Program

Advanced Materials for Construction of Bridges, Buildings and Other Structures-IV

August 14-19, 2005
Maui, Hawaii

Conference Chair
Vasant Mistry
Federal Highway Administration, USA

Conference Co-Chairs
Ian Friedland
Federal Highway Administration, USA
Atorod Azizinamini
University of Nebraska-Lincoln, USA
Edward Wasserman
Tennessee Department of Transportation, USA
Fumio Watanabe
Kyoto University, Japan
Holger Svensson
Leonardt, Andrae, and Partner GmbH, Germany

ECI

Engineering Conferences International
Six MetroTech Center
Brooklyn, NY 11201
E: info@eci.poly.edu - www.engconfintl.org
Engineering Conferences International (ECI) is the successor program to the United Engineering Foundation conferences program that was established in 1962 to provide an opportunity for the exploration of problems and issues of concern to engineers from many disciplines. ECI is a not-for-profit partnership between the Engineering Conferences Foundation and Polytechnic University.

ECF BOARD MEMBERS

Barry C. Buckland
John C. Chen
Richard A. Gross
Allen I. Laskin
Raymond McCabe
Eli Pearce
Shivendra S. Panwar
Gary W. Poehlein
P. Somasundaran

Chair of ECF Conferences Committee: Jules Routbort

ECF Technical Liaison: Richard Fein

ECI Director: Barbara K. Hickernell

ECI Assistant Director: Kevin Korpics

Engineering Conferences International
6 Metro Tech Center
Brooklyn, NY 11201
+1 718 260 3743
+1 718 260 3754
info@eci.poly.edu
www.engconfintl.org
Sunday, August 14, 2005

17:00 - 18:30  Conference Registration
18:30 - 20:00  Dinner
20:00 -   Reception

**Important Notes**

- Please observe “No Smoking” at ECI technical sessions, meals and social hours.
- Speakers should allow time at the end of their presentation for questions and discussion.
- During technical sessions please keep cell phones on vibrate or shut off. Take any telephone conversations out of the session room.
Monday, August 15, 2005

07:00 – 08:00  Breakfast
              Late Registration

Session Chairs:  Ato rod Azizinamini, University of Nebraska, USA
                 Shri Bhide, Portland Cement Association, USA

08:00 – 08:20  Vasant Mistry, Conference Chair, U.S. Federal Highway Administration
               Conference Welcome, Introductions, and Conference Overview

               Dick Fein, Engineering Conferences International Technical Liaison

08:20 – 09:00  Raymond McCabe, HNTB Corporation
               Keynote Speech, HIGH PERFORMANCE MATERIALS

09:00 – 09:30  Vasant Mistry, Federal Highway Administration, USA
               HIGH PERFORMANCE STEEL FOR HIGHWAY BRIDGES

09:30 – 10:00  Coffee/Tea Break

10:00 – 10:30  Wade S. Bonzon, P.E., Figg Bridge Inspection, Inc. USA
               CONSTRUCTION OF THE MAUMEE RIVER BRIDGE MAIN PYLON USING
               10,000 PSI MASS CONCRETE

10:30 – 11:00  Z. John Ma, University of Alaska Fairbanks, USA
               TEST OF FRP DECK PANELS AT VERY LOW TEMPERATURES

10:00 – 11:25  Richard J. Baker, Pavetech International, USA
               SMALL MOVEMENT BRIDGE EXPANSION JOINT SYSTEM

11:25 – 11:50  Rossi Pierre, Laboratoire Central des Ponts et Chaussées, France
               A NEW ULTRA-HIGH PERFORMANCE CEMENT COMPOSITE FOR
               CONSTRUCTION

11:50 – 12:00  Discussion

12:00 – 13:00  Lunch

13:00 – 13:30  Radim Cajka, Faculty of Civil Engineering TU Ostrava, Czech Republic
               ADVANCED BITUMINOUS MATERIALS AS SLIDE JOINTS IN SUBSOIL OF
               STRUCTURES

13:30 – 14:00  Bill Halsband, Mammoet USA
               COMPLETE BRIDGE SPAN INSTALLATIONS

14:00 – 14:30  Distribution of papers for review

14:30 – 15:00  Discussion

15:00 – 19:00  Ad hoc sessions, Networking, Free Time

19:00 – 20:30  Dinner

20:30 – 21:30  Social Hour
Tuesday, August 16, 2005

07:00 - 08:00 Breakfast

Session Chair: Mary Lou Ralls, PE, Ralls Newman, LLC, USA

08:00 - 08:30 Hyeong-Yeol Kim, Korea Institute of Construction Technology, Korea
FRP INTERNAL REINFORCEMENT FOR CONCRETE STRUCTURES

08:30 - 09:00 Young-Jun You, Korea Institute of Construction Technology, Korea
MECHANICAL PROPERTIES OF HYBRID FRP RODS WITH VARIOUS MATERIAL COMPOSITIONS

09:00 - 09:30 Héctor R. Laureano, P.E., PR Highway and Transportation Authority, Engineering Services Area, USA
CASE STUDY: USE OF FRP TECHNOLOGY BY THE PRDOT TO STRENGTHEN BRIDGES 2028/2029 AT PR-52, A MAJOR ACCESS TO THE SAN JUAN METROPOLITAN AREA

09:30 - 10:00 Coffee/Tea Break

10:00 - 10:25 Kenneth S. Harmon, P.E., Carolina Stalite Company, USA
HIGH PERFORMANCE LIGHTWEIGHT CONCRETE FOR BRIDGE DECKS - AN ADVANCED MATERIAL

10:25 - 10:50 Hiroyuki Suzuki, Meisei University, Japan
FIRST APPLICATION OF CARBON FIBER REINFORCED POLYMER STRIPS TO AN EXISTING STEEL BRIDGE IN JAPAN

10:50 - 11:15 Taro Tonegawa, Civil Engineering Division, Sumitomo Metal Industries, Japan
DESIGN OF HYBRID HPS BOX GIRDER WITH CONCRETE SLAB

11:15 - 11:40 Karl E. Barth, West Virginia University, USA
ULTIMATE STRENGTH AND DUCTILITY OF COMPACT COMPOSITE I-GIRDERS IN POSITIVE BENDING PERFORMANCE FIELD-TESTING A MISSOURI TWO-SPAN HPS BRIDGE

11:40 - 12:00 Discussion

12:00 - 13:00 Lunch

13:00 - 13:25 Khaled M. Mahmoud, Hardesty & Hanover, USA
HYDROGEN-INDUCED DEGRADATION OF HIGH STRENGTH STEEL CABLE WIRE

13:25 - 13:50 Mary Lou Ralls, PE, Ralls Newman, LLC, USA
HIGH PERFORMANCE CONCRETE IN TEXAS BRIDGES

13:50 - 14:15 Walid S. Najjar, PhD, PE, Chas. H. Sells, Inc., USA
DESIGN OF I-87NB HIGH PERFORMANCE STEEL GIRDER BRIDGE OVER I-287EB
Tuesday, August 16, 2005 (continued)

14:15 – 14:40  Leif G. Wathne, FHWA/SaLUT, USA
ADVANCED CONCRETE REQUIRES ADVANCED TESTING DETERMINING
IN-SITU CONCRETE STRENGTH: REDISCOVERING TEMPERATURE-
MATCHED CURING

14:40 – 15:00  Discussion

15:00 – 19:00  Ad hoc sessions, Networking, Free Time

19:00 – 20:30  Dinner

20:30 – 21:30  Social Hour
Wednesday, August 17, 2005

07:00 – 08:00 Breakfast

Session Chair:  Raymond McCabe, HNTB Corporation, USA

08:00 – 08:30 Louis R. B. Tang, Queensland University of Technology, Australia
A RESIDUAL STRESS MODEL FOR HIGH STRENGTH STEEL GIRDERS

08:30 – 09:00 Abdeldjelil Belarbi, University of Missouri-Rolla, USA
FRP/FRC HYBRID REINFORCEMENT SYSTEM FOR CONCRETE BRIDGE DECKS

09:00 – 09:30 Halil Sezen, The Ohio State University, USA
CONSTRUCTION OF STRUCTURAL MEMBERS USING INNOVATIVE PREFABRICATED STEEL REINFORCEMENT AND HIGH STRENGTH CONCRETE

09:30 – 10:00 Coffee/Tea Break

10:00 – 10:30 Fumio Watanabe, Department of Architecture and Architectural Engineering, Kyoto University, Japan
SEISMIC STRENGTHENING BY EXTERNAL CABLE-STAYED SYSTEM

10:30 – 11:00 X. Sharon Huo, Tennessee Technological University, USA
CASE STUDY OF A TENNESSEE HIGH PERFORMANCE CONCRETE BRIDGE

11:00 – 11:25 Susumu Kono, Kyoto University, Japan
SEISMIC RETROFIT USING PRECAST PRESTRESSED CONCRETE BRACES

11:25 – 11:45 Mamdouh El-Badry, University of Calgary, Canada
AN INNOVATIVE CORROSION-FREE SYSTEM FOR SHORT- AND MEDIUM-SPAN BRIDGES

11:45 – 12:00 Discussion

12:00 – 13:00 Lunch

13:00 – 13:25 Mamdouh El-Badry, The University of Calgary, Canada
EFFECTS OF TEMPERATURE ON THE BEHAVIOR OF BRIDGE DECK SLABS REINFORCED WITH FIBER REINFORCED POLYMERS

MANUFACTURED SAND ALTERNATIVE TO TRADITIONAL FINE AGGREGATE

13:50 – 14:15 Camille A. Issa, Ph.D., P.E., F.ASCE, Lebanese American University, USA
AN EXPERIMENTAL OVERVIEW OF CFRP STRENGTHENING TECHNIQUES

14:15 – 14:40 Hyung-Keun Ryu, Department of Civil Engineering, Seoul National University, Korea (presented by P.G. Lee)
BENDING CAPACITY OF CONTINUOUS COMPOSITE HYBRID BEAMS
**Wednesday, August 17, 2005 (continued)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:40 - 15:00</td>
<td>Discussion</td>
</tr>
<tr>
<td>15:00 - 19:00</td>
<td><em>Ad hoc sessions</em>, Networking, Free Time</td>
</tr>
<tr>
<td>19:00 - 20:30</td>
<td>Dinner</td>
</tr>
<tr>
<td>20:30 - 21:30</td>
<td>Social Hour</td>
</tr>
</tbody>
</table>
Thursday, August 18, 2005

07:00 - 08:00  Breakfast

Session Chair:  Fumio Watanabe, Kyoto University, Japan

08:00 - 08:30  Ji Sun Park, Korea Institute of Construction Technology, Korea
EFFECTS OF RIB GEOMETRY ON THE BOND OF FIBER REINFORCED POLYMER REBAR

08:30 - 09:00  Gintaris Kaklauskas, Vilnius Gediminas Technical University, Lithuania
LOAD-DEFORMATION BEHAVIOUR OF HIGH STRENGTH CONCRETE BEAMS

09:00 - 09:30  Peter Dusicka, Portland State University, USA
EVALUATION AND FIELD APPLICATION OF FRP DECK PANELS FOR DRAWBRIDGE DECK REPLACEMENT

09:30 - 10:00  Coffee/Tea Break

10:00 - 10:30  Pieter Samyn, Ghent University - Laboratory Soete, Belgium
INCORPORATION OF CARBON FIBRE REINFORCED UHMWPE AS BEARING MATERIAL IN THE MAESTLANT STORM SURGE BARRIER

10:30 - 11:00  Oguzhan Bayrak, The University of Texas at Austin, USA
PUNCHING SHEAR STRENGTHENING OF DEFICIENT SLAB-COLUMN CONNECTIONS WITH CFRP

11:00 - 11:25  Benjamin A. Graybeal, PSI, Inc., USA
STRUCTURAL BEHAVIOR OF OPTIMIZED UHPC BRIDGE GIRDERs

11:25 - 11:50  Robert Fish, PE, SE, HDR Engineering, USA
LAKE NATOMA CROSSING - CASE STUDY OF LIGHTWEIGHT CONCRETE SHORTENING FOR LONG SPAN BOX GIRDER BRIDGES

11:50 - 12:00  Discussion

12:00 - 13:00  Lunch

13:00 - 13:30  Eric Matsumoto, California State University, Sacramento, USA
DESIGN OF ADHESIVE ANCHORS FOR SEISMIC REGIONS USING HIGH PERFORMANCE BONDING AGENT

13:30 - 14:00  Michael Chusid, Chusid Associates, consultant to Davis Colors, USA
COLORED CONCRETE BRIDGES: CONSTRUCTION AND LIFE-CYCLE COST COMPARISON OF INTEGRAL COLORS AND SURFACE-APPLIED COATINGS

14:00 - 14:30  Louis R. B. Tang, Queensland University of Technology, Australia
INTERACTION EFFECTS ON LOCAL STABILITY OF HIGH STRENGTH STEEL COLUMNS

14:30 - 15:00  Discussion
Thursday, August 18, 2005 (continued)

15:00 - 19:00  Ad hoc sessions, Networking, Free Time
19:30 - 21:00  Conference Banquet
21:00 - 22:00  Social Hour
Friday, August 19, 2005

07:00 - 08:00  Breakfast

Session Chairs:  Khaled M. Mahmoud, Hardesty & Hanover, USA
                Karl E. Barth, West Virginia University, USA

08:00 - 08:30  Luigi Di Sarno, University of Naples, Federico II, Department of Structural Analysis and Design, Italy
               SEISMIC DESIGN AND RESPONSE OF STAINLESS STEEL FRAMES

08:30 - 09:00  Tarif M. Jaber, Silica Fume Associations, USA
               STRUCTURES REPAIR USING HIGH PERFORMANCE CONCRETE

09:00 - 09:30  Coffee/Tea Break

09:30 - 11:00  Conference wrap-up and discussions

11:00 - 12:00  Review of papers back from the reviewers

12:00        Lunch and Conference adjournment
Abstracts

Advanced Materials for Construction of Bridges, Buildings and Other Structures-IV

August 14-19, 2005
Maui, Hawaii

Conference Chair

Vasant Mistry
Federal Highway Administration, USA

Conference Co-Chairs

Ian Friedland
Federal Highway Administration, USA

Atorod Azizinamini
University of Nebraska-Lincoln, USA

Edward Wasserman
Tennessee Department of Transportation, USA

Fumio Watanabe
Kyoto University, Japan

Holger Svensson
Leonardt, Andrae, and Partner GmbH, Germany

ECI
Engineering Conferences International
Six MetroTech Center
Brooklyn, NY 11201
E: info@eci.poly.edu - www.engconfintl.org
Monday, August 15, 2005

Raymond McCabe, HNTB Corporation
Keynote Speech, HIGH PERFORMANCE MATERIALS

Vasant Mistry, Federal Highway Administration, USA
HIGH PERFORMANCE STEEL FOR HIGHWAY BRIDGES

Wade S. Bonzon, Figg Bridge Inspection, Inc. USA
CONSTRUCTION OF THE MAUMEE RIVER BRIDGE MAIN PYLON USING 10,000 PSI MASS CONCRETE

Z. John Ma, University of Alaska Fairbanks, USA
TEST OF FRP DECK PANELS AT VERY LOW TEMPERATURES

Richard J. Baker, Pavetech International, USA
SMALL MOVEMENT BRIDGE EXPANSION JOINT SYSTEM

Rossi Pierre, Laboratoire Central des Ponts et Chaussées, France
A NEW ULTRA-HIGH PERFORMANCE CEMENT COMPOSITE FOR CONSTRUCTION

Radim Cajka, Faculty of Civil Engineering TU Ostrava, Czech Republic
ADVANCED BITUMINOUS MATERIALS AS SLIDE JOINTS IN SUBSOIL OF STRUCTURES

Bill Halsband, Mammoet USA
COMPLETE BRIDGE SPAN INSTALLATIONS
Hyeong-Yeol Kim, Korea Institute of Construction Technology, Korea
FRP INTERNAL REINFORCEMENT FOR CONCRETE STRUCTURES

Young-Jun You, Korea Institute of Construction Technology, Korea
MECHANICAL PROPERTIES OF HYBRID FRP RODS WITH VARIOUS MATERIAL COMPOSITIONS

Héctor R. Laureano, PR Highway and Transportation Authority, Engineering Services Area, USA
CASE STUDY: USE OF FRP TECHNOLOGY BY THE PRDOT TO STRENGTHEN BRIDGES 2028/2029 AT PR-52, A MAJOR ACCESS TO THE SAN JUAN METROPOLITAN AREA

Kenneth S. Harmon, Carolina Stalite Company, USA
HIGH PERFORMANCE LIGHTWEIGHT CONCRETE FOR BRIDGE DECKS - AN ADVANCED MATERIAL

Hiroyuki Suzuki, Meisei University, Japan
FIRST APPLICATION OF CARBON FIBER REINFORCED POLYMER STRIPS TO AN EXISTING STEEL BRIDGE IN JAPAN

Taro Tonegawa, Civil Engineering Division, Sumitomo Metal Industries, Japan
DESIGN OF HYBRID HPS BOX GIRDER WITH CONCRETE SLAB

Karl E. Barth, West Virginia University, USA
ULTIMATE STRENGTH AND DUCTILITY OF COMPACT COMPOSITE I-GIRDERS IN POSITIVE BENDING PERFORMANCE FIELD-TESTING A MISSOURI TWO-SPAN HPS BRIDGE

Khaled M. Mahmoud, Hardesty & Hanover, USA
HYDROGEN-INDUCED DEGRADATION OF HIGH STRENGTH STEEL CABLE WIRE

Mary Lou Ralls, Ralls Newman, LLC, USA
HIGH PERFORMANCE CONCRETE IN TEXAS BRIDGES

Walid S. Najjar, Chas. H. Sells, Inc., USA
DESIGN OF I-87NB HIGH PERFORMANCE STEEL GIRDER BRIDGE OVER I-287EB

Leif G. Wathne, FHWA/SaLUT, USA
ADVANCED CONCRETE REQUIRES ADVANCED TESTING DETERMINING IN-SITU CONCRETE STRENGTH: REDISCOVERING TEMPERATURE-MATCHED CURING
Wednesday, August 17, 2005

Louis R. B. Tang, Queensland University of Technology, Australia
A RESIDUAL STRESS MODEL FOR HIGH STRENGTH STEEL GIRDERS

Abdeldjelil Belarbi, University of Missouri-Rolla, USA
FRP/FRC HYBRID REINFORCEMENT SYSTEM FOR CONCRETE BRIDGE DECKS

Halil Sezen, The Ohio State University, USA
CONSTRUCTION OF STRUCTURAL MEMBERS USING INNOVATIVE PREFABRICATED STEEL REINFORCEMENT AND HIGH STRENGTH CONCRETE

Fumio Watanabe, Department of Architecture and Architectural Engineering, Kyoto University, Japan
SEISMIC STRENGTHENING BY EXTERNAL CABLE-STAYED SYSTEM

X. Sharon Huo, Tennessee Technological University, USA
CASE STUDY OF A TENNESSEE HIGH PERFORMANCE CONCRETE BRIDGE

Susumu Kono, Kyoto University, Japan
SEISMIC RETROFIT USING PRECAST PRESTRESSED CONCRETE BRACES

Mamdouh El-Badry, University of Calgary, Canada
AN INNOVATIVE CORROSION-FREE SYSTEM FOR SHORT- AND MEDIUM-SPAN BRIDGES

Mamdouh El-Badry, The University of Calgary, Canada
EFFECTS OF TEMPERATURE ON THE BEHAVIOR OF BRIDGE DECK SLABS REINFORCED WITH FIBER REINFORCED POLYMERS

P.B.R. Dissanayake, University of Peradeniya, Sri Lanka
MANUFACTURED SAND ALTERNATIVE TO TRADITIONAL FINE AGGREGATE

Camille A. Issa, Lebanese American University, USA
AN EXPERIMENTAL OVERVIEW OF CFRP STRENGTHENING TECHNIQUES

Hyung-Keun Ryu, Department of Civil Engineering, Seoul National University, Korea (presented by P.G. Lee)
BENDING CAPACITY OF CONTINUOUS COMPOSITE HYBRID BEAMS
Thursday, August 18, 2005

Ji Sun Park, Korea Institute of Construction Technology, Korea
EFFECTS OF RIB GEOMETRY ON THE BOND OF FIBER REINFORCED POLYMER REBAR

Gintaris Kaklauskas, Vilnius Gediminas Technical University, Lithuania
LOAD-DEFORMATION BEHAVIOUR OF HIGH STRENGTH CONCRETE BEAMS

Peter Dusicka, Portland State University, USA
EVALUATION AND FIELD APPLICATION OF FRP DECK PANELS FOR DRAWBRIDGE DECK REPLACEMENT

Pieter Samyn, Ghent University - Laboratory Soete, Belgium
INCORPORATION OF CARBON FIBRE REINFORCED UHMWPE AS BEARING MATERIAL IN THE MAESLANT STORM SURGE BARRIER

Oguzhan Bayrak, The University of Texas at Austin, USA
PUNCHING SHEAR STRENGTHENING OF DEFICIENT SLAB-COLUMN CONNECTIONS WITH CFRP

Benjamin A. Graybeal, PSI, Inc., USA
STRUCTURAL BEHAVIOR OF OPTIMIZED UHPC BRIDGE GIRDERS

Robert Fish, HDR Engineering, USA
LAKE NATOMA CROSSING - CASE STUDY OF LIGHTWEIGHT CONCRETE SHORTENING FOR LONG SPAN BOX GIRDER BRIDGES

Eric Matsumoto, California State University, Sacramento, USA
DESIGN OF ADHESIVE ANCHORS FOR SEISMIC REGIONS USING HIGH PERFORMANCE BONDING AGENT

Michael Chusid, Chusid Associates, consultant to Davis Colors, USA
COLORED CONCRETE BRIDGES: CONSTRUCTION AND LIFE-CYCLE COST COMPARISON OF INTEGRAL COLORS AND SURFACE-APPLIED COATINGS

Louis R. B. Tang, Queensland University of Technology, Australia
INTERACTION EFFECTS ON LOCAL STABILITY OF HIGH STRENGTH STEEL COLUMNS
Friday, August 19, 2005

Luigi Di Sarno, University of Naples, Federico II, Department of Structural Analysis and Design, Italy
SEISMIC DESIGN AND RESPONSE OF STAINLESS STEEL FRAMES

Tarif M. Jaber, Illica Fume Associations, USA
STRUCTURES REPAIR USING HIGH PERFORMANCE CONCRETE