

# Stillwater Viaduct Bridge Rehabilitation Contractor Support Services

SMITHFIELD, RHODE ISLAND



*"This is the kind of transportation project we like to see: planned with community input, utilizing effective accelerated construction techniques, and, as a result, completed significantly ahead of schedule."*

RI Governor Lincoln D. Chafee

*"We are fortunate to have had such an accomplished team... Accelerated bridge techniques are relatively new to RIDOT, but... we plan to use similar techniques on future projects."*

Heidi Gundmunson, RIDOT

The Stillwater Viaduct is an 898-ft multi-span structure consisting of two approach spans and a main span arch over the Woonasquatucket River. The original Viaduct was constructed in 1927.

Steere Engineering, as the engineer for contractor Northern Construction Service LLC, was responsible for preparing the demolition and shielding procedures, erection procedures, temporary jacking and shoring, deck pouring, and formwork design. The demolition and erection procedures included the use of 275-ton hydraulic cranes on the bridge. The existing structure was analyzed for crane loadings during both travel and picking operations. Prefabricated 200-kip shoring towers were used to support the structure beneath the crane outriggers during picking operations. To accelerate the superstructure demolition, full span sections of double cast-in place beams, deck and diaphragms were picked and lowered to grade to be hauled off-site for complete demolition. In addition, Steere Engineering was responsible for the design of the shielding support anchorages fastened to the existing arches and columns as well as the cantilever support framing for the debris nets above the river.

The erection procedure consisted of a multitude of precast components to be erected and checked for stability including: approach span beams, bent caps, transverse floor beams, deck panels, and parapet railing. Lastly, to support the contractor's accelerated construction schedule, a jacking procedure was developed to allow for the erection of the precast transverse floor beams prior to the installation of the isolation bearings at the precast bent caps.

Originally RIDOT considered phased construction that would have kept the bridge partially open to traffic but would have taken years to complete. RIDOT closed the bridge in March 2012 to allow crews to work more quickly; with accelerated construction techniques using precast components, the historic bridge opened five weeks ahead of schedule in October 2012. This process saved RIDOT \$110,000 and winnowed what would have been a 3-year conventional project down to just 7 months. In 2013, the \$9.4-million project was awarded the *Best Rehabilitated Bridge Award* from the Precast/Prestressed Concrete Institute. The project, which was also recognized with a *Transportation Quality Award* from the University of Rhode Island Transportation Center, was also a contender for the 2013 *America's Transportation Award* competition.

**Owner/Contractor:** RIDOT / Northern Construction Service  
**Reference:** David Fish, P.E.  
**Phone:** 401.222.2053

**Design and Support:** 2012  
**Construction Completion:** 2012  
**Project Cost:** \$9.4 Million