directly proportional to cross section of ferromagnetic material. We report the principal methodology of MMFM, and the results of actual measurements by MMFM.

11-03 2:20 PM

(ROAD DEVELOPMENT AGENCY (RDA) IN ZAMBA, AFRICA BRIDGE INVENTORY PROGRAM)

Jeremy Shaffer, Ph.D., InspectTech, Pittsburgh, PA; Rankin Engineering Consultants, Chozi Road, Northmead, Lusaka, Zambia; Mike Schellhase, InspectTech, Pittsburgh, PA

MONDAY'S SESSIONS

WORKSHOP 2: FRP COMPOSITES HYBRID SYSTEMS ADVANCING SUSTAINABLE SOLUTIONS FOR BRIDGES

Time: 1:00 - 5:00 PM
Room: 327
Presented by American Composites Manufacturers Association

For over 20 years, FRP composite products used in new bridge construction and rehabilitation has provided bridge engineers and owners with innovative and cost effective solutions. In new construction, features such as lightweight, corrosion resistance, and prefabrication has contributed to the goals of accelerated bridge construction by reducing assembly and installation time resulting in lower costs for deploying FRP composites technology. In rehabilitation, features such as speed and minimal disruption to the structure while in service have provided bridge owners with solutions for extending the service life of bridge structures. The technology continues to evolve with better products and solutions for many new applications.

The design and construction of products for bridges with long-term durability and low maintenance requirements is a significant challenge for bridge engineers and is an important component in the life cycle costs of bridges constructed in the U.S. The workshop will present case histories on FRP composites used in both new construction and repair where the bridge spans are longer and job sites are more challenging than any time in the past. The presentations will cover hybrid structural systems; deck retrofits for movable bridges, FRP rebar performance testing in concrete decks, and structural strengthening of bridge structures.

Attendees will also be given a technical overview of a recently published document by ASCE titled “Pre-Standard for Load & Resistance Factor Design (LRFD) of Pultruded
Fiber Reinforced Polymer (FRP) Structures.” This Pre-standard was developed using principles of probability-based limit states design to provide uniform practice in the design of pultruded FRP structural systems and will help structural engineers design FRP composites for bridge deck systems.

Session attendees will learn about recent technology advancements on FRP composite products that are deployed to solve bridge construction problems that cannot be solved with traditional materials. The workshop will also provide information for engineers and owners with cost effective solutions.

Presenters: John Busel, American Composites Manufacturers Association, Tuckahoe, NY; Dan Richards, Ph.D., P.E., ZellComp, Inc., Durham, NC

WORKSHOP 14: BRIDGE OWNERS FORUM
Time: 1:00 - 4:30 PM
Room 324
Presented by High Steel Structures
In this forum bridge owners will describe their upcoming bridge programs. Attendees will get upcoming program details including
- Bridges programmed for letting during the next few years
- Major projects expected to be let within the next 3 to 10 years
- Upcoming projects of interest to large and medium sized contractors and fabricators
- Other details about funding that may be unique to each owner

In addition to presenting, Owner attendees will be able to assess the ongoing bridge construction and reconstruction programs in neighboring states in order to help ensure contractor capacity.

Attendees will learn about future owner bridge design needs, upcoming projects, upcoming letting information, and general bridge program information.

Forum participants include: Rebecca Nix, Utah DOT; Prasad Nallapaneni, Virginia DOT; Paul DeSignore, Amtrak; James L. Stump, Pennsylvania Turnpike Commission; Beverly Miller, Pennsylvania DOT
New ideas, innovative project delivery, design and construction challenges are explored for this first of its kind bridge that stretches over 500 feet across the mouth of the York River in historic York, Maine. The York “New Bridge” is the first bridge to utilize the Northeast Extreme Tee (NEXT) Beam. Industry, owners, designers, fabricators, and contractors share their perspectives on these massive new beams from the northeast that aim to compete in the medium span bridge market and accelerate construction.

**COFFEE BREAK:** 10:10 – 10:30 AM

**11-26** 10:30 AM

**EXPANDING THE APPLICATION OF JOINTLESS BRIDGES TO LONGER BRIDGE LENGTHS**

Ardalan Sherafati, Nima Ala and Atorod Azizinamini, University of Nebraska-Lincoln, Lincoln, NE

Integral-abutment jointless bridges are typically designed with flexible foundations which include one row of piles. Results of analysis, as expected, indicate that the stiffness of the piling system could be reduced by providing rotational capacity over the pile head. Since the major criterion limiting the application of jointless bridges is the capacity of the piles in lateral movement, the proposed detail can allow the application of jointless construction to longer bridge lengths.

**11-27** 10:55 AM

**FRAMEWORK FOR IMPROVING RESILIENCE OF BRIDGE DESIGN**

Brandon Chavel, Ph.D., P.E., HDR Engineering, Inc., Chicago, IL, M. Myint Lwin, P.E., S.E., Federal Highway Administration, Washington, DC; John Yadlosky, P.E., HDR Engineering, Inc., Pittsburgh, PA

Bridge failures can result in the disruption of commerce and services, significant repair costs, and most importantly the loss of human life. Performing a failure analysis during design, coupled with the review of past bridge failures, can help to avoid failures and the need to initiate investigations and perform forensic engineering after an event. The presentation will highlight fault tree methods and the application of lessons learned from past bridge failures.

**11-28** 11:20 AM

**DESIGN AND CONSTRUCTION OF THE MON-FAYETTE EXPRESSWAY BRIDGES - UNIONTOWN TO BROWNSVILLE, PA**

Thomas Leech, P.E., S.E., Gannett Fleming, Inc., Pittsburgh, PA; Bernard J. Zielinski, P.E., Pennsylvania Turnpike Commission, Highspire, PA; William R. Piper, ALCM Inc., Mon/Fayette Expressway, California, Pa

The Pennsylvania Turnpike Commission has adopted several guiding principles for the design and construction of 37 bridges within the rugged terrain of the 17 mile segment of the Mon-Fayette Expressway from Uniontown to Brownsville, PA. This has resulted in the construction of many unique, aesthetic and signature structures including several high level viaducts, a special structure crossing the historic National Road (U.S. 40), and a major crossing over the navigable waters of the Monongahela River.

**COFFEE BREAK:** 10:10 – 10:30 AM

**11-21** 10:30 AM

**EMERGENCY MICROPILE RETROFIT FOR I-94 BRIDGE OVER RIVERSIDE DRIVE**

Dan Thome, P.E., Nicholson Construction Company, Kalamazoo, MI; Michael J. Thelen, PE, M.ASCE, Soil and Materials Engineers, Inc. (SME)

Design/build emergency retrofit was performed by Nicholson using micropiles through the existing pier footings. Movement monitoring included Soldata’s Cyclops real-time and continuous surveying system. The Cyclops allowed the emergency retrofit to proceed while providing understanding of movement trends from the existing bridge structure and eventually verified that the bridge pier loads were gradually transferred to newly installed micropiles. Presentation will highlight design and construction procedures utilized for emergency response of the micropile solution implemented.
Faced with an increasing number of structural failures to its masonry arch bridge population, PennDOT District 6-0 developed a rehabilitation program that provided for streamlined project design delivery, cost effective repairs and the preservation of historic and aesthetic values. Rehabilitation plans for 20 masonry arch bridges have been completed and awarded for construction using this streamlined process. The paper will focus on the steps taken to improve efficiency and the cost effective repair measures utilized.

**11-07**

**REHABILITATION OF THE JACKS RUN ARCH BRIDGE**

Gary Gardner, Jr., P.E., and Daniel W. Wills, P.E. ms consultants, Inc., Coraopolis, PA; Michael J. Dillon, P.E., Allegheny County Department of Public Works, Pittsburgh, PA

The S8.9M rehabilitation of the Jacks Run Bridge, featuring a 320 foot arch, includes replacement of the deck, spandrel columns, floorbeams, and jack arches. The project was carried out with sensitivity to historic community impacts. New elements re-stored the bridge’s historic character. Utilizing temporary spans, pedestrian traffic across the bridge was maintained throughout construction. Other aspects include the use of two types of galvanic anodes and construction methods for deck replacement.

**COFFEE BREAK:**

10:10 – 10:30 AM

**11-08**

**INVESTIGATIONS AND COUNTERMEASURES OF TYPHOON-INDUCED MULTI-HAZARD ON IMPACTING ON HIGHWAY BRIDGES**

Helsin Wang, The Institute of Bridge Engineering, China Engineering Consultants, Inc., Taipei, Taiwan; Chung-Yue Wang, Professor, Ph.D., Director

Typhoon Morakot severely damaged approximately 200 highway bridges in Taiwan in August, 2009. The induced multiple natural hazards, such as flood, landslide, debris flow, drafting wood, and barrier lakes, caused embankment erosion, discharge loss, overflow accompanying with debris, vibratory stream bending, etc. around bridges. Both traditional and innovative techniques are introduced to investigate different types of bridge failure. The cause analysis provides crucial information to take proper countermeasures on engineering and policy for future reconstruction.

**11-09**

**REHABILITATION OF NORTHBOUND 14TH STREET BRIDGE OVER THE POTOMAC RIVER IN WASHINGTON DC**

Wagdy Wassef, P.E., Ph.D., Modjeski and Masters, Inc., Mechanicsburg, PA; Nick Theofanis, Dan Irwin, and Martin Smith, Modjeski and Masters, Inc., Harrisburg, PA; Konjit Eskender, District of Columbia Department of Transportation

The northbound 14th Street Bridge in Washington DC carries northbound I-395 across the Potomac River. Several of the concrete river piers of the bridge exhibited vertical cracking. The piers are being rehabilitated using a post-tensioned concrete encasement. Dewatering the area around the piers required an innovative construction method to allow the construction of the cofferdam despite the low underclearance. In addition, the non-operable movable span and problem areas of the fixed spans are being rehabilitated.
LONG SPAN BRIDGES, PART 1 SESSION

Time: 8:30 AM - 12:00 NOON
Room: Theatre 2, Hall A
Chair: Richard Connors, P.E., Bureau Veritas North America, Inc., Pittsburgh, PA

11-10 8:30 AM
DESIGN AND CONSTRUCTION OF THREE EXTRADOSED BRIDGES
IN LA PAZ (BOLIVIA)
Juan A. Sobrino, Ph.D., PEDELTA, Coral Gables, FL

The construction of a beltway allowing traffic decongestion in La Paz, Bolivia, has just been completed. The new elevated road crosses three parallel valleys with signature bridges. These three consecutive bridges have similar features and as a result are called the Triplets. All three-span structures are extradosed concrete bridges with maximum span of 372 feet. The presentation includes the design criteria using American and European Codes and the main features of the erection process.

11-11 8:55 AM
TIED ARCH BRIDGE WITH TWIN, FREE-STANDING STEEL RIBS
OVER MISSISSIPPI RIVER, HASTINGS, MN
Vincent Gastoni, P.E., Martin Furrer, Greg Hasbrouck, and Shaoyun Sun, Parsons, Chicago, IL

The new Mississippi River crossing at Hastings, MN consists of a 545 foot main span tied arch with free-standing ribs. This bridge was selected as part of a design-build “best value” competition, to create a community icon for this scenic recreation area. The free-standing arch ribs are steel boxes, with no upper wind bracing, and are supplied with post-tensioned concrete ties; this offers not only aesthetic appeal, but a cost-effective solution in this context. When completed, the bridge will represent a record span for this type of structure in North America.

In addition to the unique structure type, the project is mandated to meet rigorous structural redundancy requirements specified by the Minnesota Department of Transportation and to provide a 100-year design life. The redundancy requirements significantly exceed typical considerations for arch and hanger redundancy, and include requirements for floor beam loss and the failure of other main structural elements, with restrictions for both service and strength limit states. To meet the corresponding design challenges, a unique floor system with both longitudinal and transverse main girders has been developed to provide sufficient alternate load paths. Also, detailed computer models with response time history analyses are being used to validate the structural redundancy under various fracture scenarios. To meet the 100-year design life, stainless steel deck reinforcement and other innovative material usage and details are employed.

11-12 9:20 AM
THE PRACTICE OF THREE BUNDLES CABLE-STAYED BRIDGE WITH
DOUBLE COMPOSITED WARREN TRUSS GIRDER
Chang Kyu Park, Ph.D., Hyundai Engineering & Construction Co., Ltd., Jongno-Gu, Seoul Korea, In-Ho Jang, Ph.D., Jun-Soo Ha, P.E., Geun-Young Kim, P.E., Kwan-Woo Park, P.E.

The 2nd Geo-Geum Bridge is a part of the fixed connection of the Geo Geum Island to the South Korean Peninsula. The bridge is a 2-lane national highway bridge with a total length of 2,028 m composed of a 912 m long approach bridge and a 1,116 m long main span for this type of structure in North America.

In addition to the unique structure type, the project is mandated to meet rigorous structural redundancy requirements specified by the Minnesota Department of Transportation and to provide a 100-year design life. The redundancy requirements significantly exceed typical considerations for arch and hanger redundancy, and include requirements for floor beam loss and the failure of other main structural elements, with restrictions for both service and strength limit states. To meet the corresponding design challenges, a unique floor system with both longitudinal and transverse main girders has been developed to provide sufficient alternate load paths. Also, detailed computer models with response time history analyses are being used to validate the structural redundancy under various fracture scenarios. To meet the 100-year design life, stainless steel deck reinforcement and other innovative material usage and details are employed.

11-13 9:45 AM
WANDO BRIDGE IN KOREA - FABRICATION AND CONSTRUCTION
Won-Jin Yu, Ph.D., Chang-Ho Chun, Hyun-Seok Choi, Jae-Beom Shim, Samsung C&T Corporation, Chunnam, South Korea

The Wando bridge is an asymmetric cable-stayed bridge located in Wando island, Korea. The bridge is composed of 75m steel tower, 500m steel girder and 32 cables. Pre-assembled large blocks - one tower and nine girders, have been erected rapidly using 750 t crane and 4000 t floating crane. To minimize the working time of floating crane, variety of ideas and thoughtful engineering were applied to erection and joint connection.

COFFEE BREAK: 10:10 – 10:30 AM

11-14 10:30 AM
A BRIDGE IN HARMONY WITH NATURE - US 191 COLORADO RIVER BRIDGE IN MOAB, UTAH
Steve Fultz, P.E., S.E., FIGG Bridge Engineers, Inc., Denver, CO; Fred Doehring, P.E., Utah Department of Transportation, Salt Lake City, Utah

The new US 191 Colorado River Bridge in Moab, Utah was designed by FIGG for the Utah DOT. The sustainable, long-span bridge features twin concrete segmental structures built from above in balanced cantilever to protect the river and surrounding landscape. Context sensitive solutions developed through extensive community involvement resulted in a bridge that appears to be born of the earth with colors, textures and shapes that blend the bridge into nature. Opened to traffic in December 2010.

11-15 10:55 AM
DETAILED DESIGN AND CONSTRUCTION OF ULSAN HARBOR SUSPENSION BRIDGE WITH 1,150M MAIN SPAN

The Ulsan Harbor Bridge is a single span suspension bridge which spans the harbor mouth of Ulsan in Korea. The bridge has 1,150m long main span with 303m and 355m long approach viaducts respectively. It was the 3rd longest one as a single span suspension bridge in the world when planned in 2007. The width between main cables is 23.5m with 4 traffic lanes. The tensile strength of main cables is 1,960 Mpa.

11-16 11:20 AM
R&D FOR THE CONSTRUCTION OF LONG SPAN BRIDGES
Kyoung-Jae Lee, Ph.D., Inho Hwang, Ph.D., Jae-Hong Kim, P.E., Un Il Baek, P.E., Daelim, Seoul, South Korea

Super Long Span Bridge R&D Center has established in Korea to develop and support the construction techniques of long span bridges. Daelim, a leading company in the bridge construction, has developed the equipment for the erection of main cables in suspension bridge and the geometric control systems for the construction stages. This paper presents the status of R&D of Daelim in the construction of long span bridge and its technical advance in this area.
**SEMINAR: (TICKETS REQUIRED)**

IBC Seminars are intensive, four-hour, single-topic focused sessions. An additional fee of $175 is required for each seminar and advance registration is required, and a ticket will be provided to you at that time. Tickets are required to attend all seminars. Seating for each Seminar is limited, so please register early. Certificates of Completion are awarded upon completion.

**SUCCESSFUL DESIGN AND CONSTRUCTION MANAGEMENT OF THE HOOVER DAM BYPASS BRIDGE**

**Time:** 8:00 AM–12:00 NOON

**Seminor Leader:** M. Myint Lwin, P.E., S.E. FHWA, Washington, DC

**Goals:** To provide (1) a forum for the Owner’s, Designer’s and Contractor’s Management Teams to share the lessons learned in successfully completing the Hoover Dam Bypass Bridge and (2) an opportunity for attendees to discuss the success factors that are essential for managing highly challenging bridge design and construction projects successfully.

- 1: Planning and Managing for Success, Dave Zanetell, FHWA
- 2: Design of Permanent Works (criteria and constructability), David Goodyear
- 3: Construction Execution — (engineered construction), Ken Hirschmugl bayashi / PSM JV
- 4: Erection Engineering (3D modeling to facilitate construction), Mark Ketchum. OPAC Engineers
- 5: Integration and Proactive Risk Management, Dave Zanetell, FHWA
- 6: Open Discussion, M. Myint Lwin, P.E., S.E.

**WORKSHOP 3: NATIONAL BRIDGE INDUSTRY WORKSHOP: “NEW FOCUS, DEVELOPMENTS, AND OPPORTUNITIES”**

**Time:** 8:00 AM - 12:00 NOON

**Room:** 330

Presented by ARTBA

The National Bridge Industry Workshop will bring leaders from FHWA, states and industry together in one room to discuss the future of the bridge program in key policy areas, including:

- A. Bridge Preservation
- B. Asset Management
- C. Contracts Administration
- D. Public — Private Partnerships
- E. Innovation

You do not want to miss this extremely informative session that will provide you with a look into the future of bridge policy and opportunity in the United States. Presenters: King Gee, Associate Administrator, Office of Infrastructure, FHWA; Butch Wlaschin, Director of the Office of Asset Management, FHWA; Gerald Yakovenko, Group Leader, Contracts Administration, FHWA; Anwar Ahmad, Bridge Preservation Engineer, FHWA; Chris Kane, P3 Collaborative
The planned agenda for the workshop:

- Overview of Structural Health Monitoring — National Instruments
- Applicable Sensor Technology and Economics with Case Studies — Applied Geomechanics
- Structural Health Monitoring of the Marboche Bridge - Advitam
- Structural Health Monitoring of the Seohaee Grand Bridge — National Instruments
- Structural Health Monitoring for Large and Small Bridges: Project Review of a Steel Truss Cantilever Bridge in Vancouver — DigiTess Data Systems
- Structural Health Monitoring of the Tacony-Palmyra Bridge — IIS/Drexel University
- Bridge Monitoring Systems with Fiber Optic Sensing — Chandler Monitoring Systems
- Development of Low-Power Wireless Monitoring System for Fracture Critical Highway Bridges — University of Texas at Austin

Attendees will gain an understanding of the current practice of structural health monitoring, and have the opportunity to discuss the challenges and opportunities of applying SHM systems to improve the management and maintenance of bridge assets.

Presenters: David Potter, National Instruments, Austin, TX; Tom Weinmann, Applied Geomechanics, Buffalo Grove, IL; Benoit Kroely, Advitam, Sterling, VA; DigiTess Data Systems, Scottsdale, AZ; Matthew Yamold, IIS/Drexel University, Philadelphia, PA; Keith Chandler, Chandler Monitoring Systems, Lawrenceville, GA; Todd Helwig, University of Texas, Austin, TX

W-5: COATINGS WORKSHOP

Time: 8:00 AM - 12:00 NOON
Room: 328

Presented by SSPC: The Society for Protective Coatings

- 8:00-8:30AM Time is Money: Improving Shop and Field Painting Throughput by Reducing Finish Coat Handling Time - Handling and transportation of finish coated steel from the fabrication shop to the project site is impacted by the length of time that the finish coat must dry. Known as shop-field throughput, a reduction in the dry time required prior to handling (without compromising performance), as well as a minimization of handling damage can greatly reduce project costs. Additionally, faster dry times reduce the risk of dust and abrasive embedment into the finished product. This study compares the handling time of three generic types of high performance finish coats cured under normal and cold/damp conditions, applied as two and three-coat systems, using traditional standardized test procedures as well as novel testing procedures designed to simulate actual handling and environmental conditions in the shop or field.

Presenters: Kurt Best- Bayer, Pittsburgh, PA
- 8:30-9:30AM Suspended Scaffold Access in Power Plants, Bridges and Offshore - This presentation will focus on how suspended scaffolding can be used to provide access to bridges for inspection, maintenance and repair operations. Applications photos and case studies from Spider projects will be displayed. We will focus on proper planning, platform configuration options and worker safety considerations.

Presenters: Pradeep Kodumuri- SES Group & Associates, McLean, VA
- 10:00-11:00AM An In Depth Look at Standards Most Frequently Used by Industrial Painter-This presentation will explore all of the standards, used by industrial painters including a review of the basics and a focus on the more obscure requirements and ambiguities. The presentation will also address what constitutes an industry standard, the contractual implications of specifying using only a standard, and the impact of secondary and tertiary references in standards.

Presenters: Aimee Beggs & Heather Stiner – SSPC, Pittsburgh, PA
- 11:00-12:00PM Span PI-2 Climate Control Program- Holding a 210 Foot Span of a Highway at 60 Degrees While Pier Concrete is Completed - The construction of a major project such as a bridge can often provide significant challenges to say the least. These challenges are not always within the physical building or logistics of the bridge but often can be material related. One such challenge can be the curing of the materials on the project. To that end the industrial contractor knew that they would need temporary climate control to meet the tight specifications for concrete curing during a construction project for the new Pearl Harbor Memorial Bridge in New Haven, Conn.

Scheduled for completion by 2016, the Pearl Harbor Memorial is a 10-lane bridge that will be one of the first extradosed cable stayed bridges constructed in the U.S. An extradosed bridge is a hybrid design combining a concrete cable stressed girder bridge with a cable stayed bridge. The structure is the centerpiece of a $2.2 billion mega-project to reconstruct and widen 7.2 miles of I-95 in Connecticut between West Haven and Branford.

Presenters: David Simkins- Polygon, Amesbury, MA
- 11:30AM-12:00PM Slip Coefficient and Tension Creep Testing Protocol for Coatings used in Bolted Connections- Appendix A of the Specification for Structural Steel Joints Using ASTM A325 or A490 Bolts published by the Research Council on Structural Connections describes the testing methods to determine the slip coefficient of coatings used in bolted connections. The presentation will describe the process associated with testing and certifying coatings targeted for use in slip-critical connections, including panel fabrication, surface preparation, coating application, selection of mating surfaces, testing for resistance to slip and tensioned creep, and data reporting including A, B and C classifications.

Presenters: Bill Corbett- KTA Tator Inc., Butler, PA

For more information, visit http://www.structuralhealthmonitoringworkshop.com
LONG SPAN BRIDGES, PART 2 SESSION

Time: 1:30 - 5:00 PM
Room: Theatre 2, Hall A
Chair: M. Myint Lwin, P.E., S.E., Federal Highway Administration, Washington, DC

11-36 1:30 PM
DESIGN AND CONSTRUCTION OF HWAMYUNG BRIDGE
Kwang-Soo Kim, Ph.D., Eun-Chul Lee, M.S., Chun-Soo Lee, B.S., Eui-Taek Yoon, M.S., P.E., Hyundai Engineering & Construction Company, Busan, South Korea; Jong-II Jung, B.S., P.E., Dohwa Consulting Engineers Co., LTD.

The Hwamyung bridge was designed as concrete cable-stayed bridge crossing the Nakdong River in Busan. This bridge is the largest cast-in-place concrete cable-stayed bridge in Korea with center span of 270m and side span of 115m each. A typical segment is 27.8m wide by 6.8m long and 4.0m depth. It consists of a single cell box with inclined webs and transverse wall with tie tendons provided to transfer the stay-cables forces from the anchorage area.

11-38 1:55 PM
DESIGN OF THE NEW MILLENNIUM CABLE-STAYED BRIDGE IN SOUTH KOREA
Younghak Kwak, P.E., Young-Min Kim, Ph.D., Myeong-Su Choi, Ph.D., DAEWOO E&C, Seoul, South Korea; Woo-Jong Kim, P.E., Ph.D., DM Engineering, Seoul, South Korea; Kyung-Sik Cho, Ph.D., DM Engineering, Seoul, South Korea

The New Millennium Bridge project is developed in the south-western part of Korea. The cable stayed bridge in Lot1 is a FCM-anchored hybrid two-pylon cable stayed bridge with a main span of 510m. A distinct feature of the bridge is their high (195m) and low (135m) pylons with two bundle cables in the side span. The Link is directly exposed to the south-western Sea, and the site is characterized by strong wind during typhoon.

11-39 2:20 PM
LONG CONCRETE SPANS AND TALL PIERS IN PENNSYLVANIA - TURNPIKE SECTION 51H OVER THE MONONGAHELA RIVER IN BROWNSVILLE
Ken Heil, P.E., FIGG Bridge Engineers, Inc., Exton, PA; Eric Hayes, Walsh Construction Company, Denbo, PA

The new Monongahela River Bridge near Brownsville, Pennsylvania features long spans and 200-foot tall piers to create an elegant concrete segmental bridge. The 3,022 foot long bridge has seven spans, including a main span of 518 feet, built in balanced cantilever to cross the river, rail lines, and local roads. Walsh Construction and FIGG teamed to provide a Contractor Alternate design that resulted in a savings of $8.6 million for the Pennsylvania Turnpike Commission.

11-40 2:45 PM
THE DESIGN & CONSTRUCTION OF A CABLE-STAYED BRIDGE WITH ELLIPTIC PYLONS
Dong-Ho Lee, Ph.D., Dong-Keun Kim, P.E., Hyun-Koo Kim, P.E., Se-Hoon Choi, P.E., Jae-Geum Kim, P.E., Infrastructure Business Division, SK Engineering & Construction, Seoul, South Korea

In this paper, the elliptic pylon cable-stayed bridge in Korea is introduced. This bridge is a two-span cable-stayed steel plate deck bridge, which has 230m of a main span (2@115 = 230m). It is located in sector 4 of connecting road of the Incheon Grand Bridge. The design parts will introduce the landscape design concept of the main bridge and the structural behavior of cable-stayed bridge. The construction parts will introduce the pylon Roll-Up erection during construction.

COFFEE BREAK: 3:10 – 3:30 PM

11-41 3:30 PM
CONSTRUCTION ENGINEERING OF CONCRETE CABLE STAYED BRIDGE CONSTRUCTED BY DAELIM
Dae-Yong Park, Ph.D., Sung Ho Kim, Ph.D., Joo Taek Park, Kwang Min Lee, Jae Hong Kim, P.E., Daelim Industrial Co., Ltd., South Korea

The construction engineering of concrete cable-stayed bridge consists of four steps which are review phase, pre-execution phase, execution phase, and special analysis phase. In this paper main four steps of the construction engineering are described for the 2nd Dolsan concrete cable-stayed bridge of edge girder type constructed by DAELIM Corporation in Korea. IBC Attendees can indirectly experience the construction process and get the information for construction engineering in the concrete cable stayed bridge of edge girder type.

11-42 3:55 PM
CABLE LOSS: CASE STUDY WITH DYNAMIC FACTORS IN EXCESS OF 2.0
Greg Hasbrouck, Eddie He, Ph.D, P.E., S.E., Parsons, Chicago, IL

Time history response study of cable loss for design of the Christopher S. Bond Cable-Stayed Bridge in Kansas City resulted in valuable insights into the structure behavior. One notable phenomenon demonstrated by the study resulted in dynamic factors for structure elements subject to combined dynamic response in excess of the maximum of two recommended by the Post-Tensioning Institute Recommendations for Stay Cables.

INNOVATIVE CONCEPTS SESSION

Time: 1:30 - 5:00 PM
Room: Theatre 3, Hall A
Chair: Kenneth J. Wright, P.E., HDR Engineering, Inc., Pittsburgh, PA

11-43 1:30 PM
DESIGN OF A PC BOX GIRDER BRIDGE WITH CORRUGATED STEEL WEBS IN MIANMAO EXPRESSWAY
Weiguo Yan, Jiangsu Transportation Research Institute Co., Ltd., Nanjing, Jiangsu Province, China

Donghe 3# bridge, which is a curved continuous rigid frame bridge with high pier and long span in high earthquake intensity area, has been designed as a two-span PC box girder bridge with corrugated steel webs. The structural scheme is expected to reduce the dead load of girder and to shorten the construction period. In this paper, some new technical characteristics and properties of design methods for the bridge are discussed.
This paper explains how mechanically fastened, fiber reinforced polymer (MF-FRP) strips provided the significant advantages of a low-cost, rapid construction, rehabilitation method for increasing the structural load carrying capacity of a concrete flat slab bridge, while minimizing impacts to the traveling public. Faced with a difficult decision about how to spend limited financial resources on the bridge, the MF-FRP rehabilitation scheme economically upgraded the bridge capacity from a 14 Ton weight limit to legal loads.

**Low-Cost Rehabilitation with FRP Strips**

Mark Whittemore, P.E., Dubois and King Inc., Bedford, NH; Robert Durfee, P.E., SEC B

This paper summarized an investigation of the design and cost considerations regarding the use of stainless steel in bridge design. Design standards used include; AASHTO LRFD Bridge Design Specifications, Fourth Edition 2007 and the latest edition of the AISC standard specification for steel. An initial construction cost and life cycle cost comparison was performed on a two-span continuous horizontally curved girder bridge using both standard grade 345 carbon steel and Duplex 2205 stainless steel.

**USE OF DUPLEX STAINLESS STEEL IN GIRDERS & CROSS FRAMES OF BRIDGE SUPERSTRUCTURE**

Ronald Spacht, Jr., P.E., URS Corporation, Harrisburg, PA; Dr. Stuart Chen, Ph.D., University at Buffalo, Buffalo, NY

This paper investigated the use of stainless steel in bridge design. The necessary safety measures.

**Comparing the Use of Stainless Steel in Bridge Design**

This paper proposed a novel vulnerability index as a reliable time-dependent measure of the seismic damageability of corroded bridges. While this index can be directly used for the structural design and performance assessment of bridges, it can also be considered as a critical parameter for the life-cycle cost analysis of bridges subjected to multiple natural hazards and environmental stressors.
focused on possible causes of cracking in the longitudinal shear keys of adjacent box beams and suggested improvements in current bridge design, construction, and repair practices. The project consisted of numerical simulations and laboratory studies of the shear key elements. Results suggested that a full depth epoxy grouted shear key has the highest potential to reduce shear key grout failure.

**11-32  2:20 PM**

**EFFECT OF TRANSEVERSE STIFFENERS ON SHEAR STRENGTH OF INTERMEDIATE WEB PANELS**
Sherif Safar Aly, Ph. D., American University in Cairo, New Cairo, Egypt

According to AISC specification, transverse stiffeners of web panels support axial compression force in the post-buckling stage. However, it was previously reported that transverse stiffeners were mainly loaded by bending. Therefore, transverse stiffeners inertia requirement stipulated by the AISC was revisited. The effect of flexural rigidity of one-sided intermediate transverse stiffeners on the ultimate shear strength of web panels was investigated by the finite element method. New recommendations for sizing transverse stiffeners of web panels were established.

**11-33  2:45 PM**

**RELIABILITY-BASED DURABILITY DESIGN AND CONTROL OF CRACK WIDTH IN BUSAN-GEOJE FIXED LINK PROJECT OF KOREA**
Sehoon Kim, Ph.D., Jechun Kim, Ph.D., and Bohyun Yang, DAEWOO E&C, Busan, South Korea;

This paper includes the details of reliability-based durability design against chloride diffusivity and the method of crack control by combining the analysis of hydration heat and stress with the calculation of crack width, which are applied in Busan-Geoje Fixed Link Project.

**11-34  3:30 PM**

**ANALYTICAL AND EXPERIMENTAL ASSESSMENT OF STEEL TRUSS BRIDGE GUSSET PLATE CONNECTIONS**
Yavuz Mentes, Georgia Institute of Technology, School of Civil and Environmental Engineering, Atlanta, GA; Yoon Duk Kim, Ph.D., Donald White, Ph.D., Roberto T. Leon, Ph.D., P.E., Georgia Institute of Technology, Atlanta, GA; Robert S. Zobel, Ph.D., P.E., Professional Service Industries (PSI), McLean, VA; Mark Iadicola, Ph.D., National Institute of Standards and Technology, Gaithersburg, MD; Justing M. Ocel, Ph.D., P.E., Federal Highway Administration, McLean, VA

This paper focuses on findings from comprehensive studies of steel truss bridge gusset plate behavior and proposes practical design and rating procedures. The studies include comparisons of analytical models to responses from large-scale experimental tests from discrete and innovative full field measurements. The paper shows that there is considerable consistency between the experimental data and analytical solutions.
WORKSHOP 6: FUNDAMENTALS OF BRIDGE BENEFIT AND LIFE CYCLE COST ANALYSIS (PERSONAL LAPTOP OPTIONAL)

Time: 1:00 - 5:00 PM
Room: 330

This workshop conveys fundamental concepts used in the economic analysis of highway bridge projects and proceeds to an explanation of economic analysis methods, especially life-cycle cost analysis and benefit-cost analysis. The workshop also reviews the use of traffic forecasts, risk analysis, and economic impact analysis in the economic analysis process. It concludes with an interactive training session on use of benefit-cost analysis tools. Participants wishing to explore the software to be displayed should bring their laptops and contact Nathaniel Coley at ncoley@dot.gov to obtain the software for installation on personal laptops.

Participants should bring their personal laptop if interested in walking through the software presentation. Laptops should be equipped with wireless access and have extended life batteries. Wireless access can be purchased from the convention center.

Presenters: Nathaniel Coley, Federal Highway Administration, Washington, D.C.

WORKSHOP 8: WORKZONE SAFETY WORKSHOP, PART 1

Time: 1:00 - 5:00 PM
Room: Theatre 4, Hall A
Presented by ARTBA

This event, sponsored by ARTBA’s National Work Zone Safety Information Clearinghouse, is being held in conjunction with the International Bridge Conference.

The workshop is packed with timely information delivered by national experts in the safety field.

- 1 - 2:00 PM: Session Opening — Work Zone Clearinghouse Activities Update: This session will help you understand all the benefits you can obtain by using the resources of this phenomenal organization.
- 2:15 - 3:15 PM: Night Work and Vehicle Intrusions, Reoccurring Challenges in Work Zone Safety: When it comes to work zone safety, there are a lot of concerns, but contractors will tell you two are critical: night work and vehicle intrusions. If you represent an owner/agency, design firm, safety professional or contractor, come listen to what leading researchers have to say about these issues and how they are working to address these problems.
- 3:30 - 4:30 PM: Training Requirements in OSHA’s Crane and Derrick Standard: While mandatory certification for crane operators is still several years away, other training provisions in the new OSHA standard are now effective, including standards for riggers, signal persons and others. Get up-to-date on OSHA’s new standard by participating in this important session.

Presenter: Larry DeMark, Equipment Training Solutions

WORKSHOP 9: NEXT BEAMS: PRESTRESSED CONCRETE BEAMS

Time: 1:00 - 5:00 PM
Room: 328
Presented by High Concrete Group

NEXT Beam is a new Bridge Beam that is an open double tee, accommodates inspection and utilities, is a single pour production process, and is well suited for ABC. The NEXT Beam is a cost effective and Contractor safety friendly prestressed concrete solution for 30’-90’ span range. Durability, Economy and Accelerated Construction will be part of the Presentation.

Presenters: Doug Lorah, High Concrete Group & Mike Alterio, Alpha Structures

IBC BRIDGE AWARDS RECEPTION

TIME: Tuesday, June 7; 5:00 - 7:00 PM
ROOM: Concourse C
HOST: Tom Leech, P.E., S.E., Gannett Fleming, Inc., Pittsburgh, PA

ESWP, in association with bridge design and engineering (bd&e) Magazine, Roads and Bridges Magazine, Bayer MaterialScience LLC, presents the 24th Annual IBC Bridge Awards Ceremony. Following Tuesday’s sessions, unwind and network apart from the Conference with fellow attendees and celebrate the Award winners at our IBC Awards Reception. A separate registration is required with a fee of $25 ($40 without conference registration).

The International Bridge Conference® annually awards five medals and one student award to recognize individuals and projects of distinction. The medals are named in honor of the distinguished engineers who have significantly impacted the bridge engineering profession worldwide. Honorees will be recognized as follows:

- Michael J. Abrahams, P.E., New York, NY is awarded the John A. Roebling Medal, recognizing an individual for lifetime achievement in bridge engineering.
- Stonecutters Bridge, Hong Kong, China is awarded the George S. Richardson Medal, presented for a single, recent outstanding achievement in bridge engineering.
- North Arm Fraser Crossing, British Columbia, Canada is presented the Gustav Lindenthal Medal, awarded for an outstanding structure that is also aesthetically and environmentally pleasing.
- Mike O’Callaghan-Pat Tillman Memorial (Hoover Dam By-Pass) Bridge, connecting Arizona and Nevada is presented the Eugene C. Figg, Jr. Medal, awarded for Signature Bridges, recognizing a single recent outstanding achievement for bridge engineering, which is considered an icon to the community for which it is designed.
- Te Rewa Rewa Bridge in New Plymouth, New Zealand is awarded the Arthur C. Hayden Medal, recognizing a single recent outstanding achievement in bridge engineering demonstrating vision and innovation in special use bridges.
- FHWA Manual entitled: “Analysis and Design of Skewed and Curved Steel Bridges with LRFD Reference Manual” is presented the Engineering Excellence Award, awarded to be special and beyond the traditional guidelines of the medal categories.
- Behrouz Shafei, University of California at Irvine is presented the James D. Cooper Student Award, awarded to undergraduate and graduate students who demonstrate an interest and passion for bridge engineering.
**DESIGN, PART 2 SESSION**

**Time:** 8:30 AM - 12:00 NOON  
**Room:** Theatre 1, Hall A  
**Chair:** Thomas G. Leech, P.E., S.E., Gannett Fleming, Inc., Pittsburgh, PA

**11-50 8:30 AM**

**CALIBRATION OF AASHTO LRFD FOR FILLED GRID DECKS BASED ON HISTORICAL PERFORMANCE**

Chris Higgins, P.E., Ph.D., and O. Tugrul Turan, Oregon State University, Corvallis, OR; Mark Kaczinski and Phil Gase, Bridge Grid Floor Manufacturing Association, North Baltimore, OH

The American Association of State Highway Officials Load and Resistance Factor Design Specifications provide design criteria for fully and partially filled grid decks and unfilled grid decks composite with reinforced concrete slabs. These deck systems are widely used in practice for both new construction and rehabilitation of existing bridges. The current AASHTO-LRFD equations were not calibrated against historically successful field performance of actual in-service bridge decks. This paper evaluates the current AASHTO-LRFD design specifications using 26 in-service decks. The deck designs were compared with the current AASHTO-LRFD design moments (for strength and fatigue) as well as deflection criteria, the previous AASHTO-LRFD design moments, and with AASHTO-LRFD concrete slab deck design tables. Design demands, fatigue stress ranges, and deflection limits were compared for each of the decks considered. Based on the results, design recommendations are provided.

**11-51 8:55 AM**

**PEDESTRIAN BRIDGES WITH HYBRID STAINLESS STEEL-GFRP STRUCTURE**

Juan Sobrino, Ph.D., PEDELTÁ, Coral Gables, FL

One of the most interesting issues in the development of bridge engineering is the use of new high-performance structural materials such as stainless steel and GFRP that provide excellent mechanical properties, magnificent durability and aesthetic possibilities. Three pedestrian bridges built in Spain with hybrid structure combining steel (or stainless-steel) and GFRP are presented: a 131 feet arch, a simply supported 92 feet truss and two similar 164 feet span trusses with variable depth.

**11-52 9:20 AM**

**BRIDGE LESSONS LEARNED FROM THE CHILE EARTHQUAKE IN 2010**

Phillip Yen, Ph.D., P.E., FHWA, McLean, VA; Genda Chen, Ph.D., P.E., Missouri University of Science and Technology, Rolla, MO; Ian Buckley, University of Nevada at Reno, Tony Allen, Washington State Dept. of Transportation, Daniel Alzamora, Federal Highway Administration, Jeffrey Ger, Federal Highway Administration, Juan Arias, University of Nevada at Reno

In 2010 a devastating earthquake, measuring 8.8 on the Richter scale, struck off the coast of the Maule region of Chile affecting Chile’s two biggest population cities: Concepcion and Santiago. A Transportation Infrastructure Reconnaissance Team (TIRT) was organized by the Federal Highway Administration, which performed a thorough post-earthquake investigation of highway infrastructure focusing on structural and geotechnical concerns on and around bridges, and retaining walls. This paper presents the summary of the preliminary findings of the earthquake performance of the transportation infrastructure which the team visited during the reconnaissance.

**11-53 9:45 AM**

**I-40 MISSISSIPPI RIVER BRIDGE SEISMIC RETROFIT PROJECT**

Robert Schamber, P.E., TRC, Rancho Cordova, CA; Fred Stephenson, P.E., TRC, Memphis, TN

The I-40 Mississippi River Bridge is a steel-tied arch bridge located in Memphis, Tennessee. This bridge is a vital transportation, commerce and defense link carrying 60,000 vehicles daily. It is situated at the southeastern edge of the New Madrid Seismic Zone.

Considering the potential for a major earthquake, TDOT and AHTD gave priority status to seismically retrofit the bridge and its approaches. TRC is providing retrofit design and construction engineering for this $265 million project.

**11-54 10:10 AM**

**SEISMIC VULNERABILITY AND RETROFIT DESIGN OF SLENDER BRIDGE PIER WALLS**

Majid Sarraf, Ph.D., P.E., P.Eng., Parsons, Irvine, CA;

I-10 Bridge over Warm Creek Channel in San Bernardino, CA, is one of many bridges with slender pier walls which was constructed in 1970. The bridge is also located in the vicinity of major faults and ground acceleration as high as 0.7 g. As little seismic criteria existed and considered at the time of the design for such pier walls, their seismic evaluation often reveals their deficiencies which includes: Inadequate longitudinal reinforcement for bending and lack of confinement, as well as inadequate shear strength. A traditional retrofit strategy allows for pinning of the wall and the in-plane shear failure in due large longitudinal moment and transverse shearing off the longitudinal bars. However, important seismic behavior and combined vulnerabilities could be missed. This involves stand-alone mode of the piers walls vibration out of their plane, particularly most critical when already under longitudinal failed rebar condition. Thus, slender pier walls would be subjected to secondary order effects which are particularly important and could cause collapse of the entire structure. This paper focuses on a new methodology for seismic evaluation and retrofit design considerations for slender piers particularly in high seismic regions. The modeling and analysis using SAP2000, the effect of fault rupture on an existing bridge will be presented along with the retrofit design to maintain hydraulic efficiency of the channel with minimum cost of retrofit construction. This paper describes very critical and new considerations in seismic evaluation and retrofit design of many slender pier walls in many bridges built over water ways and drainage canals, to avoid instability of piers and bridge collapse.
ABC SESSION

**Chair:** Louis J Ruzzi, P.E., Pennsylvania Dept. of Transportation, Pittsburgh, PA
**Room:** Theatre 2, Hall A
**Time:** 8:30 AM - 12:00 NOON

---

**11-55 10:55 AM**  
**A SYNERGY FOR INCREASED SEISMIC PROTECTION OF BRIDGES**  
Roy Imbsen, P.E., D. Engr., and Anoop Mokha, Ph.D., S.E., Earthquake Protection Systems, Mare Island, Vallejo, CA

The AASHTO Guide Specification for LRFD Seismic Bridge Design (2009) was developed for bridges, using a displacement based approach. The Guide Specification suggests three possible alternative Global Seismic Design Strategies to consider at the beginning of the design process, one of which is isolation. Seismic isolation design also uses a displacement based approach which provides a means to easily compare, for a given bridge, the level of performance and cost differences between a ductile design and an isolation design.

---

**11-56 8:30 AM**  
**MOVING THE CAPILANO RIVER BRIDGE TO USE AS A CONSTRUCTION DETOUR**  
Murray Johnson, P.Eng., Buckland & Taylor Ltd., North Vancouver, BC, Canada; David J. Queen, P.Eng., British Columbia Ministry of Transportation and Infrastructure, South Coast Region, Burnaby, B.C., Canada; Nick Sandhu, E.I.T., British Columbia Ministry of Transportation and Infrastructure, South Coast Region, Burnaby, B.C., Canada

To facilitate the construction of a new river crossing in a congested urban setting the original bridge was moved sideways for the detour. This allowed a staged construction approach to rapidly build during the environmental window and make the site available for construction of the new bridge. The conceptual and detailed design to slide the bridge was developed by the BC Ministry of Transportation & Infrastructure and Buckland & Taylor Ltd.

---

**11-57 8:55 AM**  
**REHABILITATING NEW HAMPSHIRE’S INTERSTATE BRIDGES 60 HOURS AT A TIME**  
Tom Kendrick, P.E., McFarland-Johnson, Inc., Concord, NH; Ronald L. Kleiner, Jr., P.E., New Hampshire Department of Transportation, Concord, NH

This Accelerated Bridge Construction project involved the superstructure replacement of a structurally deficient bridge in a high profile, urban location. After evaluating several conventional rehabilitation options, ABC methods were selected that allowed each half of the bridge superstructure (one interstate barrel) to be replaced in a single 60-hour weekend closure period. For this project, ABC saved project costs, shortened the construction duration, and greatly reduced impacts to the local community and the traveling public.

---

**11-58 9:20 AM**  
**CONSTRUCTION OF CURVED TRUSS BRIDGE USING ILM AND INCLINED CLIMBING SYSTEM**  
Sung Man Yang, P.E., Kyung-Ho Park, Ph.D., Hyundai Engineering & Construction Co. Ltd., Youn-Chul Shin, Hee-Hong Kim, P.E. and Sung-Ryong Park, Hyundai Engineering & Construction Co. Ltd., Jongno-Gu, Seoul, South Korea

Incremental Launching Method (ILM) is applied to construct the 1,520m curved double warren truss railway bridge without any intermediate supports. And, Inclined Climbing System is contrived to maximize operational efficiency, which realize one spanning bridge could be launched continuously in every 15 days. The Inclined Climbing System is designated as “Newly developed and advanced construction technique” by KICTEP, and awarded the golden prize on “Domestic Tournament on Innovative construction technology” by Korean Government in 1997.

---

**11-59 9:45 AM**  
**ACCELERATED BRIDGE SUPERSTRUCTURE WIDENING & REPLACEMENT**  
Khossrow Babaei, and Amir M. Fouladgar, P.E., The LPA Group, a unit of Michael Baker Corporation, Falls Church, VA; Claude S. Napier, Jr., P.E., FHWA Resource Center

The design and construction aspects of accelerated superstructure replacement and widening of the eastbound Route 15/29 bridge over Broad Run in Prince William County, Virginia are presented. The existing bridge is 130’ concrete T beam structure comprised of 3 spans. The accelerated construction was accomplished in 3 stages, after the preparatory work for widening (including extending the piers and abutments) was completed under normal traffic. Construction for each stage began Friday night and finished Sunday evening, while the traffic was detoured and the bridge was closed. At each stage a span of the bridge was replaced with prefabricated segments comprised of steel beams and concrete deck. When opened to traffic Sunday evening, the installed span participated in carrying the normal traffic. The overall superstructure was replaced in 3 weekends. This innovative project was sponsored by the FHWA Highways for Life Program.

**COFFEE BREAK:** 10:10 – 10:30 AM

---

**11-60 10:30 AM**  
**ACCELERATED BRIDGE CONSTRUCTION USING PRECAST SUPERSTRUCTURE COMPONENTS IN INCHEON BRIDGE PROJECT**  
JongYoung Song, Ph.D., P.E., Samsung C&T Corporation, Yeongi-Gun, Chungnam, South Korea.

The main span of the Approach Bridge is the longest 145m, precast PSC box-girder bridge in South Korea. Total 836 numbers of small segments ranging from 7.2m to 3m in depth was erected using balanced cantilever method by specially designed derrick crane for this project. Pier table of superstructure was designed as 20-meter long precast unit for rapid bridge construction and erected by 3000 tonnage capacity floating crane. At mid span precast key segments connecting the adjacent cantilevers was applied to shorten construction time. Also, precast end span segment with 11m length provided significant time saving by eliminating formwork system. These applications of precast components of superstructure provided rapid bridge construction by increasing work zone safety and reducing environmental impacts at sea crossing project. The success of large precast component highly depends on precise geometry.
control associated with well planned construction monitoring. In this paper, the key aspects of construction engineering

11-61 10:55 AM
FOUR INFORMATIVE PLUS ENTERTAINING MOVIES ON DVD'S THAT EXPLAIN ACCELERATED BRIDGE CONSTRUCTION SOLUTIONS TO THE GENERAL
PublicAlfred Mangus, P.E., and Craig Copelan, P.E. Professional Engineers in California Government, Sacramento, CA

Four award winning California Bridge case histories movies entertain but inform the general public about various Accelerated Bridge Construction techniques. PECG, Director David Brown and PBS Channel KVIE of Sacramento, California describe repairs to the fire damaged MacArthur Maze Bridge, San Francisco Oakland Bay Bridge and the I-5 Boat Section. These films educate the general public or can be a training tool for the bridge industry. Caricatures and cartoons make complex issues easier to understand.

11-62 11:20 AM
OVERNIGHT DECK REPLACEMENT OF THE I-190 GRAND ISLAND BRIDGE
Mark Horschel, PE, Bergmann Associates, Rochester, NY; Christian Hulse, P.E. New York State Thruway Authority, Cheektowaga, NY

This presentation will describe how the cast-in-place, reinforced concrete deck on the 3,383 foot long South Grand Island Bridge was replaced with concrete-filled, steel grid panels in overnight operations to accommodate the high traffic volumes during the daytime.

INSTRUMENTATION/INSPECTION SESSION
Time: 8:30 AM - 12:00 NOON
Room: Theatre 3, Hall A
Chair: Gary Runco, P.E.,Borton-Lawson,Lancaster,PA

11-63 8:30 AM
INSPECTION AND EVALUATION OF NON-COMPOSITE ADJACENT PRESTRESSED CONCRETE BOX BEAM BRIDGES
Leon Lai, P.E., S.E., Ph.D., Peter Kim, P.E. and Tony Jen, P.E., Specialty Engineering, Inc., Bristol, PA; Clay Naito, Ph.D., P.E., Lehigh University, Bethlehem, PA

This paper presents findings from recent inspections of non-composite prestressed concrete adjacent box beam bridges. The current PennDOT load rating procedure is compared to a new procedure, which is based on a non-destructive testing research recently completed at Lehigh University. This research proposed a refined correlation between strand deteriorations and facial conditions of deteriorated beams. The cause of diagonal cracks and the impact of these cracks on bridge strength are also reported.
WEDNESDAY’S SESSIONS

GEOTHERMAL ENERGY PILE SYSTEMS
Time: 8:00 AM - 12:00 Noon
Presented By The Sustainability Committee Of The Deep Foundations Institute

Geothermal energy piles are an innovative renewable energy technology designed to exploit the relatively constant temperature of the ground for efficient heating and cooling of structures. In this seminar, notable practitioners and researchers will discuss the design issues and operational considerations of geothermal energy piles and provide an overview of their basic processes, mechanisms and key research initiatives. Results from thermal conductivity tests performed on individual piles and pile groups will be presented along with U.S. and international case histories. The technology as applied to large commercial and government installations will be highlighted, including considerations of installation geometry and varying construction techniques. Research involving long-term monitoring of an instrumented building will be presented including a comparison of a conventional heating and cooling system with a heat pump system comprising energy foundations and borehole ground-source heat exchangers. Design challenges that must be overcome to promote wider usage of this technology will be discussed.

1. Design Considerations of Energy Piles, Guneey Olgun, Virginia Tech
3. Ground-Source Geothermal Technology Applied to Large Commercial and Government Installations, Thomas Lapham & Tony Amis, Geothermal International
4. Efforts currently underway in Colorado related to Energy Foundations, John McCartney, Ph.D., P.E., University of Colorado at Boulder; Karen Henry Ph.D., P.E., United States Air Force Academy

WORKSHOP 8: WORKZONE SAFETY WORKSHOP (PART 2)
Time: 8:00 AM - 12:00 NOON
Room: Theatre 4, Hall A
Presented by ARTBA

• 8 - 9:00 AM Why is OSHA Updating its Silica Standard? What are the hazards associated with crystalline silica? How are industry workers exposed? What is OSHA planning for its new standard on silica? Do we need a stricter standard or should we simply enforce the current version? This panel will explore the health effects of silica and express the pros and cons of a new OSHA standard.

Presenter: Scott Schneider, Laborers’ Health and Safety Fund of North America

• 9:15 - 10:45 AM Roadway Safety+ The Latest Safety Training Tool for Roadway Construction: Roadway Safety+ is a comprehensive training tool covering a range of safety topics in road, bridge and heavy construction. From animated Typical Applications from the MUTCD, to managing work zone speed, to tips for safe nighttime construction, this program has it all. (Attendees will receive a free Roadway Safety+ Training Program CD, which is the basis for this presentation.)

Presenters: Scott Schneider, Laborers Health and Safety Fund of North America; Don Elsibus, National Asphalt Pavement Association; Emmett Russell, International Union of Operating Engineers; Omar Lopez, American Road and Transportation Builders Association; Jerry Ullman Texas Transportation Institute; Rod Wolford and Beth Larson, FO Communication

• 11 AM - 12:00 PM New Decision Tool— Determining When to Use Accelerated Bridge Construction: The industry is buzzing with innovative designs and techniques for accelerated bridge construction, but when should these techniques be considered and used? This session introduces a new tool developed by Oregon State University that walks you through the decision process and helps planners, designers and contractors understand when—and when not to accelerate.

Presenter: Toni Doolen, Oregon State University

WEDNESDAY’S SESSIONS

WORKSHOP 10: PRODUCTS AND OUTCOMES OF SHRP 2 FOR THE INTERNATIONAL BRIDGE COMMUNITY
Time: 8:00 AM - 12:00 NOON
Room: 330
Presented by Transportation Research Board, SHRP 2, NAS

The Second, Strategic Highway Research Program, SHRP 2 is a $230 million focused research program that will change the highway transportation state of the art and practice for future decades. The overall program has a broad and diverse range of projects which touch all aspects of highway transportation including: long range planning, environmental considerations, highway renewal, system operations and many aspects of safety. SHRP2 will yield over 100 hundred products and outcomes which are anticipated to have a broad appeal to both researchers as well as practitioners.

The SHRP 2 Renewal focus area has a total of ten (10) projects, representing approximately $16.5 million, in application based research and development focused on critical topics for structures and bridges, such as, innovative bridge design and accelerated bridge construction, 100-year service life for bridge systems and components, and design guidance for 100 year service life bridges and structures. The pre-implementation and implementation phases of this strategic national program will be performed in close coordination and cooperation with the AASHTO Technology Implementation Group (TIG) and the AASHTO Subcommittee on Bridges and Structures (SCOB) as well as FHWA’s bridge community. These coordinated efforts will result in both strengthening the research products and mainstreaming their acceptance by the national bridge/structures communities of practice. The subject workshop will consist of four; unique presentations provided by SHRP 2 staff and the principal investigators from several key SHRP 2 structures projects. Each presenter is internationally recognized for their respective experience, knowledge and contributions to the engineering and construction communities.

• Knowledge of the SHRP 2 Research program and the outcomes and products focused on the bridge and structures communities.

• Learn the latest details on accelerated bridge construction (ABC) with a special emphasis on mainstream acceptance, ABC structural detailing and seismic design details.
WEDNESDAY’S SESSIONS

- Ability to discuss the SHRP 2 bridge research results and outcomes with SHRP 2 project experts and internationally recognized subject matter specialists.
- Learn the latest technical platform regarding the LRFD serviceability limit state guidance and features and needs for future calibration and guidance refinements.
- Understand the philosophy and decision making protocols for the selection, design, and preservation of 100 year service life bridges and bridge components.

Presenters: Jerry DiMaggio, Transportation Research Board, SHRP 2, NAS, Washington, D.C.

WORKSHOP 11 (PART 1): AUTOMATED REBAR DETAILING AND ADVANTAGES OF USING 3D MODELS

Time: 8:00 AM - 10:00 AM
Room: 328
Presented by Bentley BrIM

Today’s bridge industry embraces automated software, providing designers with unique options for detailing diverse concrete structures and enhanced design capabilities using 3D modeling tools. For demonstration purposes, this presentation uses automated detailing solutions from Bentley to look beyond CADD to the innovative bridge technologies useful in generating quantity takeoffs to create and track automated bar lists, running 3D conflict checks for rebar, and dealing with other bridge construction challenges.

Presenters: Alexander Mabrich, PE, MSc, Bentley BrIM

WORKSHOP 11 (PART 2): USING DIGITAL TERRAIN MODELING FOR BRIDGE LOCATION OPTIMIZATION

Time: 10:00 AM - 12:00 NOON
Room: 328
Presented by Bentley BrIM

Surveyors provide a wealth of data, such as electronic ground data and Digital Terrain Models (DTMs), to optimize the civil aspect of bridge projects, including the location, length, slopes, and skew angles for bridges. Discover how roadway software uses this data to streamline design workflows. In this presentation, Bentley’s civil engineering solutions will be used to explore site grading options for configuring slopes for abutments and identifying final road elevations for bridge construction.

Presenters: Alexander Mabrich, PE, MSc, Bentley BrIM

WORKSHOP 12: RECENT ADVANCES IN LIGHTWEIGHT AGGREGATE IN CONCRETE FOR BRIDGES (PART 1)

Time: 8:00 AM - 12:00 NOON
Room: 327
Presented by the Expanded Shale, Clay and Slate Institute

The objective of this workshop is to introduce designers and owners to the results of several major research projects that are revealing substantial durability and design benefits when lightweight aggregates are used in concrete for bridges. The limited number of presentations in the workshop will allow the presenters to go into much greater detail than is normally given in most technical sessions. The workshop is also intended to provide a forum for attendees to ask questions and for researchers to exchange information and ideas. The information presented will allow attendees to design and construct more durable transportation structures and more efficient bridge designs using lightweight aggregate in concrete.

Evaluating the effects of “internal curing,” which is achieved by replacing a portion of fine aggregate in conventional concrete with prewetted lightweight fine aggregate, is the first topic of discussion. Two research teams will report on their work that demonstrates the benefits of internal curing, including reduced shrinkage and permeability. One research team has considered all manufactured lightweight aggregates in the US and has conducted a range of detailed investigations using several of the aggregates. The second team will present results of analytical modeling of high performance concrete, field testing of concrete slabs, and the impact of internal curing on the service life of bridges.

The effect of using internally cured concrete, “all” lightweight concrete and “sand” lightweight concrete on the cracking of bridge decks is the second topic of discussion. The research team will present results that demonstrate a significant reduction in the cracking tendency of concrete when lightweight aggregate is used. Lightweight aggregate from three sources was used in this research program. Other concrete material properties will also be discussed.

The structural testing of lightweight concrete for bridges is the final topic discussed in the workshop. The first report will be on a comprehensive research program that has investigated a range of structural tests on specified density concrete, including development of reinforcement and shear. Concrete made with lightweight aggregate from three suppliers was considered in this study. The second report will give results from monitoring and testing high-strength lightweight pretensioned concrete girders in a highway bridge. Issues considered include prestress losses, modulus of elasticity and camber.

Presenters: Jason Weiss, Purdue University; Daniel Cusson, National Research Council — Canada; Ben Byard, Auburn University; Gary Greene, PSI at FHWA’s Turner-Fairbank Highway Research Center; Brett Holland, Georgia Institute of Technology

WORKSHOP 13: A PRACTITIONER’S GUIDE TO CURRENT AND FUTURE STATUS OF BRIDGE PAINTING

Time: 8:00 AM - 12:00 NOON
Room: 326
Presented by KTA-Tator

This exciting Workshop will be of interest to General Contractors, Painting Subcontractors, Steel Fabricators, Erectors and Others involved in either Shop or Field Painting Operations. The current state of the practice will be discussed. In addition Mr. Kline will provide a sneak-peek and what lies ahead in the paint arena for bridges.

- Metalizing versus Galvanizing versus Zinc-Rich Paint will be discussed.
- The likely role of Nanotechnology in the future of Bridge Coatings.

A discussion and Q and A Session will follow the Presentation.

Presenters: Eric S. Kline, KTA-Tator, Inc.
CONSTRUCTION SESSION

Time: 1:30 - 4:00 PM
Room: Room 330
Chair: Donald W. Herbert, P.E., Pennsylvania Dept. of Transportation, Pittsburgh, PA

11-74 1:30 PM
THE TAXIWAY R BRIDGE, TAKING THE SKY TRAIN OVER THE PLANES
David Burrows, P.E. and Mark Stark, P.E., Gannett Fleming, Inc., Phoenix, AZ; David Hensley, P.E., City of Phoenix Aviation Department, Phoenix, AZ; Tim Muller, P.E., Austin Bridge & Road LP, Phoenix, AZ

At Phoenix Sky Harbor International Airport, one of the ten busiest airports in the world, cast-in-place, post-tensioned concrete was successfully used to provide superior value, meet an aggressive construction schedule, squeeze into a tight construction corridor, and clear span an aircraft taxiway. Gannett Fleming, the lead designer, Austin Bridge & Road the bridge contractor, and the City of Phoenix Aviation Department all worked together to accomplish the world’s first transit system crossing over an active aircraft runway.

11-70 1:55 PM
DESIGN AND CONSTRUCTION OF THE FULTON ROAD PRECAST CONCRETE ARCH BRIDGE
Daniel Baxter, P.E., S.E., Michael Baker Jr. Inc., Cleveland, OH; Presented by: John Dietrick, P.E., S.E.; Chris Cummings, P.E.; Michael Baker Jr., Inc., Cleveland, OH

This paper describes the design and construction of the Fulton Road Bridge. Located in Cleveland, Ohio, and spanning over the Cleveland MetroParks Zoo, two active railroad lines, an innovative ground anchorage, with 5000kN of pull-out resistant capacity and from advanced materials of CFRP and RPC was developed and put into practice successfully.

11-71 2:00 PM
HUEY P. LONG BRIDGE TRUSS LIFT MONITORING
Thomas Weinmann, Applied Geomechanics Inc., Buffalo Grove, IL

As an alternative to the stick-build truss widening specified for the Huey P. Long Bridge, the MTI Joint Venture proposed a pre-built truss erection alternative to reduce impact on public, rail and river traffic requiring the lifting of three sets of paired trusses over 500-ft long, weighing more than 2700 tons. A real-time, remote monitoring system was used during the transport, lift and setting operation to limit truss distortion during the lifting and skidding operation.

11-72 2:45 PM
DESIGN AND CONSTRUCTION OF LARGE-SCALE GROUND ANCHORAGE SYSTEM WITH HIGH PERFORMANCE MATERIALS
Zhi Fang, Ph.D., College of Civil Engineering, Hunan University, Changsha, Hunan China; ; Mingxian Chen, P.E., Department of Communication and Transportation of Hunan Province; Kuangyi Zhang, Ph.D. student, College of Civil Engineering, Hunan University; Guoping Chen, P.E., Administrative Bureau of Expressway of Hunan Province; Jianhua Hu, P.E., Design and Planning Institute of Communication of Hunan Province

A innovative ground anchorage, with 5000kN of pull-out resistant capacity and from advanced materials of CFRP and RPC was developed and put into practice successfully during the lifting and skidding operation.

A real-time, remote monitoring system was used during the transport, lift and setting operation to limit truss distortion during the lifting and skidding operation.

11-73 3:00 PM
DESIGN, PRODUCTION AND ERECTION OF FULL-SPAN PRE-TENSIONED PRESTRESSED CONCRETE BOX-GIRDERS IN INCHEON BRIDGE VIADUCT
Young-Lae Park, Eng., P.E., Chung-Hee Lee, Min-Kwan Kim, and Jong-Ho Yang, Samsung C&T Corporation, Seoul, South Korea

The objective of this study is to represent the design and construction of prestressed concrete box-girders in Incheon Bridge Viaduct. The superstructure of the Viaduct were made by pre-tensioned prestressing method in a specially built casting factory, transported to the construction field at the sea, and erected by FSLM(Full Span Launching Method), using specially developed methods and equipment. In this paper, detailed analysis and design of PSC box-girders are introduced. Also; brief construction method and sequences are represented.

11-75 3:35 PM
PILE INSTALLATION CLOSE TO ADJACENT BRIDGE STRUCTURE: A CASE HISTORY
Aravinda Ramakrishna and Raymond Mankbadi, P.E., M. ASCE, Hardesty & Hanover, LLP, West Trenton, NJ; Kuang-yu Yang, P.E., M. ASCE, New Jersey Department of Transportation, Trenton, NJ

This paper presents a case history involving planning and construction of a pier foundation close to an existing foundation supporting bridge for the proposed Route 52 Causeway project. Details on construction planning and results of piles installation for the proposed structure are discussed. The theory of ground motion and vibration, and its applicability to develop foundation construction planning are also discusses. Finally, recommendations on planning and construction of piles close to adjacent structures are represented.

RAIL SESSION

Time: 1:30 - 3:45 PM
Room: Room 328
Chair: James Dwyer, Advanced Rail Management Corporation, Pittsburgh, PA

11-76 1:30 PM
REPLACEMENT OF SEPTA BRIDGE 20.25 - R5 LANSDALE LINE

Bridge 20.25 is a twin, riveted two-girder open deck structure located on SEPTA’s R5 Lansdale Regional Rail Line believed to have been rebuilt in the early 1900’s. A welded two-girder weathering steel superstructure with new precast concrete bearing seats was designed in approximately three (3) weeks. Each bridge was removed and replaced with the new prefabricated structures over two (2) weekend outages during the fall of 2009 while maintaining single-track service during peak travel operations.
**WEDNESDAY’S SESSIONS**

### 11-77 1:55 PM

**PADUCAH AND LOUISVILLE RAILROAD BRIDGE**

John Harms S.E., P.E., Hanson Professional Services Inc., Springfield, IL USA

An integral component of the U.S. Army Corps of Engineers’ Kentucky Lock addition is the new Paducah and Louisville Railroad Bridge over the Tennessee River. This new bridge is part of the Corps’ railroad relocation project required for the new 1,200-foot lock. Construction of the high-level 3,094-foot-long railroad bridge required extensive coordination, innovative design and logistical considerations to realign this mainline railroad over a major river crossing.

### 11-78 2:20 PM

**DESIGN AND CONSTRUCTION OF THE NORTH SHORE CONNECTOR AERIAL STRUCTURE**

Christopher Vollmer, P.E., PMP, Gannett Fleming, Inc, Pittsburgh, PA; Keith A. Wargo, P.E., Port Authority of Allegheny County, Pittsburgh, PA

The terminus of the Port Authority of Allegheny County’s North Shore Connector project which is supported on a 14-span aerial structure adjacent to Heinz Field presented many unique challenges due to the specific project constraints and stakeholder requirements. Several factors which influenced the design and layout of the structure included: site constraints, an integrated train station and platform, a double cross-over, continuously welded rail, aesthetic commitments and requirements to provide free flowing pedestrian access.

### 11-79 2:45 PM

**STRUCTURAL MODELING AND DESIGN OF THE DENVER I-225 LRT CORRIDOR BRIDGE OVER I-225**

Daniel Baxter, P.E., S.E., Michael Baker Jr. Inc, Cleveland, OH; David Nemovitz, P.E., Michael Baker Jr., Inc., Lakewood, CO

This presentation describes the structural modeling and design for the proposed bridge carrying the FasTracks I-225 corridor over I-225 in Denver. This nine span, reverse-curvature bridge will carry two direct-fixation tracks with continuously welded rail (CWR). Due to curved geometry and direct-fixation force effects, a three-dimensional, non-linear, finite element model was developed to evaluate rail-structure interaction, including thermal force distributions and rail gap analysis. Variable fastener stiffness and effects of CWR terminations were also considered.

### 11-80 3:10 PM

**METRIFICATION AND EVALUATION OF GUSSET PLATES ON THE ROUTE 100 VIADUCT**

William Farrow, P.E., Gannett Fleming, New York, NY; Christopher Higgins, Ph.D., P.E. and O. Tugrul Turan, Ph.D., Oregon State University, Corvallis, OR; Chris Carnes, P.E., SEPTA, Philadelphia, PA

A technique has been developed that deploys digital imaging technologies to quickly determine the as-built geometry of gusset plates in the field and was recently used by bridge inspection personnel on an in-service truss bridge on SEPTA’s Route 100 Line in suburban Philadelphia. The plate geometric data acquired from the images was extracted for implementation in finite element analysis (FEA) as well as the Whitmore section method to quickly assess the gusset plate connections.
# INTERNATIONAL BRIDGE CONFERENCE® SCHEDULE AT A GLANCE

## MONDAY JUNE 6 EVENTS

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 AM - 12 NOON</td>
<td>KEYNOTE SESSION</td>
<td>BALL ROOM B</td>
</tr>
<tr>
<td>12:00-7:00 PM</td>
<td>EXHIBIT HALL OPEN (LUNCHEON BUFFET AT NOON, AND NETWORKING RECEPTION AT 5:00)</td>
<td></td>
</tr>
<tr>
<td>1:00-5:00 PM</td>
<td>INNOVATIVE FINANCING (W-1) ROOM 328</td>
<td>(W-2) ROOM 327</td>
</tr>
<tr>
<td>1:30 - 5:00 PM</td>
<td>FEATURED COUNTRY (W-1) ROOM 328</td>
<td>PROPRIETARY SESSION THEATRE 1</td>
</tr>
</tbody>
</table>

## TUESDAY JUNE 7 MORNING EVENTS

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 AM - 5:00 PM</td>
<td>EXHIBIT HALL OPEN</td>
<td></td>
</tr>
<tr>
<td>8:00 AM - 12 NOON</td>
<td>HOOVER DAM BYPASS SEMINAR</td>
<td>(W-3) ROOM 330</td>
</tr>
<tr>
<td>8:30 AM - 12 NOON</td>
<td>DESIGN, PART 1 THEATRE 1</td>
<td>DRILLED FOUNDATIONS THEATRE 3</td>
</tr>
<tr>
<td>10:00 - 10:30 AM</td>
<td>NETWORKING COFFEE BREAK</td>
<td></td>
</tr>
</tbody>
</table>

## TUESDAY JUNE 7 AFTERNOON EVENTS

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00 - 5:00 PM</td>
<td>LIFE CYCLE COST ANALYSIS (W-6) ROOM 330</td>
<td>WORKZONE SAFETY (W-8) THEATRE 4</td>
</tr>
<tr>
<td>1:00 - 5:00 PM</td>
<td>IBC BUS TOUR</td>
<td></td>
</tr>
<tr>
<td>1:00 - 5:00 PM</td>
<td>FHWA/AASHTO TUNNEL SCAN SEMINAR</td>
<td></td>
</tr>
<tr>
<td>1:30 - 5:00 PM</td>
<td>LONG SPAN THEATRE 2</td>
<td>INNOVATIVE CONCEPTS THEATRE 3</td>
</tr>
<tr>
<td>3:00 - 3:30 PM</td>
<td>NETWORKING COFFEE BREAK</td>
<td></td>
</tr>
<tr>
<td>2:30 - 3:30 PM</td>
<td>POSTER SESSION Q&amp;A</td>
<td></td>
</tr>
<tr>
<td>5:00 - 7:00 PM</td>
<td>IBC AWARDS RECEPTION CONCOURSE C</td>
<td></td>
</tr>
</tbody>
</table>
### TRENDY TOPICS/SUSTAINABILITY SESSION

#### STATE OF SUSTAINABLE BRIDGE DESIGN PRACTICES IN THE UNITED STATES

Allison Halpern and Sigrid Adriaenssens, Princeton University, Princeton, NJ

This paper provides an overview of the measures private industry, academia, and the federal government are taking to develop sustainable bridge design practices in the United States, as well as a discussion of recommended changes to the governing bridge design standards to account for future sustainability concerns. Concluding remarks include suggestions for innovative ways to incorporate sustainable choices into vehicular and pedestrian bridge design, which are not currently being considered by the bridge design industry.

#### SUSTAINABLE BRIDGE SOLUTIONS USING RECYCLED PLASTICS

Vijay Chandra, P.E., Parsons Brinckerhoff, Inc., Herndon, VA; Presenting Paper: John S. Kim, P.E., Ph.D., Parsons Brinckerhoff, Inc., Richmond, VA; Thomas J. Nosker, Ph.D., Rutgers University, Piscataway, NJ

The world's first vehicular bridges made of nearly 100% recycled plastics were opened at Fort Bragg, NC in 2009. The world's first railroad bridges made of the same material were opened at Fort Eustis, VA in 2010. This new innovative and sustainable construction material can provide a cost-effective solution to the currently aching infrastructures and an excellent solution to the environmental issues of plastic waste.

#### TESTING OF A FIBER GLASS REINFORCED POLYMER HONEYCOMB BRIDGE IN HURON COUNTY OHIO

Douglas Nims, University of Toledo, Department of Civil Engineering, Toledo, OH; Ed Baznik, EIT, Michael Baker Jr., Inc., Cleveland, OH; H. John Snyder, P.E., W.E. Quicksall & Associates, New Philadelphia, OH; Mike Endredi, EIT, University of Toledo, Toledo, OH

A Fiber Reinforced Polymer Honeycomb bridge was installed in Huron County, Ohio in 2008. The bridge spans approximately 17 feet (5.2 meters) and is on a low traffic road. This case study describes the design, fabrication, and testing done in the laboratory, at commissioning testing and after two years of service. The design and material standards for polymer bridges are not fully developed. The work completed provides an understanding of the bridge’s early life.

### HEALTH MONITORING OF PRECAST GFRP-REINFORCED BRIDGE DECK PANELS

Rebecca Nix, S.E., Utah Department of Transportation, Salt Lake City, UT; Chris P. Pantelides, Ph.D., S.E. and Jim Ries, Department of Civil and Environmental Engineering, University of Utah, Salt Lake City, Utah

The deck of the Beaver Creek Bridge was constructed in 2009 using precast concrete deck panels reinforced with glass fiber reinforced polymer (GFRP) bars. The paper
presents the monitoring of two panels during lifting, transportation, post-tensioning, and static and dynamic truck load tests. Results from the truck load tests include relative deflections between the bridge deck and girder diaphragms, as well as deflections and vertical accelerations of the prestressed girders.

**WORKSHOP 12: RECENT ADVANCES IN LIGHTWEIGHT AGGREGATE IN CONCRETE FOR BRIDGES (PART 2)**

**Time:** 1:30 - 4:00 PM  
**Room:** 327  
**Presented by the Expanded Shale, Clay and Slate Institute**  
A Continuation of Part 1 from Wednesday morning

**SEMINAR: (TICKETS REQUIRED)**

IBC Seminars are intensive, four-hour, single-topic focused sessions. An additional fee of $150 is required for each seminar and advance registration is required, and a ticket will be provided to you at that time. Tickets are required to attend all seminars. Seating for each Seminar is limited, so please register early. Certificates of Completion are awarded upon completion.

**BRIDGE INSPECTION AND BRIDGE MANAGEMENT**

**Time:** 1:00 - 5:00 PM  
**Seminar Leader:** Hal Rogers, Michael Baker Jr., Inc  
This seminar will provide a better understanding of bridge management systems that use transition probabilities to predict future bridge needs. Its target audience is bridge owners and consultant inspection program managers who need this type of information to set agency budgets and performance goals to manage their bridges in a rational manner. Topics include:

- Introduction to transition probabilities,
- bridge modeling (Maintenance Repair and Rehabilitation vs. Improvement projects),
- changes to AASHTO’s bridge element-level condition data, and
- new directions for bridge management.

The AASHTOWare Pontis BMS will be the center of Topic One, while the other topics will be discussed from a more general perspective.

1. Using Modeling Capabilities, Paul Thompson
2. Changes in Element Level Data for Bridge Management, Anwar Ahmad, FWHA
3. New Directions For Pontis Bridge Management, Jose Aldayuz, Hal Rogers, Paul Thompson, Michael Baker Jr., Inc

**INTERNATIONAL BRIDGE DESIGN COMPETITION IN HELSINKI, FINLAND**

Helsinki invites proposals for an iconic bridge

Vast waterfront areas of the Finnish capital Helsinki are being redeveloped from former industrial uses. Two of the main areas will be connected by a bridge for trams, cycling and pedestrians.

Located in the heart of the city, the new bridge will be an icon of Helsinki and form part of the city’s legacy for future generations.

The bridge should pay respect to Helsinki’s history and culture, harmonizing with the city’s maritime landscape.

Helsinki invites teams of bridge designers and engineers to participate in a design competition, open from May 30th to August 3rd, 2011.

More at [www.kruunusillat.fi](http://www.kruunusillat.fi)

[City of Helsinki](http://www.cityofhelsinki.fi)
POSTER SESSION

Time: Tuesday, June 8: 9:00 AM - 5:00 PM,
       Wednesday, June 9th 8:30 AM - 1:30 PM
Room: Exhibit Hall A

Make time to visit the IBC Poster Session on Tuesday or Wednesday during the conference. Poster Presenters will be present at their poster for 1 of 2 arranged time slots to entertain Q&A. Stop by either from Tuesday 2:30 - 3:30 PM or from Wednesday 9:30 - 10:30 AM to visit with the poster presenters!

POS 11-1: INNOVATIVE UHPC PEDESTRIAN CABLE STAYED BRIDGE IN KOREA, Changbin Joh, Korea Institute of Construction Technology (KICT)

POS 11-2: DETAIL DESIGN OF 3-PYLON SUSPENSION BRIDGE WITH TWO MAIN-SPANS IN KOREA, Do Gyun Kim, Daelim Industrial

POS 11-3: CABLE SUPPORTED BRIDGES OF DAELIM INDUSTRIAL COMPANY, Young Jae Seo, Daelim Industrial

POS 11-4: HYBRID STRUCTURAL TESTING CENTER, Nak-hoon Shim, Myongji University

POS 11-5: DEVELOPMENT AND OPERATION OF CONSTRUCTION RESEARCH, Jung Dae-Sung, KOCED CMI

POS 11-6: SUPERSTRUCTURE CONSTRUCTION OF NAK-DONG RIVER BRIDGE, Jaehyoung Park, Samsung C&T Corporation

POS 11-7: DESIGN AND CONSTRUCTION SPECIFICATIONS OF MAIN AND CRESCENT BRIDGES IN PALM JEBEL ALI, Jaehong Kim, Samsung C&T Corporation

POS 11-8: EVALUATION OF WAKE GALLOPING OF UNPARALLEL TWIN CABLES OF THE MOPO CABLE-STAYED BRIDGE, Sang-Hoon Lee, GS Engineering & Construction

POS 11-9: THE YEOSU BRIDGE IN KOREA, Young-Jun Hong, GS Engineering & Construction

POS 11-10: THE SECOND NAMHAE BRIDGE IN KOREA, Jung-II Yoo, GS Engineering & Construction

POS 11-11: DEVELOPMENT OF HIGHLY EFFICIENT CONSTRUCTION TECHNOLOGIES FOR SUPER LONG SPAN BRIDGE, Byung-Suk Kim, Korea Institute of Construction Technology (KICT)

POS 11-12: AUTOMATED BARGE IMPACT MONITORING SYSTEM AT US41 NORTHBOUND BRIDGE OVER THE OHIO RIVER, Asadollah Bassam, CTLGroup

POS 11-13: CONSTRUCTION STAGE ANALYSIS OF CABLE-STAYED BRIDGE, Heena Kharat

POS 11-14: SUPER LONG SPAN BRIDGE R&D CENTER, Kyoung-Bong Han

POS 11-15: EXPERIMENTAL TESTS OF CFT MEMBERS FOR PREFABRICATED BRIDGE, Oh Hyun Chul, DAEWOO

MINI THEATRES

The 28th Annual International Bridge Conference® is excited to offer Mini-Theaters located within our expanded exhibit hall! Mini-Theater presentations are unique in length, and content — presentations times are a half an hour in length during exhibit hall hours. Content is provided by companies already represented in the Exhibit Hall, and provides attendees a further opportunity to learn more their products and services. Check out our Mini-Theatre location near Aisle 300 in the Exhibit Hall!

MINI THEATERS SCHEDULE

Monday, June 06, 2011        4:00 PM
Presented by: American Shotcrete Association
“Shotcrete Specifications for Quality In-Place Concrete”
This presentation will focus on the content and structure of a shotcrete specification which directly impact the quality of in-place concrete when placed via the shotcrete process. A questions and answer period will follow the presentation and printed specification guidance and example will be available.

Tuesday, June 07, 2011        9:00 AM
Presented by: Substructure Inc.
“High Resolution Seafloor and Structural Mapping”
Substructure Inc. will provide an educational presentation on the applications for high resolution multibeam surveying and mapping and the technologies involved. Discussed will be the challenges of multibeam surveying and how Substructure’s survey vessel Orion was custom-built to address those challenges.

Tuesday, June 07, 2011        3:00 PM
Presented by: American Shotcrete Association
“Infrastructure Repair Using Shotcrete”
The benefits and advantages of shotcrete in infrastructure repair will be discussed along with strategies and examples. The presentation will also offer attendees the opportunity to participate in a question and answer period.

Tuesday, June 07, 2011        4:00 PM
Presented by: American Shotcrete Association
“DOT Case Studies Using Shotcrete”
This presentation will focus on 3 case studies of State DOT projects that successfully employed the shotcrete process. The strategies used as well as the benefits that resulted from the use of the shotcrete process will be discussed for each case.
WELCOME TO THE IBC EXHIBIT HALL!

The 2011 IBC Exhibit Hall has moved to larger space in the David L. Lawrence Convention Center, in HALL A. We can now accommodate even more displays than ever before—heavy equipment, active displays and super-sized exhibits and our brand new Mini-Theatres, along with numerous enhancements for your enjoyment. With more space than ever to accommodate additional features, the IBC Exhibit Hall is the place to be for attendees and exhibitors! In addition to more than 150 Exhibits, the Featured Country display from the Republic of South Korea is prominently featured in the center of the Exhibit Hall. The Mini-Theatres provide Exhibitors with an opportunity to step out from their Exhibit booth and present additional information about their products & services—a separate schedule of presentations can be found alongside the listing of all other presentations.

The IBC Exhibit Hall is open:
- Monday: 12:00 Noon - 7:00 PM, featuring complimentary lunch from 12:00 Noon - 1:00 PM and evening “Get Acquainted” reception from 5 - 7:00 PM.
- Tuesday: 8:00 AM - 5:00 PM, concession lunch sales available
- Wednesday: 8:00 AM - 1:30 PM, featuring complimentary lunch from 12:00 Noon - 1:00 PM

Coffee breaks, when scheduled, will be located throughout HALL A.

Thanks to all of our returning Exhibitors, and to our new Exhibitors, too! The following is a quick find numerical listing of all exhibitors. Following, an alphabetical listing with full contact information and company description can be found. This listing contains all Exhibitors as of May 31, 2011.

Bridge Preservation Maintenance & Rehabilitation

- **T-48 Thin Overlay:**
  (3/8 - 1/2”) Bonds Well to Steel and all Surfaces
- **T-48 Chip Seal:**
  Easy Application, Skid and Water-Resistant
- **T-70 & T-78 Crack Sealer:**
  Seals Cracks, Lower “life-cycle cost”
- **T-18 Overlay:**
  Light weight, Waterproof, Fast-Setting (under 1 hour)
- **T-17 Patch:**
  Rapid-Setting, Permanent

Bridge Grid Flooring Manufacturers Association (BGFMA)

<table>
<thead>
<tr>
<th>EXHIBITORS</th>
<th>2011 IBC EXHIBITORS, BY BOOTH NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>301</td>
<td>United Fiberglass of America Inc.</td>
</tr>
<tr>
<td>303</td>
<td>WorkZone Safety Clearing House/ARTBA</td>
</tr>
<tr>
<td>305</td>
<td>American Road and Transportation Builders Association</td>
</tr>
<tr>
<td>307</td>
<td>Sci-Tek Consultants, Inc.</td>
</tr>
<tr>
<td>309</td>
<td>Hydro-Technologies, Inc.</td>
</tr>
<tr>
<td>313</td>
<td>All Access Rigging Co.</td>
</tr>
<tr>
<td>317</td>
<td>Hardesty &amp; Hanover, LLP</td>
</tr>
<tr>
<td>323</td>
<td>Terex Hydra Platforms</td>
</tr>
<tr>
<td>325</td>
<td>ADSC</td>
</tr>
<tr>
<td>327</td>
<td>SIMCO Technologies Inc.</td>
</tr>
<tr>
<td>335</td>
<td>Layne GeoConstruction</td>
</tr>
<tr>
<td>339</td>
<td>Fatigue Technology</td>
</tr>
<tr>
<td>343</td>
<td>Substructure Inc.</td>
</tr>
<tr>
<td>347 &amp; 446</td>
<td>Hill &amp; Smith Inc.</td>
</tr>
<tr>
<td>400</td>
<td>Klaas Coating (NA) LLC</td>
</tr>
<tr>
<td>401</td>
<td>Salit Specialty Rebar</td>
</tr>
<tr>
<td>402</td>
<td>Applied Foundation Testing</td>
</tr>
<tr>
<td>403</td>
<td>Moog USA, Inc.</td>
</tr>
<tr>
<td>404</td>
<td>Fabreeka International Inc.</td>
</tr>
<tr>
<td>405</td>
<td>Missouri Department of Transportation</td>
</tr>
<tr>
<td>406</td>
<td>Sapa Aluminum Bridge Decking</td>
</tr>
<tr>
<td>407</td>
<td>Gerdau - ZBAR Division</td>
</tr>
<tr>
<td>408</td>
<td>Silicone Specialties, Inc. (SSI)</td>
</tr>
<tr>
<td>409</td>
<td>Dynamic Isolation Systems</td>
</tr>
<tr>
<td>412</td>
<td>HiVisPriceSaver.com</td>
</tr>
<tr>
<td>413</td>
<td>Hardwire LLC</td>
</tr>
<tr>
<td>416</td>
<td>Applied Geomechanics, Inc.</td>
</tr>
<tr>
<td>417</td>
<td>Palmer Engineering</td>
</tr>
<tr>
<td>422</td>
<td>Bridge Grid Flooring Manufacturers Association (BGFMA)</td>
</tr>
<tr>
<td>423</td>
<td>Applied Bolting Technology</td>
</tr>
<tr>
<td>424</td>
<td>Techstar-Inc.</td>
</tr>
<tr>
<td>425</td>
<td>Armtec</td>
</tr>
<tr>
<td>426 &amp; 428</td>
<td>Wacker Neuson Corporation</td>
</tr>
<tr>
<td>427</td>
<td>American Arminox, Inc.</td>
</tr>
<tr>
<td>429</td>
<td>Bentley Systems, Incorporated</td>
</tr>
<tr>
<td>430</td>
<td>Ecological Fabrication Technologies</td>
</tr>
<tr>
<td>431</td>
<td>Arup</td>
</tr>
<tr>
<td>432</td>
<td>Harbor Technologies LLC</td>
</tr>
<tr>
<td>433</td>
<td>Thomas Industrial Coatings</td>
</tr>
<tr>
<td>434</td>
<td>Neel Company, The</td>
</tr>
<tr>
<td>435</td>
<td>Splice Sleeve North America, Inc.</td>
</tr>
<tr>
<td>438</td>
<td>Modjeski and Masters Inc.</td>
</tr>
<tr>
<td>439</td>
<td>Wirerope Works, Inc.</td>
</tr>
<tr>
<td>442</td>
<td>Earthquake Protection Systems, Inc.</td>
</tr>
<tr>
<td>443</td>
<td>Campbell Scientific, Inc.</td>
</tr>
<tr>
<td>500</td>
<td>R.J. Watson, Inc.</td>
</tr>
<tr>
<td>501</td>
<td>Reinforced Earth Company, The</td>
</tr>
<tr>
<td>502 &amp; 504</td>
<td>Computers &amp; Structures, Inc.</td>
</tr>
<tr>
<td>503</td>
<td>Advitam, Inc.</td>
</tr>
<tr>
<td>505</td>
<td>Scougal Rubber Corporation</td>
</tr>
<tr>
<td>506</td>
<td>Kentucky Transportation Center</td>
</tr>
</tbody>
</table>
EXHIBITORS

507 Loadtest, Inc.
508 Transpo Industries Inc.
509 EarthCam, Inc.
512 & 516 Acrow Corporation of America
513 CTLGroup
517 Wheeling Corrugating Company
522 McClain & Co., Inc.
524 LARSA Inc.
526 Sofis Company, Inc.
528 AECOM Technical Services, Inc.
530 Chase Construction Products
532 Clearspan Construction Products
534 Seismic Energy Products, L.P.
538 Carolina Stalite Company
539 ATLSS Research Center - Lehigh University
542 PlasmaFab
543 Advanced Infrastructure Technologies
547 Harcon Corporation
600 CONTECH Construction Products Inc.
601 Termarust Technologies
602 Coastal Precast Systems
603 Roads & Bridges Magazine
604 Freyssinet, Inc.
605 Bureau Veritas
606 NDT Corporation
607 American Shotcrete Association
608 Highway Care
609 G.A. & F.C. Wagman, Inc.
612 ChemCo Systems
613 Trinity Highway Products, LLC
616 FIGG
617 D.S. Brown Company, The
638 LUSAS
639 Vector Corrosion Technologies
642 Surtreat Holding LLC
646 Pickering, Corts & Summerson, Inc.
647 DYWIDAG Systems International USA, Inc.
700 Sika Corporation
701 Clodfelter Bridge & Structures Int'l, Inc. (CBSI)
702 The Dyson Corp
704 American Composites Manufacturers Association (ACMA)
705 D'Appolonia Engineering
706 Monotube Pile Corporation
707 Dynamic Surface Applications, Ltd (DSA)
708 Strand7 PTY Ltd
709 MDX Software
712 InspectTech Systems, Inc.
713 Pennoni Associates Inc.
716 Hilman Rollers
717 Central Atlantic Bridge Associates
723 L.R. Kimball
725 Houston Structures
727 Williams Form Engineering
729 National Steel Bridge Alliance
731 Pierereasearch
733 HRV Conformance Verification Associates, Inc.
735 MIDASoft, Inc.
738 Eriksson Technologies, Inc.
739 National Academy of Science
742 Rampart Hydro Services
743 Safway Services, LLC
746 Greenman-Pedersen, Inc./Instrument Sales, Inc. a GPI Company
801 WireCo World Group
803 Euclid Chemical Company, The
804 AZZ Galvanizing Services, Inc.
807 Foundation Technologies Inc.
808 Bridon International
809 BendTec, Inc.
812 DOTQS
813 Deep Foundations Institute
816 Viathor, Inc.
817 Silica Fume Association
822 Hayward Baker Inc.
823 Polyset Company
824 ZweigWhite
825 Power Team, An SPX Brand
826 American Bridge Manufacturing
827 Corrpro Companies, Inc.
828 Plaxis
830 Kwik Bond Polymers
831 DeAngelo Brothers Inc.
832 Sealite USA
833 Interstate Road Management
834 MC Ironworks
835 Mabey Bridge & Shore, Inc.
838 Short Span Steel Bridge Alliance
839 Skyline Steel, LLC
843 Phoenix National Laboratories, Inc.
847 Geocomp Corporation
900 TUV Rheinland Industrial Solutions
902 Langan Engineering & Environmental Services
904 E.T. Techtonics Inc.
906 TransCon Supply / Strongwell
908 FRP Bridge Drain Pipe
912 Brayman Construction Corporation
916 G.W.Y., Inc.
922 Michael Baker Jr., Inc.
924 Quikrete Companies, The
926 A.D. Marble & Company
928 Bridge design & engineering magazine
930 ICE - International Construction Equipment
932 Tokyo Rope Mfg. Co. Ltd.
934 Erdman Anthony
938 Professional Engineers in California Government
942 Conduit Constructors/ Bridge Line
#END#
A.D. MARBLE & COMPANY
Booth #: 926
Phone: 412-968-5977
Fax: 412-968-5978
E-mail: kstockert@admarble.com
Website: www.admarble.com
A.D. Marble & Company is an employee owned consulting firm specializing in environmental studies, cultural resources studies, and engineering services. Our studies include NEPA documentation, wetland delineation and mitigation, air & noise, social environment, hazardous waste, geospatial data, historic structures, archaeology, public involvement, and transportation, structural, and water resources engineering.

ACROW CORPORATION OF AMERICA
Booth #: 512 & 516
Contact: Eugene Sobiec
Fax: 973-244-0085
E-mail: sales@acrowusa.com
Website: www.acrowusa.com
Acrow is an industry leader in the design and manufacture of prefabricated modular steel bridges. Acrow’s principal business is the engineering, manufacturing, and supply of Acrow Panel Bridges. We have been in business for over 50 years. Acrow is based in North America with representation in 35 countries.

ADSC
Booth #: 325
Contact: Antonio Marinucci, PhD, PE
Phone: 214-343-2091
Fax: 214-343-2384
E-mail: tmarinucci@adsc-iafd.com
Website: www.adsc-iafd.com
The ADSC-IAFD is a non-profit, international, professional, trade association representing the drilled shaft, anchored earth retention, micropile, and other related civil construction/design industries. Its members include specialty subcontractors, manufacturers and suppliers, and design engineers in the private and public sectors, and academicians. Through its 19 technical committees the ADSC establishes standards and specifications, funds research and scholarships, conducts design, construction, inspection and testing seminars, and offers field and management training programs. The ADSC-IAFD provides project review services to government agencies and owners at all levels, conducts technical conferences and industry trade shows, and publishes and distributes technical materials including its flagship periodical, FOUNDATION DRILLING Magazine. The ADSC is served by a national staff and eight regional chapters.

ADVANCED INFRASTRUCTURE TECHNOLOGIES
Booth #: 543
Contact: Barry Raeburn
E-mail: barry@aitbridges.com
Website: www.aitbridges.com
Advanced Infrastructure Technologies (AIT) is revolutionizing bridge construction through advancements in technology. AIT’s innovative composite-based superstructure components facilitate a longer-lasting, cost-effective and eco-friendly alternative to traditional steel and concrete designs. The Company’s technology has won numerous awards and has been featured in The New York Times and Popular Science.

ADVITAM, INC.
Booth #: 503
Phone: 703-674-0485
Fax: 703-674-0700
E-mail: benoit.kroely@advitam-group.com
Website: www.advitam-group.com
Advitam is a leading provider of solution and services for infrastructure management. We provide inspection software and asset management systems for bridges and other highway structures. Advitam is also an expert in structural health monitoring, our Eversense system provide long/short-term solutions for both signature structures and regular highway bridges.

AECOM TECHNICAL SERVICES, INC.
Booth #: 528
Contact: Stanley Nalitz
Fax: 412-395-8897
E-mail: Stan.Nalitz@aecom.com
Website: www.aecom.com

ALL ACCESS RIGGING CO.
Booth #: 313
Phone: 866-643-8303
Fax: 724-899-2280
E-mail: contact@allaccessrigging.com
Website: www.allaccessrigging.com
AARC is a nationwide bridge inspection support service company with over 30 years of experience. We provide access to the most challenging structures while eliminating the need for lane closures and track time. We also provide traffic control. We are PennDot prequalified, hold PA & WV contractor licenses.

AMERICAN ARMINOX, INC.
Booth #: 427
Contact: Ross Paulson
Fax: 212-554-4089
E-mail: rp@americanarminox.com
Website: www.americanarminox.com
Fabrication and distribution of stainless steel rebar all grades.

AMERICAN BRIDGE MANUFACTURING
Booth #: 826
Phone: 412-631-3000
Fax: 412-631-4001
E-mail: pmccarthy@americanbridge.net
Website: www.americanbridge.net
American Bridge is a vertically integrated construction, engineering, and manufacturing firm with operations throughout the USA and abroad. The company is specialized in the general construction, manufacture, erection, and rehabilitation of complex bridges and...
other structures. The manufacturing arm of American Bridge is uniquely qualified in the fabrication of structural steel for various bridge designs including arch, truss, girder, beam and movable type bridges. Two modern fabrication facilities in Pennsylvania and Oregon serve North America’s bridge rehabilitation and new bridge markets.

**AMERICAN COMPOSITES MANUFACTURERS ASSOCIATION (ACMA)**

Booth #: 702 & 704  
Phone: 914-961-8007  
Fax: 914-961-8004  
E-mail: jbusel@acmanet.org  
Website: www.acmanet.org

ACMA is the world’s largest composites trade association and hosts the largest composites conference in North America - COMPOSITES. The ACMA Transportation Structures Council serves to inform and educate practitioners on FRP composites used in civil engineering / construction applications. Manufacturers products on display include structural profiles, bridge decks, pedestrian bridges, rebar, piling, and concrete repair/strengthening systems. Visit www.acmanet.org/doc/tsc.cfm.

**AMERICAN ROAD AND TRANSPORTATION BUILDERS ASSOCIATION**

Booth #: 305  
Contact: Jim Colleton  
Phone: 202-289-4434  
Fax: 202-289-4435  
Website: www.artba.org

We are a federation whose primary goal is to aggressively grow and protect transportation infrastructure investment to meet the public and business demand for safe and efficient travel. In support of this mission, ARTBA also provides programs and services designed to give its 5,000+ public and private sector members a global competitive edge.

**AMERICAN SHOTCRETE ASSOCIATION**

Booth #: 607  
Contact: Chris Darnell  
Fax: 248-848-3740  
E-mail: Info@Shotcrete.org  
Website: www.Shotcrete.org

ASA is a non-profit organization of contractors, suppliers, manufacturers, designers, engineers, owners, and others with a common interest in promoting and educating the concrete industry on the versatility, quality and economic advantages of the use of shotcrete.

**APPLIED BOLTING TECHNOLOGY**

Booth #: 423  
Contact: Chris Curven  
Phone: 802-460-3100  
Fax: 802-460-3104  
E-mail: chrisc@appliedbolting.com  
Website: www.appliedbolting.com

Applied Bolting Technology manufactures Squirter Direct Tension Indicating (DTI) washers. These washers are used to install bolts to the right TENSION, regardless of the bolt’s torque resistance. Tens of millions of Squirter DTIs have revolutionized the bolt-up process in structural steel projects around the world, making bolt installation and inspection easy and accurate.

**APPLIED FOUNDATION TESTING**

Booth #: 402  
Contact: Tracy Bedingfield  
Phone: 904-284-1337  
Fax: 904-284-1339  
Website: www.testpile.com

Specializing in statnamic axial and lateral load testing, crosshole sonic logging (CSL), sonic integrity testing, video shaft inspection device, post grouted shafts, shaft inspection, dynamic pile testing, conventional load tests, embedded data collectors.

**APPLIED GEOMECHANICS, INC.**

Booth #: 416  
Contact: Tom Weinmann  
Phone: 847-850-5051  
Fax: 847-850-5021  
Website: www.geomechanics.com

Applied Geomechanics specializes in providing integrated monitoring solutions associated with existing infrastructure, as well as new construction. From tiltmeters to GPS and Fiber Optics, our innovative and comprehensive instrumentation monitoring programs are cost effective tools to reduce both the risk and the cost of construction.

**ARMTEC**

Booth #: 425  
Contact: Eric Humphries  
Phone: 203-715-5050  
Fax: 860-760-6658  
E-mail: eric.humphries@armtec.com  
Website: www.armtec.com

Armtec noise barriers are complete wall systems designed for absorptive noise abatement in residential and industrial applications. Made of proprietary composite concrete materials, our products are among the most technologically advanced and effective noise barriers on the market. Armtec is also a supplier of transparent barriers that can enhance scenic views along roadways, improve commercial visibility, reduce the apparent height of a noise wall, and increase the amount of sunlight in neighbouring yards.

**ARUP**

Booth #: 431  
Contact: Jarney Barbas  
Fax: 212-229-1056  
E-mail: jarney.barbas@arup.com  
Website: www.arup.com

Working on bridges for nearly 40 years, Arup offer a complete service for all aspects of the design and construction of bridges. We respond to challenges by bringing together traditionally separate disciplines and specialists into a single multi-professional practice. Arup have access to an unusual range of skills and unique experience helping us achieve successful solutions that meet our clients’ needs and aspirations.
EXHIBITORS

ATLSS RESEARCH CENTER - LEHIGH UNIVERSITY
Booth #: 539
Contact: Chad Kusko
Phone: 610-758-5299
Fax: 610-758-5902
Website: www.atlss.lehigh.edu

The Center for Advanced Technology for Large Structural Systems (ATLSS) was established in 1986, and is Lehigh’s internationally respected center for engineering research and education addressing the civil and marine infrastructure for Pennsylvania and the nation. This mission includes Pennsylvania’s bridge and highway structures, and the contributions of research, education and technology transfer to enhancing their design and performance. ATLSS has extensive experience in laboratory and field instrumentation, testing, and fatigue and strength evaluation of bridges.

AZZ GALVANIZING SERVICES, INC.
Booth #: 804
Contact: Kevin Irving
Phone: 815-693-4242
Fax: 815-723-5008
E-mail: kevinirving@azzgalv.com
Website: www.azz.com

As America’s Largest Galvanizer we have 33 locations to serve you. We are DOT Certified and in the last few years we have galvanized over 75 million pounds of bridgework for various States. We are also the proud recipient of numerous American Galvanizer Association “Excellence Awards”.

BENDTEC, INC.
Booth #: 809
Contact: Wendy Meierhoff
Fax: 218-722-6598
E-mail: wendy@bendtec.com
Website: www.bendtec.com

BendTec, Inc is a LEADER in the bending, fabrication, design, and engineering of large and small piping & structural steel for structural & architectural applications. BendTec is AISC certified in compliance with Simple Steel and Major Steel Bridges, Fracture Critical Endorsement & Sophisticated Paint Coating Endorsement.

BENTLEY SYSTEMS, INCORPORATED
Booth #: 429
Contact: Barbara Day
Phone: 919-851-8559
Fax: 919-851-8533
Website: www.bentley.com/Bridge

Bentley Systems, Incorporated provides software for the lifecycle of the world’s infrastructure. Bentley delivers Bridge Information Modeling (BIM) technology for the entire bridge lifecycle. Bentley BIM provides broad access to advanced bridge products in Bentley’s comprehensive software portfolio. Bentley products provide an interoperable, data-managed bridge solution for planning, design, engineering, analysis, fabrication, construction, maintenance, and rehabilitation. These end-to-end solutions enable the transportation industry to efficiently and effectively address the challenges of new and aging bridges and deliver sustainable, long lasting infrastructure.

BRAYMAN CONSTRUCTION CORPORATION
Booth #: 912
Phone: 724-443-1533
Fax: 724-443-8733
E-mail: d_uranowski@brayman.com
Website: www.braymanconstruction.com

Brayman is a full service provider of General Contracting and Specialty Geotechnical design/build solutions throughout the entire eastern United States. Capabilities include - bridges and complex structures, steel erection, lock and dam construction/repair, marine construction, demolition, excavation/drainage, specialty geotechnical solutions - micropiles, caissons, driven/drilled piles, sheet piling, augercast piles, rock/soil nailing, ground anchors/tiebacks, grouting, underpinning and more.

BRIDGE DESIGN & ENGINEERING MAGAZINE
Booth #: 928
Contact: Lisa Bentley
Phone: 44-207-973-4698
Fax: 44-207-233-5057
Website: www.bridgeweb.com

The leading magazine for the international bridge industry. Every issue of Bd&e looks at the latest news, projects reports, interviews and technical & application features from around the world. Bd&e is essential reading for anyone who finances, plans, designs, builds, maintains, operates, or owns bridges.

BRIDGE GRID FLOORING MANUFACTURERS ASSOCIATION (BGFMA)
Booth #: 422
Contact: Mark Kaczinski
Fax: 419-257-0332
E-mail: bgfma@bgfma.org
Website: www.bgfma.org

BGFMA... this next generation Bridge Grid Flooring Manufacturers Association industry group features an expanded professional organization focused on the reliable development and application of bridge grid flooring and Exodermic™ decking. The role of the association is to promote the use of grid reinforced concrete bridge decks through data collection, research/development and education.

BRIDGELINE & CONDUIT CONSTRUCTORS
Booth #: 942
Contact: Kent Gruber
Phone: 704-598-5684
Fax: 704-598-5683
E-mail: kent@bridgelinesolutions.com
Website: www.bridgelinesolutions.com

BridgeLine represents the next generation of fluid, data, and energy piping and conduit systems for bridges and tunnels. Our engineered systems are supported by over 40 years of field experience and thousands of bridge installations.
BRIDON INTERNATIONAL
Booth #: 808
Phone: +44 1302 565100
Fax: +44 1302 565190
E-mail: structures@bridon.com
Website: www.bridon.com
Bridon specialise in providing architects and designers with cable solutions which enable the most ambitious designs to be realised. As aesthetics become increasingly important, Bridon has been leading the way by developing the Stylite range of cable systems. Bridon cable systems combine a century of manufacturing experience, proven technological expertise and cutting edge design to provide the bridge industry with a complete range of products from Ultra High Strength Bridge Wire to Full Locked Coil Cable Systems.

BUREAU VERITAS
Booth #: 605
Phone: 412-921-8833
Fax: 412-921-8836
E-mail: richelle.mcguire@us.bureauveritas.com
Website: www.us.bureauveritas.com
Bureau Veritas helps clients comply with standards and regulations relating to Quality, Health and Safety, Environment and Social Responsibility. We can assist with clients’ Quality Assurance needs during manufacture, fabrication and erection of industrial materials, engineered products, machinery and civil structures. Bureau Veritas provides inspection, testing, auditing, certification and training.

CAMPBELL SCIENTIFIC, INC.
Booth #: 443
Contact: Ken Stevens
Phone: 435-753-2342
Fax: 435-750-9540
Website: www.campbellsci.com
Campbell Scientific, Inc. manufactures data acquisition systems for bridge monitoring and testing. Proven on many of the world’s premier bridges, our rugged, stand-alone, DC powered instrumentation features multiple telemetry options, low power use, non-volatile data storage, rainfall histograms, real-time FFTs, and rugged reliability even in harsh, remote environments.

CAROLINA STALITE COMPANY
Booth #: 538
Contact: Dr. Reid W. Castrodale, PE
Phone: 704-642-1572
Fax: 704-642-1572
E-mail: rcastrodale@stalite.com
Website: www.stalite.com
Stalite is a high performance lightweight aggregate manufactured by expanding slate in a rotary kiln at high temperatures. Lightweight concrete produced using Stalite has reduced density that improves structural efficiency and reduces handling costs for precast elements, enhanced durability and design compressive strengths of 10,000 psi or more.
EXHIBITORS

CLODFELTER BRIDGE & STRUCTURES INT’L, INC. (CBSI)
Booth #: 701
Contact: Jerry V. Clodfelter
Phone: 713-675-1180
Fax: 713-675-1140
Website: 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.

COASTAL PRECAST SYSTEMS
Booth #: 602
Contact: Joe Rose
Fax: 757-545-6296
E-mail: jrose@cpsprecast.com
Website: www.cpsprecast.com
Coastal Precast Systems, a PCI Certified Producer, located right on the Elizabeth River in Chesapeake, VA and services markets all along the eastern seaboard. CPS manufactures a full range of pre-cast/pre-stressed, structural concrete products and noise wall products for port facilities, marine and highway structures. We invite you to visit us on our website at www.cpsprecast.com.

COMPUTERS & STRUCTURES, INC.
Booth #: 502 & 504
Contact: Asif Habibullah
Phone: 510-649-2200
Fax: 510-649-2299
Website: www.csiberkeley.com
Bridge software, powered by SAPFire®, offers quick and comprehensive design and retrofitting of all types of steel & concrete bridges. A parametric modeler rapidly generates layout lines, spans, bearings, abutments, bents and hinges. Integrated capabilities include lane & vehicle live loads, Gantt chart construction scheduling, nonlinear geometric and material modeling, and AASHTO LRFD and seismic design.

CONTECH CONSTRUCTION PRODUCTS INC.
Booth #: 600
Contact: Lisa Doroba
Phone: 513-645-7004
Fax: 513-645-7993
Website: www.contechbridge.com
CONTECH Construction Products Inc. offers a comprehensive line of vehicular and pedestrian bridge products to suit any application need. A variety of plate, precast and truss products include CONTECH Structural Plate, CON/SPAN Bridge System, the BEBO Arch System, Steadfast Bridges and Continental Bridge. More then 65,000 structures are installed worldwide.

CORRPRO COMPANIES, INC.
Booth #: 827
Phone: 330-289-4635
Fax: 330-722-7606
E-mail: cfirlotte@corrpro.com
Website: www.corrpro.com
Corrpro offers complete corrosion engineering, cathodic protection materials and coating services to protect your steel and concrete structures from corrosion.

CTLGROUP
Booth #: 513
Phone: 847-965-7500
Fax: 847-965-6541
E-mail: DKleinhans@CTLGroup.com
Website: www.CTLGroup.com
CTLGroup is a firm of engineers, scientists, consultants, technical specialists and architects who help our clients with complex challenges around the world. We serve clients in the global markets of: energy & resources, green solutions, transportation, litigation & insurance, materials & products, and buildings & facilities.

D.S. BROWN COMPANY, THE
Booth #: 617
Contact: Bob Rose
Fax: 732-262-4443
E-mail: brose@dsbrown.com
Website: www.dsbrown.com
Design and manufacture engineered bridge construction materials including expansion joint systems, structural bearing assemblies (elastomeric, HLMR and spherical), Cable-guard™ elastomeric wrap (corrosion protection for bridge cables), and Exodermic™ (composite, unfilled steel grid) Bridge Decks.

D’APPOLONIA ENGINEERING
Booth #: 705
Contact: Dave Leitze
Phone: 412-856-9440
Fax: 412-856-9535
Website: www.dappolonia.com
D’Appolonia provides civil, geotechnical and environmental engineering analysis and design services for infrastructure and transportation systems. The firm’s areas of specialization include foundations, earth retention and excavation support structures, slope stabilization, ground improvement, subsidence mitigation, dewatering, instrumentation, geophysical reconnaissance and Value Engineering.

DEANGELO BROTHERS INC.
Booth #: 831
Contact: Fred Grant
Fax: 570-459-5500
E-mail: fgrant@dbiservices.com
Website: www.dbiservices.com
We are your resource for industrial service solutions for federal, state and local governments, DOT’s, railroads and industries throughout North America. Our Cleaning Management services include bridge cleaning, street sweeping, graffiti removal, tunnel washing.
and high-pressure cleaning. We also provide total Asset Management for contracts which include multiple maintenance services.

**DEEP FOUNDATIONS INSTITUTE**

 Booth #: 813  
 Phone: 973-423-4030  
 Fax: 973-423-4031  
 E-mail: mebruce@dfi.org  
 Website: www.dfi.org

One of the strengths of DFI is the broad spectrum of its membership. All disciplines participate on an equal footing, be they contractors, engineers, owners, academicians, equipment manufacturers and distributors or materials manufacturers and suppliers. All types of foundation systems are represented, whether installed by driving, drilling or other means. This diversity provides a wealth of knowledge and an opportunity to learn from one another.

**DOTQS**

 Booth #: 812  
 Contact: Paul Proczko  
 Phone: 312-285-5344  
 Fax: 216-373-7297  
 E-mail: info@dotqs.com  
 Website: www.dotqs.com

DOT Quality Systems is an assessment firm that conducts supplier audit programs for transportation project owners and their teams. Owners use DOTQS to free up funding by utilizing experienced quality professionals and engineers with technical and quality system credentials to assure an effective supply chain for a single project or to maintain an approved supplier group of fifty suppliers or more.

**DYNAMIC ISOLATION SYSTEMS**

 Booth #: 409  
 Phone: 775-359-3333  
 Fax: 775-359-3985  
 E-mail: tng@dis-inc.com  
 Website: www.dis-inc.com

Dynamic Isolation Systems Inc. (DIS) has been at the forefront of seismic isolation for over 25 years. DIS designs, manufactures and tests seismic isolation bearings of all sizes and specializes in custom designs. We have supplied isolators for the majority of prominent isolation projects around the world. Please contact DIS for design assistance for your isolation project.

**DYNAMIC SURFACE APPLICATIONS, LTD (DSA)**

 Booth #: 707  
 Contact: Mike Stachowicz  
 Phone: 570-546-2415  
 E-mail: mstachowicz@dsa-ltd.com  
 Website: www.dsa-ltd.com

Dynamic Surface Applications, Ltd (DSA) is the manufacturer of the Thorma-Joint® asphaltic plug joint system and the installer of a variety of maintenance and safety products including Thorma-Joint and the Imprint® surfacing system.

**THE DYSON CORP**

 Booth #: 701  
 Contact: Patrick Sheffield  
 Phone: 800-680-3600  
 Fax: 440-352-2700  
 E-mail: psheffield@dysoncorp.com  
 Website: www.dysoncorp.com

The Dyson Corporation is a manufacturer of large diameter structural fasteners and construction accessories including foundation and anchor rods, upset forgings, eyebolts, turnbuckles and clevises, bridge pins, bridge cable sockets, heavy hex nuts, free-spinning lock nuts and other custom machined components and forgings.

**DYWIDAG SYSTEMS INTERNATIONAL USA, INC.**

 Booth #: 647  
 Contact: Joe Salvadori  
 Phone: 630-739-5517  
 E-mail: dsiamerica@dsiamerica.com  
 Website: www.dsiamerica.com

International leading manufacturer/supplier of specialized construction materials and equipment: Post-Tensioning, Reinforcing, Stay-Cables, Geotechnical, and Formwork Accessories. DSI offers the following services: heavy lifting, NDT, structural repair/strengthening, value-engineering and post-tensioning installation. Our mission: provide the highest degree of technical support/customer service and superior engineered systems. Local Presence-Global Competence. Rely on DSI.

**E.T. TECHTONICS INC.**

 Booth #: 904  
 Contact: Eric Johansen  
 Phone: 215-592-7620  
 E-mail: etteric@aol.com  
 Website: www.ettechtonics.com

E.T. Techtonics, Inc., located in Philadelphia, PA , specializes in the design and construction of lightweight maintenance-free fiberglass pedestrian bridges. Started in 1987, the company was in the research and development phase from 1987-1993 to develop the bridge system. To date it has sold over 500 fiberglass bridges worldwide.

**EARTHCAM, INC.**

 Booth #: 509  
 Contact: Brian Cury  
 Phone: 201-488-1111  
 Fax: 201-488-1119  
 Website: www.earthcam.net/roadsandbridges

EarthCam is the global leader in professional webcam technology and software. Founded in 1996, EarthCam provides live streaming video and megapixel cameras, along with complete managed services for engineering and construction clients in more than 1,500 cities and 46 countries worldwide plus 80 of the top 100 construction companies.
**EUCLID CHEMICAL COMPANY, THE**

Booth #: 803  
Contact: John Weisbarth  
Phone: 800-321-7628  
Fax: 216-481-7072  
Website: www.euclidchemical.com  

The Euclid Chemical Company is a leading manufacturer of polymer bridge deck overlay systems, epoxy adhesives and coatings, concrete and masonry ad mixtures, curving and sealing compounds, cementitious and epoxy grouts, joint fillers and sealants, as well as a complete line of concrete repair and restoration materials. These products are available world wide.

**FABREEKA INTERNATIONAL INC.**

Booth #: 404  
Contact: Patti Palizzolo  
Phone: 781-341-3655  
Fax: 781-341-3983  
Website: www.fabreeka.com  

Fabreeka bridge rail and lamp post pads accommodate irregularities in concrete mounting surfaces while providing vibration isolation. Fabreeka structural expansion bearings provide a durable sliding surface with a low coefficient of friction. Fabreeka also offers drain trough as a flexible water drainage system.

**FATIGUE TECHNOLOGY**

Booth #: 339  
Contact: Robbie Boyd  
Phone: 206-246-2010  
E-mail: rboyd@fatiguetech.com  
Website: www.fatiguetech.com  

Fatigue Technology (FTI) is the pioneer and world leader of cold expansion technology. FTI’s solutions increase the fatigue life of holes in metal structures and have been used by the aerospace industry for the past 40 years. Cold expansion arrests the growth of small cracks in holes. Using this technology to install a bushing into a drill stop hole improves the fatigue life of the hole by 10 to 12 times.

**FIGG**

Booth #: 616  
Contact: Linda Figg  
Phone: 850-224-7400  
Fax: 850-224-5428  
Website: www.figgbridge.com  

FIGG specializes in bridge design and construction engineering and management. Celebrating over 30 years of Creating Bridges as Art® for our customers with more than 300 awards for innovation, economy and aesthetics. Our focus on bridges allows us to create landmarks that incorporate function, sustainable design and beauty to enhance the quality of life for communities across America.

---

**EUCLID CHEMICAL COMPANY, THE**

Booth #: 803  
Contact: John Weisbarth  
Phone: 800-321-7628  
Fax: 216-481-7072  
Website: www.euclidchemical.com  

The Euclid Chemical Company is a leading manufacturer of polymer bridge deck overlay systems, epoxy adhesives and coatings, concrete and masonry ad mixtures, curving and sealing compounds, cementitious and epoxy grouts, joint fillers and sealants, as well as a complete line of concrete repair and restoration materials. These products are available world wide.

**Fabreeka International Inc.**

Booth #: 404  
Contact: Patti Palizzolo  
Phone: 781-341-3655  
Fax: 781-341-3983  
Website: www.fabreeka.com  

Fabreeka bridge rail and lamp post pads accommodate irregularities in concrete mounting surfaces while providing vibration isolation. Fabreeka structural expansion bearings provide a durable sliding surface with a low coefficient of friction. Fabreeka also offers drain trough as a flexible water drainage system.

**Fatigue Technology**

Booth #: 339  
Contact: Robbie Boyd  
Phone: 206-246-2010  
E-mail: rboyd@fatiguetech.com  
Website: www.fatiguetech.com  

Fatigue Technology (FTI) is the pioneer and world leader of cold expansion technology. FTI’s solutions increase the fatigue life of holes in metal structures and have been used by the aerospace industry for the past 40 years. Cold expansion arrests the growth of small cracks in holes. Using this technology to install a bushing into a drill stop hole improves the fatigue life of the hole by 10 to 12 times.

**FIGG**

Booth #: 616  
Contact: Linda Figg  
Phone: 850-224-7400  
Fax: 850-224-5428  
Website: www.figgbridge.com  

FIGG specializes in bridge design and construction engineering and management. Celebrating over 30 years of Creating Bridges as Art® for our customers with more than 300 awards for innovation, economy and aesthetics. Our focus on bridges allows us to create landmarks that incorporate function, sustainable design and beauty to enhance the quality of life for communities across America.
FOUNDATION TECHNOLOGIES INC.
Booth #: 807
Contact:
Fax: 678-407-4645
E-mail: info@foundationtechnologies.com
Website: www.foundationtechnologies.com

FREYSSINET, INC.
Booth #: 604
Contact: Andrew Micklus
Phone: 703-378-2500
Fax: 703-378-2700
E-mail: Drew.Micklus@freyssinetusa.com
Website: www.freyssinetusa.com
Freyssinet offers value added products and services to the civil engineering industry including: Multi-Strand and Thread Bar Post-tensioning Systems, Stay Cable Systems, Suspension Bridge Cables and Hangers, Expansion Joints, Bearings, Structural Dampers & Seismic Devices, Structural Repair/Strengthening, Barrier Cables, Monitoring Systems & Services, Heavy Lifting / Moving

FRP BRIDGE DRAIN PIPE
Booth #: 908
Contact: Nathan Peters
Fax: 636-938-3120
E-mail: npeters@westfallcompany.com
Website: www.frpbridgedrainpipe.com
FRP Bridge Drain Pipe specializes in fiberglass drain systems that provide a corrosion resistant, lightweight, and extremely versatile alternative to PVC and steel. Our products have been installed on projects ranging from elevated highways, bridges, marine construction and railway overpasses. Come see our new and improving solutions for age-old problems.

G.A. & F.C. WAGMAN, INC.
Booth #: 609
Contact: Brandon Zerilla
Phone: 717-764-8521
Fax: 717-764-2799
Website: www.wagman.com
G.A. & F.C. Wagman, Inc. is a heavy civil contractor specializing in transportation infrastructure and has grown to become a nationally recognized leader within the industry. Wagman’s core competencies include: design-build, bridges, structures, highways, excavation, drainage, marine construction, modified concrete and geotechnical construction services.

G.W.Y., INC.
Booth #: 916
Phone: 603-547-3800
Fax: 603-547-3801
E-mail: Info@gwyinc.mv.com
Website: www.gwyinc.com
G.W.Y., Inc. is North America’s largest supplier of both Tone and Makita structural bolt installation tools. G.W.Y. has a full line of electric wrenches and hand wrenches for all installation methods (Calibrated Wrench, DTI, TC Bolts & Turn of Nut.) G.W.Y. sells, rents, services and carries an extensive inventory of tools and parts. G.W.Y’s consulting staff is known for its ability to solve bolting problems both inhouse and at the job site.

GEOCOMP CORPORATION
Booth #: 847
Contact: Don Jacobs
Phone: 978-635-0012
Fax: 978-635-0266
Website: www.geocomp.com
Geocomp Corporation helps clients identify, manage, and mitigate underground risk by providing expert geo- engineering services for all types of infrastructure projects. We specialize in: underground engineering for buildings, bridges, tunnels, power projects, landfills, dams and other civil works; real-time web-based monitoring; and lab testing of soils, rock, geosynthetics, and construction materials.

GERDAU - ZBAR DIVISION
Booth #: 407
Contact: Wesley Miller
Fax: 865-637-9991
E-mail: wkmiller@gerdauameristeel.com
Website: www.specifyzbar.com
ZBAR by industry leader Gerdau is a high-performance reinforcing steel product that is ideal for harsh environments susceptible to corrosion, such as marine applications or where deicing salts are used. ZBAR offers performance comparable to stainless steel for an estimated 100-year maintenance-free life and has been used by commercial builders, departments of transportation and the military.

GREENMAN-PEDERSEN, INC./INSTRUMENT SALES, INC. A GPI COMPANY
Booth #: 746
Contact: Denise Badini
Fax: 772-337-0294
E-mail: dbadini@uesi.com
Website: www.gpi.com
Greenman-Pedersen, Inc. is a top national engineering/architectural design and construction firm involved on major projects throughout the U.S. and overseas since 1966. Provides many multi-discipline services to various industries. Instrument Sales, Inc. a GPI Company specializes in corrosion instruments and other equipment plus safety equipment. Underwater Engineering Services a GPI Company specializes in power plant maintenance and marine construction. Acquired in 2006 CCC&L a (new) GPI Company specializes in expert witness testimony, coating conditions survey, including a full service laboratory.
HARBOR TECHNOLOGIES LLC
Booth #: 432
Contact: Erik Grimes
Phone: 207-725-4878
Fax: 207-721-0971
E-mail: info@harbortech.us
Website: www.harbortech.us

Harbor Technologies is a manufacturer of composite infrastructure parts for marine and transportation applications. Specializing in hybrid composite bridge beams (HCB’s) and composite bridge protection systems.

HARCON CORPORATION
Booth #: 547
Contact: Harry Stoltzfus
Fax: 717-687-9296
E-mail: harry@harconcorp.com
Website: www.harconcorp.com

Harcon Corporation provides Bucket Boats, Bridge Trackers and rigging services on bridge inspection and repair projects. Since 1988, we’ve eliminated the need for lane closures and track time on thousands of structures nationwide.

HARDESTY & HANOVER, LLP
Booth #: 317
Contact: Hank C. Pokigo
Fax: 410-573-0650
E-mail: hpokigo@hardey-hanover.com
Website: www.hardey-hanover.com

Hardesty & Hanover, a world renowned bridge engineering firm, boasts 120 years of experience in engineering enduring structures. From conceptual design through construction inspection, Hardesty & Hanover projects include major bridges, highways, expressways, and heavy movable structures. We offer clients great customer service and projects that end on-time and within budget.

HARDWIRE LLC
Booth #: 413
Contact: Skip Ebaugh
Phone: 410-957-3669
Fax: 410-957-3424
E-mail: skip.ebaugh@hardwiredllc.com
Website: www.hardwiredllc.com

Hardwire is the leading supplier of bridge protection and hardening solutions in North America. We manufacture a wide range of composite armor solutions to protect the cables — be it a stay cable, suspend cable, or main suspension cable — against a wide array of threats including blast, fragmentation, mechanical and thermal cutting tools, and fire.

HAYWARD BAKER INC.
Booth #: 822
Contact: Greg Simmons
Fax: 410-551-8206
E-mail: gesimmons@haywardbaker.com
Website: www.haywardbaker.com

Hayward Baker Inc. is the leading geotechnical construction contractor in North America, providing the complete range of ground improvement services. As a member of the worldwide group of Keller companies, Hayward Baker Inc. is committed to providing the most economical and technically correct geotechnical solutions for planned and existing bridges. Ranked #1 Specialty Foundation Contractor by Engineering News-Record, year after year.

HIGHWAY CARE
Booth #: 08
Contact: Sam Arnold
Phone: 702-204-0732
Fax: 702-242-4733
E-mail: sam.arnold@highwaycare.com
Website: www.highwaycareint.com

Barrierguard 800 is a portable lightweight steel barrier. FHWA approved at TL-3 & TL-4, it can be used for permanent bridge railing, Basque bridge or bridge rehabilitation projects. Rapid installation, 60 pounds p/ft, limited anchoring and lowest deflection of any steel barrier. Barrierguard Gate TL-3 can be used for many bridge applications or easy access through any barrier line.

HILL & SMITH INC.
Booth #: 347 & 446
Contact: Gary Lalio
Fax: 614-340-6296
E-mail: gary.lalio@hillandsmith.com
Website: www.hillandsmith.com

Manufacturer of permanent and portable steel barriers.

HILMAN ROLLERS
Booth #: 716
Contact: Jeff Hill
Fax: 732-462-6355
E-mail: sales@hilmanrollers.com
Website: 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!

HI-VIS PRICE SAVER
Booth #: 412
Contact: Todd Mitchell
Phone: 800-932-2301
Fax: 814-476-1892
E-mail: admin@HiVisPriceSaver.com
Website: www.HiVisPriceSaver.com

HiVisPriceSaver.com is the lowest priced online distributor of High Visibility Apparel. We specialize in custom imprinting and embroidery of company logos on the work clothing that we sell. We are also a distributor of fall protection, hard hats, safety glasses, work gloves, welding apparel, and traffic safety products.

HARBOR TECHNOLOGIES LLC
Hayward Baker Inc. is the leading geotechnical construction contractor in North America, providing the complete range of ground improvement services. As a member of the worldwide group of Keller companies, Hayward Baker Inc. is committed to providing the most economical and technically correct geotechnical solutions for planned and existing bridges. Ranked #1 Specialty Foundation Contractor by Engineering News-Record, year after year.

HIGHWAY CARE
Barrierguard 800 is a portable lightweight steel barrier. FHWA approved at TL-3 & TL-4, it can be used for permanent bridge railing, Basque bridge or bridge rehabilitation projects. Rapid installation, 60 pounds p/ft, limited anchoring and lowest deflection of any steel barrier. Barrierguard Gate TL-3 can be used for many bridge applications or easy access through any barrier line.

HILL & SMITH INC.
Manufacturer of permanent and portable steel barriers.

HILMAN ROLLERS
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!

HI-VIS PRICE SAVER
HiVisPriceSaver.com is the lowest priced online distributor of High Visibility Apparel. We specialize in custom imprinting and embroidery of company logos on the work clothing that we sell. We are also a distributor of fall protection, hard hats, safety glasses, work gloves, welding apparel, and traffic safety products.
**HOUSTON STRUCTURES**

**Booth #:** 725  
**Phone:** 503-651-3174  
**Fax:** 503-651-1176  
**E-mail:** mikeu@ulvencompanies.com  
**Website:** www.ulvencompanies.com

Houston Structures Incorporated is a supplier of specialty forged, cast, machined and fabricated structural support products for the infrastructure industry. Located in Oregon, Houston Structures products supplied include open and closed wire rope and strand sockets, wire rope and strand assemblies, open and closed bridge sockets, anchor sockets, turnbuckles, and specialized cable castings and forgings.

**HRV CONFORMANCE VERIFICATION ASSOCIATES, INC.**

**Booth #:** 733  
**Contact:** Jackee Ging  
**Phone:** 412-788-2522  
**Fax:** 412-788-1697  
**Website:** www.hrvin.com

HRV provides a comprehensive range of services worldwide in materials and construction inspection, including steel, concrete, coatings, mechanical, and electrical. Serving the public and private sector, HRV is a leader in quality assurance, engineering consulting and expediting for the bridge/highway, water/wastewater, power, pressure vessel and commercial construction markets.

**HYDRO-TECHNOLOGIES, INC.**

**Booth #:** 309  
**Contact:** Edward Liberati  
**E-mail:** eliberati@hughesgrp.com  
**Website:** www.hydro-technologies.com

Hydro-Technologies, Inc. is the most experienced hydrodemolition company in North America. Our expertise is the selective removal of reinforced concrete using computer-controlled “high pressure water jet” robots. Our company specializes in the rehabilitation of the following type’s reinforced concrete structures: Bridges, Parking garages, Tunnels, Plants, Dams. We understand what is important to the Owners and Contractors. Bridge deck preservation is necessary to keep our nation’s roadway system in service. We have developed the Fast Track Hydro-Demolition Bridge Deck Overlay Method™ which is used by many Highway Departments and Contractor’s as the fastest and most economical construction method to repair and preserve bridge decks. The service life of bridge decks are extended by 25 years when this method is used with minimum disruption to traffic.

**ICE - INTERNATIONAL CONSTRUCTION EQUIPMENT**

**Booth #:** 930  
**Phone:** 704-821-8200 x188 & x182  
**E-mail:** sales@iceusa.com  
**Website:** www.iceusa.com

International Construction Equipment, Inc. is the leading international manufacturer and distributor of vibratory drivers and extractors, diesel hammers, hydraulic hammers, excavator-mounted rotary heads and hammers, large and small-bore drill tooling (including EDME Kelly Bars), limited access drills, Comacchio drills and other deep foundation equipment.

**INSPECTTECH SYSTEMS, INC.**

**Booth #:** 712  
**Contact:** Jeremy Shaffer, PhD  
**Fax:** 412-682-3068  
**E-mail:** shaffer@inspecttech.com  
**Website:** www.inspecttech.com

InspectTech provides easy to use software solutions that streamline the inspection process from onsite to back-office. The BridgeInspectT software suite can be quickly customized for each client and offers significant time-savings to inspectors and managers. The bridge inventory and management software includes cost estimates, GIS interface, full searching, custom reports, maintenance, and scheduling modules. The standalone inspection software significantly enhances the inspection process through customized forms with pick lists, coding manuals, and digital picture integration. InspectTech works with governments, private owners, and engineering consulting companies to meet their specific software needs.

**INTERSTATE ROAD MANAGEMENT**

**Booth #:** 833  
**Contact:** Richard Baker  
**Fax:** 804-213-0337  
**E-mail:** rbaker@dbiservices.com  
**Website:** www.dbiservices.com

Interstate Road Management’s High Friction Surfacing Treatment division provides the only automated application technology for skid resistant surfaces and bridge deck coatings, making roads and bridges safer worldwide.

**KENTUCKY TRANSPORTATION CENTER**

**Booth #:** 506  
**Contact:** Dr. Ted Grossardt  
**Fax:** 859-257-1815  
**E-mail:** tgrossardt@uky.edu  
**Website:** www.spi.uky.edu

The UK Transportation Center specializes in Structured Public Involvement in large bridge design. We design and deploy efficient, effective large groups processes that accurately measure the public’s aesthetic preferences across a broad envelope of potential bridge types, using cutting edge feedback and decision support technologies. Come to our booth and text in your preferences during the conference.

**KLAAS COATING (NA) LLC**

**Booth #:** 400  
**Phone:** 866-317-3633 (Toll free)  
**Fax:** 214-363-8422  
**E-mail:** info@klaascoatings-northamerica.com  
**Website:** www.klaascoatings-northamerica.com

North American manufacturer distributor of Klaas Coatings Si-Rex03™ Silicone Resin Emulsion Paint (SREP) for concrete and masonry. Water repellent, breathable architectural coating - using UV resistant inorganic pigments for non-fading colors - eliminates flaking and peeling with excellent durability and resistance to weathering and chalking to significantly outlast and outperform conventional paints. Primers: Si-Prime™ silane/siloxane/ acrylic blend and Cremsil™ 80% active octylsilane based thixotropic cream that penetrate and seal the substrate.
**Layne GeoConstruction**
Booth #: 335
Phone: 804-448-8060
Fax: 804-448-1771
E-mail: amneumann@laynegeo.com
Website: www.laynegeo.com
Layne GeoConstruction specializes in state of the art geotechnical construction techniques which include jet grouting, micropiles, high and low mobility grouting, chemical grouting, real time data monitoring, rock/soil anchors, underwater anchors, sonic drilling, ground improvement, stone columns, diaphragm slurry walls, excavation support systems, environmental remediation and in situ stabilization.

**LoadTest, Inc.**
Booth #: 507
Contact: John Hayes
Phone: 352-378-3717
Fax: 352-378-3934
Website: www.loadtest.com
Loadtest, Inc. specializes in deep foundation testing using the award winning Osterberg Cell method. Loadtest offers: Osterberg cell testing equipment, installation services as well as full planning & specification support, field load testing and analytical services.

**Lusas**
Booth #: 638
Contact: Terry Cakebread
Fax: 212-257-6441
E-mail: terry.cakebread@lusas.com
Website: www.lusas.com
Use LUSAS Bridge software for all your frequency, seismic, dynamic, nonlinear, buckling and fatigue analysis. Staged construction, creep modeling, prestress / post-tensioning and curved girder analysis is supported. A vehicle load optimisation facility simplifies worst-case loading patterns. AASHTO and other design codes supported. Extensive results processing facilities are provided.

**Mabee Bridge & Shore, Inc.**
Booth #: 835
Phone: 407-856-8283
E-mail: info@mabey.com
Website: www.mabey.com
M.B.S.I. carries the broadest range of products available for bridging, shoring, propping, and temporary roadways. Our expert Engineering Staff provides P.E. Certified arrangements, and our knowledgeable on-site support staff can answer your jobsite questions. Available for sale or rent worldwide, Mabey’s prefabricated bridges are for temporary, permanent, and emergency use.

**MC IronWorks**
Booth #: 834
Contact: Tom Caskey
Phone: 610-837-9914
Fax: 610-837-7939
E-mail: Tom.caskey@mcironworks.com
Website: www.mcironworks.com
AISC Structural Steel Bridge & Building Fabricator
MCCLAIN & CO., INC.
Booth #: 522
Contact: Valerie Ellington
Phone: 540-423-1110
Fax: 540-423-1066
Website: www.mcclainandcompany.com
Underbridge Access Equipment Rentals, Truck Mounted Aerial Platforms & Certified Traffic Control. Over 35 units including A-75’s, UB-60’s, Mark IV Snoopers, UB-50’s, Bridgemasters, variety of 40’ Platform & Bucket Snoopers, UB-30 rail-mounting unit, small & large Moog Platforms ranging 24’ - 70’. Hi-Reach & Bucket Trucks 27-120’. Certified Operators, innovative audio/visual system for added safety, ANSI certified units.

MDX SOFTWARE
Booth #: 709
Contact: Chris Douty
Fax: 573-446-3278
E-mail: support@mdxsoftware.com
Website: www.mdxsoftware.com
Developer of curved and straight steel bridge design and rating software for AASHTO ASD, LFD, and LRFD.

MICHAEL BAKER JR., INC.
Booth #: 922
Phone: 412-269-6300
Fax: 412-375-3998
E-mail: jdietrick@mbakercorp.com
Website: www.mbakercorp.com
Innovation and sustainability. To bridge infrastructure owners challenged by schedules and budgets, these design elements provide valuable solutions. To the traveling public, they provide safe, reliable, and cost effective transportation infrastructure delivered in an environmentally responsible manner. That’s what we do.

MIDASOFT, INC.
Booth #: 735
Contact: Sang Shim
Fax: 212-202-6465
E-mail: swshim@midasuser.com
Website: www.MidasUser.com
MIDASoft presents midas Civil 2010 bridge engineering and design software. Forward Stage cable stay bridge analysis concurrently reflects cable tuning, post-tensioning segmental spans fully accounting for creep, shrinkage and all tension losses. It features very efficient composite bridge analysis in construction stages, integral bridge module reflecting soil-structure interaction and seismic engineering capabilities.

MISSOURI DEPARTMENT OF TRANSPORTATION
Booth #: 405
Contact: Dennis Heckman
Phone: 573-751-0267
Fax: 573-526-5488
E-mail: dennis.heckman@modot.mo.gov
Website: www.modot.org
Stop by booth 405 and visit with the 2012 Featured Agency.

MODIESKI AND MASTERS INC.
Booth #: 438
Contact: Douglas Beaver
Fax:
E-mail: debeaver@modjeski.com
Website: www.modjeski.com
Modjeski and Masters is a nationwide leader in the design, inspection, and rehabilitation of all bridge types. Additional life-cycle services include: field instrumentation and nondestructive testing, bridge security and vulnerability analysis, vessel collision analysis, scour analysis, suspension bridge cable and suspender investigations, fatigue evaluations, emergency evaluations and forensic studies, seismic evaluation and design, and bridge research/code/course development.

MONOTUBE PILE CORPORATION
Booth #: 706
Phone: 330-454-6111
Fax: 330-454-1572
E-mail: monotube@raex.com
Website: www.monotube.com
End-driven longitudinally fluted steel shell for friction bearing applications available in a variety of diameters and tapers with engineering support for your project needs.

MOOG USA, INC.
Booth #: 403
Phone: 540-586-6700
Fax: 540-586-6161
E-mail: quotes@moogusa.com
Website: www.moogusa.com
Since 1980 Moog has been supplying their customers with state of the art mobile under-bridge inspection/maintenance equipment. Superior quality, innovative design, plus fulfilling our customer’s requirements have been the driving force of Moog’s success. Moog supplies units with reaches ranging from 15 ft. to 70 ft. and load capacities from 660 lbs. to 2,200 lbs.

NATIONAL ACADEMY OF SCIENCE
Booth #: 739
Contact: Jerry A. DiMaggio
Phone: 202-334-2109
Fax: 202-334-3471
E-mail: jdimaggio@nas.edu
Website: www.TRB.org/SHRP2
The Second, Strategic Highway Research Program, SHRP 2 is a $230 million focused research program that will change the highway transportation state of the practice for future decades. The program will produce a broad and diverse range of products which touch all aspects of highway transportation including; long range planning, environmental considerations, highway renewal, system operations and safety SHRP2 will yield approximately 130 products which are anticipated to have a broad appeal to both researchers as well as practitioners.

The SHRP 2 Renewal focus area has a total of ten (10) projects, representing approximately $16.5M focused on critical topics for structures and bridges, such as, innovative bridge design and accelerated bridge construction, 100-year service life for
Pennoni offers comprehensive bridge engineering services, including structural design, condition evaluation and inspection of highway, rail, movable, historic and long span structures. Our bridge engineers have successfully completed bridge projects that include underwater inspections, 3-D finite element analyses, emergency structural repairs, and constructability assessments for federal, state, and local agencies.

Phoenix National Laboratories is an independent third party lab specializing in the testing of elastomeric bridge bearings. We test to the latest AASHTO and State specifications including Standard Specifications, LRFD, and M251. All test results are reviewed and stamped by a registered Professional Engineer. [Alex] PNL also provides NDT and Inspection Services.

One of the region’s leading engineering firms, Pickering Corts & Summerson, Inc. provides comprehensive engineering services from our headquarters in Newtown, PA, and two regional offices in West Trenton, NJ and Plymouth Meeting, PA. Thriving on a 91-year tradition of excellence, PCS maintains award-winning practices in Civil Engineering, Municipal Engineering, Landscape Architecture, Transportation Design, Land Surveying, Bridge Inspection, and Underwater Bridge Inspection. A recognized leader in bridge design and inspection, PCS has inspected thousands of bridges in New Jersey and Pennsylvania, including many of the largest, most complex structures in the region. PCS underwater inspection teams include professional, commercially-certified, divers and employ cutting-edge underwater imaging equipment.

Piersearch manufacturers concrete pier accessories, Centraligner pier sleds, Hijacker pier bolsters, Quick-Lock pier wheels, and Bar Boosters, whose sole purpose is to keep a reinforcing steel cage centered and off of the floor of the drilled shaft.
PLASMAFAB
Booth #: 542
Contact: Michael Rush
Phone: 877-853-9227
E-mail: m.rush@e-zbar.com
Website: www.e-zbar.com
Providers of E-ZBar rebar spacers

PLAXIS
Booth #: 828
Contact: Erwin Beernink
Phone: +31(0)152517720
E-mail: reception@plaxis.nl
Website: www.plaxis.nl
Plaxis is the name of our company as well as our brand name. Under this brand name we supply a range of software tools, courses, seminars and expert services all targeted at the world of geotechnics, geo-engineering and civil engineering.

Our software is based on the finite element method and intended for 2-Dimensional and 3-Dimensional analysis of deformation and stability of soil structures, as well as groundwater and heat flow, in geo-engineering applications such as excavations, foundations, embankments and tunnels.

Our courses and seminars focus on knowledge transfer rather than on learning how to use Plaxis software. With our Expert Services we help customers with complicated modelling issues and expert advice.

POLYSET COMPANY
Booth #: 823
Contact: Benny Zlotnick
Phone: 518-664-6000
Fax: 518-664-6001
E-mail: b.zlotnick@polyset.com
Website: www.polyset.com
Polyset has been a leading manufacturer of expansion joint products and systems for bridges and commercial structures for over 25 years. We also have a line of Zero VOC HRZC coatings featuring Ply-Zinc, a high temperature, chemical resistant sprayable cathodic coating.

POWER TEAM, AN SPX BRAND
Booth #: 825
Contact: John Corona
Phone: 610-247-4314
Fax: 610-247-4311
E-mail: john.corona@spx.com
Website: www.powerteam.com
POWER TEAM is a world leader in hydraulic special service tools and equipment for global construction markets. We manufacture precision quality high-pressure hydraulic products including pumps, jacking cylinders/rams, post tension jacks, and valves. Products are sold through a worldwide network of stocking industrial distributors.

PROFESSIONAL ENGINEERS IN CALIFORNIA GOVERNMENT
Booth #: 938
Contact: Chelsea Mitchell
Phone: 916-446-0400
Fax: 916-446-0489
E-mail: cmerrill@pecg.org
Website: www.pecg.org
PECG provides representation in employment and professional matters for 13,000 state-employed engineers, architects, engineering geologists, land surveyors, and related professionals. PECG members design and inspect California’s highways and bridges, ensure schools and hospitals are seismically safe, and protect our air, water, and beaches for today and generations to come.

QUIKRETE COMPANIES, THE
Booth #: 924
Contact: Dennis Bittner
Fax: 404-841-0289
E-mail: dbittner@quikrete.com
Website: www.quikrete.com
The QUIKRETE® Companies are the largest manufacturers of packaged concrete in the United States and an innovative leader in the heavy highway industry. With more than 88 manufacturing facilities in the United States, Canada, Puerto Rico and South America, The QUIKRETE Companies have unsurpassed product distribution and depth.

R.J. WATSON, INC.
Booth #: 500
Contact: Jeremy Konst
Phone: 716-691-3301
Fax: 716-691-3305
Website: www.rjwatson.com
R.J. Watson, Inc. specializes in the design manufacture and testing of high load multirotational bearings, seismic isolation devices, joint sealing systems, waterproofing membranes and high strength fiber composite materials used to strengthen and rehabilitate structural members such as columns, beams, walls, piles, girders and slabs. In addition, R.J. Watson is now involved in the design and supply of FRP bridge deck and girder systems.

RAMPART HYDRO SERVICES
Booth #: 742
Contact: Jeff Parks
Fax: 412-262-6188
E-mail: sales@rampart-hydro.com
Website: www.rampart-hydro.com
Rampart is the world leader in ultra-high pressure (UHP) Hydrodemolition and HydroCleaning. Ultra high pressure Hydrodemolition uses less water; is environmentally friendly; provides a superior bond; and is fast and cost effective. Rampart has used Hydrodemolition on bridge surfaces and substructures, dams, tunnels, and parking garages. Rampart now offers complete vacuum cleanup of the water and debris creating Dry Hydrodemolition. We look forward to helping you with your demanding projects.
EXHIBITORS

REINFORCED EARTH COMPANY, THE
Booth #: 501
Contact: Michele A. Curry
Fax: 703-821-1815
E-mail: info@reinforcedearth.com
Website: www.reinforcedearth.com
The Reinforced Earth Company is a world leader in the design and supply of proprietary retaining wall system and earth-related technologies. Recognized as the supplier to some of our nation’s largest highway construction projects, working as a subcontractor/material supplier on Department of Transportation and privately owned projects, we perform all duties associated with our jobs from sales, marketing, engineering, design, supply and construction assistance.

ROADS & BRIDGES MAGAZINE
Booth #: 603
Contact: Rick Schwer
Fax: 847-390-0408
E-mail: rschwer@sgcmail.com
Website: www.roadsbridges.com
As the leading monthly trade publication for the transportation construction market, Roads & Bridges Magazine reaches over 60,000 engineers, contractors, DOT and other public officials (local, county, state & federal). Our readers design, build and maintain the roads, highways, bridges, and viaducts across the US and Canada.

SAFWAY SERVICES, LLC
Booth #: 743
Contact: Jerry Dolly
Phone: 518-381-6000
Fax: 518-381-4613
Website: www.safway.com
The QuikDeck™ Platform System can provide the solution to reduce labor costs and enhance access for bridge construction, rehabilitation and maintenance. QuikDeck™ can significantly reduce man-hours and overall project costs. Safety is our number one goal. All QuikDeck™ components are designed to meet or exceed OSHA safety regulations.

SALIT SPECIALTY REBAR
Booth #: 401
Phone: 716-299-1990
Fax: 716-299-1993
E-mail: kcornell@stainlessrebar.com
Website: www.stainlessrebar.com
Salit Specialty Rebar (SSR) is North America’s stainless rebar specialist. At SSR we offer shipping across North America, fabricated rebar, dedicated equipment, on time delivery, cut to length, and shrink wrapped to avoid contamination. SSR offers all sizes in both metric and Imperial from our vast inventory.

SAPA ALUMINUM BRIDGE DECKING
Booth #: 406
Contact: Greg Osberg
E-mail: gregory.osberg@sapagroup.com
Website: www.sapagroup.com/us/Company-sites/Sapa-Industrial-Extrusions---Sapa offers the advantages of aluminum isotropic bridge deck technology proven over 43 years of experience. Our advanced bridge deck products allow for accelerated construction (including preassembled “Deployment Ready designs), facilitate rehabilitation versus replacement and reduce life cycle costs. Engineers and bridge owners can complete more projects, in less time and at lower cost!

SCI-TEK CONSULTANTS, INC.
Booth #: 307
Contact: Felicia Thomas
Fax: 412-371-4462
E-mail: fthomas@scitekanswers.com
Website: www.scitekenvironmental.com
Sci-Tek, one of the largest minority owned companies in the Pittsburgh region, offers a broad range of experience and deep expertise in civil, environmental, and geotechnical engineering. Private and public clients are located throughout the Mid-Atlantic and Northeastern United States. Sci-Tek provides the following solutions for the transportation industry: Hydraulic/Hydrologic Modeling and Analysis, Lighting Design, Environmental Consulting, Water Resources Engineering, and Railroad Crossing Designs and Approvals.

SCOUGAL RUBBER CORPORATION
Booth #: 505
Contact: Rob Anderson
Phone: 206-783-2650
Fax: 206-764-4984
Website: www.scougalrubber.com
Manufacturer of Steel Reinforced and Plain Elastomeric Bearings, PTFE Slide Bearings, Vibration Isolators as well as Cable Dampers and Sealing Boots. In business since 1916 Scougal Rubber has been a supplier to the bridge industry for over 40 years.

SEALITE USA
Booth #: 832
Contact: Mark Novo
Phone: 603-737-1311
Fax: 603-737-1320
E-Mail: m.novo@sealiteusa.com
Website: www.sealite.com
Sealite USA is a supplier of solar powered bridge navigation lighting as well as buoys and navigation aids for all types of bridge construction projects and obstruction lighting.
SIMCO TECHNOLOGIES INC.

SIMCO Technologies offers integrated solutions for the optimum design and maintenance of concrete infrastructure. STADIUM®, its leading-edge service-life predictive software, reliably predicts concrete degradation kinetics and time to initiate reinforcing steel corrosion. SIMCO Technologies solutions serve all those vested in developing safe, sustainable, and cost-effective concrete structures.

SKYLINE STEEL, LLC

A premier steel foundation supplier serving the US, Canada, Mexico, Central America, Caribbean and South American markets, Skyline Steel is a wholly-owned subsidiary of ArcelorMittal, the world's largest and most respected steel company. ArcelorMittal's backing complements and synergizes Skyline Steel's internal strengths and empowers it to service its customers and the industry.

SOFIS COMPANY, INC.

Sofis Company, Inc. has been a General Contractor for 50 years. We are DOT prequalified. We have earned a reputation for knowledge and respectability specializing in Bridge Repair, Inspection and Support Services. Supplying top of the line Snoopers, Cable Rigging, Traffic Control and all related services, with an exemplary safety record.

SPICE SLEEVE NORTH AMERICA, INC.

Splice Sleeve North America markets the NMB Splice-Sleeve System, a grouted coupler for rebar used primarily to connect precast concrete elements like bridge piers and abutments, sound walls and retaining walls. Couplers exceed the requirements of ACI-318 and AASHTO for type 2 performance. Also rated 18-KSI in NCHRP 10-35, a 5 Million cycle fatigue test.
TEREX HYDRA PLATFORMS
Booth #: 323
Contact: Christer Bradley
Fax: 803-366-0603
E-mail: christer.bradley@terex.com
Website: www.terexrb.com
Terex Hydra Platforms self erecting, self propelled, under bridge aerial access platforms used for bridge inspections and repairs. Key Features:
• Patented Tower Separation System
• Five minute single lane deployment
• Remote start from platform
• Primary and Secondary hydraulic pumps
• 180 degree platform rotation
• Emergency Stops
• Hydrostatic Drive
• Operator activated Communication system

TECHSTAR-INC.
Booth #: 424
Contact: Warren Brown
Phone: 419-424-0888
Fax: 419-424-5959
E-mail: Warren@techstar-inc.com
Website: www.techstar-inc.com
D. S. TechStar, Inc. designs, manufactures and sells a variety of engineered products for bridges. Over the past twenty years, TechStar has supplied modular expansion joints, pot bearings, disc bearings, shock transmission units and parallel wire cable to bridges around the world. With manufacturing bases in several continents, TechStar can supply the bridge community with quality products meeting any design specification.
At TransCon, the entire team is involved in the bidding and estimation process. This extensive knowledge of each project enables the sales and management team to provide materials and services that meet or exceed project-specific standards and specifications.

- TransCon Supply focuses on transportation-construction and energy-transmission projects.
- We emphasize partnering with our customers and suppliers, keeping projects On Time and On Budget.

As we move forward, TransCon will provide continuing education opportunities for its team members, so they can stay abreast of leading edge products and high tech manufacturing methods, all of which affect our customers’ industries.

Strongwell has been pultruding fiber reinforced polymer composite structural products since 1956. Today, with more than 66 pultrusion machines and 647,000 square feet of manufacturing space in three plant locations, Strongwell has unequalled capacity, versatility and flexibility to meet the needs of its customers and allied partners. All Strongwell pultruded products are made in the USA. The company is financially strong, total quality oriented, technically advanced, and customer focused. Strongwell’s customers include Fortune 500 industrial and commercial firms, major architectural and engineering firms, leading contractors and distributors, and many other companies - both large and small - in a variety of markets.

Since 1968 Transpo Industries, Inc. has manufactured and supplied “Smart Solutions” safety products and new technology materials for bridges, roadways, tunnels, railroads, airports and ports. Our dedication to ensuring safer and more forgiving roadways and sustainability for our transportation infrastructure makes us a leader in safety, preservation and rehabilitation products and materials.

Trinity Highway Products, LLC is the leading manufacturer of highway guardrail, highway guardrail end treatments, temporary and permanent crash cushions, truck-mounted attenuators and cable barrier. Trinity is the market leader in booth innovation and safety standards.
WORKZONE SAFETY CLEARING HOUSE/ARTBA
Booth #: 303
Contact: Lisa McCluskey
Fax: 202-289-4435
E-mail: lmccluskey@artba.org
Website: www.workzonesafety.org
The National Work Zone Safety Information Clearinghouse is dedicated to providing the transportation construction industry and the general public with comprehensive information to improve motorist, worker and pedestrian safety in roadway work zones.

ZWEIGWHITE
Booth #: 824
Contact: Kevin Carmody
Fax: 800-842-1560
E-mail: kcarmody@zweigwhite.com
Website: www.zweigwhite.com
Twice named to the Inc. 500 list of best firms, ZweigWhite is the nation’s leader in enhancing business performance for architecture, engineering, and environmental consulting firms. ZweigWhite publishes CE News, Structural Engineering & Design, and Rebuilding America’s Infrastructure magazines in addition to events, electronic media, consulting, and research. ZweigWhite provides exclusive access to innovative products and consulting services and supplies objective coverage of industry news, trends, technology, and professional issues to the A/E/P and environmental consulting community.

WACKER NEUSON CORPORATION
Booth #: 426 & 428
Contact: Austin Hoffmann
Fax: 262-255-2550
E-mail: austin.hoffmann@wackerneuson.com
Website: www.wackerneuson.com
Wacker Neuson is a global manufacturer of light and compact equipment with a comprehensive product portfolio. Wacker Neuson is the partner of choice among professional equipment users in construction, utility, municipal, industrial, landscape, agricultural, restoration and homeowner markets.

WHEELING CORRUGATING COMPANY
Booth #: 517
Contact: Mike Benson
Phone: 304-234-2326
Fax: 304-234-2378
Website: www.wheelingcorrugating.com
Wheeling Corrugating Company specializes in permanent metal bridge deck forms. Form depths range from 2 inches through 4.5 inches accommodating girder spacings up to 15’-0”

WILLIAMS FORM ENGINEERING
Booth #: 727
Contact: Ryan Williams
Phone: 616-866-0815
Fax: 616-822-1890
Website: www.williamsform.com
Williams Form Engineering Corporation has been offering high capacity Ground Anchors, Concrete Anchors, Post Tensioning Systems, and Concrete Forming Hardware to the construction industry for over 80 years.

WIRECO WORLD GROUP
Booth #: 801
Contact: Richard Humiston
Phone: 816-270-4825
Fax: 816-270-4707
Website: www.MacWhyte.com
WireCo WorldGroup, the largest wire rope manufacturer in North America, leads in the production of structural bridge rope and strand. Our reputation for quality and service is unmatched. Each aspect of our engineering, manufacturing and fabrication process is monitored and controlled to assure the highest quality.

WIREROPE WORKS, INC.
Booth #: 439
Contact: Bill Austin
Fax: 570-327-4274
E-mail: w.austin@wireropeworks.com
Website: www.wireropeworks.com
We have a full (GP) General Purpose product line including spin resistant crane ropes. We are also capable of producing the largest diameter strand in the country, as well as having the longest prestretching track.
Bridge Information Modeling – It’s everything to do with the bridge.

Bridge Information Modeling (BrIM) is a compelling new methodology for project delivery that dramatically improves bridge quality and reduces risk. Using the Bentley bridge solution for BrIM, engineers develop and employ an unprecedented depth of information about the bridge as they streamline the entire bridge development process, design through construction engineering.

Join the world’s top engineering consultancies. Choose the Bentley bridge solution for BrIM – and the satisfaction of delivering safe, sustainable bridges on time and on budget.

Only Bentley can take you there. www.bentley.com/IBC