

27th Annual International Bridge Conference 2010

(IBC 2010)

**Pittsburgh, Pennsylvania, USA
6 - 9 June 2010**

ISBN: 978-1-61782-251-3

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2010) by the Engineers Society of Western Pennsylvania
All rights reserved.

Printed by Curran Associates, Inc. (2011)

For permission requests, please contact the Engineers Society of Western Pennsylvania
at the address below.

Engineers Society of Western Pennsylvania
Pittsburgh Engineers Building
337 Fourth Avenue
Pittsburgh, Pennsylvania 15222

Phone (412) 261-0710
Fax: (412) 261-1606

www.eswp.com

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

IBC 2010 Technical Program by Session

Keynote/Plenary

Monday, June 7, 2010

Chair: Jeffrey J. Campbell, P.E., International Bridge Conference® 2010 General Chair

Cable Stayed Bridges: The way forward

Peter R. Taylor, Ph.D., P.Eng., P.E., Buckland and Taylor, Ltd., North Vancouver, BC,

Canada 87"

Infrastructure Challenge

Jim J. Moynihan, Balfour Beatty Infrastructure, Inc., Atlanta, GA 87"

Overview of the Maryland State Highway Administration

Neil J. Pedersen, Administrator, Maryland State Highway Administration, Baltimore,

MD 84

Featured Agency

Monday, June 7, 2010

Chair: Robert Healy, Deputy Director, Office of Structures, MSHA

StateStat: The State of the State of Maryland Bridges

Robert Healy, Deputy Director, Office of Structures, Maryland State Highway

Administration, Baltimore, MD 8

Woodrow Wilson Bridge Project: "Water in the Ducts"

James Ruddell, PE, CCM, PB Americas, Inc., Portland, OR 25

Concrete Arch Bridge over Rock Creek

Paul J. Alterini, P.E., Parsons Transportation Group, Baltimore, MD 63

I-95 Express Toll Lanes

Dave LaBella, P.E., Maryland Transportation Authority, Baltimore, MD 97

Research Efforts to Test and Detect Chlorides in Concrete and their Effects on Durability and Strength

Jeff Robert, Maryland State Highway Administration, Baltimore, MD 27

Smart Aggregate - A Chloride Detection System

Rengaswamy (Srini) Srinivasan, The Johns Hopkins University, Applied Physics

Laboratory, Laurel, MD 44

Accelerated Bridge Construction: The Replacement of MD 362 over Monie Creek

William N. Pines, P.E., Maryland State Highway Administration, Baltimore, MD 46;

Preserving the Bay Bridge

Geoffrey V. Kolberg, P.E., Former Maryland Transportation Authority Chief Engineer,

STV, Inc., Baltimore, MD 32

The American Legion Bridge, MD No. 1510000, I-495 over Potomac River

Cecil W. Kincaid, P.E., Maryland State Highway Administration, Baltimore, MD 2

Curtis Creek Bascule Span Rehabilitation

Dan Williams, P.E., Maryland Transportation Authority, Baltimore, MD; Scott Reynolds,

P.E., Hardesty & Hanover, LLP, Annapolis, MD 5; 5

Four Span Bridge on MD 32 over Liberty Reservoir

Mark Glass and Rod Thornton, Maryland State Highway Administration, Baltimore, MD 644

Span Replacement of MD 90 over Assawoman Bay

William N. Pines, P.E., Maryland State Highway Administration Structures, Baltimore,

MD 688

Design, Part 1

Tuesday, June 8, 2010

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

The 4th Street Bridge - Crossing the Pueblo Rail Yard with Colorado's Longest Highway Span

John Dvorak, P.E., FIGG, Pueblo, CO ; Karen Rowe, P.E., Colorado Department of Transportation, Region 2, Pueblo, CO; Steve Fultz, P.E., FIGG, Denver, CO 697

Fantasy Harbour Bridge

Zhugang "Amos" Liu, P.E. and Gregory Sigmon, P.E., STV/Ralph Whitehead Associates, Inc., Charlotte, NC; Barry Bowers, P.E., South Carolina Department of Transportation, Columbia, SC 69;

Design and Construction Check of the Astana Arch Bridge

(Not Available at Time of Publication)

Alexandre Chaperon, Advitam, Vélizy Cedex, FRANCE 6: 8

The George Street Bridge Over Route 18 and Boyd Park

Thomas Zink, P.E., Gannett Fleming, Inc., Mount Laurel, NJ ; Michael DiGiacomo, P.E., Gannett Fleming, Inc., Orlando, FL 6: 9

Analysis and Design of the New St. Croix River Extradosed Bridge

Preston D. Vineyard and Darren Vian, Ph.D., P.E., Parsons Brinckerhoff, New York, NY 6; 7

Replacement of the Hillery Street Bridge over the Passaic River, Passaic County, NJ

Bruce Karalius, P.E., Greenman-Pederson, Inc., Lebanon, NJ ; Aurelia Mayer, Passaic County Engineer, Paterson, NJ 726

Seismic Performance of Precast Bridge Columns with Energy Dissipating Joints

Sarira Motaref, PhD student of Earthquake and Structural Engineering Research Assistant, University of Nevada, Reno, NV 732

Long Span Bridges

Tuesday, June 8, 2010

Chair: *Herbert M. Mandel, P.E., GAI Consultants, Inc., Homestead, PA*

Design, Construction and Organization of a Major Sea Crossing in Korea

Andrew Yeoward and Don Fraser, Halcrow Group Ltd, Swindon, Wilts, UK; Koo

*Im Sig, Daewoo E & C Ltd, Busan, Korea*742

US62/641 Tennessee River Bridge - Innovative Long-Span Design

C. Tony Hunley, P.E., S.E. and Don Mills, P.E., S.E., ENTRAN, PLC, Lexington,

*KY*74:

Design of Indian River Inlet Bridge

Benjamin Soule, International Bridge Technologies, San Diego, CA ; Eric Nelson,

*AECOM Transportation, Nashville, TN*758

Comparison of Characteristics of Some Unique Cable-Stayed Bridges under
Construction in Korea

Young-Jae Seo, Kyoung-Jae Lee, Jae-Hong Kim, Daelim Industrial Company,

*Seoul, South Korea*765

The Amelia Earhart Tied Network Arch Bridge

Natalie McCombs, P.E., S.E. and Frank Blakemore, P.E., HNTB, Kansas City,

*MO; Mark Hurt, P.E., S.E., Kansas Department of Transportation, Topeka, KS*773

The Geometry Control of Sepoong Bridge : A Curved Cable-Stayed Bridge

(Not Available at Time of Publication)

Jung-Min Nam, Joong-San Ahn, Jung-Nam Lee, and Jae-Hong Kim, Daelim

*Industrial Company, Ltd., Seoul, South Korea*779

Main Bridge Design and Construction Innovations of the Autoroute A-25 Project

Thomas Spoth, P.E., Joseph Viola, P.E., Augusto Molina, P.E., and Seth Condell,

*P.E., Parsons, New York, NY*77:

Mark Ennis, P.E., P.M.P. and Kara Crawford, P.E., STV Incorporated, Boston,
MA 02118

Design Part 2

Tuesday, June 8, 2010

Chair: Carl Angeloff, P.E., Bayer Material Science, LLC, Pittsburgh, PA

Elastomeric Bearings: Effects of Specification Changes on Design and Construction

John Stanton, University of Washington, Seattle, WA 848

The Point Marion Bridge: Structural Aspects of a New Truss Design

Anthony P. Ream, P.E. and William F. Beining, P.E., HDR Engineering, Inc.,

Pittsburgh, PA; Stephen E. Hvizda, P.E., Pennsylvania Department of

Transportation, Uniontown, PA 862

Replacement of the Northbound Whitestone Expressway Bridge over Flushing River

James A. Bager, P.E. and Daniel Wan, P.E., Hardesty & Hanover, LLP, New

York, NY; Michael Bergmann, P.E., John Elias, P.E., John Kwok, P.E., New York

State Department of Transportation, Long Island City, NY 868

Design and Construction of the Curved and Severely Skewed Steel I-Girder East-West Connector Flyover Ramp over I-88

Brandon Chavel, Ph.D., P.E. and Lance Peterman, P.E., S.E., HDR Engineering,

Inc., Chicago, IL ; Caahlen McAtee, P.E., Illinois State Toll Highway Authority,

Downers Grove, IL 876

Bridge Management

Tuesday, June 8, 2010

Chair: Gary Runco, P.E., Borton-Lawson, Wexford, PA

Integrated Bridge Inspection and Management System for State of West Virginia

(Not Available at Time of Publication)

Jeff Gula, West Virginia DOT/DOH - Maintenance Division - Bridge

Management Section, Charleston, WV 884

United States Fish & Wildlife Service Bridge Safety Program

Ronald R. Begin, P.E., U.S. Fish & Wildlife Service, Arlington, VA 885

Bridge Information Modeling of Quincy Avenue Bridge: A Case Study of BrIM
for Project Delivery throughout the Bridge Life-Cycle

Stuart Chen, Hanjin Hu, Qiang Gao and Il-Sang Ahn, University at Buffalo,

Buffalo, NY; Arun Shirole', S & A Shirole' P.C., Minneapolis, MN 895

AREVA Transportation Project

(Not Available at Time of Publication)

Bryan Spangler, P.E. and Ronald Ladyka, Michael Baker Jr, Inc, Harrisburg, PA 8: 3

Introduction to the Maintenance Specification for Long Span Cable-Supported
Bridges in Jiangsu China

Congming Zhu and Yufeng Zhang, Ph.D. Jiangsu Transportation Research

Institute, Co. Ltd, Nanjing, Jiangsu Province P.R. China 8: 4

Bridge Rehabilitation 2

Tuesday, June 8, 2010

Chair: Calvin Boring Jr., Trumbull Corporation, Greensburg, PA

Tendon Investigation and Grout Injection Repairs for the Jamestown-Verrazzano Bridge

(Not Available at Time of Publication)

Michael Abrahams, P.E. and Steven Kaufman, P.E., Parsons Brinckerhoff, New York, NY; Ahmad El-Beik, Parsons Brinckerhoff, Boston, MA; Paul Fisk, NDT Corporation, Worcester, MA 8 ;

Shear Capacity Testing and Assessment of Corrosion Damaged Reinforced Concrete Beams

William Farrow, III, P.E., Gannett Fleming, New York, NY ; Christopher Higgins, Ph.D., P.E. and O. Tugrul Turan, Oregon State University, Corvallis, OR 8 ; 2

Grand Concourse Bridge over Metro-North Railroad

(Not Available at Time of Publication)

Christopher Mele, P.E., P.M.P and Porfirio Lantigna, P.E., Michael Baker Engineering, Inc., White Plains, NY 8 ; 9

Existing Simple Steel Spans Made Continuous, a Retrofit Scheme for the I-476 Bridge over the Schuylkill River

John Milius, P.E. and Daniel Griffith, P.E AECOM, Philadelphia, PA 8 ;

Fatigue Evaluation and Enhancement of a Modular Steel Orthotropic Deck

(Not Available at Time of Publication)

Sougata Roy, Ph.D. and Yeun Chul Park, Lehigh University, ATLSS Engineering Research Center, Bethlehem, PA 9 28

Critical Member Removal and Load Redistribution of a Deteriorated Truss Bridge

Lynsey D. Reese, Virginia Polytechnic Institute and State University, Blacksburg, VA; Daniel G. Linzell, The Pennsylvania State University, University Park, PA 9 29

Research/Evaluation 1

Wednesday, June 9, 2010

Chair: *W. Jay Rohleder Jr., P.E. S.E., FIGG, West Chester, PA*

Analysis on Longitudinal Cracks of Prestressed Concrete Hollow Slab Beam Bridge

Zhu Xiaowen, Zhang Yufeng and Peng Yousong, Jiangsu Transportation Research Institute Co.,Ltd, Nanjing, Jiangsu, China; Yuan Aiming, Hohai University, Nanjing, China

937

Stability Analyses and Determination of Limiting Load Capacity of Washington Avenue Bridge Girders

(Not Available at Time of Publication)

Sougata Roy, Lehigh University, ATLSS Engineering Research Center, Bethlehem, PA ; John Milius, AECOM, Philadelphia, PA

94:

Investigation of Cracks in the Web of a Horizontally Curved Twin Box Girder Bridge

Jian Huang, Ph.D., P.E. and R. Wayne McLennon, P.E., TranSystems Corporation, Fort Lauderdale, FL; Anthony Koloze, E.I., TranSystems Corporation, Cleveland, OH

94;

Barge Impact Design of Highway Bridges Over Inland Waterways

Joseph J. Romano, P.E., Ling Zhao, P.E., Yong-Xian Chen, P.E., Michael Baker Jr., Inc., Hamilton, NJ; Terrence Tiberio, P.E., Michael Baker Jr., Inc., Moon Township, PA; Aaron Stover, P.E. S.E., Michael Baker Jr. Inc., Louisville, KY;

958

Use and Performance of Epoxy-Coated Reinforcing Steel over 37 years

David McDonald, Epoxy Interest Group of CRSI, Schaumburg, IL ;

966

Construction

Wednesday, June 9, 2010

Chair: *Lisle Williams, P.E., PLS, Consultant, Coraopolis, PA*

Launch of Structural Steel for the Athabasca River Bridge

Matthias Schueller, Matthew Bowser, and Prabhjeet (Raj) Singh, Infinity

Engineering Group Ltd., North Vancouver, Canada, and Brad Gunnlaugson,

Surespan Construction Ltd., North Vancouver, Canada 974

I-76 Allegheny River Bridge - Preserving the Environment with Pennsylvania's
Longest Concrete Segmental Span

Garrett Hoffman, P.E., FIGG, Exton, PA; Gary Graham, P.E., Pennsylvania

Turnpike Commission, Harrisburg, PA 97;

Design and Construction of Segmental Bridge in Algeria East-West Corridor

Adel R. Zaki, P.E. and Abdelkrim Settouf P.E., SNC-Lavalin Inc., Montreal, QC

Canada 984

Innovative Applications of Precast Concrete to Complex Bridge Projects in
Colorado

Gregg A. Reese, P.E., Summit Engineering Group, Inc., Littleton, CO ; 98:

Roll-out of the Clifton Avenue and Nesbitt Street Bridges over New Jersey
Transit

(Not Available at Time of Publication)

Wendy Haugeto, Michael Baker Jr., Inc., Hamilton, NJ 97

The Successful Implementation of Florida's First Post-Tensioned Duct Couplers

Timothy Barry, P.E., Reynolds Smith & Hills CS, Inc, Rockledge, FL ; Robert

Bennett, LEED AP, Reynolds Smith and Hills CS, Inc, Jacksonville, FL 98

Temporary Works In Large Construction Projects - Responsibilities and
Liabilities

Martin Kendall, P.E., STV Incorporated, New York, NY 9: 6

Accelerated Bridge Construction

Wednesday, June 9, 2010

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

Roll-in/Float-in Combination Truss Bridge (NY Rte 270 over the Erie Canal)

Robert A. Cisneros, Robert G. Urban, and Ronald D. Medlock, High Steel

Structures, Inc., Lancaster, PA 9; 4

Four Bridges Completely Replaced and Opened in an Average Closure Time of Seven Hours

Jason Klopheus, S.E., Michael Baker Jr., Inc., Salt Lake City, UT ; Josh Sletten,

S.E., Utah Department of Transportation, Salt Lake City, UT 24

Rail Bridge Replacement using Temporary Track Supports and Precast Concrete

Michael J. McAtee, P.E. and James E. Maccariella, Ph.D., P.E., Urban

Engineers, Inc., Cherry Hill, NJ; Robert J. Lund, Jr., P.E., Southeastern

Pennsylvania Transportation Authority (SEPTA), Philadelphia, PA 2:

Laboratory Testing of Transverse Connections for Use in Accelerated Bridge Construction

J. Logan Julander and Hugh Boyle, Michael Baker Jr., Inc., Midvale, UT ;

Marvin W. Halling, Paul J. Barr, and Scott D. Porter, Utah State University,

Logan, UT 36

Development and Effects of Accelerated Construction Method for Overpasses

Using Steel Bridges with Steel Spread Foundations

Yuji Mishima, Kazuhiro Fukumoto, and Yasumi Wakabayashi Hitachi Zosen

Corporation, Osaka, Japan 43

Rehabilitation of the Northbound and Southbound Bruckner Expressway Bridges as Easy as A, B, C (Accelerated Bridge Construction)

Marco Buyson, P.E. and Mohammad Shams, Ph.D., HDR Engineering, Inc., New

York, NY 4;

Short Span Innovative Bridge Design Choices

Sevak Demirdjian, P.E. and Olivier Joly, P.E., SNC Lavalin Inc., Montreal,

Quebec, Canada 5:

Bridge Maintenance

Wednesday, June 9, 2010

Chair: Louis J. Ruzzi, P.E., Pennsylvania Dept. of Transportation, Bridgeville, PA

Testing of Very Old Cathodic Protection Systems on Ohio Bridge Decks

Jack Bennett, J.E. Bennett Consultants, Inc., Chardon, OH ; Thomas Turk and

Matt Sexton, De Nora Tech, Chardon, OH (66)

An International Approach to Detailing for Safety, Serviceability, and Sustainability in Bridge Design

Meghann Valeo and Harry A. Capers, Jr., P.E., Arora and Associates, P.C.,

Lawrenceville, NJ (6)

A Vehicle mounted Bridge Deck Scanner for Internal Condition Assessment of Concrete Bridge Decks

(Not Available at Time of Publication)

Yajai Tinkey, Ph.D., P.E., Pat Miller, and Larry Olson, Olson Engineering, Inc,

Wheat Ridge, CO (79)

Market Street Bridge and Chestnut Street Bridge Rehabilitation

Leon Lung-Yang Lai, Ph.D., P.E., S.E. and Wan-Shu Chang, Ph.D., P.E, Specialty

Engineering, Inc., Bristol, PA (7)

Pedestrian

Wednesday, June 9, 2010

Chair: *Matthew P. McTish, P.E., McTish, Kunkel & Associates, Allentown, PA*

Walkway over the Hudson: A Century Old Marvel, Derelict for Decades,
Returned to Glory in 18 Months

(Not Available at Time of Publication)

*Charles Michael Cooper, P.E., Bergmann Associates, Albany, NY ; H.J. Marcelle,
The Fort Miller Co., Inc., Schuylerville, NY; Jeffrey DiStefano, Harrison &*

Burrowes Bridge Constructors, Inc., Glenmont, NY 88

Conceptual Design and Cold Weather Challenges of The Fort Edmonton
Footbridge Over The North Saskatchewan River

*Alex Harrison, P.E., CH2M HILL, Sacramento, CA ; Brendan Gill, P.E., S.E. and
Joe Showers, P.E., CH2M Hill, Denver, CO; Gary Kriviak, P. Eng. CH2M HILL,*

Edmonton, Alberta, Canada 89

Restoration of a Historic Phoenix Column Truss Bridge

Nathan W. Buttorff, P.E., Pennoni Associates Inc., Wilmington, DE 98

Research/Evaluation 2

Wednesday, June 9, 2010

Chair: Donald W. Herbert, P.E., Pennsylvania Dept. of Transportation, Uniontown, PA

Simplified Methods for Triage Evaluation of Gusset Plate Connections

Jeffrey W. Berman, Aaron Olson, Bo-Shiuan Wang, Charles W. Roeder, Dawn E.

Lehman, University of Washington, Seattle, WA () ; 4

Effect of Pile Orientation in Skewed Integral Abutment Bridges

Rabih Najib, Ph.D., P.E., Alpha Corporation, Baltimore, MD ; Amde M. Amde,

Ph.D., P.E., University of Maryland, College Park, MD () ; 3

Advanced Underwater Acoustic Imaging on Mississippi River Bridges: A Case Study in How to Inspect Bridges Underwater when Diving cannot be Performed Safely

David R. Reser, P.E., Infrastructure Engineers, Inc., Saint Cloud, FL () ; 9

Design of Concrete Filled Tubular Flange Girders

Richard Schoedel, P.E., Michael Baker Jr. Inc, Moon Township, PA ; Richard

Sause, Ph.D., P.E., Lehigh University, Bethlehem, PA () 24

Noise Localization via Acoustic Emission Monitoring on a Rolling Bascule Bridge

David E. Kosnik, Daniel R. Marron, David J. Corr, and Mathew P. Kotowsky,

Northwestern University, Evanston, IL () 32

Poster Session

Tuesday, June 8 and Wednesday, June 9, 2010

Multi-Span Precast Arch Bridge Backfilled with Light Weight Cellular Concrete
Sherif Aziz, P.E., Kim Truong, P.E., John Sankey, P.E., and Hieu Tran, The Reinforced Earth Company, Vienna, VA 3;

Arrigoni Bridge Inspection and Testing Program
Basil Bantimba, P.E., AI Engineers, Inc., Boston, MA ; Aslam Siddiqui, P.E., AI Engineers, Inc., Middletown, CT 3;

Innovative System of FRP Bridge Deck Panels with Crash-Worthy Guardrail
Moni G. El-Aasar, Ph.D., P.E., F. ASCE, BG Consultants, Inc., Manhattan, KS ; Hani Melhem, Ph.D., P.E., F.ASCE, Kansas State University, Manhattan, KS 47

An In-Depth Analysis of I35W Bridge Collapse
Su Hao, Ph.D., ACH, INC., Wilmette, IL 48

Development and Installation of Foam Sealant for Small Movement Bridge Expansion Joints
Ramesh Malla, Ph.D., Brian Swanson, and Montgomery Shaw, Ph.D., University of Connecticut, Storrs, CT 66

Replacement of SEPTA Bridge 20.25
Justin McCarthy, P.E., HNTB Corporation, Harrisburg, PA ; Robert Bistline, P.E., HNTB Corporation, Harrisburg, PA; Robert L. Lund, Jr., P.E., SEPTA, Philadelphia, PA 67

Roosevelt Island Bridge
Christopher McMillan, International Paint LLC, Houston, TX ; Ronald Rauch, New York City Department of Transportation, New York, NY 68

Numerical Simulations on The Effect of Edge Details on Aerodynamic Characteristics of Long Span Bridge Deck Sections
Richard Obisanya, Ph.D., Moffatt & Nichol, Long Beach, CA 6;

Bridge Information Modeling - Benefit and Challenges
Abdul Rauf, P.E., URS Corporation, Tampa, FL 86

Execution of the Bureau of Indian Affairs Bridge Inspection Program
David Reser, P.E., Infrastructure Engineers, Inc., Spartanburg, SC 87

Elevated Structures - An Elegant Solution to Reduce Urban Congestion
Brice Urquhart, P.E., FIGG, Exton, PA 88