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Nockamixon Township: Historic Bridge Restored to Safety and Beauty

If you've ever enjoyed a scenic drive on Old Easton Road through Bucks County's Nockamixon Township, you may be familiar with the historic bridge over Gallows Run. Built in 1826, Bucks County Bridge No. 223 was closed in May of last year after an early spring flood event led to the partial collapse of the structure.



At the time of the flood, Bucks County enlisted the help of Carroll Engineering Corporation (CEC): "We performed an emergency inspection, and then provided the County with recommendations for repair, reconstruction or replacement," explains Paul Cardie, manager, CEC Structural Engineering Department. All work was coordinated through Bucks County Director of Public Works Joseph A. Bush, Jr.



Because of the bridge's historic and contextual value, the County opted for rehabilitation — which would allow for structural repairs while maintaining the bridge's appearance. To that end, CEC performed survey and structural design work, prepared plans and specifications, and helped the County obtain emergency quotes.

"In addition, the CEC team obtained an emergency Pennsylvania Department of Environmental Protection permit for the project," Cardie notes. "We also secured erosion and sedimentation

approval from the Bucks County Conservation District and coordinated with the Pennsylvania Department of Transportation for the installation
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From My Chair

Harry J. Barford, Jr., P.E.



From skyrocketing oil prices to a less-than-encouraging housing market, it's easy to feel frustrated by today's economy. That's true whether you're running a business or balancing a household budget. As the pundits stay busy outlining the reasons for today's economic woes — and making predictions about when the situation will improve — the rest of us are left to carry on with our professional and personal responsibilities.

Life, and business, must go on.

While it's arguably easier to operate in a booming economy, I think it's worthwhile to see the "silver lining" in an economic downturn. Times like these serve as a reminder of the importance of discipline, vision and good, old-fashioned common sense. (You know the cliché: If something seems too good to be true...) When an organization adheres to such values, it usually survives or even thrives — despite bleak economic indicators.

Those of us who have survived a downturn (or two or three) know that today's economic conditions will eventually improve. It might not be tomorrow or even next month. In the meantime, I encourage you to do what we're doing at CEC:

1. Continue focusing on your organization's core mission.
2. Shore up your commitment to meeting clients' needs.
3. Get creative about how you can deliver your products or services more cost-effectively.

In other words, stay so busy, so productive and so disciplined that your organization becomes stronger than ever. Then you'll be well-positioned to enjoy the eventual economic upturn — even if it doesn't mark the return of \$2-a-gallon gas. •

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of traffic control measures along Route 611."

The rehabilitation project was awarded to Bi-State Construction Company in the fall of 2007. As Cardie explains, the rehabilitation was complex — involving removal of the existing roadway to expose the entire top surface of the arches. "The arches were then repaired, and the collapsed portions were rebuilt," says Cardie.



But prior to performing that work, the contractor had to install temporary timber supports within the arches to keep them intact during the rehab process — and to serve as a "template" for the portions of the arches that needed to be rebuilt altogether. In addition, the contractor constructed concrete collars at the face of the abutments and center support; reconstructed both spandrel walls; reconstructed two stone wingwalls; reconstructed all parapet caps; performed stone repointing of the entire structure; and repaved the approaches.

"The project was further complicated by how close the bridge is to Route 611," Cardie adds. "The east end of the bridge is only 10 feet from the edge of the road. Since the depth of excavation over the arches reached about 20 feet below grade, the contractor also had to install sheeting and shoring along the edge of Route 611."

The typical timeframe for a project of this scope funded by PennDOT is usually about three to five years from the onset of design to completion of construction. However, since this bridge is one of only two bridges serving the community, the County could not wait that long for this bridge to be reopened. Consequently, the County funded the project itself and the design and construction process was completed in one year — restoring Bucks County Bridge No. 223 to a state of safety and beauty. •

Water Distribution System Modeling for the 21st Century

Through computer modeling of water distribution systems, CEC has recently enabled several clients to determine the feasibility, cost effectiveness and impacts of proposed projects.

“While the basic physics and equations for modeling water distribution systems haven’t changed through the years, complex modeling software has now replaced columnar pads and slide rules,” explains Brian Morrison of the CEC Authority & Municipal Services Department. “As a result, we can now create dynamic models that can be easily updated as an actual distribution system changes.”

To do so, CEC has invested in the latest distribution system modeling software: WaterCAD® by Bentley Systems, Inc. The firm has also invested in training for staff — enabling them to help clients better leverage their infrastructure investments.

By integrating WaterCAD with AutoCAD®, CEC engineers can create dynamic system maps that indicate the locations of features of the piping network. What’s more, this tool supports generic “what if” scenarios simulating events — from the construction of an interconnecting water main to the addition of a new water source, a pressure-reducing valve or a pressure-sustaining valve.



The computer model can also help in preparing response plans for a range of emergencies, such as pipe breaks, fire flow scenarios, power outages and contamination.

It isn’t necessary to enter every pipe and node in an existing water system to enjoy the benefits of computer modeling. Depending on an organization’s objectives, it may be necessary to include only the “backbone” of the system or the particular portion or corner of interest.

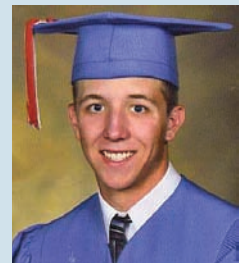
Whatever your goals for optimizing a water distribution system, consider the power and efficiency of CEC’s computer modeling capabilities. •

FYI from CEC

- **Charity recycling program:** This summer, CEC joined the AbitibiBowater Paper Retriever “What’s Your Goal” paper recycling program. If CEC meets the goal of eight tons by the end of August, \$250 will be donated to the Cradles to Crayons nonprofit organization. According to Cynthia McLaughlin, who oversees the program, over 1.4 tons were recycled in May.
- **Stop by our booth:** Check out CEC’s booth at the Pennsylvania Municipal Authorities Association’s 66th Annual Conference and Trade Show in Hershey, Pa., September 7 to 10. Don’t miss Executive Vice President Ken Heydt’s presentation about Wastewater TMDL Issues and Updates on September 9.
- **Crushers softball is back:** With the season in full swing, the Carroll Crushers are looking toward the playoff for the second straight year and eyeing a championship. The team plays weekly through mid-August and uses Warrington’s Palomino Park as home field. Catch the excitement of Crushers softball!
- **Summer picnic:** On June 7, CEC held a summer picnic for employees and their families at the Philadelphia Sports Club in Chalfont.

Accolades

- CEC congratulates **Tom Crawley** and **Greg Hucklebridge** for earning certifications as Professional Engineers. Tom and Greg both work in the Planning & Site Design Department.
- CEC congratulates **Mike Shinton** for graduating from Drexel University and passing the Engineering In Training exam. Mike works in the Traffic & Transportation Department.
- CEC welcomes new employees — **Jean Marie Tucker** in the Accounting Department and **Joanne Powell** in the Planning & Site Design Department.
- Congratulations to **Kevin West** — a 2008 graduate of Central Bucks High School East and recipient of CEC’s 2008 Scholarship. This fall, West will attend Pennsylvania State University to study chemical engineering.



BUILDING CHANGE: MAJOR PROJECT TO ENHANCE FACILITIES FOR WILLIAM TENNENT HIGH SCHOOL

William Tennent High School — the only high school serving Centennial School District — first occupied its current facility in the 1970s. As the school has grown to nearly 2,100 students and its facility has aged, Centennial School District officials began to explore options for renovating and/or replacing structures on the William Tennent campus.

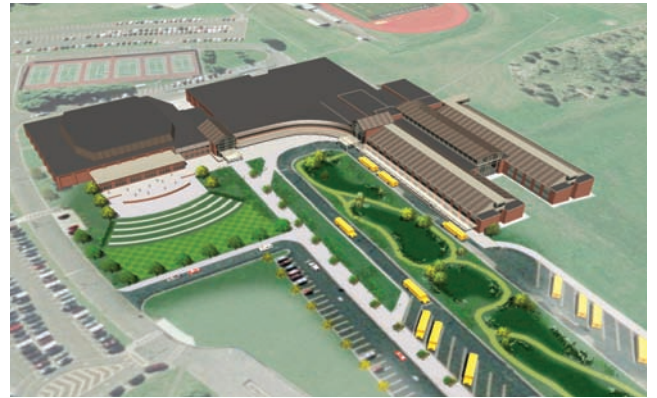
As with any project of this size and scope, the process has been a long and careful one, and it has culminated in the District's plan to:

- Renovate the school's 150,000-square-foot "B" Building, which contains the gymnasium, auditorium, natatorium and associated support facilities
- Replace the 200,000-square-foot "A" Building with new classroom wings
- Construct other additions to provide entries, lobbies, vertical circulation and other "public" spaces
- Extend and revise the existing vehicular and pedestrian paths

Centennial School District hired Burt Hill Architects, who in turn enlisted Carroll Engineering Corporation (CEC) to perform all site-related engineering. As Greg Hucklebridge of the CEC Planning & Site Design Department explains, CEC's

portion of the project involves reconfiguring parking lots and driveways throughout the site, relocating tennis courts, designing stormwater management facilities, pursuing Land Development approval from Warminster Township, and obtaining a National Pollutant Discharge Elimination System (NPDES) permit through the Bucks County Conservation District.

"We expect to have plans before the Township in the fall, with approvals slated for the spring of next year," Hucklebridge says, adding that construction is tentatively scheduled to begin next summer and that the target completion date is 2011. •



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