

Summer has come to a close but road and bridge construction is still in full force, so many of you have jam-packed work and personal schedules to adhere to. So first off, thank you to everyone who takes time out of their busy schedule to read through the periodic BGFMA Gridline newsletters, hopefully you find the material informative. I'm sure many of you still have some recreational travel planned before it cools down, so have fun and be safe, and please remember to be extra careful when traveling through construction areas with workers present.

It would be nice to have the luxury of discussing a robust new long-term transportation funding plan at this time, however, that's not the case and we're currently staring at another disappointing extension that will not bode well for fall and winter project planning. Rather than belabor a sore subject, let's just skip to the BGFMA updates...



2015 ASCE/AISC Student Steel Bridge Competitions

As a way of continuing support of the next generation of bridge engineers, the BGFMA was once again a proud sponsor of the ASCE/AISC National Student Steel Bridge Competition (NSSBC) in 2015. This year's competition was hosted by the University of Missouri - Kansas City and was held on May 22-23. Forty-seven universities from across the United States, Mexico and Canada participated in the competition. This year, 224 teams competed, but only the top few teams from each regional conference were invited to take part in national competition, so great job to all of the teams that qualified. Special congratulations to the student team from the University of Florida who walked away as National Champions.

In addition to sponsoring the national competition, the BGFMA also contributed money to the University of Toledo (UT) student steel bridge team earlier this year. The Association's contributions helped the team get up and running, as it's been several years since ASCE students at UT last competed in the steel bridge competition. The team did very well at the North Central Regional Conference that was hosted at UT, winning 1st place in the stiffness category on their way to a 4th place overall finish. Although this 4th place finish did not qualify them for the national event, the UT students did learn a lot and have very high expectations for the team at next year's conference.

The 2016 NSSBC will be hosted by Brigham Young University in Provo, Utah on May 27-28.



BGFMA Presentation on Accelerated Bridge Deck Replacements at National ABC Conference



*Hyatt Regency Hotel in Downtown Miami, FL
December 6-8, 2015*

At last year's 2014 National ABC Conference, BGFMA Executive Director Mark Kaczinski presented on the paper "Overnight Deck Replacement on the South Grand Island Bridge." The 2011 deck replacement project was a huge success and the precast Exodermic[®] deck was a star with the New York State Thruway Authority (NYSTA) and commuters. This was not the Thruway's first use of precast grid deck panels for accelerated construction, and will not be their last either. Roughly 15 years ago, the NYSTA replaced over 250,000 square feet of deck on the Tappan Zee Bridge with precast Exodermic[®] panels using nighttime closures similar to the Grand Island work. And currently, another Grand Island structure, the SB North Bridge is receiving 100,000+ square feet of new precast Exodermic[®] deck panels during nighttime closures as well.

However, it's not always large and/or high profile structures where accelerated bridge deck replacement is important! Mark will be presenting again at this year's 2015 National ABC Conference, and will discuss Georgia DOT's I-20 Alcovy River project and how full-depth precast grid deck panels helped the owner keep traffic moving during peak traffic times on weekends. The presentation will also touch on a few other small accelerated deck replacement projects where owners benefited from precast grid deck systems. If you attend the ABC conference in December, please make sure to sit in on Mark's presentation that is currently scheduled for Monday, December 7th at 3:30 PM.

Directly following Mark's presentation, Rama Krishnagiri and his colleagues at Parsons Brinckerhoff will be covering the rehabilitation and redecking of the Route 37 Eastbound Mathis Bridge over the Barnegat Bay in New Jersey. The Mathis Bridge will receive nearly 180,000 square feet of precast Exodermic[®] deck panels during seasonal closures.



Staged Accelerated Superstructure Replacement of I-81 over Leitersburg Road, Franklin County, PA

Interstate 81 is a vital trucking route along the Appalachian corridor and in particular, south central Pennsylvania. Years of heavy traffic and the harsh northeast weather abused the parallel bridges spanning Leitersburg Road near Greencastle. The conventional concrete bridge decks and steel girders on both the northbound and southbound bridges were in poor condition and needed to be replaced. No economical detours were available, so one of the main challenges PennDOT faced was how to rehabilitate the structures and maintain both lanes of traffic in each direction throughout peak traffic times. The resulting solution was an aggressive rehabilitation project that would replace the superstructures with nearly 10,000 square feet of bridge deck in four stages and only 48 total days. The \$3.9M accelerated construction contract was awarded to Cottle's Asphalt Maintenance Inc., a local Pennsylvania contractor headquartered in Everett only an hour away from the project site.



Accelerated staging on the project separates the work into four half-width bridge closures, with a crossover redirecting one lane of traffic from the bridge under construction onto the opposite bound. Each stage requires removing and replacing the bearings, girders and deck, along with as-needed abutment and bearing seat repair. PennDOT requires all four lanes of traffic maintained throughout



the day, but is permitting the contractor a full bridge closure from 9pm to 6am each night with only three lanes of traffic open. During the full closures the contractor is able to remove and set the new girders, as well as make the closure pours in the precast grid reinforced concrete deck panels. In order to meet the aggressive performance schedule allotting only 12 days per stage, including time for traffic management, significant planning was needed by the contractor as crews are working almost around-the-clock.

A key component allowing the short construction turnarounds is the precast steel grid reinforced concrete deck panels, supplied by BGFMA member fabricator L.B. Foster Company. There are 14

precast grid panels, and two additional skewed end panels at the expansion joints that are set with cast-in-place concrete at each stage. Cottle's Asphalt Maintenance handled the precasting with their own prevailing wage forces, which saved them significant time and money over using a local precast yard. The precast deck panels are installed in less than a day for each stage and the concrete closure pours are reaching 4,000 psi in less than 20 hours, allowing the contractor to put equipment on the bridge to install the cast-in-place parapets the day following the closure pours.

The project kicked off on August 5th and is well underway, with a scheduled completion date late in September. According to Mike Cottle, President, "The project is ahead of schedule and I expect we will wrap things up about a week early and have the bridge open on the first day of Fall. There was only a short learning curve to place the precast grid deck panels and closure pours, so installation is going quicker than anticipated. It took us roughly 11 days to complete the first stage of construction, but we've shaved down the later stages



to about eight work days each. This is a significant time savings considering we lost three days of work over the Labor Day weekend. The precast grid deck played a large role in the success of keeping the project on schedule. I expect the durable steel grid deck to stand up well to the heavy truck pounding that I-81 sees. In fact, there was a request for a 200+ ton permit load to cross the bridge right after we opened up the NB structure, which was approved and went off with no issues. This has been a fun project and a great experience, so I hope we can procure another bridge rehabilitation project that utilizes a concrete filled steel grid deck in the near future!"

Grid Facts

Aluminum and Concrete Don't Mix!

Hot-dip galvanization in accordance with ASTM A123 is the recommended corrosion protection for all types of grid deck because it provides a cost-effective, complete and durable coverage. From time to time, damage to the initial hot-dip galvanized surface occurs due to rough handling or field modifications in which welding or flame cutting was required. Repair is required to protect the affected area and ASTM A780 provides three suitable types of material or methods:

1. Repair using zinc-based alloy solders (Hot stick)
2. Repair using paints containing zinc dust (Cold galvanization), and
3. Repair using sprayed zinc (Zinc metallizing).

If repair using zinc rich paint is selected, ensure that the product does not contain aluminum because aluminum reacts with the alkalis found in Portland cement concrete. When the two are combined, the reaction produces hydrogen gas which will bubble to the surface creating localized spalling or "blisters" in the wet concrete leading to costly repairs and compromising quality.

Upcoming Conferences

[Western NY ABCD Annual Fall Bridge Conference in Buffalo, NY](#) - November 13, 2015

[ABC-UTC Conference in Miami, FL](#) - December 6-8, 2015

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