Sibley Pond Bridge Replacement, Canaan-Pittsfield, Maine

Bridge Open to Public 10½ Months Ahead of Schedule

The 10 span 790 ft long Sibley Pond Bridge with integral abutments and with only one expansion joint in the middle of the bridge was opened to traffic on November 21, 2011; before winter and approximately 10½ months ahead of the MaineDOT’s scheduled project completion of October 2012. The bridge was designed and completed in 15 months.

The selection by the Lane Construction Corporation/Parsons Brinckerhoff Design-Build Team of the NEXT D beam (New England Extreme Tee) with its integral precast deck enabled the bridge to be erected very rapidly due to maximizing precast and limiting cast-in-place field concrete construction to continuity place-
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The bridge spans over a shallow pond/peat bog with increasing thickness of organic soil deposits and depth to rock toward the middle of the bridge. As a result, fixity is provided at each semi-integral abutment supported on H piles driven to rock. Each intermediate pier is supported on a single row of 4 - 2 ft. diameter concrete filled steel pipe piles which are designed to flex as “lollipop piers” as the bridge expands and contracts. There is a single expansion joint located in the middle of the bridge at the crown of the roadway vertical curve.

Full depth cast-in-place concrete pier diaphragms will be provided at the piers and the longitudinal top slab continuity rebars that extend from the end of adjacent precast beams will be spliced using mechanical couplers. Transverse continuity will be achieved using 8 inch wide non-shrink high performance concrete closure pours, with interlocking headed stud anchors that protrude from the precast beam flanges. The deck will be protected from chlorides by a high performance waterproofing system and hot mix asphalt at variable depth to compensate for the beam cambers.

In April 2010, the design-build team of The Lane Construction Corporation and Parsons Brinckerhoff (PB) submitted to MaineDOT the best value and lowest bid for the replacement of the existing Rt. 2 Bridge that spans over Sibley Pond. In June 2010, the team received notice to proceed. The new 2-lane bridge is 36 ft curb to curb, 790 ft long (i.e. 10 - 79 ft spans), and straddles the Town lines between Canaan and Pittsfield, Maine. The bridge is comprised of two 5-span continuous units using the new PCI New England 36 inch deep NEXT D precast inverted T beam sections. The NEXT D beams with their full depth top slabs (unlike the NEXT F beams which require a cast-in-place topping slab) were selected by the design-build team for their economy, speed of erection, and since the deck is both precast and prestressed, for its potential to meet a 100 year life expectancy with minimal maintenance as specified by MaineDOT’s RFP.

The beams were erected using a gantry crane running transversely on rails from the partly demolished existing bridge and across the new piers while Rt. 2 traffic was using a 2-lane temporary detour.

First NEXT “D” Project Underway in Maine

The Sibley Pond Bridge in Canaan-Pittsfield, Maine was built in 1939, after 72 years of service this concrete bridge is ready for its replacement to take over. Under the Maine Department of Transportation (MaineDOT) the new bridge would need to be cost effective with a minimum 100 year design life, low maintenance, and minimal impact to the traveling public.

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Fast, Faster…Wicked Fast – Accelerated Bridge Construction

There is no such thing as fast construction on a bridge…when you are sitting in traffic. Bridges are complicated to replace and keep traffic flowing, but the MASSDOT has found a way to minimize the pain.

Accelerated Bridge Construction (ABC) is being used on the Phillipston Bridge in Massachusetts, and it is reducing construction time from years to months. This method involves building the bridge, or the major bridge elements, nearby. When the new bridge is ready the existing bridge is demolished and the new bridge is eased into place using cranes or self-propelled trailers. Although the bridge is shut down completely, the duration is only 202 hours rather than weeks or months.

One of the keys to this ABC (Accelerated Bridge Construction) method working smoothly is the Design/Build relationship between the designer, in this case TranSystems, and the contractor, SPS New England. Their ability to work together has proven equally time saving as has the method of construction. Problems are solved and avoided by working together.

Precast concrete abutment caps and approach slabs were placed after the demolition of the existing bridge superstructure to facilitate the rapid installation of the new superstructure. Precast barrier rail sections were used to bridge between the cast-in-place rails on the approach and on the bridge structure. Precast concrete abutment caps, approach slabs, and barrier rail sections were produced by J.P.Carrara & Sons, Inc., Middlebury, VT.

This project was started in May 2010 and the new bridge was in place on November 1st. The Phillipston Bridge proves that ABC is a doable system that effectively replaces a deteriorating bridge without the costly and irritating traffic delays. This is now a proven success and MASSDOT has several more of these projects already on the drawing board. Thanks again to Mike Weigand, J.P.Carrara & Sons for submitting this article and accompanying photographs.
Congratulations to Ron Thornton, P.E. of Delta Engineers & Land Surveyors, who represented ASTM International at this year’s Reunion Del Concreto Conference, held in Cartagena, Colombia. Mr. Thornton delivered two presentations at the conference. “Standards for Precast Concrete Products” provided a high level overview of the ASTM mission and organizational structure as well as discussing the benefits of industry standards and how those standards are established. The second presentation, “Super Bowl Pedestrian Promenade Precast Concrete Alternate”, described a project that used precast concrete as a design solution for a high profile and time-constrained project. Delta’s role in the project related to the conversion of the underground sluce way design from a cast-in-place process to a design solution that employed precast concrete. This enhancement reduced the overall construction time for the project and ensured that the pedestrian promenade would be ready in time for the Super Bowl.

And Congratulations to PCANY Professional Members: CDM Smith, named as one of the top New England Contractors on the September ENR Annual List, and on making special ranking notations in several top categories; and AECOM, named in the top 50 Architectural Firms.