



September 12-13, 2005  
Third New York City Bridge Conference  
at the New York Marriott East Side, 525 Lexington Avenue in NYC

# September 12th-13th, 2005 Third New York City Bridge Conference

*Organized and sponsored by the Bridge Engineering Association*

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## KEYNOTE SESSIONS

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**Chair: Khaled Mahmoud, PhD, PE, President, Bridge Technology Consulting & Engineering**

**Specifications and Guidelines for the Design of Curved Steel Girder Bridges**

John Kulicki, President & CEO, Modjeski and Masters

**An Architect's Perspective on Bridge Design**

Poul Ove Jensen, Architect, Dissing & Weitling, Denmark

**Success and Failure in Bridge Design**

Henry Petroski, A. S. Vesic, Duke University

**Load Rating by Load and Resistance Factor Evaluation Method**

Dennis Mertz, Professor, University of Delaware

**City Island Cable-Stayed Bridge in New York City**

Henry Perahia, Deputy Commissioner & Chief Bridge Officer, New York City DOT

**State-of-the-art in Cable Vibrations of Cable-Stayed Bridges**

Michel Virlogeux, Consulting Engineer, France

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SESSION 1A: LONG SPAN BRIDGES

Session Chair: Thomas Bach, PE, Chief Engineer, MTA Bridges & Tunnels

**Seismic Study and Marathon Analysis of the Verrazano-Narrows Bridge**

M. J. Abrahams, Parsons Brinckerhoff Quade & Douglas, Inc., T. Ingham, T. Y. Lin International, J. Bryson, J. Wang, Parsons Brinckerhoff Quade & Douglas, Inc., J. Chang, B. Silberfarb, T. Paskova, Triborough Bridge and Tunnel Authority

**Panama Canal Second Crossing Paraiso, Panama**

R. Manzanarez, A. Sanjines, R. Donikian, J. Duxbury, J. Lopez-Jara, Dr. Man-Chung Tang, T.Y. Lin International

**Design and Construction of a Long-Span, Curved Steel Box Girder Bridge**

B. N. Robson, Palmer Engineering, S. Waddle, Kentucky Transportation Cabinet, and J. Burchett, Jr., Bush & Burchett, Inc.

**Suspender Testing and Replacement Study for George Washington Bridge**

S. Sloan, H. Patel, Port Authority of NY&NJ and D. Khazem, Parsons

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SESSION 1B: SEISMIC ANALYSIS & DESIGN (I)

Session Chair: Malcolm Kerley, PE, Chief Engineer for Project Development, Virginia Department of Transportation

**Geographic Information Systems for Ground Motion Evaluation in Seismic Bridge Analysis**

S. Nikolaou, Mueser Rutledge Consulting Engineers and M. P. Gaus, Gaus Association

**Effectiveness of Commercial Oil Pressure Seismic Devices for Bridges**

M. Merli, S. Bergonzoni, T. Trombetti, and G. Gasparini, University of Bologna, Italy

**Seismic Response and Retrofit Design Recommendations for Braced Steel Bridge Piers**

J. W. Berman and M. Bruneau, State University of New York at Buffalo

**Seismic Retrofitting Manual for Highway Structures: Retaining Structures, Slopes, Tunnels, Culverts and Roadways**

G. Smith, Federal Highway Administration

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SESSION 1C: BRIDGE SCOUR

Session Chair: George Christian, PE, Deputy Chief Engineer, New York State Department of Transportation

**Impact of the Federal Highway Administration's Scour Evaluation Program on Highway Bridges in the United States**

J. Pagan-Ortiz, Federal Highway Administration

**Bridge Health Scour Monitoring**

B. E. Hunt, Hardesty & Hanover, LLP

**Treating Channel Instability at Bridges**

P. Johnson, Penn State University

**Case Study: Tidal Hydraulic and Scour Analysis for Two NYC Bridges**

S. Mahmutoglu, and R. Edison, Earth Tech Inc.

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**SESSION 2A: BRIDGE AESTHETICS**

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**Session Chair: Henry D. Perahia, PE, Deputy Commissioner, New York City Department of Transportation**

**Bridge Aesthetics Cuckoo's Eggs- A Treatise on Context** K. Brownlie, Wilkinson Eyre Architects, England

**The True Goals of Bridge Aesthetics** F. Gottemoeller, R. Arch., Bridgescape, LLC

**Bridge Design as Structural Architecture** J. J. Arenas, Arenas & Asociados, Spain

**The Sauvie Island Bridge: Achieving Public Consensus on Design Issues**

J. Fox, RA, T. Piotrowski, AIA, SARP, H2L2 Architects / Planners, LLP

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**SESSION 2B: BRIDGE SEISMIC RETROFIT**

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**Session Chair: Richard Sause, PhD, PE, Director, Professor of Civil Engineering, ATLSS, Lehigh University**

**Seismic Retrofit of a Historic Arch Rib Bridge**

S. Morcos, B. Reznikov, HDR Engineering, Inc., R. Mardirosian, City of Pasadena, California

**FHWA'S 2005 Seismic Retrofitting Manual, Part 1-Bridges**

P. Yen, J. O'Fallon, Federal Highway Administration, J. O'Connor, MCEER, University at Buffalo

**Detailed Seismic Evaluation and Retrofit Studies of Goethals Bridge Main Spans**

B. Sivakumar, A. Wolek, A. Yazdani, Lichtenstein Consulting Engineers, Inc., and S. Sloan, The Port Authority of NY & NJ

**Seismic Vulnerability Evaluation and Retrofit of Kosciuszko Bridge**

C. Fan, F. Lin, A. C. Shroff, Edwards & Kelcey, and R. Adams, New York State DOT

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**SESSION 2C: MOVABLE BRIDGES**

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**Session Chair: Nicholas Altebrando, PE, Director of Bridges, STV Inc.**

**A Case Study of the Resolution of Design/ Construction Issues for the Stutson Street Bridge**

P. J. Davis, Bergmann Associates

**Advancements in the Field of Wire Rope Design and Manufacturing for Movable Bridge Applications**

T. W. Klein, Wire Rope Corporation of America

**Proper Maintenance of Movable Bridges**

J. W. Newman, and D. M. Barrett, Modjeski and Masters

**Knapp Street Towerless Vertical Lift Bridge**

W. E. Nickoley, HNTB Corporation

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### SESSION 3A: BRIDGE SECURITY

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**Session Chair: Harry A. Capers, Jr., PE, Manager, Office of Transportation Security, New Jersey Department of Transportation, and Mohammed Ettouney, PhD, PE, Principal, Weidlinger Associates**

**The Challenge of Economically Balancing Security and Mobility Needs of New Jersey's Bridge Infrastructure** H. Capers, New Jersey DOT

**Theory of Multihazards for Bridge Structures**

M. Ettouney, Weidlinger Associates, and S. Alampalli, New York State DOT, A. Agrawal, City College of New York

**Techniques for Quantifying Security Risk for Bridges**

S. King, Weidlinger Associates

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### SESSION 3B: BRIDGE ANALYSIS & DESIGN (I)

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**Session Chair: Michael Abrahams, PE, Technical Director, Parsons Brinckerhoff**

**Efficiency of Closed Stiffener Orthotropic Deck Panels for Railway Bridges**

W. De Corte, P. Van Bogaert, H. De Backer, Ghent University, Belgium

**Tension Field Action Behavior in the Hybrid Steel Girders For Ohio Approach Spans of Blennerhassett Island Bridge**

F. Ahmad, and N. Zoubi, E.L. Robinson Engineering Co.

**Redundancy Issues of Steel Bridges**

S. Kumarasena, and R. McCabe HNTB Corp.

**Twin Arch Bridge or Not. New County Road Over Main & Bergen Lines, New Jersey Transit**

T. Roberson Edwards, NJ Transit, C. J. Bhoraniya, Medina Consultants

**Finite Element Analysis of Bridge Approach Slabs Considering Soil-Structure Interaction**

Y. A. Khodair and H. Nassif, Rutgers University

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### SESSION 3C: SEGMENTAL & POST-TENSIONED BRIDGES

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**Session Chair: Subi Chakraborti, PE, Regional Director, Region 10  
New York State Department of Transportation**

**Advancing Segmental Construction**

R. A. Lawrie, and C. Redfield, Lawrie & Associates, LLC

**Structural Form of the Route 52 Causeway Segmental Concrete Bridge**

W. Gottshall, Michael Baker Jr. Inc., D. Lambert, and N. Kasbekar, New Jersey DOT

**Sensitivity Studies of Grout Defects in Post-tensioned Bridges Using Impact Echo Scanning Technique** Y. Tinkey, L. Olson, and A. Gibson, Olson Engineering, Inc.

**Mitigation of Alkali-Silica Reaction Damage Using Post-Tensioning**

W. Wassef, M. Smith, Modjeski and Masters, Inc., C. Bognacki, and S. Sloan, Port Authority of NY & NJ

**Finite Element Analysis of Segmental Concrete Structures**

Aline da Silva Ribeiro, Alexandre Rodrigues Pacheco, Américo Campos Filho Universidade Federal do Rio Grande do Sul - UFRGS Civil Engineering, Brazil

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## SESSION 4A: BRIDGE ANALYSIS & DESIGN (II)

Session Chair: **Barney T. Martin, PhD, PE, Vice President, Modjeski & Masters, Inc**

### Design Development: Bridge Across Ohio River and Blennerhassett Island

G. Wollmann, K. Meyer, J. Francisco, Michael Baker Jr., Inc., T. Zoli, HNTB Corporation, J. Shook, West Virginia DOT, Division of Highways

Experimental Influence Lines for Bridge Evaluation Jasmine Hirachan and M. Chajes, University of Delaware

### Evaluation of Live-Load Distribution Factors for a three-span Continuous Girder Bridge

N. Suksawang and H. Nassif, Rutgers University

### Analysis Techniques for Curved and Skewed Steel Girder Bridges

D. Coletti, and J. Yadlosky, HDR Engineering

### A General Method for Nonlinear Analysis of Bridge Structures

M. Arici, Universita di Palermo, Dipartimento di Ingegneria Strutturale e Geotecnica, Italy

## SESSION 4B: BRIDGE INSTRUMENTATION, MONITORING AND MAINTENANCE

Session Chair: **Russell Holcomb, PE, Deputy Chief Engineer, New York City Department of Transportation**

Maintaining Safety and Serviceability of Concrete Bridges in Croatia J. Radic, University of Zagreb, J. Bleiziffer, Croatian Institute for Bridge and Structural Engineering, and D. Tkalcic, Civil Engineering Institute of Croatia, Croatia

### Structural Health Monitoring for Bridge Maintenance

S. Alampalli, New York State DOT, M. Ettouney, Weidlinger Associates, Inc. and A. Agrawal, City College of New York

### Life Cycle Cost of RC Slab Deteriorated by Anti-Freezing Agent

Y. Mimura, I. Yoshitake, K. Tsuji, and S. Hamada, Yamaguchi University, Japan

### Evaluation and Validation of Ground Penetrating Radar for Bridge Deck Condition Assessment

D. A. Grivas, Institute for Infrastructure Asset Management, F. A. Romero, WaveTech-GEOVision Geophysical Services, and R. L. Roberts, Geophysical Survey Systems, Inc.

### Damage detection in bending beams through Brillouin distributed optic-fiber sensor

R. Bernini, National Research Council, M. Fraldi, A. Minardo, V. Minutolo, F. Carannante, L. Nunziante, and L. Zeni, University of Napoli "Federico II", Italy

### Instrumentation and Health Monitoring of Star City Bridge. WV

S. Shoukry, M. Riad and G. William, West Virginia University

## SESSION 4C: BRIDGE PERFORMANCE AND REHABILITATION

Session Chair: **Richard E. Miras, PE, Program Manager, MTA New York City Transit, Capital Program Management**

Rehabilitation of the New Hope-Lambertville Toll Supported Truss Bridge W. Gottshall, Michael Baker Jr. Inc., A.P. Ranasinghe, McCormick Taylor, Inc., and C. Harney, Delaware River Joint Toll Bridge Commission

### Rehabilitation of Novoarbatsky Bridge in Moscow

Y. Ponomarev, Gidromost, Russia, and G. Brodski, AGA Group, USA

### Use of Prefabricated Bridge Deck Panels on Rapid Reconstruction Projects

M. Kaczinski, The D.S. Brown Company and R. Bettigole, Consultant

Lessons from the Kinzua T. G. Leech, J. McHugh, Gannett Fleming, and G. Dicarantonio, Pennsylvania Department of Conservation and Natural Resources

### Replacement of Route 9W Viaduct over Washington Street

S. W. Smith, P. Bousader, and W. S. Najjar, Chas. H. Sells, Inc., Consulting Engineers

Performance Design of a Shear-Key System of High Speed Railroad Bridges E. H. Wang, M. Hsin, University of Science and Technology, Taiwan, and Forrest H S Wu, Li-Joe Engineering Consultant

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## SESSION 5A: CABLE-SUPPORTED BRIDGES

Session Chair: William J. Moreau, PE, Chief Engineer, New York State Bridge Authority

### State-of-the-Art Main Cable Corrosion Protection by Dehumidification

M. L. Bloomstine, Ove Sørensen, COWI, Denmark

Puente Centenario Crossing the Panama Canal K. Humpf, Leonhardt und Partner Gmbtt, Germany

### Ironton Russell Single Tower Cable-Stayed Bridge Configuration - Optimization for Client Engineering Constraints

R. W. Bondi, T. J. Tiberio, M. Baker Jr., Inc., A. Schemmann, Buckland & Taylor Ltd, and J. E. Salvadori, Michael Baker Jr., Inc.

### Interactive Horizontal Load Model for Pedestrians Crossing Footbridges

P. Archbold, P. Fanning, University College Dublin, Ireland, A. Pavic, University of Sheffield, United Kingdom

## SESSION 5B: INNOVATIVE BRIDGE TECHNOLOGY

Session Chair: Phillip Eng, PE, Deputy Regional Director, Region 11, New York State Department of Transportation

### Lessons For Rapid Urban Bridge Construction From The International Scan of Prefabricated Bridge Elements and Systems in Japan and Europe

H. A. Capers, Jr., New Jersey DOT, M. L. Ralls, Ralls Newman, LLC and B. Tang, PE, Federal Highway Administration, US Dept. of Transportation

### Numerical Analysis of Shear Debonding at FRP-Concrete Interface for Girders Strengthening Applications

M. Ali-Ahmad, K. Subramaniam, and M. Ghosn, City College of New York

### Innovative Floor Beam Replacement Procedures for the Chicago Skyway Bridge

M. B. Civelek, Edwards and Kelcey, S. McNally, McNally Design & Construction, LLC, and R. Schickel, Edwards & Kelcey

### Stay Cable Technology Applied to Suspension Bridges

A. Micklus, Freyssinet LLC, USA, B. Lecinq, S. Petit, I. Zivanovic, Freyssinet International, Vélizy, France

## SESSION 5C: SEISMIC ANALYSIS & DESIGN (II)

Session Chair: Douglas Currey, PE, Regional Director, Region 11  
New York State Department of Transportation

### Seismic Hazard Analysis for New York City Bridges

R. McGuire, G. Toro, Risk Engineering Inc, K. Kishore, J. Patel, A. Razzaq, S. Jain, New York City DOT, G. Fanjiang and R. Gajer, Weidlinger Associates Inc.

### Seismic Performance of Bridges of The San Francisco Bay Area Transportation Network Bridges

E.C. Stergiou and A. Kiremidjian, Stanford University

### Determination of Response Modification Factor for Seismic Design

A. Mechakhchekh and M. Ghosn, City College of New York

### Near-Field Effects on Seismically Excited Highway Bridge Equipped with Nonlinear Viscous Dampers

P. Tan, A. K. Agrawal and Y. Pan, City College of New York

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## SESSION 6A: BRIDGE ANALYSIS & DESIGN (III)

**Session Chair: Charles Minervino, PE, Principal, Lichtenstein Consulting Engineers, Inc.**

### Context Sensitive Design for the Fulton Road Bridge Replacement

J. C. Dietrick, and J. Broadwater, Michael Baker Jr. Inc.

### Evaluation and Retrofit of Floorbeam Cracking on a Tied Arch Bridge

R. J. Connor, I. C. Hodgson, and J. W. Fisher, Lehigh University

### Spatial Tubular Solution for Bridge Design B. Briseghella, E. Siviero and T. Zordan, Bolina Ingegneria, Italy

### Interactive Seismic Analysis and Design of the Roslyn Viaduct

R. Eslinger, K. Griesing, B. Yin, Hardesty & Hanover, LLP, T. Sung, and M. Novak, New York State DOT

### Evaluation of Highway Bridge Strength Considering Parapets

B. Brenner, M. Sanayei, D. Lattanzi, Tufts University and E.S. Bell, University of New Hampshire

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## SESSION 6B: BRIDGE INSPECTION & MANAGEMENT

**Session Chair: Bojidar Yanev, PhD, PE, Director, Bridge Inspection & Mgmt., New York City Department of Transportation**

### Specific Features of Standard Inspections of Engineering Structures in Major Cities

Y. Yenyutin, V. Fedoseyev, Gormost, Russia, and E. Brodskaya, AGA Group

### New Bridges in Croatia

J. Radic, Z. Savor, University of Zagreb, and J. Bleiziffer, Croatian Institute for Bridge and Struct. Engineering, Croatia

### City of Philadelphia: from Paper to Computers in Bridge Inspection and Management System

J. Shaffer, and M. Schellhase, Inspect Tech

### Improving the Quality and Usability of Bridge Inspection Information

T. Le Diouron, Advitam Inc.

### Proposal of Concrete Bridges and Viaducts Management System

Julia Wippich Lencioni, Maryangela Geimba de Lima, Fabiano Morelli, Brazil

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## SESSION 6C: OPEN SESSION

**Session Chair: Martin H. Kendall, PE, Vice President, Edwards & Kelcey**

### Rolling the Northeast 8th Street Bridge

J. Lem, and L. Kyle, HDR Engineering

### Replacement of I-287 Curved Girder Bridge over Route 119

M. Buonocore, P. Bousader, and W. S. Najjar, Chas. H. Sells, Inc., Consulting Engineers

### Replacement of the Belt Parkway Bridge over Ocean Parkway

C. Sklavounakis, New York City DOT, P. Atkins, Granite Halmar Construction Co., C. Norrish, III, Gannett Fleming, and J. Liebowitz, HAKS Engineering

### Norway Bridges Utilizing Lightweight Concrete K. S. Harmon, Carolina Stalite Co.

### Alternative Waterproof System & Wearing Course for Bridge Decks that Resist Rutting/Shoving

D. Zuberer, Chase Specialty Coatings

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