

## A Message from the Executive Director

I hope this newsletter finds everyone enjoying the final weeks of summer! It is hard to believe that it has been more than five months since our first issue of the new **GRIDLINE** was published. Time sure seems to fly by during the summer construction season. We are all lucky to work in an industry that was doing pretty well in this current economic slowdown even before the stimulus bill was signed into law in February. It looks as if we can continue this momentum into 2010 and hopefully beyond.

BGFMA held its annual meeting in June and at that time we were pleased to introduce the newest Associate Member to our organization - **Gautier Steel Ltd.** Based in Johnstown, Pennsylvania, Gautier Steel is one of the nation's leading producers of hot rolled carbon and alloy flats, sharp cornered squares and special sections.

June was also the starting date for **Ryan Schade** as Marketing Manager of the association. Ryan obtained his civil engineering degree from Ohio University and has spent the past 7 years working as a project engineer for **The D.S. Brown Company**. He is enthusiastic about interacting with bridge engineers and owners regarding the features and benefits of grid deck systems. Please stop by to meet Ryan at our exhibit booth during one of the upcoming bridge conferences.

Mark Kaczinski, P.E.  
BGFMA Executive Director



Ryan Schade

## Information on Recently Completed Projects:

### Robert C. Beach Memorial Bridge

The **WVDOT** teamed with **WVU** to design this 149' aesthetically pleasing timber arch structure, which crosses Dunkard Creek just west of WV 7. Originally completed in 2003, the **Robert C. Beach Memorial Bridge**, also known as the West Buckeye Bridge was constructed using a fiber-reinforced polymer (FRP) deck system. It was apparent almost immediately after the structure was opened to traffic that the FRP deck system was not performing as intended, and many attempts were made to repair the deck in order to keep it functional. The DOT knew at this point a new deck system would be required in the near future.

Although the bridge does not see high traffic volumes by today's standards, it is an extremely vital path for local residents. The nearest access point for local residents to WV 7, which is the main route to Morgantown and surrounding areas, is nearly 20 miles either direction of the Buckeye Bridge. With this in mind, the DOT needed a quick way to replace the 5,400 SF of existing FRP deck. Another consideration was the replacement deck weight, which needed to be a very lightweight system to replace the existing FRP deck system without structural strengthening. Based on the above information, the DOT selected a precast **Exodermic™ Deck System** utilizing LW concrete to replace the failed FRP deck. **LB Foster** supplied the Exodermic™ (continued)



Robert C. Beach Memorial Bridge

panels, with precasting done by **Faddis Concrete Products**. The Exodermic™ deck was placed in 16' and 24' panels, which spanned floorbeams spaced at 8' O.C. In addition to the two 11' lanes, there was a 5' wide raised sidewalk, which was accommodated with hollow precast Exodermic™ panels. **Orders Construction** was awarded the job, and allotted a 30 calendar day window for replacement. The project was a huge success, as it was completed 10 days ahead of schedule. With several other FRP decks installed around the same time and currently in the same general condition, WVDOT will likely be looking at similar replacements in the near future.



**Precast Exodermic™ Panels**  
(Photo Courtesy of Orders Construction)

## Profile of New Projects:

### Royal Alexandra Bridge

This centenarian bridge, originally built for the Canadian Pacific Railway in 1900, is now a major interprovincial, national capital crossing for vehicles, cyclists, and pedestrians. Montreal contractor, **Pomerleau, Inc.** has retained **LB Foster** to fabricate the grid for this partially filled deck that was selected for its weight savings, which will minimize required superstructure strengthening. Although maintenance and protection of traffic plans have not been finalized, speed of construction was surely another argument for selecting grid reinforced concrete given the importance of this structure.



*Royal Alexandra Bridge*

### Ben Sawyer Swing Bridge

The design-build team of **PCL** and **Hardesty & Hanover** has aggressive plans to replace the entire bridge in a seven-day closure yet to be scheduled. The entire bridge, including the swing span truss, is being prefabricated off site and will be moved into position onto the existing supports. **Bailey Bridges** is supplying the Exodermic™ deck panels, which will be set onto the truss, and poured with concrete prior to being barged to the final location. The structural efficiency of the lightweight deck system has resulted in savings in the truss design, and reduction of load onto the existing center pier.



*3D Rendering of Ben Sawyer Bridge*  
(Photo Courtesy of SCDOT)

### Gustavus-Causeway Replacement

The Alaskan loading ramp structure is made up of six different sections of causeway, utilizing open and filled grid to create a roll-off and roll-on marine transfer facility. This is one of the unique applications of grid deck, and consists of 37,500 SF of open and filled grid supplied by **IDSi** for contractor **Jesse Engineering & Western Marine**. The concrete filled sections of grid are used in the walkway regions, which provides a better walking surface.



*Groundbreaking Ceremony - Gustavus-Causeway Replacement*  
(Photo Courtesy of AKDOT)

## Research Efforts:

In a follow-up to the previous newsletter, research is complete and the final report has been issued on calibration of **AASHTO LRFD Section 4.6.2.1.8** with respect to historical performance of grid reinforced concrete bridge decks. Deck details and traffic data for 26 in-service structures were submitted to **Professor Christopher Higgins, PhD, PE** at Oregon State University for investigation.

Among the conclusions and recommendations, Professor Higgins suggests (continued)



using the current design equations with a continuity factor of 1.0 (simple span) and further divide the fatigue moments by a factor of two. Deflection limits can be calculated with the current equations and limited to L/800.

## Fabricator Profile:

### Interlocking Deck Systems International, LLC (IDSI)

In addition to its core business of manufacturing welded steel bridge decking and steel fabrications for the bridge and transportation markets, **IDSI** is also a world-class fabricator serving general industry. Located in Pittsburgh, Pennsylvania, IDSI's broad range of products and services include in-plant machining and heavy duty stamping dies to heavy weldments. With a 120,000 SF fabrication facility, state-of-the-art manufacturing technology and a recent strategic alliance with a barging facility, IDSI is capable of managing and expediting any size job. IDSI has been involved with and provided steel grid deck systems on many large, high profile jobs and they are currently working on the following grid deck projects: **Full-depth grid on the Point Marion Bridge in PA, Exodermic™ deck on Grand Island Bridges for NY Thruway, and open grid on Gustavus Causeway in AK.** To obtain more information about IDSI or to contact them, visit their website at: [www.idsi.org](http://www.idsi.org).



*IDSI Fabrication Facility  
(Photo Courtesy of IDSI)*

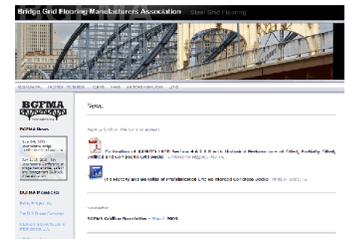


## Recent Paper Presented at NYC Bridge Conference:

### The History and Benefits of Prefabricated Grid Reinforced Concrete Decks:

Philip M. Gase, PE  
The D.S. Brown Company, North Baltimore, Ohio, USA

Mark R. Kaczinski, PE  
Bridge Grid Flooring Manufacturers Association, North Baltimore, Ohio, USA



To view the complete paper, go to:  
<http://www.bgfma.org/news.htm>

### ABSTRACT:

**Accelerated Bridge Construction (ABC)** techniques are employed predominately to reduce on-site construction time, minimize traffic impacts, and improve work zone safety. Grid reinforced concrete bridge decks have been an economic, lightweight, rapid deck replacement option long before ABC became the vogue acronym defining the desired construction practice for the 21st century. The prefabricated modular nature of grid reinforced concrete deck naturally lends to reduced construction periods and offers the advantage of shortened work windows – nighttime or weekend – when traffic volumes are lower and the traveling public is less encumbered. In addition, the reduced weight translates into direct savings in the superstructure and substructure for new construction and can minimize superstructure rehabilitation and increase live load capacity of existing structures.

## Grid Facts:

**Q:** If I specify a grid reinforced concrete deck, how long can I expect it to last?

**A:** Grid reinforced concrete bridge decks have been in operation since the 1930's. The **10th Street Bridge** in Pittsburgh was opened to traffic in 1932 utilizing one of the earliest forms of a grid reinforced deck. At the time of its rehabilitation in 1981, an inspection revealed that the deck was in excellent condition. Now, at more than (continued)

75 years old, the deck is still performing after enduring heavier truck traffic and de-icing chemicals for most of its service life. There are several other structures in existence with grid reinforced concrete decks with service lives now beyond 50 years.



*10th Street Bridge, Pittsburgh, PA  
(Photo Courtesy of Rick Armstrong)*

### More Information:

If you would like to receive more information about the features and benefits of grid deck systems, please contact us at 1-877-257-5499 or [bgfma@bgfma.org](mailto:bgfma@bgfma.org). We are also available to make presentations at your office and can offer continuing education credits for professional engineers as a registered provider in New York and Florida.

### BGFMA Tradeshow Schedule:

Please visit BGFMA members at our exhibit booth during the following upcoming bridge engineering conferences:

<b>Western Bridge Engineers Seminar</b>	September 21-23	Sacramento, CA
<b>Ohio Transportation Engineering Conference</b>	October 27-28	Columbus, OH
<b>World Steel Bridge Symposium</b>	November 17-20	San Antonio, TX
<b>International Bridge Conference</b>	June 7-9, 2010	Pittsburgh, PA
<b>International Conference on Bridge Maintenance, Safety and Management</b>	July 12-15, 2010	Philadelphia, PA
<b>International Conference on Short &amp; Medium Span Bridges</b>	August 3-6, 2010	Niagara Falls, Ontario, Canada
<b>Heavy Movable Structures Symposium</b>	October 18-21, 2010	Orlando, FL



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

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