PCANY MONTHLY NEWSLETTER

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2013 PCI Design Awards Winner *Best Total Precast Concrete Bridge*

Route 112 Bridge over the Kearney Brook, Worthington, Massachusetts

The Route 112 Bridge over Kearney Brook in Worthington, Mass., is part of the state's multi-billion-dollar, eight-year accelerated bridge program to fix bridges that have been deemed structurally deficient. It is also one of the first bridges in Massachusetts built with precast concrete abutments, though it surely won't be the last.

"The goal of the project was to reduce road user impacts by reducing the construction time of the bridge," says Michael Culmo, vice president of structures and transportation for CME Associates in East Hartford, Conn. By choosing an all–precast concrete solution, the designers were able to deliver a high-performance, cost-effective bridge in far less time than a traditional design.

Setting first footing piece

Setting first wingwall

Setting abutment pieces

In traditional bridge construction projects, the Massachusetts DOT would build the structure in stages over two years, Culmo says, but one of the goals of the accelerated bridge program is to accelerate construction so that all lanes of traffic are open before the winter shutdown. Designers were able to accelerate construction substantially by replacing the deteriorated single-span steel bridge with a more durable prestressed, precast concrete span that features a two-lane roadway curved with a radius of 920 ft (280 m).

"Precast concrete for all portions of the bridge is the tool that allows this approach to work," Culmo says. "By prefabricating the ele-

(continued on page 2)

Route 113 Bridge *(continued from page 1)*

ments off-site in a fabrication plant, the majority of the construction is completed before a shovel is placed in the ground, and construction was completed in 60 calendar days."

Erection of the bridge could have been accomplished in even less time, Culmo says; however that would have led to cost increases. "The goal of this project was to build in a reasonably fast time frame, balancing construction speed with cost-effectiveness," he says.

The only significant cast-in-place concrete on the project was the bridge deck topping. To simplify that process, the team used Northeast Extreme Tee (NEXT) beams as the deck forms, which meant that the contractor simply had to form the sides and ends of the deck. The NEXT beam was developed for the purpose of promoting greater uniformity among DOTs, engineers, and the precast concrete industry of the Northeast with respect to planning, designing, fabricating, and constructing highway bridges with the Federal Highway Administration's philosophy of accelerated bridge construction.

During construction, the team placed the full 8 in. (200 mm) reinforced, high-performance concrete deck on top of the 4 in. (100 mm) thick top flange of the beam. "This technically results in a deck thickness of 12 in. (300 mm), which will provide a very durable, long-lasting structure," Culmo says.

Setting NEXT 32F beams

Next Beams installed on bearing pads

Setting approach slabs

It's also cost effective. "Preliminary investigations by several fabricators indicate that the NEXT beams could be as much as 40% less expensive than traditional beam slab bridges," Culmo says. The savings is realized by simplifying the fabrication process, reducing the number of elements that need to be handled, and eliminating traditional deck forming. "The lack of forming and form stripping can offset the cost of additional concrete used in the deck."

Thanks to Lee Edwards, Dailey Precast, for the photos and facts: This bridge consists of 8 footing pieces, 6 abutment wall sections, 4 wingwalls, 4 guardrail transition bases, 8 approach slabs, and 3 NEXT 32F Beams with integral backwall cast on each end.

PROJECT CREDITS

Owner: Massachusetts Department of Transportation, Boston, Mass.
Engineer of Record: CME Associates Inc., East Hartford, Conn. (also Photo Credit)
Precaster: William E. Dailey Precast LLC, Shaftsbury, Vt.
Precast Concrete Specialty Engineer: Calderwood Engineering, Richmond, Maine
Contractor: J. H. Maxymillian Inc., Pittsfield, Mass.
Total Cost: $900,000
Bridge Length: 64 ft. 6 in. (19.7 m)

Story and photos taken from: *2013 PCI Design Awards*

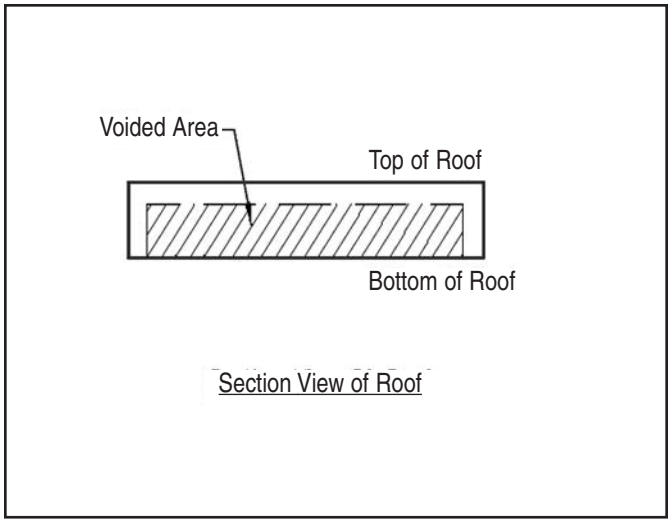
Welcome Ronald Thornton, PE,
next PCANY Executive Director

Starting January 1, Ron will take over for the "retiring" Carl Buchman. Since Carl lives in Rochester, and Ron lives in Binghamton, look for many detail changes to be announced, such as a new mailing address, phone numbers, etc. If you need to reach Ron sooner, his phone is 607-595-1636, email is rthornton2@stny.rr.com, and address is 31 Riverview Ave, Binghamton, NY 13904.

Precast Reservoir Covers Upgrades Letchworth State Park

Letchworth State Park was looking to replace the wood roofs over three of their water reservoirs. The issue was the new roofs needed to be water tight, and with normal planks, the expansion and contraction of so many pieces with an overlay was a concern.

Lakelands approached the engineers prior to the bid for a value engineered design to reduce the planned joints and the overall cost of on-site work by making custom roofs that could be wider, reducing the number of joints. The new design also incorporated an overhang of the reservoir which would have been cast in the field by the General Contractor, CCS Pipeline.



Section View of Roof

With the reservoirs having a clear span of 25'-0" the roofs were voided in the center to reduce weight allowing the contractor to handle the roofs with two excavators, tracking the roofs up the mountain and setting them on preset shims.

The joints were then sealed with backer rod, caulk, 3" butyl sealant and a galvanized tin cap screwed to galvanized dovetail cast on either side of the joints. All five sections of this reservoir unit were delivered and set in one day.

Thanks to Chad Bond, Lakelands Concrete Products Inc., for this article and the photos.

Metro Fire Station, Nashville, TN, Storm Capture Detention System

To detain stormwater runoff at the Metro Fire Station #21, the Metropolitan Government of Nashville and Davidson county elected to remove an aboveground detention pond and construct an underground stormwater detention system to gain back valuable land for parking during the recent replacement of the facility. In the final design, Oldcastle Precast's Storm Capture® stormwater management system was chosen and subsequently constructed under the entrance road, since it reduced the detention system width and overall footprint by over 40%, and easily fit under the fire station roadway. For additional information, go to www.stormcapture.com/content/pdfs/CaseStudy_OldcastlePrecast_FireStation21.pdf.

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