

In this edition of the *Gridline*, we spotlight another BGFMA certified member company individual whose many years of experience can be valuable to provide sound advice during plan preparation, fabrication and installation.

Meet Timothy Pace, P.E

Tim was born and raised in Ontario, Canada and graduated in 1983 from nearby **McMaster University** with a bachelor of science in Engineering and Business Management with an emphasis in Civil and Structural Engineering. Right out of school, Tim began working in the engineering department for the Burlington, Ontario, Canada division of the **Watson Bowman Acme Corporation** where he engineered and tested core products (bearings, expansion joints and railings) with a keen eye on value-engineering to maximize profitability. This position allowed him to continue his education at McMaster to earn his MBA while working. His furthering education, achievements and interpersonal skills led to a promotion as General Manager of the entire facility responsible for the supervision of up to 75 employees.



Brooklyn Bridge, NYC

With an already established marketing relationship, in 1995 Tim was asked to become the Director of Southeast Asia for **Harris Specialty Chemicals (HSC)** in Jacksonville, Florida. During the next three years, he would expand distribution of construction-related products including the establishment of a joint venture in China for the manufacture of expansion joints and bearings.

In 1998, Tim moved to Pittsburgh, Pennsylvania to become the Operations Manager for **IKG Greulich** where he would be introduced to the steel grid deck market and begin a working relationship with [Mike Riley](#). He was responsible for overall project management to include estimating, engineering, manufacturing and customer service for all grid decking, expansion joints and structural bearing projects. Tim directly managed high profile projects such as the re-decking of the **Brooklyn Bridge** main span, and several Chicago movable bridges.

In 2002, Tim would oversee and ensure a smooth transition of the department when **LB Foster** purchased the assets and backlog from IKG Greulich. Tim was promoted to his current position as General Manager of Operations for the Fabricated Products Division supervising all project management. He works with the Sales and Marketing Department to secure notable projects such as the re-decking of the **Walt Whitman Bridge**, the **Manhattan Bridge** and currently the **Peace Bridge** for which he takes direct responsibility. During his tenure, he has directed the growth of the division through an expansion of sales nearly five times greater than when he started. Perhaps his greatest achievement is the institution of a value-engineered approach to each project which has served to increase bottom line profit year after year.



Walt Whitman Bridge, Philadelphia, PA

Tim is an avid runner and has completed 14 marathons including the **Boston**, **New York** and **Chicago** marathons. In addition, he has completed two “ultra-runs” (greater than 50 km) and recently completed a full Ironman in 2016.

Engineer's Estimate for Grid Reinforced Concrete and Exodermic® Bridge Decks

One of the more frequent requests to the **BGFMA** is to provide an **engineer's estimate** for the installed cost of a grid reinforced concrete or Exodermic® deck. In this article, the bid tab results for the awarded contractor of three completed projects are examined to provide ballpark pricing. The prices for each project include only those items that differentiate from a standard reinforced concrete deck. Items such as shear stud connectors, bridge railing, bridge deck grooving, etc., are excluded since they would be pertinent to any concrete deck.

The re-decking of span 10 of the **MLK Bridge** over the Mississippi River between St. Louis, MO and East St. Louis, IL let in November, 2014. 31,026 square feet of cast-in-place, partially filled grid deck between panel points L17 and L17' was installed with 110 pcf lightweight concrete providing a minimum 1.75" overfill. All costs associated with the installation of the deck were included with the bid item for the steel grid deck. The award unit price for the grid deck was \$57.65 per square foot.

The **Boston Bridge** serves Pennsylvania State Route 48 over the Youghiogeny River in Allegheny County. A 30-mile truck detour was implemented during the re-decking rehabilitation. The project let in April, 2010 with 36,803 square feet of precast partially filled grid deck specified on the plans but the contractor elected to replace the deck using cast-in-place methods. The unit price for the associated items for precast construction figured to be \$64.88 per square foot but this price can assume to be about \$10 per square foot lower for cast-in-place construction.



Precast panels are set on the Mathis Bridge over Barnegat Bay, New Jersey.

Finally, 176,076 square feet of precast **Exodermic®** deck were installed on the **Mathis Bridge**, State Route 37 over Barnegat Bay, during the non-hurricane season due to its importance as an evacuation route. The project let in November, 2014 and the unit price for the installation of the deck was \$75.82 per square foot which includes railing anchors, scuppers and the installation of a polyester polymer concrete overlay. Subtracting out the overlay, the price of the deck is reduced to \$64.24 per square foot.

The above projects exemplify two of the primary reasons to use **grid reinforced concrete** or **Exodermic®** decks: weight savings and speed of construction. Traffic control measures for accelerated bridge deck replacements during weekend and overnight construction tend to drive up the overall costs of a project. Although slightly more expensive, these systems were incorporated because they actually saved money by reduction of user costs (congestion delays, detours, etc.) and lifecycle costs since the average life of a grid reinforced concrete deck is approximately twice that of a standard reinforced concrete deck. The weight of a grid reinforced concrete and Exodermic® deck averages 30%-50% of the weight of a full depth reinforced concrete slab for the given span. Weight reduction of the deck can help eliminate or reduce any structural strengthening for rehabilitation/widening projects and reduce the costs of superstructure and foundation elements for new construction.

The **BGFMA** encourages designers to consult with the association during plan development to incorporate additional cost-saving measures including:

- **Panel redundancy** - Fewer different types of panels requires less detailing and setup during fabrication and facilitates installation.
- **Attachments** - Expansion joints, scuppers and railing attached during fabrication add to the unit cost.

BGFMA Donates Exodermic® Panels and Supplies to Purdue University

The **Steel Bridge Research, Inspection, Training and Engineering (S-BRITE)** Center at **Purdue University** in West Lafayette, Indiana was developed by **Professor Robert Connor, PhD.** and **Research Engineer Mr. Jason Lloyd, P.E.** in 2014. Its mission statement: To work with all stakeholders to ensure the existing and future steel infrastructure continues to be a safe and reliable part of the transportation system. This will be accomplished by partnering with industry, government agencies, and consultants through relevant research, unique hands-on inspection training in our bridge component gallery, developing educational opportunities for students, and delivering specialized technical expertise.



Exodermic® deck panels await rebar and concrete at the S-BRITE Center.

Through the generous support of the industry and owners, **S-BRITE** has acquired an assortment of superstructure components from bridges that have either been decommissioned or collapsed. To add to the collection, the BGFMA donated Exodermic® panels, rebar and form pans that are being installed on a pony truss taken out of service, disassembled, shipped, and reassembled in the S-BRITE Center. “What we are trying to do is to educate and train bridge inspectors and improve the methods of inspecting,” said Connor. Nearly **50%** of the **steel bridges** in America are now **50 years** or older according to **2016 National Bridge Inventory** data. Old trusses that have a reduced live load capacity due to deterioration are excellent applications for grid reinforced concrete and Exodermic® decks, where a savings in dead load translates into an increase of live load capacity.

“The grid has been placed on the truss and we have all the material. We’re just waiting for the weather to break to set the rebar and pour the concrete,” said Lloyd. “The Exodermic® deck offers a uniqueness that will complement the gallery. It’s one more thing that we can offer to broaden the horizons of the students, professional engineers and inspectors that come through the Center, making them more knowledgeable and proficient.”

To find out more about the S-BRITE Center, click on the link to the [S-BRITE](#) home page.

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**. 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:

International Bridge Conference (IBC)	June 11 - 14	National Harbor, MD
Heavy Movable Structures (HMS)	October 22 - 25	Orlando, FL
APC/PennDOT Fall Seminar	November 14 - 16	Hershey, PA

