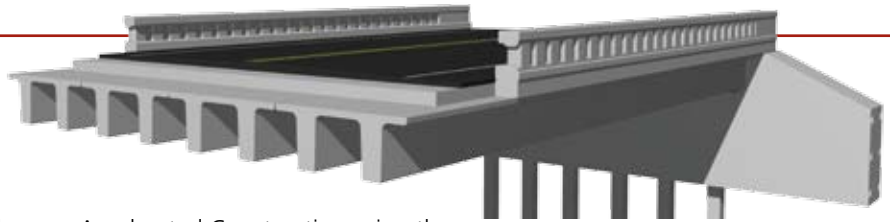




innovations

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SPOTLIGHT — BRIDGE ISSUE



PCI Northeast hosts workshops on Accelerated Construction using newly developed Northeast Extreme Tee (NEXT) beam

Over 300 people attended the PCI Northeast workshop on Accelerated Construction using the NEXT beam. The workshops were held in Rhode Island, Massachusetts, Vermont, Maine, New Hampshire, and Connecticut and introduced designers to the new bridge section called the Northeast Extreme Tee (NEXT) beam. The speakers for the workshop were **Michael Culmo** from CME Associates and **Rita Seraderian** from PCINE. The new section was developed by the **PCI Northeast Bridge Technical Committee** over the past two years. The committee which is a public private partnership of State Highway Departments, Area Precasters and Private Consultants, covers the six New England States and New York. Some of its important milestones have been the Development of the New England Bulb Tee (*PCI Journal* Article November-December 1997), Full Depth Deck Panel Guidelines, and its most recent document the Guidelines for Accelerated Bridge Construction.

Why Develop the NEXT Beam?

Adjacent Box Beams bridge systems have typically been the solution of choice for medium span bridges in the northeast region. The system does have limitations and over the years has not worked well for all types of bridge replacements. One major limitation is the accommodation of utilities across the width of the bridge. The box beam itself is a relatively difficult beam to produce because it involves multiple steps. The new section was proposed in concept by Rita Seraderian to the PCI Northeast Bridge Technical Committee in October 2006. All members felt this would be an excellent solution and approved the development of the new beam. The committee kept costs in mind while establishing the basic parameters for the new beam.

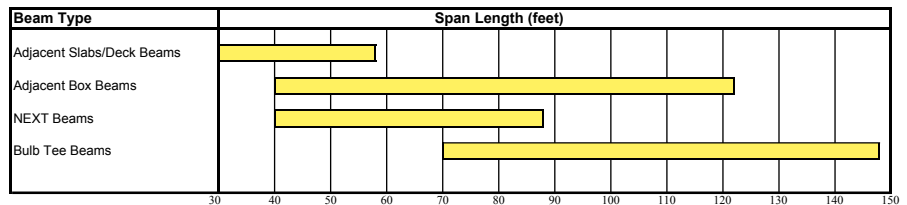
The section would be used for bridge spans from 45' to 90'. The chart (below right) shows how the new beam would work within the existing beam sections available in the northeast.

The section width would vary from 8'-0" to 12'-0" and the depth from 24" to 36". The section would not compete with the Northeast Bulb Tee which starts at a depth of 39". A single form could be used that would allow variation in the beam by adjusting the depth with fillers and the width using magnetic side rails. This would reduce the upfront cost of purchasing several form shapes. The new section would be easier to fabricate and it would require less pieces to construct a typical bridge. Shipping weights were also discussed and a weight limit was set at approximately 120,000 lbs.

The top flange was kept at 4" and would act as a stay-in-place form. The bridge would have an 8" deck cast over the section out in the field. The construction of the bridge would eliminate deck forming; joint details and parapet details would be easier, which in turn should accelerate the construction of the bridge and reduce construction costs.

The NEXT Beam has not been used on a project yet, therefore specific cost data is not available. The fabricators on the committee all feel that the NEXT Beam will produce a bridge with lower overall costs when compared to adjacent butted box beam bridges. There are several factors that will keep the cost of a NEXT Beam low. The NEXT Beam has virtually no deck forming. It uses only straight strand patterns, in place of costly draping techniques. There are fewer pieces to ship and erect. Additional workshops are planned for New York in 2009 (page 7).

PCI Northeast Bridge Beam Sections
Common Span Ranges



- Notes:
1. This chart is for information purposes. It should not be construed to mean specific limits.
 2. Common span ranges are shown for the type of beams listed.
 3. Minimum spans shown are based on common bridges. Shorter spans can be used for all beams. For instance, a bulb tee bridge can be built to a 40 foot span, but this is not common.
 4. Maximum spans are approximate based on previous and current studies. The maximum span length will vary depending on many factors such as number of beams, size of parapets and sidewalks, concrete strengths, etc.

www.pcline.org DOWNLOADABLE RESOURCES

- *NEXT Beam – Northeast Extreme Bridge Tee*, Report; Feb. 2008; pdf. (779.8 KB)
- *Guidelines for Accelerated Bridge Construction Using Precast/Prestressed Concrete Components*, Report; Oct. 2006; pdf. (4.1 MB)

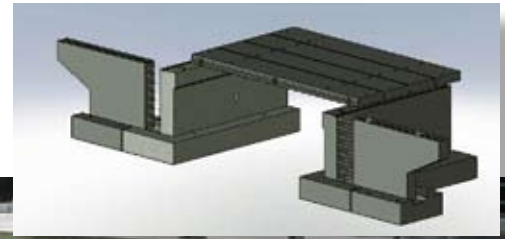
spotlight – bridge market

Two Bronx River Parkway Bridges widened in Three Months

Westchester County, New York initiated a project to reconstruct the **Bronx River Parkway** from Cemetery Road to Lafayette Avenue.

The project consisted of widening the highway and two existing bridges by approximately 20 feet. Montesano Brothers Construction working with Dailey Precast value engineered the CIP footings, abutments, and wing walls to a precast system. Precast, prestressed deck slabs were already part of the originally design. Considerable time was spent coordinating with the county, engineer and precaster to solve the design, fit, size, handling, and shipping issues required to meet the objective.

One bridge consisted of 15 precast pieces, while the other 13 pieces. Each bridge took one day to set footings, one day to set abutments and wing walls, and one half day to set deck slabs. The contractor had to complete the CIP joint and grouting requirements between and after settings along with the post tensioning of deck beams.



Owner: **Westchester County Dept. of Public Works**
White Plains, New York

Engineer: Berger, Lehman Associates PC
Rye, New York

GC: Montesano Brothers Inc.
New Rochelle, New York

Precaster: Dailey Precast LLC
Shaftsbury, Vermont

Original bridges: 45'- 2" wide with a span of 26'- 4".
Each bridge was widened by 20'- 6".



Time Line for the Project:

Bridge #1 – Excavation of Abutment the week of 8/18/2008.

Bridge #1 – Footings, Abutments, and Wing Walls installed 8/28 & 8/29.

Bridge #2 – Excavation of Abutment the week of 9/8/2008.

Bridge #2 – Footings, Abutments, and Wing Walls installed 9/18 & 9/19.

Bridges #1 & 2 – Deck Slabs (5 each) installed 11/12.

Bridges #1 & 2 – Pavement installed week of 12/10.

Bridges #1 & 2 – Guardrail Installed week of 12/19.