Brian Brenner, P.E., is a Principal Bridge Engineer with Tighe and Bond in Westwood, Massachusetts. He has been a project manager and lead structural engineer for several bridge and transportation projects around New England. He also is a Professor of the Practice at Tufts University, where he teaches structural design classes and works on research for long term performance of bridges. Brian is the author of three volumes of engineering essays published by ASCE Press: "Don't Throw This Away!," "Bridgeness," and most recently, "Too Much Information."

New England

Town Bridge Rehabilitation

Town Bridge, Canton CT By Spbilbrick - Own work, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=26595077

June 25, 2019

Brian Brenner

4 Comments

KEYWORDS bridge / construction / crane / Historic bridge / lift / Superstructure

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The Town Bridge in Canton, Connecticut, was the subject of an impressive bridge move last month. The bridge is an historic truss that was constructed in 1895. It crosses the Farmington River on a 160' span. The fabricator was the Berlin Bridge company, known for lenticular truss bridges around New England. The structure is a Parker Through truss, one of the few the company has fabricated. It is also unusual because the superstructure features many decorative details that the company typically included on lenticular truss bridges.

The rehabilitation design, prepared by Transystems, called for extensive reconstruction of the superstructure. The truss was to be removed from its bearings, disassembled, repaired off site, and then rebuilt on site.

ROTHA Contracting Company, Inc, of Avon, Connecticut, completed the complex operation to lift the superstructure onto temporary bearings on the east shore of the river. A video of the operation is here.

Town Bridge Move - Town of Canton CT/ ROTHA

Russell Bush, from Rotha, described the operation:

The bridge is a notable historic structure based on the environmental review and documentation. Did this pose any special concerns for your means and methods?

> *Russell Bush: Being a historic structure posed a number of concerns. First and foremost, the bridge had undergone multiple rehabilitations over its 125 life span. This made weight estimations very difficult because there wasn't precise documentation of all of the repairs. Additionally, the unknown grade of the old steel gave us challenges when we had to install welded stiffeners to brace the structure for the pick.*

The last inspection report noted that the condition of the superstructure was "5: serious condition". Did this impact means and methods for the truss move- what type of reinforcement did you need to do before the move?

> *Russell Bush: Multiple layers of paint as well as the limited access we had to inspect the structure also made our checks of structural integrity of the structure difficult...we knew it was in poor condition but determining the exact extent was challenging. We inspected every member and connection to the best of our ability as we removed the deck. Additionally, we installed welded stiffeners at the pick points to reinforce the structure for the lift.*

Were there any special concerns/ procedures for the truss move, especially for the crane on the far bank that had the extended boom?

> *Russell Bush: Engineering the pick itself took multiple weeks and iterations. We had specific restrictions on the amount of ground pressure we were allowed to induce into the existing substructures which forced us to get creative with the construction of our crane pads and also pushed our pick radius's out about as far as they could go. The more capacity we tried to squeeze out of the cranes by adding special boom sections or more counter weight was counter balanced by forcing us to push the cranes further away to reduce ground pressure. Through a collaborative effort between our engineers and Ray Crane we found the happy medium that facilitated the successful pick without over loading the existing substructure.*

How did the jacking go before the truss move? What jacks did you use?

> *Russell Bush: Before the pick we used a Power Team jack to make sure each bearing was free from the substructure. We also used the jacks to double check our weight estimates for the structure.*

Is it planned to galvanize the truss superstructure offsite?

> *Russell Bush: After we picked up the truss and set it on our preconstructed access pad, we dismantled and tagged every piece. We loaded out the individual pieces and shipped them to Regal Industrial Corp in PA for blast cleaning. From there, the pieces are being sent to Michelman Steel Enterprises, LLC, also in PA, where they will be reassemble, repaired and reinforced. Once all the repair work is completed, the truss pieces will be shipped to galvanizing and then back to us for reassembly on the site.*

Watching the video of the move, you get to see an impressive combination of the old and the new. When the job is done, the beautiful, historic truss bridge will live again to grace its site as a working structure. To get there, the rehabilitation project employed a spectacular lift.

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Was the bridge made of wrought iron instead of steel ?

Angelo Ruggiero June 28, 2019

The Berlin Iron Bridge Company, as its name and a surviving specification indicate, made bridges of wrought iron but perhaps not exclusively.

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The original superstructure was wrought iron

Brian Brenner July 1, 2019

Based on the inspection reports and other documents, the original superstructure was largely wrought iron. But rehabilitation projects added structural steel (56ksi and 50ksi) over time.

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Bridge

Loretta Fiora December 17, 2019

Hello, do you know when the bridge is going to be reinstalled? Thank you

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Current project schedule for return of truss

Brian Brenner December 18, 2019

I understand that the current project schedule anticipates the truss returning to the site in March 2020.

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