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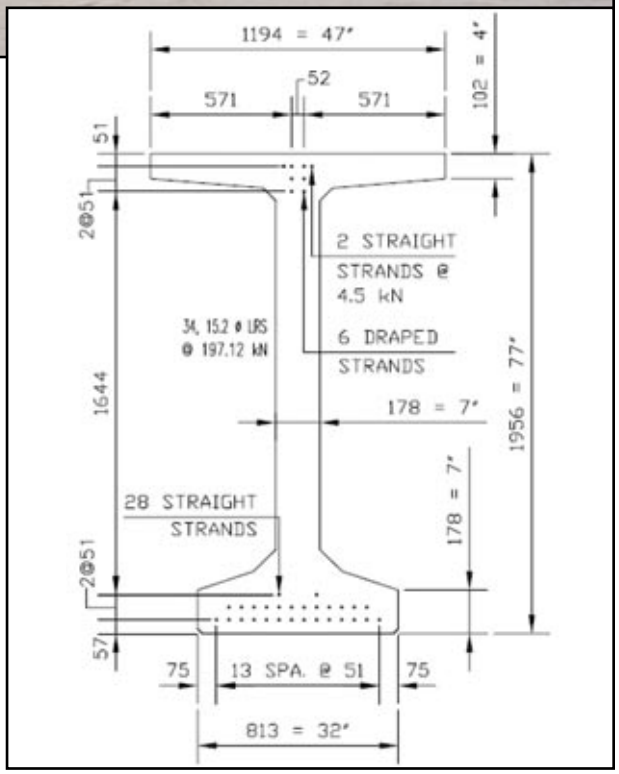
Focus of This Issue: Bridges

Route 52 Causeway, New Jersey

Rt. 52 Causeway, Somers Point, NJ
Photo by Bayshore Concrete Products Corp.

A combination of precast and cast-in-place concrete was used to build this imposing bridge now being constructed by George Harms Construction Co. Inc. for the NJDOT. The first step, unseen, was driving the 24" and 30" square solid prestressed piles, made with both epoxy coated strands and spirals. Jet pipes were installed during casting to assist in pile driving. Over 520 piles support the superstructure. The pier caps and projecting columns were cast in situ.

The superstructure is constructed of 243 Bulb Tees (77" deep PCEF shape), approximately 140' long. Over 3000 precast deck slabs, 3-1/2" thick, were provided as stay-in-place forms for the cast-in-place bridge deck. The superstructure is all HPC (High Performance Concrete), specified as 8000 psi strength at 28 days. All precast components were manufactured at Bayshore's Cape Charles plant, and barged to the site. Completion of this New Jersey DOT project is scheduled for the end of 2008. Thanks to Patricia Barnes at Bayshore Concrete Products for this story.



PCEF – Prestressed Concrete Committee for Economic Fabrication – a committee established by FHWA for economic fabrication of prestressed/precast concrete.

Roslyn Viaduct, New York

Roslyn Viaduct, Roslyn, NY
Photo by Bayshore Concrete Products Corp.

Roslyn Viaduct, Roslyn, NY **Photo by NYSDOT**

Patricia Barnes, Sales Assistant/Project Coordinator at Bayshore, writes that this is one of NYSDOT's first segmental bridges, which replaces an old steel superstructure built in 1949. There are 348 pier segments, each cast with self-consolidating concrete. The 64 pier box columns are also segmental. The pier columns have a ship-lap architectural profile, achieved by using form-liners.

To provide an enhanced vista of Hempstead Harbour, the new structure consists of nine spans and eight piers in each direction, compared to the current bridge, which has 15 spans and 14 piers. Four main casting cells were used to produce all of the variable depth segments (as shown in the photo above). The largest segments weighed close to 100 tons. All pieces were made with 10,000 psi high performance concrete. Produced at the Bayshore Cape Charles plant, all pieces were barged close to the job site. Tully Construction is the project contractor, and is erecting the precast segments.

Joints between the match cast segments are grouted and sealed as the work progresses; the Contractor is using Sikdur 31 Segmental Bridge Adhesives within the joints and Sikadur 300 PT thixotropic prebagged grout within the post-tensioning tendons. There is access to the finished cell interiors for future inspection; the only utilities to be installed are for bridge lighting. Following completion of the first bridge, as shown in these photos, the old steel structure will be removed and the second half of the new bridge will be installed. During construction, each bridge accommodates three traffic lanes, with the middle lane switched as needed for major traffic.

Charles Maass, P.E., Engineer-in-Charge, NYSDOT, estimates the project is over 60% completed, and will finish by next fall. Construction on this 129-million dollar project started soon after bidding in 2005. Thanks to Charles and to Rich Lorenzen, NYSDOT, for these photos and facts for this story.

Roslyn Viaduct

Photo by New York State Department of Transportation

Monumental Milestone

Tragic Collapse Site Now Houses a Monumental Milestone; Under intense scrutiny and controversy, a crossing is reborn. [*Engineering News Record*, 09/10/2008, By Aileen Cho, with Jean Thilmany]

The new Interstate 35W bridge in Minneapolis is a metaphor and a milestone. Rising above swirling waves of both the Mississippi and of controversy surrounding why and how it came to be built, it symbolizes a country's ability to rebound from tragedy and the crucial infrastructure issues that America faces.

Just 13 months ago, on Aug. 1, 2007, the nation was stunned by the collapse of the I-35W steel truss bridge, which killed 13 people. Now, the new 1,223-ft. long twin-span concrete crossing, called the St. Andrews Falls Bridge, is structurally complete.

The construction details are geared to remove any doubts about the bridge's structural integrity. Designer Figg Engineering Group, Tallahassee, incorporated multiple non-fracture-critical elements for maximum redundancy. The 504-ft.-long main span's elements, ranging from 11 ft. to 25 ft. tall, up to 16.5 ft. long and up to 200 tons each, are post-tensioned with high-strength steel strands encased in plastic ducts and high-strength grout, says Tim Jenkins, Figg quality-assurance engineer.

Each 90-ft.-wide main span twin structure is comprised of precast segments forming two box girders, supported on four 70-ft.-tall curving piers on either side of the river. Vibrating wire strain gauges, accelerometers and chloride sensors are embedded to monitor both construction and service life, and MnDOT will continue to use an anti-icing system provided by Switzerland's Boschung Inc.

Curving piers supporting each box girder ensures redundancy of new I-35W bridge.

Photos and copy above are copied from the *Engineering News-Record* of September 15, 2008.

And from *ENR* 9-22-08, the new $234-million Interstate 35W bridge in Minneapolis was set to open on Sept 18, well ahead of the Dec. 24 deadline. The design-build team led by Longmont, CO-based Flatiron Constructors Inc. and Seattle-based Manson Construction Co. stands to earn a full $27-million bonus for completing the bridge 3 months early.

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