



Monday, June 7, 2010

1:30–4:30 pm

Room 330

David L. Lawrence  
Convention Center,  
Pittsburgh, PA

## FRP COMPOSITES IN ACCELERATED CONSTRUCTION

### PRESENTATIONS

#### ***Bridge Girder Installation***

John Hillman, HC Bridge  
1:30 - 2:00 pm

#### ***New AASHTO Codes on FRP Bars***

Fabio Matta,  
U of South Carolina  
2:00 - 2:30 pm

#### ***Deck Installations***

Dan Richards, Zellcomp  
2:30 - 3:00 pm

#### ***Concrete Repair***

Mo Ehsani, Quakewrap  
3:00 - 3:30 pm

#### ***Louisiana Deck Replacement***

Kurt Feichtinger,  
Baltek, Inc.  
3:30 - 4:00 pm

#### ***Decorative Panels for Bridges***

Bob Pierson,  
DEC Architectural  
Composites  
4:00 - 4:30 pm

## Workshop W-1

# FRP Composites in Accelerated Construction

### ABOUT THE WORKSHOP

FRP composites provide cost-effective solutions for new construction and rehabilitation of bridge structures. Workshop presentations will specifically focus on installations, design, and recently published AASHTO design standards. Attendees will learn about product advancements for bridge decks, girders, and codes, and will see that composite products are no longer experimental, are less expensive than traditional materials when life cycle is considered, and solve bridge construction problems that can't be resolved using traditional materials. The workshop will provide information for engineers and owners on how, even with limited funds, they can use FRP composites to improve infrastructure.

#### ***HCB - Keeping America Connected***

The "Hybrid-Composite Beam" (HCB) combines the strength and stiffness of conventional concrete and steel with the lightweight and corrosion advantages of FRP composite materials. What results is a new and cost-effective alternative for major infrastructure projects using state-of-the-art sustainable structures with strength capacity exceeding the codes, and offering a reduced carbon footprint. This technology also lends itself to Accelerated Bridge Construction (ABC) and bridges with a 100+ year service life. This presentation will focus on the development of the HCB, with emphasis on successful deployment on major structures throughout North America.

#### **John R. Hillman, P.E., S.E.**

HC Bridge Company, LLC, 1521 Lake Avenue, Wilmette, IL 60091  
P: 847-722-4072 E: hillmanjr@hcbridge.com

#### ***AASHTO Design Specifications for Glass FRP Reinforced Concrete Bridges State-of-the-Art and Critical Gaps***

Glass FRP bars are a competitive alternative to steel for reinforced concrete bridge structures where corrosion is of concern. In Canada, the use of this technology is codified in the Canadian Highway Bridge Design Code (2006), and the viability of construction management practices has been shown where FRP reinforcement is adopted through traditional bid letting processes. In the US, the first edition of the AASHTO LRFD Bridge Design Guide Specifications for GFRP-Reinforced Concrete Bridge Decks and Traffic Railings was published in November 2009. This presentation will review the salient contents of the new AASHTO code. Critical gaps will be discussed, and a perspective will be offered on the latest research and its practical implications.

#### **Fabio Matta, PhD, Assistant Professor**

University of South Carolina, Dept. of Civil and Environmental Engineering,  
300 Main Street, Room C210 Columbia, SC 29208  
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## About the Session Sponsor

ACMA is the world's largest trade association representing the FRP composites industry. Formed in 1979, ACMA is the foremost leader in regulatory compliance and formulation, education, training and market development of FRP composites. ACMA also hosts the largest composites conference/trade show in North America. In 2011, the conference will be held on February 2-4 in Fort Lauderdale, FL.

[www.acmashow.org](http://www.acmashow.org)

## Transportation Structures Council (TSC)

Specialty councils are formed under the ACMA umbrella to handle the unique needs of major FRP composite markets. The Transportation Structures Council was established to educate practitioners on FRP composites used in civil engineering and construction applications. The TSC coordinates the development and promotion of composites technology materials and products used in the repair or replacement of transportation structures. TSC partners with professional, technical and trade organizations in order to promote awareness of composites technology, and industry leadership in the development of codes and standards. For more information, please visit:

[www.acmanet.org/dac/tsc.cfm](http://www.acmanet.org/dac/tsc.cfm)

### ***FRP Bridges - The Future is Now: Advances Proven by 2009 & 2010 Installations***

FRP bridge decks are cost efficient, provide rapid installation, use progressive materials, and, with a lower carbon footprint, offer significant environmental advantages. Recent advances and installations of a two-part mechanically fastened FRP deck system will be explored. In 2009 and 2010 these decks have been installed in three different states. With these installations – two different depths of deck have been used; both concrete and open steel decks have been replaced; and both steel and concrete guardrails have been successfully attached to the FRP deck. Results from live load tests will also be presented.

#### **Dan Richards, PhD, P.E., President & CEO**

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P: 919-401-4000 C: 919- 949-1735 E: [dan.richards@zellcomp.com](mailto:dan.richards@zellcomp.com)

### ***What's New in Repair & Strengthening of Bridges with FRP Composites***

Conventional wet layup FRP Composites has been successfully used for over a decade to repair and retrofit bridge structures. Case studies include repair of a bridge deck where reinforcing steel was accidentally left out during construction, repair of corrosion-damaged columns, etc. Additionally, a new FRP product will be introduced that can offer unique solutions for repair of bridge piers, underwater piles, and culverts.

#### **Mo Ehsani, PhD, P.E., S.E., President**

QuakeWrap, Inc., 2055 E. 17th Street, Tucson, AZ 85719  
P: 520-791-7000 C: 520-250-7020 E: [mo@quakewrap.com](mailto:mo@quakewrap.com)

### ***Cost Effective FRP Deck Replacement for Deteriorated Steel Deck in Louisiana***

A removable, 7.6 m (25 ft) span of steel grid decking in Louisiana was the target for an Investigational Bridge Research Deployment grant to demonstrate suitable performance for a comparable weight and performance composite deck solution. An optimized construction was identified, resulting in a composite monolith with tightly controlled dimensions and performance comparable to the steel grid deck. Field installation was accomplished in September, 2009. Compared to a recent replacement project of the same steel grid decking on the same highway, the installed composite decking was only 29% more costly per unit area, and the rate of installation (area per unit time), was over three times as fast.

#### **Kurt Feichtinger, PhD. Chem. Engr., Manager of Tech Services**

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### ***Lightweight Composite Enhances Florida Toll Road Bridges***

Lightweight, ready-to-install FRP composite cladding is helping the state of Florida reduce traffic delays, lower highway bridge weight, and reduce installation/maintenance costs. The FRP cladding was selected to replace precast concrete panels as part of the ongoing upgrade of Florida State Road 408, a vital east-west Orlando artery. FRP performance along with demonstrated cost savings has expanded the project to include over 23 overpass structures on this toll road alone winning awards for design. This presentation will show how composites can be used in conjunction with standard bridge construction to decoratively clad the structure to fit more aesthetically in urban environments providing a more cost effective solution for decorative cladding of bridges.

#### **Bob Pierson, President**

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