

## A Message from the Executive Director

Although much of the east coast has struggled with record cold temperatures and snowfall in recent weeks, we are looking forward to warmer temperatures and a busy 2010 construction season! I am happy to share with you the winter edition of our electronic newsletter where we have focused attention on several older concrete filled steel grid decks to highlight the systems superior long-term performance. Just one of the benefits to specifying concrete filled grid deck systems.



Mark Kaczinski, P.E.  
BGFMA Executive Director

## News:

At the most recent Bridge Grid Flooring Manufacturers Association meeting it was announced that the **Carolina Stalite Company** has joined the association as an associate member. With nearly 60 years in the business, Carolina Stalite has been committed to manufacturing the finest quality, high strength, low absorption lightweight aggregate in the world. Carolina Stalite is one of the industry leaders in research and production of lightweight aggregates, and will be a knowledgeable associate for bridge owners and designers interested in using lightweight concrete in conjunction with a steel grid deck system. Reid Castrodale, PhD, P.E. from the Carolina Stalite Company stated, *"We are excited to work with the Bridge Grid Flooring Manufacturers Association to provide the lightest concrete filled bridge deck systems available!"*



Carolina Stalite Management Team

## Recent Inspection of Pittsburgh's South 10th Street Bridge Deck:

Located in Pittsburgh, PA, the **South 10th Street (Phillip Murray) Bridge** was built in 1932 with a grid reinforced concrete deck that is still in service today! The deck is comprised of parallel 3" tees, flush filled with concrete and an asphalt overlay. Now over 75 years old, this is one of the earliest grid reinforced concrete deck installations and has endured much heavier truck traffic and deicing chemicals than originally planned for.

In September 2009, the Pittsburgh office of **AECOM** conducted an inspection of the deck, and they were very pleased with their findings. Visual inspections of the deck from below showed only minor and isolated corrosion along the bottom of the grid. Given the age of the deck and the potential cost of replacing a deck of this magnitude, AECOM felt it was necessary to take a closer look. The more detailed inspection included hydro-demolition of the concrete fill and asphalt overlay in isolated areas to inspect the (Continued)



Inspection of the 10th Street Bridge Deck

internal components and overall integrity of the original steel grid and establish the need for potential replacement. The inspection revealed that the grid is in great condition with only minor, isolated pitting of the steel members while the asphalt overlay has been replaced multiple times throughout the life of the structure. Matt Pierce of AECOM stated *“The findings of this inspection and the decision to keep this 78-year old grid deck in service for the foreseeable future, clearly demonstrate how concrete filled grid deck in such applications as the 10th Street Bridge can offer significant life-cycle cost savings to owners.”*



*Inspection area of the 10th Street Bridge*

Additional article information courtesy of AECOM.

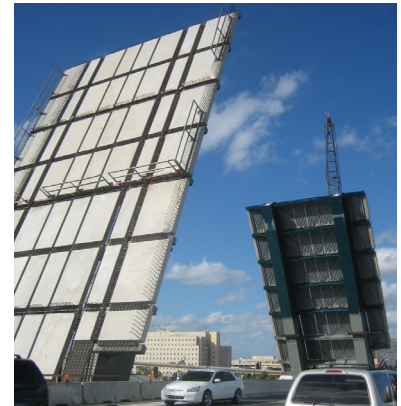
## FDOT's Miami River Bridge on NW 12th Ave. wins 2009 FTBA Construction Award:

The **NW 12th Avenue Bridge** in Miami-Dade, FL was acknowledged by the Florida Transportation Builders Association with the Major Bridge Award at the 2009 FTBA Convention. One of the commendations of the award was how the contractor, **Kiewit Southern Company**, tackled the obstacle of a short 72-hour closure window on the busy Miami River. Kiewit's unique solution involved preassembly of the toe sections for adjoining leaves downriver from the jobsite, then barging and hoisting them into position - a technique that was new to both Kiewit and the FDOT. The new four-leaf, six lane bascule structure replaced the nearly 80-year old functionally obsolete existing bridge.



*Pre-Cast Exodermic™ Deck*

A major component of Kiewit's success was the specification of an **Exodermic™** deck by Engineer of Record, **E.C. Driver & Associates, Inc.** Using 4-½ inches of sand-lightweight concrete (115 pcf) with a compressive strength of 5,500 psi, the deck weighed approximately 63 pounds per square foot and spanned floorbeams spaced at 13'-2". The deck is fully composite with the main girders and floorbeams for additional structural efficiency and weight savings. Reduced weight in the deck translates into savings throughout the structure, including the counterweight, trunnion assemblies, drive machinery, structural steel, and piers. Additional benefits of the closed deck system include a solid concrete riding surface that reduces noise, better skid resistance, and reduced future maintenance costs.



*NW 12th Avenue Bridge*

## Longevity Profile:

The bridge between Michigan's upper and lower peninsulas opened for traffic on November 1, 1957 with a unique deck configuration - flush-filled 4-1/4" grid reinforced lightweight concrete with asphalt overlay on the outer lanes and open grid deck in the center lanes. At 8,614 feet, the **Mackinac Bridge** is the longest suspension bridge with two towers between anchorages in the Western Hemisphere.

The 1940 collapse of the first Tacoma Narrows Bridge, due to its instability in high winds, directly influenced D. B. Steinman's design of the Mighty Mac. Deep stiffening trusses supporting the deck reduce wind resistance and the open grid deck in the center lanes effectively reduce lift creating stability in winds up to 150 miles per hour.

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*Construction on the Mackinac Bridge*

Current Average Annual Daily Traffic (AADT) figures are consistently around 11,000 vehicles per day with roughly 800 trucks per day making the crossing. The Straits of Mackinac receive approximately 110 inches of snowfall during its annual long, cold and windy winter. Unlike most other bridges in the state, the Mackinac Bridge Authority does not use deicing salts to control ice accumulation on the closed deck surfaces of the structure because of its corrosive propensity to vital steel members. Salts are however carried onto the bridge by vehicles entering from the shore roads. The asphalt surfaces have been designed for waterproofing and rut resistance and have been removed and replaced only twice in the 50+ year life of the bridge. The success of protecting grid reinforced concrete decks has been documented and was the topic of a May 2000 BGFMA Technical Bulletin. Although the open grid in the center lanes has undergone some repairs over the years, the original deck of the outside two lanes remains in service and in satisfactory condition.



*Mackinac Bridge*

*Mackinac Photos Courtesy of Michigan Department of Transportation and Mackinac Bridge Authority*

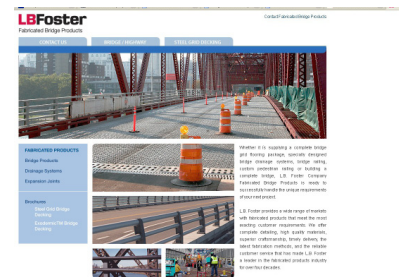
## Fabricator Profile:

**L.B. Foster Company (NASDAQ: FSTR)** is a \$500 million company engaged in the manufacture, fabrication and distribution of products to serve the nation's surface transportation infrastructure. The company is a key supplier to the rail market providing rail, trackwork and accessories to railroads, mass transit, mines and industry. For the construction industry, L.B. Foster sells and rents sheet, H-bearing, pipe piling and micro piles for foundation and earth retention systems. Additional products include precast concrete products, coated pipe and threaded pipe.



*L.B. Foster Fabrication Facility  
(Photo Courtesy of L.B. Foster)*

For well over 100 years, L.B. Foster has provided quality products for the transportation, construction, utility and energy industries, and is one of the leading manufacturers of steel grid bridge decking products. As an innovator in this important market, L.B. Foster works with bridge owners and their consultants to develop custom tailored solutions to their complex bridge management issues such as maintaining traffic on a structure through construction, limiting construction duration or increasing bridge live load capacity. L. B. Foster has the resources, experience and capacity to supply materials on time and to specification for your major rehabilitation or new construction project. L.B. Foster is currently supplying steel grid bridge decking for the rehabilitation of the Brooklyn Bridge Approach Ramps, New York City (170,000 sf), US 40 over the Susquehanna River, Baltimore, MD area (400,000 sf) and the Royal Alexandra Bridge, Ottawa, Ontario (40,000 sf). Other notable previously completed projects include the Brooklyn Bridge Main Span, Manhattan Bridge Main Span, Henry Hudson Bridge, along with thousands of other successful projects. For more information visit us at [www.lbfoster.com](http://www.lbfoster.com).



*L.B. Foster Website*

## Grid Facts:

**Q:** What connection, if any, should be made in the cross bar direction between adjacent grid reinforced concrete bridge deck panels?

**A:** Over the years various techniques have been used to splice the cross bars at panel splice locations – including both welding and bolting. However the most economical and effective method to connect grid

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reinforced concrete bridge deck panels is by using a rebar dowel. A test report entitled “**Splicing Grid Reinforced Concrete Bridge Deck Panels Without Welding Using Conventional Rebar Methods**” is available on the BGFMA website <http://www.bgfma.org/Newsletter/HTML/TECHnews2.html> which demonstrates the effectiveness of this connection. Additional testing of this connection will soon be conducted at Purdue University as part of NCHRP Project 10-72 “Bridge Deck Design Criteria and Testing Procedures”.

### 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>Concrete Bridge Conference</b>	February 23-26	Phoenix, AZ
<b>FHWA Bridge Engineering Conference</b>	April 8-9	Orlando, FL
<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



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