The Angus L. Macdonald Bridge Suspended Spans Deck Replacement Project in Halifax, Nova Scotia, includes cable dehumidification to remove moisture and minimize corrosion.

PHOTO: AMERICAN BRIDGE

Bridges I

Capitalizing On Innovation

Modernizing the nation's aging bridge infrastructure

By Vicki Speed

What's Inside

Federal Grants Facilitate Accelerated Bridge Construction

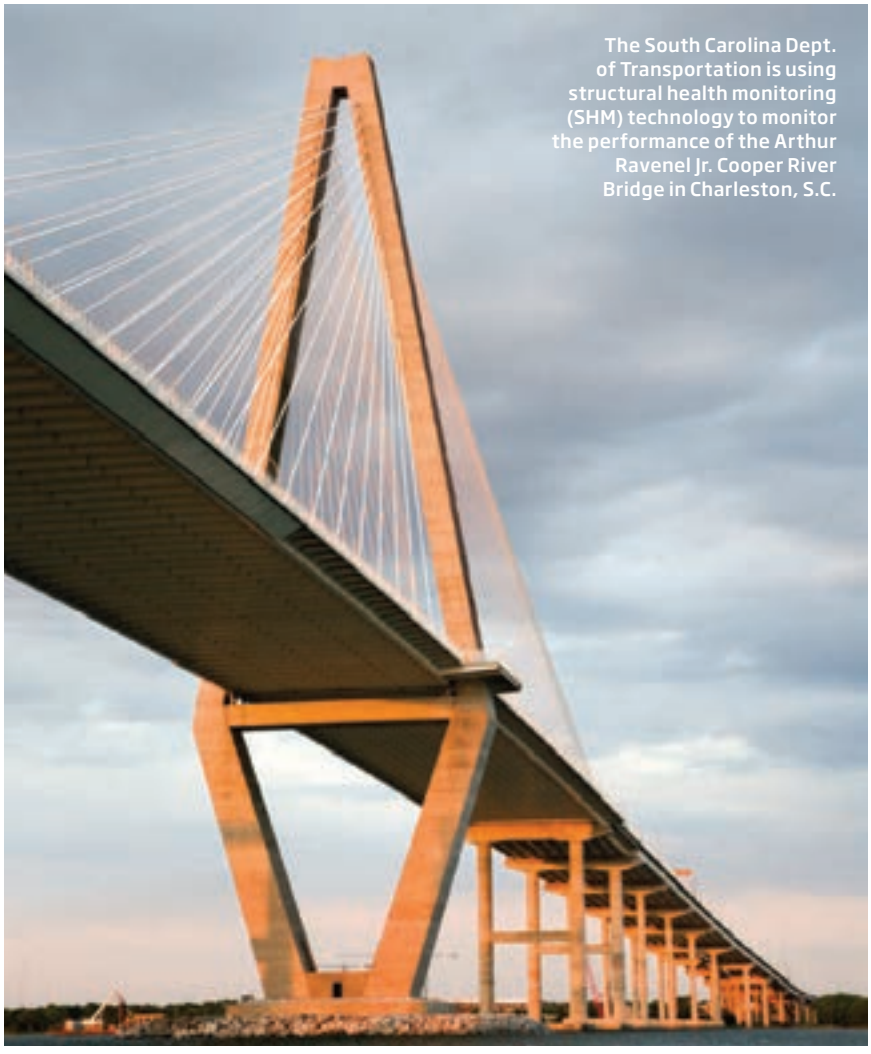
The need for funding to repair, replace, inspect and maintain today's aging bridges is a regular drumbeat of dialog. Certainly the proposed six-year $478-billion highway funding reauthorization, which would provide $317 billion for highway and bridge projects, would help.

In the interim, bridge owners are taking advantage of another funding resource, the Federal Highway Administration's (FHWA) Accelerated Innovation Deployment (AID) Demonstration program. The AID Demonstration program, begun in early 2014, is designed to facilitate the use of accelerated highway and bridge tools and techniques. In 2014, at least seven bridge projects were awarded grants from the program.

In April 2015, FWHA selected two more bridge projects for grant monies. The South Carolina Dept. of Transportation (SCDOT) was awarded a $787,104 grant to continue development of its structural health monitoring (SHM) technology that will complement visual inspection and management of selected bridges in the state. The AID grant will allow SCDOT to conduct field work and determine if SHM technology can be used statewide.

The North Carolina Dept. of Transportation (NCDOT) was awarded a $400,000 grant to help pay for a bridge replacement project in Anson County using Geosynthetic Reinforced Soil-Integrated Bridge System (GRS-IBS) technology, a method of using compacted and encapsulated geotextile fabric combined with a granular fill material to reinforce foundations. The state expects the project will accelerate statewide adoption of GRS-IBS, a technology that can minimize traffic congestion during construction.

The Arkansas State Highway & Transportation Dept. (ASHTD) is already using an AID grant to demonstrate GRS-IBS abutments on the West College Avenue Replacement Project in Jonesboro, Ark. The new bridge, currently in design, will be comprised of a simple-span, 50-ft x 40-ft precast bridge on GRS-IBS abutments.



The South Carolina Dept. of Transportation is using structural health monitoring (SHM) technology to monitor the performance of the Arthur Ravenel Jr. Cooper River Bridge in Charleston, S.C.

In 2014, the Iowa Dept. of Transportation was awarded a $1-million AID grant to use prefabricated bridge structural components and high-performance materials to replace Iowa 92 over Little Silver Creek Bridge in Pottawattamie County, Iowa. As well, Alabama Dept. of Transportation (ALDOT) is working with a $1-million AID grant to help construct two side-by-side bridges over an existing structurally deficient, high-fill triple-box culvert. The two bridges increase capacity by widening the divided roadway from four lanes to six lanes. Construction is expected to begin in 2015.

Similarly, state agencies are applying accelerated bridge construction techniques as a way to reduce time, cost and minimize traveler inconvenience. For instance, the Vermont Agency of Transportation (VTrans) is replacing two highway bridges over U.S. Route 5 on Interstate 91 at exit 11 in White River Junction through its Accelerated Bridge Program (ABP). VTrans will use the lateral slide method to replace both bridges in 2015, limiting road closures to two weekends.

To-date, the AID program has awarded over $20 million in grants to state agencies.

Projects to Watch

Advancing the Repair, Replacement & Inspection of Bridges

Scudder Falls Bridge Replacement
Bucks County, Pa. and Mercer County, N.J. | Completion: 2020

The Delaware River Joint Toll Bridge Commission's new $327-million multi-lane Delaware River crossing will replace the existing 55-year-old functionally obsolete Scudder Falls Bridge, which connects Pennsylvania and New Jersey. With traffic volume approaching 60,000 vehicles per day, the project will improve the roadway and interchanges along 4.4 miles of I-95 and enhance the overall mobility of the entire region.

Fore River Bridge
Quincy, Mass. | Completion: Dec. 2017

Part of the Commonwealth's historic, $3-billion Accelerated Bridge Program (ABP), the new Fore River Bridge is a permanent vertical lift bridge designed with a 75-year life. The design-build project team is using accelerated construction techniques to advance the project schedule and streamline the environmental process. Formwork helps keep the project on track.

UAVs for Bridge Inspections
Global | Status: In Development

Companies around the world are developing unmanned aerial vehicle (UAV) systems to support commercial bridge inspection programs. Asymmetric Technologies LLC was the first to receive approval by the FAA to "pioneer the practice" of bridge inspections using UAVs throughout the U.S. in February 2015. High-definition and thermal imaging detects faults, corrosion and other signs of deterioration.

U.S. 6 Over Garrison Street Bridge
Denver, Colo.
Completion: End of 2015

The $15-million U.S. 6 Over Garrison bridge replacement project will replace a deteriorating structure with an improved, less curved bridge design. Unique to the project is the use of two wire wall systems that deliver a seamless mechanically stabilized earth (MSE) design for full bridge loading.

City Island Road Bridge
Bronx, New York | Completion: 2017

The new $100-million City Island Bridge replacement project includes construction of the Mabey Universal Panel Bridge System (MU), the longest temporary bridge of its kind in the U.S.

PHOTOS: (TOP LEFT TO TOP RIGHT) MICHAEL BAKER INTERNATIONAL; DOKA; ASYMMETRIC TECHNOLOGIES; (BOTTOM) MABEY INC.

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This completely reconstructed bridge in Buchanan County, Iowa was designed in less than five minutes and constructed in just two months. That was made possible by a new web-based tool that creates steel bridge designs in three easy steps. Allowing engineers to compare the economics of various designs and choose the best for their project and budget. That saved Buchanan County time and resources. Not to mention it helped to quickly provide a stronger foundation for farmers and the community. To use the free design tool or to learn more about this story visit ShortSpanSteelBridges.org.

www.nucoryamato.com

It's Our Nature.®


Jesup South Bridge


Boggs Road Bridge

Bridge Engineers Look to Steel for Local Short-Span Bridges

More than two-thirds of the bridges in the United States measure less than 140 ft (classified as short span), and approximately 25% of them are listed as structurally deficient or functionally obsolete. With an eye on safety and long-lasting solutions, two counties initiated innovative bridge replacement programs designed to replace their aging bridges. At the heart of their replacement solutions? Steel.

Demonstrated Success

Of the 257 locally owned bridges in Buchanan County, Iowa, the Jesup South Bridge was one of 10 that ranked highest for replacement. Through a unique demonstration project, Buchanan County had an opportunity to use the free eSPAN140 web-based design tool developed by members of the Short Span Steel Bridge Alliance (SSSBA). The tool includes standard designs and details for short-span steel bridges and for buried soil steel structures up to 140 ft long. It provides customized preliminary design solutions in less than five minutes, saving countless hours and costs for users.

With eSPAN140, the user enters information such as the bridge span length, number of striped traffic lanes, roadway width and skew angle. The web-based tool then creates a Solutions Book in PDF file format that offers standard designs for rolled beam, plate girder, and corrugated steel pipe and structural plate options.

The Jesup South Bridge was constructed in two months using the local crew to construct the bridge. Buchanan County has about 70 more short-span bridges that need upgrades or replacement. The county is already planning to use eSPAN140, and possibly steel, for future projects to accelerate the design process required for building a short-span bridge.

Life-Cycle Value

As part of an ongoing county-wide bridge replacement program, Ohio's Muskingum County Engineer's Office (MCEO) initiated the replacement of the structurally deficient Boggs Road Bridge in Perry Township, east of Zanesville, Ohio. The original 33-ft Boggs Road Bridge, constructed in the 1950s, had begun to show signs of deterioration and MCEO had already imposed weight limits. As a common practice, MCEO performed a detailed engineering analysis to compare the cost of replacing the existing bridge with steel or concrete.

Douglas R. Davis, P.E., P.S., county engineer for MCEO, compared the cost of five galvanized steel beams with the cost of six concrete box beams which were needed to replace the short-span bridge superstructure. He confirms, "The galvanized steel beams saved us more than $10,000. Since local crews would not need a crane to set 1.5-ton steel beams, which would be necessary for 17-ton box beams, we realized significant additional savings on materials and equipment rental. Added to the lower cost of materials and equipment, we also secured a 35-year warranty on the galvanized coating system and the ability to rehabilitate the steel in the future. The engineering analysis showed that steel was the best choice."

The in-house engineering team designed a 24-ft-wide steel beam structure constructed of five beam lines, 5 ft on center covered with a 9-in.-thick cast-in-place composite concrete reinforced deck with no skew, placed on new concrete abutments with spread footings. The team saved significant time and costs by planning and designing the structure in-house. The Boggs Road Bridge reopened on June 20, 2014.

Approximately 60%, or 248 bridges, of Muskingum County's 414 bridges are steel.

Davis says, "We've found that steel is strong and economical for our typical span lengths. It's easy to fabricate and construct, and its strength-to-weight ratio allows us to erect most structures without the use of a crane. Steel is also easy to maintain and repair, which promotes longevity of our structures. Finally, steel is recyclable and reusable. We have reused/repurposed several structures in other locations, saving tens of thousands of dollars. The cost savings of steel versus other materials—coupled with other advantages like sustainability and easy maintenance—mean that we can repair and replace more bridge structures and shorten road closures."

Davis also plans to use the eSPAN140 tool for short-span bridge design in the near future. To-date, more than 1,600 bridges have been designed using eSPAN140. ■

—Gary Crouch,
Sales Manager,
Nucor-Yamato Steel


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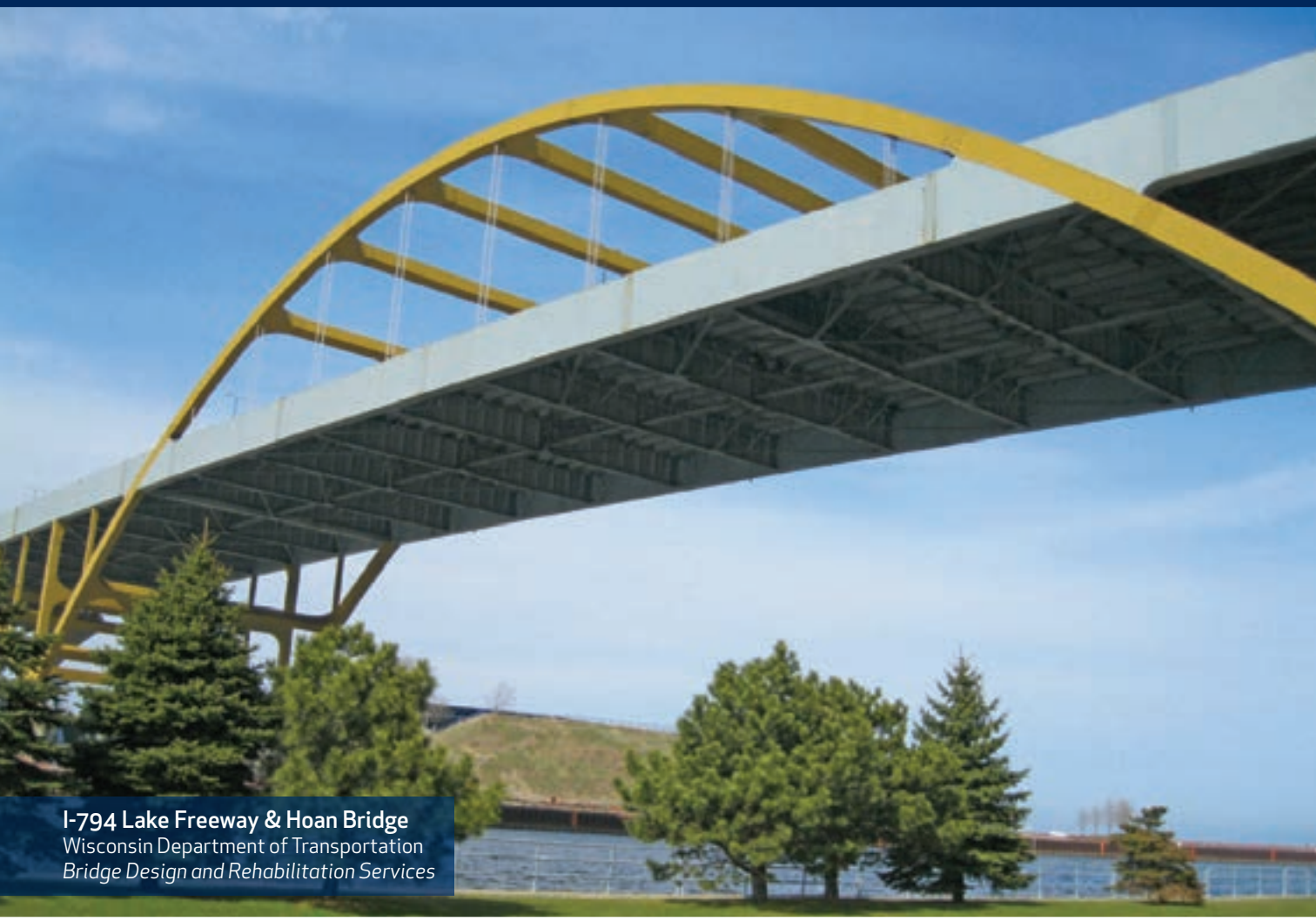

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P3 Team Readies to Rehab 558 Pennsylvania Bridges

The Pennsylvania Rapid Bridge Replacement Program to design and replace 558 bridges throughout Pennsylvania and then maintain those bridges for 25 years is among the most comprehensive public-private partnerships (P3) in the country. The three-year, $899-million design and construction portion of the P3 contract is the largest ever awarded by the Pennsylvania Dept. of Transportation (PennDOT).

Bridge rendering shows an example of how aesthetic treatments could be applied.

It's up to the Plenary Walsh Keystone Partners team, which includes the Plenary Group, The Walsh Group and Granite Construction Co., to complete the program with the design and engineering expertise of HDR.

HDR has a strong and enduring history of creating unique bridge design and construction solutions for the country's most challenging projects. The firm's ability to achieve an aggressive schedule and engineer innovative solutions was a critical factor in the selection process. Ultimately, the Plenary Walsh Keystone Partners team was able to develop additional time savings, allowing for the bridge replacements to occur eight months sooner than required.

Ken Wright, project manager with HDR, says, "Delivering the design for a program of this magnitude on such an aggressive schedule will require both the HDR design team and PennDOT to imagine new possibilities on how to deliver bridge designs in Pennsylvania."

Design is ongoing as the team prepares to begin construction in summer 2015 with a plan to complete all bridge replacements by year-end 2017. The commonwealth will retain ownership of the bridges, though the P3 team will be responsible for maintaining each bridge for 25 years.

HDR's experience with large multi-asset replacement projects includes the Oregon Bridge Delivery Partners joint venture, which provided program management, construction management and engineering oversight for the Oregon Transportation Investment Act III State Bridge Delivery Program. The $1.3-billion program included approximately 400 bridges on state highways. ■

Jobsite Safety Begins With Training

In today's fast-paced, increasingly complex construction environment, safety-conscious contractors look for rental equipment business partners who provide more than just tools to complete a job. True partners provide technical expertise, innovative solutions and on-site technical support and continuing operational training.

Every jobsite has its challenges and the unexpected is often the norm in any project. That's why Mabey Inc. has in-house engineers work with contractors to prepare P.E.-certified plans and site techs follow up to lend a hand in the field. Not only do engineers create plans prior to a project, they are also responsive with innovative ideas when the unexpected alters those plans. Mabey site technicians are pros at creating work-arounds or helping to implement changes in the field, and professional installation crews have expertly built temporary roads in any terrain using Mabey's composite DURABASE® matting system.

Continued education is imperative in keeping crews safe, and training can help a contractor finish a job ahead of schedule and under budget. Whether you are renting a bridge system, trench shoring, structural propping or a temporary roadway, choose an experienced professional team who will literally get in the trenches with you through hands-on training as well as classroom learning.

Partner with a rental equipment provider that offers technical support, engineering services and hands-on training for comprehensive jobsite safety. ■

Mabey Inc. power brace system readied for sheet and frame shoring system

Celebrating 90 Years of Bridge Building

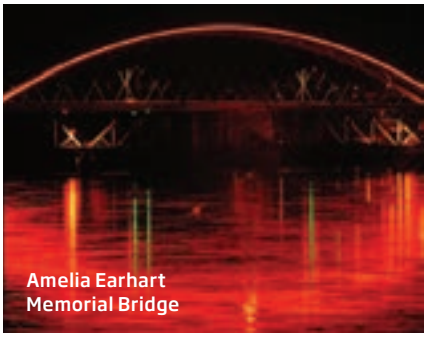
The bays, lakes and wetlands of the Gulf Coast form a unique and beautiful landscape. The bridges that traverse these waterways are among the world's longest. A key contributor to these crossings, Volkert was founded in New Orleans 90 years ago and is based in Mobile, Ala. The firm now has a national stature, but its Gulf Coast roots are evident in the design of these landmark bridges.

Most notably, the company designed the Lake Pontchartrain Causeway in Louisiana, the world's longest continuous overwater bridge at nearly 24 miles, and sixth longest overall, linking the New Orleans area with St. Tammany Parish. Volkert's design won an American Institute of Steel Construction Prize Bridge award.

Volkert also designed the Atchafalaya Basin Bridge, the third longest bridge in the U.S. and 14th longest in the world by total length at over 18 miles. The bridge links I-10 between Baton Rouge and Lafayette, La. In coastal Alabama, the firm designed the 7-mile-long Mobile Bay crossing, the 44th longest in the world. Known as the "Bayway," the dual, two-lane structures carry I-10 between Mobile and Baldwin Counties. The National Society of Professional Engineers named the bridge one of its annual "Ten Outstanding Engineering Achievements in the United States."

Volkert continues to build on these contributions. The firm recently completed a draft environmental impact statement for planned improvements to Mobile's Bayway. ■

The award-winning Volkert-designed Jubilee Parkway (Bayway) bridge carries I-10 over Mobile Bay.



Amelia Earhart Memorial Bridge

New Memorial Bridge Lights Up Missouri River

More than 1,000 ft of LED lights stretched along the new Amelia Earhart Memorial Bridge create a spectacular sight over the Missouri River. The new 2,500-ft, four-lane, tiered-arch structure, which connects Atchison, Kan. and Winthrop, Mo., replaces the previous two-lane structure built in 1938.

Capital Electric Line Builders, an MDU Construction Services Group company, supplied and installed the new bridge's lighting, traffic signals and utility conduit system.

Capital Electric Line Builders Project Manager Gary Wurdack says the company installed power distribution systems inside the bridge by crawling through 2-ft by 3-ft passageways in the steel girders. The crew drilled 12 holes through the 2-in.-thick steel girders from inside the bridge to power the exterior lights.

In addition, Capital Electric Line Builders installed high-candle-power search lights within the truss assemblies, 16 lighting poles and fixtures, 120 maintenance lights inside the arches and girders, a navigation lighting system and a traffic signal system with roadway interconnection and railroad pre-emption features. More than 3 miles of conduit and 35,000 ft of communication cable were installed on the bridge.

Throughout the nearly four-year project working in close quarters and at great heights, Capital Electric Line Builders experienced zero accidents. Kansas and Missouri Depts. of Transportation are joint owners of the bridge.

MDU Construction Services Group is part of the MDU Resources Group, Inc. family of companies. ■

PHOTO: KANSAS DOT

Big Picture **Delivery**

Oregon's $1.3 billion bridge program is leaving a legacy. Together with our partners, we collaborated with ODOT to customize and streamline the repair or replacement of nearly 300 bridges. By thinking differently, the program management team maximized savings and economic returns while reducing construction impacts. **This is where great begins.**

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The Case for Cable Dehumidification in Suspension Bridges

During main cable inspections, suspension bridge owners have found corrosion of the strands or parallel wires within the main cables. Historically, the solution, particularly in the U.S., was to oil and paint the cables. However, owners found that the oil would drain out of and dry within the cables, thus not guaranteeing that the corrosion was prevented.

In the late 1990s, the Honshu-Shikoku Bridge Authority developed a system for the Akashi-Kaikyo Bridge whereby dehumidified air is produced locally and introduced into the main cable at specified injection points. The dehumidified air is then blown along the length of the cable and expelled at exhaust points, collecting and removing moisture in the process, and reducing the relative humidity within the cables to below 40%. The system was effective, and subsequently successfully installed on a number of bridges in Europe and the United Kingdom. In the UK, all three long-span suspension bridges have been successfully dehumidified and dried using this technology.

Angus L. Macdonald Bridge, Halifax, Nova Scotia

As reported in numerous technical papers, empirical data from these bridges has proven that a forced air dehumidification system is the most cost-effective and successful means of inhibiting corrosion in both new and existing bridges. Recently constructed bridges in Norway and Turkey have had this system installed from the outset, guaranteeing the cable's residual factor of safety for the entire bridge design life.

American Bridge has been closely monitoring the development of this technology for application in North America. We are currently leveraging our world-class in-house resources in preparation for self-performance of cable dehumidification as part of the Angus L. Macdonald Bridge Suspended Spans Deck Replacement project in Halifax, Nova Scotia. Bridge cable dehumidification technology has been continually refined since its inception in the late 1990s, and American Bridge believes that our installation in Halifax will demonstrate the value of cable dehumidification systems to the North American market. ■

– Jim Mawson, American Bridge Company

PHOTO: AMERICAN BRIDGE

Supplier Plays Critical Role in Fast-Track Ohio River Bridges Project

As one of the largest transportation infrastructure projects in the country, the $2.6-billion Ohio River Bridges Project includes the construction of two bridges: the Downtown Crossing and the East End Crossing. Walsh Construction Co. is the lead design-build contractor for the Downtown Crossing that connects downtown Louisville and Jeffersonville, Ind.

Both projects will be completed in 2016, earlier and at less cost than previous estimates. For Walsh Construction, building bridges with efficiency, quality and safety is strongly dependent on qualified people and the ready availability of materials and supplies.

For concrete forming products and solutions to support the Ohio River Bridges Projects, Walsh Construction looks to Gamco Inc. Gamco is a primary supplier of formwork and shoring systems and accessories, as well as engineering expertise and detail drawings for the multi-year project. To-date, Gamco has provided overhang brackets, beam hangers, bridge deck and pier cap falsework, shoring systems, barrier wall forms, steel walers for gang forms and much more.

Matt Brown, senior superintendent for Walsh Construction, says, "We're about 62% done with the current Ohio River Bridges project and its firms like Gamco that are vital to our ability to complete projects with speed and ease." ■

Gamco Scaffold Shoring sets the foundation for safe, efficient bridge construction.

PHOTO: WALSH CONSTRUCTION

Ironworkers Build Iconic Bridges

City skylines would look very different without the help of ironworkers and their contractors: no skyscrapers, no office buildings, no stadiums and definitely no bridges.

For over 100 years, the ironworkers and their contractors have fearlessly played an instrumental part in building iconic bridges across the U.S. and Canada. From the Golden Gate Bridge in San Francisco, to the Tappan Zee Replacement Project currently under way in New York, to the Second Narrows Bridge in Vancouver, ironworkers are building and restoring our busiest transportation thoroughfares. Without ironworkers' dedication, transportation would be very different. There's no limit to what ironworkers can do. Ironworkers are working to repair and rebuild American's crumbling infrastructure to ensure the public's continued safety for years to come.

That's why IMPACT is committed to recruiting, training and delivering the safest and best-trained ironworkers in the world to build North America. There's one name you can trust in the construction industry: Ironworkers.

IMPACT offers world-class training and apprenticeships for the highly skilled men and women eager to build the structures we depend on every day. Available at more than 150 locations across the U.S. and Canada, IMPACT's top-of-the-line apprenticeship program delivers the best ironworkers in the world. ■

Learn more at www.ironworkers.org/become-an-ironworker/apprenticeship.

Aerial view of the New NY Bridge project site from Westchester County

Michigan's 'Free Bridge' Incorporates Slip-Resistant Sidewalks

The historic truss swing Grosse Ile Parkway Bridge (also known by residents as the Free Bridge) spans the Trenton Channel connecting the island of Grosse Ile, Mich., to the city of Trenton, Mich. Constructed in 1932, the bridge has undergone a number of renovation and upgrades to support its increasing use by cars, bikes and pedestrian traffic.

The most recent renovation focused on replacing the bridge's decking, sidewalks and pedestrian walkways. To support the project, Ohio Gratings, Inc. supplied over eight truckloads of galvanized steel industrial grating and plank grating for the decking, sidewalks and walkways.

For the walkways, the contractor specified ADA-compliant aluminum planks with a diagonal punched pattern coated with medium grade 2 slip-resistant aluminum coating from SlipNOT®. In total,

Aluminum extruded plank grating on Grosse Ile Bridge with slip-resistant coating

over 9,000 sq ft of 2-1/2-in. x 3/16-in. coated aluminum extruded plank grating was prepared for the renovation project. The coated planks provide a durable, non-corrosive slip-resistant surface in all directions of travel.

The Grosse Ile Parkway Bridge has 10 steel girder spans, each 118 ft long, and a single camelback through truss swing span 340 ft in length, yielding a total length of 1,350 ft. The structure was originally built for the Michigan Central Railroad by Augustus J. Dupuis Company of Detroit. ■

Bayonne Bridge Project Gets a Lift from Reinforced Earth Walls

The historic 1,671-ft Bayonne Bridge steel arch bridge across the Kill Van Kull channel connects Bayonne, N.J., to Staten Island, N.Y. To prepare for longer and wider ships that will come through the Panama Canal starting in 2016, the Port Authority of New York and New Jersey is raising the bridge's roadway by 64 ft, from 151 ft to 215 ft.

The new approach roadways must climb the extra 64 ft to reach the raised bridge. The new approaches, partially on retained fill and partially on viaduct, are being constructed of MSE retaining walls. Wall heights vary by location, but as much as 30 ft of that climb is accomplished on permanent Reinforced Earth® retained fills.

The project is being constructed in two phases to maintain traffic flow: first northbound (New York to New Jersey) with all traffic using the old roadway, then southbound while all traffic uses the newly constructed northbound lanes, then opening all lanes, with project completion in mid-2017.

A temporary wire mesh facing supports

A Reinforced Earth® wall with 5-ft x 10-ft precast panel facing and smooth steel form finish will support the new roadway.

the half-wide Phase 1 roadway. Since the temporary facing is wire mesh, it will behave just like the rest of the embankment, eliminating the chance of a hard spot in the center of the finished roadway. The Phase 2 construction will butt up to and bury the temporary wall. The project is on track for completion by end of 2015. ■

PHOTO: NEW YORK STATE THRUWAY AUTHORITY

Engineer Extraordinaire Honored for Lifetime Achievements

Edward (Jack) D. Geer was perhaps born to build. Jack studied electrical engineering in college as a tribute to his father who had dreamed of becoming an engineer. However, while engineering was certainly his calling, Jack quickly found that his passion was on the civil side.

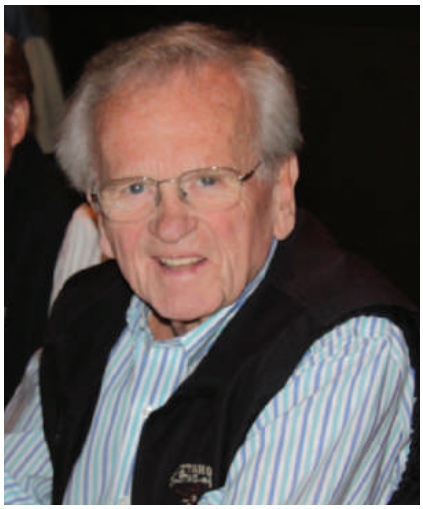
He joined the Army in 1952, serving as a platoon leader for the Engineer Construction Battalion in the Korean Combat Zone. After his tour of duty, he took a job with Bethlehem Steel to engineer structural systems for powerhouses, buildings and missile sites. It was his work in the steel industry that set the foundation for a long and illustrious career, one that would include significant contribution to some of the world's most famous bridges.

In his role as an engineer and project manager, Jack was integral to the construction of the San Mateo-Hayward Bridge in San Francisco, the Fremont Bridge in Portland, Ore. (the world's heaviest lift in 1973), the Snake River Bridge in Twin Falls, Idaho, and the Mississippi River Bridge at Vicksburg, Miss. to name a few.

In 1974, he joined Tokola Corporation, an engineering and project management company. As an integral part of Tokola's executive team, he managed key projects all over the world. He took over as president of Tokola in 1982.

When asked, Jack speaks most proudly of his involvement with four different retrofit projects on the Golden Gate Bridge, including the replacement of suspender cables. He was also a key member of the team that performed the rapid repair of Chicago's landmark Michigan Avenue Bridge.

Like the signature bridges that he helped build, Jack is an icon in the bridge-building industry—a man who embodies the definition of engineering with innovation. Danny's Construction is honored to have Jack Geer as a longstanding member of its Board of Directors and leadership team. He continues to be a key voice in shaping the next era of signature bridges. ■



Danny's Construction Company honors Edward (Jack) Geer.

Precast Elements Speed Construction at the New NY Bridge

At the New NY Bridge in Tarrytown, N.Y., one of the major activities Tappan Zee Constructors is currently performing is construction of the waterline footings, which are the large concrete elements on top of piles that become the foundation for columns and pier caps.

The new 3.1-mile-long bridge alignment calls for 60 total from bank to bank. Tappan Zee Constructors is utilizing precast tubs to speed the construction process. The four types of precast elements range from approximately 365 to 550 tons and, with the exception of the four largest, are set with Traylor Bros.' Manitowoc 4600 ringer crane, the "Hank Hummel."

The Hank Hummel 4600 ringer crane sets a precast tub to efficiently form the waterline footings on the New NY Bridge project in Tarrytown, N.Y.

Conventional construction of the waterline footings consists of multiple steps: installation of a temporary cofferdam; sealing the bottom and dewatering; forming and pouring concrete; removing forms; and finally, removing the temporary cofferdam. To make this process more efficient, Tappan Zee Constructors is pre-casting the shell of the majority of these elements off site. The concrete "tubs" are cast in Cape Charles, Va. and brought to the jobsite on barges. Once they arrive, they are lifted and threaded over the pre-driven piles. The annular spaces around the piles are then grouted, the interior dewatered before rebar installation, and then concrete operations are completed.

This process provides multiple schedule-related benefits. Off-site construction of precast tubs and on-site pile driving are able to occur simultaneously, rather than in succession. The "tub" concept requires no temporary cofferdam, eliminating the time it takes to build and remove the temporary structure. Additional benefits include minimizing impacts to the environment by eliminating temporary structures to be constructed or removed in the river.

As of April, 24 of the 60 waterline footings have been set. The remainder will be complete by November 2015, followed by column and pier cap construction. ■

It's Time to Take Bridge Preservation Personally

Faced with ongoing budget challenges, transportation agencies know that effective management of transportation assets is vital to a safe, viable system. While pavement assets represent agencies' largest investment, bridges represent the greater risk to the public if they fail. However, while the most important aspect of any asset management plan is preservation, bridge preservation remains an under-appreciated component of the process.

The inherent value of preservation is apparent in our personal lives; whether it is the routine oil change at every 5,000 miles or cleaning the gutters on one's home. Transportation professionals must begin to take bridge preservation personally and work with transportation agencies to elevate bridge preservation conversation to the same level as bridge replacements.

How do we get there? Advocacy, research and training are good places to start!

The current transportation funding debate at national and state levels is an opportunity to raise awareness for bridge preservation. Funding needed to meet MAP-21 performance metrics, in terms of keeping most bridges in good and fair condition, is much less than replacing bridges in poor condition. We have gone down the "fix the worst first" road before, only to learn that needs far outweigh resources.

Preservation advocacy through participation in debates and discussions at every opportunity will bring focus to bridge preservation's long-term benefits to our transportation infrastructure. AASHTO, the Transportation Research Board (TRB) and Federal Highway Administration (FHWA) promote bridge preservation. AASHTO initiated the Bridge Preservation Partnerships as part of its TSP2 Program, and the AASHTO Subcommittee on Bridges and Structures devoted Technical Committee T-9 to bridge preservation. In 2014, the TRB elevated the Joint Task Force on Bridge Preservation to full Subcommittee status (AHD-37). FHWA and the National Highway Institute (NHI) recently engaged Michael Baker International to develop a three part, web-based Bridge Preservation training course.

Let's raise awareness about the benefits of long-term bridge preservation.

All transportation professionals must support efforts to implement strong research and training programs and make bridge preservation the cornerstone of every effective bridge asset management plan. ■

*— Richard W. Dunne, P.E., Director of Structures, Hamilton, N.J., Michael Baker Internationa*l

PHOTO: (BOTTOM) MICHAEL BAKER INTERNATIONAL

Customized Formwork Speeds Intracoastal Bridge Construction

The 3-mile-long Route 72 causeway connects Long Beach Island with Ocean City, N.J., carrying traffic over the Intracoastal Waterway on the Manahawkin Bay Bridge and three trestle bridges. All four bridges show signs of age and deterioration even as marine and highway traffic increases. In response, the New Jersey Dept. of Transportation initiated the $90-million Route 72 Manahawkin Bay Bridges Project which includes the construction of a new structure parallel to the existing Manahawkin Bay Bridge as well as the rehabilitation of the other four bridges.

The new Manahawkin Bay Bridge will have the same tapered, radial style as the existing bridge along with pedestrian and bicycle access. The contractor, Schiavone, designed custom-fabricated steel girder panels to handle the slope, radius and taper of the new piers and caps. Approximately 10,000 sq ft of rental formwork and custom steel radius soffit forms are needed to support the project.

The Doka engineering team developed the formwork concept for the new bridge, calling for custom forms and standard steel girder forms for two of the tallest piers. Self-spanning girder panels were also used for the massive caps. Using Doka customized Steel Girder Formwork, Schiavone was able to span large distances without any additional support or shoring. The forms are modular and can be ganged and picked in large sections, increasing production time.

The all-steel, modular, waler-less, large-size panel system is best suited for columns, piers, pier caps, beams, retaining walls, foundation walls and culverts. It achieves faster pour rates and quicker assembly, while spanning large distances without intermediate support.

Doka's steel girders span large distances without any additional support or shoring.

"With the girder forms, we don't have to put up any shoring to let it cure for the 21 days it's required. We can just leave the form up there and jump up to the top to do all the beam seats. So it's another time saver for us," says Rob Slevins, Dockbuilder general foreman with Schiavone. ■

To hear about Schiavone's experience using Doka Formwork, visit http://bit.ly/Manahawkin