



Road Business

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On the Road in New Hampshire

Fast Track Bridge

NHDOT and UNH researchers recently designed a 117 foot by 28 foot bridge for the Town of Epping. They integrated proven technologies to achieve construction speed and affordability. With demolition, using normal designs, the bridge would have been closed for over four months. This project closed the bridge for only 6 weeks. This article describes the innovative design features so others can apply them to their projects.

With conventional designs, building the bridge would have taken several months. With innovative design and coordination, the contractor erected the bridge in 8 days. Erection could have taken 7 days. However, two hurricanes delayed the contractor, R. M. Piper Construction Company. He had to add sand bags to stop flooding, repeat the dewatering process, and clean up silt.

The off-site fabricator cast the 48 inch wide by 36 inch deep box girders using a very high slump

concrete mixture. Crews assembled reinforcement in the forms, used Styrofoam to create voids, and filed the forms with the high slump concrete.

The fabricator built footers, abutments, and wing walls off-site using self-consolidating concrete (SCC), which sped up fabrication and reduced costs. Because SCC does not require a vibrator, one person worked on each pour rather than the 3 to 5 needed for conventional concrete. On-site, excavation and pouring concrete subfooters, using flow-able fill, took less than 3 days.

An abutment and the wing walls created a retaining wall. Reinforcement protruded out of the footers to fit into splice sleeves cast into the abutment and wing wall sections. This provided reinforcement continuity between the footers and the vertical sections. On-site, the contractor set abutment and wing components in channels on top of the footer sections. Cranes lowered abutment and wing wall sections onto the footers. The protruding footer reinforcement slipped into the splice sleeves. Crews then pumped grout into the splice sleeves to bond the footer to the abutment and the wing walls. Placement of vertical sections took less than a day.

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Milestones:

Stephen Gray retired from the NHDOT.

Mike Pillsbury was promoted to Highway Maintenance Engineer at the NHDOT.

Vic Richards, Town Administrator in Atkinson passed away in July.

Alan Swan retired from Derry.

Websites:

EPA NOI Website. Use the search features to view stormwater notices of intent (NOIs) for construction projects seeking coverage under EPA's Construction General Permit.

<http://cfpub1.epa.gov/npdes/stormwater/noi/noisearch.cfm>

Kansas Workplace and Equipment Safety Sheets

<http://www.kutc.ku.edu/pdffiles/WorkplaceFS.pdf>

National Transportation Library

<http://www.ntl.bts.gov/>

Signage for Business

<http://www.sba.gov/starting/signage/>

Traffic Calming <http://www.trafficcalming.org/>

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Each abutment and wing wall section took three quarters of an hour to grout.

The backfill was a well-graded crushed rock mixture compacted to 98%. The high quality backfill shorten this task to about one day.

Cranes placed the seven, 117 foot, 65,000 pound box girders. They were post-tensioned together and full depth shear keys were grouted. This took about a day and one-half. A 3½ inch wearing surface completed the bridge.

The bridge opened 8 minutes short of 8 days. Over a hundred residents traveled on horseback, in antique cars, and convertibles to participate in the Town sponsored ribbon cutting celebration.

This FHWA demonstration project was a joint effort of

- The NH Department of Transportation
- The Northeast Region of the Precast Concrete Institute Technical Committee
- The University of New Hampshire

The project demonstrated ways to construct bridges faster money. For more information, contact Prof. Charles Goodspeed at 603-862-1443.

