

A short-span bridge in suburban Pittsburgh comes together over a long weekend.

The Long and Short of It

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NOTHING SAYS THANKSGIVING like football, family, food—and bridge replacements.

While the latter may seem out of place on this list, it was a major part of the long Thanksgiving Day weekend for a construction team in Allegheny County, Pa.

The Montour Run Bridge No. 6 (MT06) carries Scott Road over the Montour Run, a stream in North Fayette Township, Pa., a few miles west of downtown Pittsburgh. The existing bridge needed to be replaced, as the concrete box beams supporting it had become deteriorated; a similar, nearby bridge over Interstate 79 experienced a beam collapse a few years ago, and the county didn't want a repeat of that scenario. Thus, a replacement plan was developed.

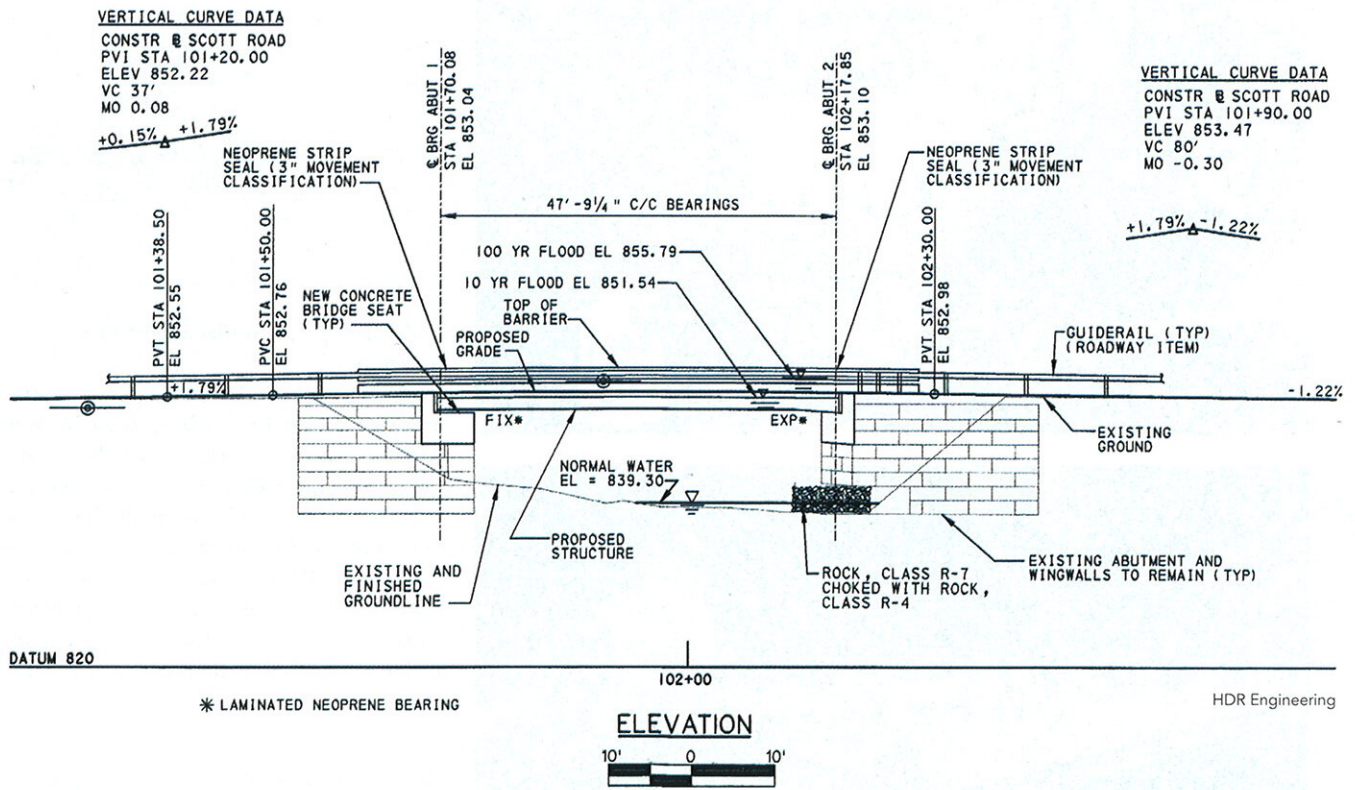
Complete Closure

The bridge serves as the only means of access to five businesses on one side of the stream. To minimize disruptions to these businesses, the design called for prefabricated bridge elements and systems, with the goal of demolishing the old bridge and building the new one in just a few days.

It was initially assumed that the bridge could be replaced using staged construction and maintaining a single 11-ft-wide lane on the existing bridge. However, during preliminary design, one of the five affected businesses notified Allegheny County that they regularly have 15-ft-wide permit loads moving rental equipment to and from their facility. The need to move these wide loads across Montour Run at this location



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- ▲ An elevation drawing of the new Montour Run Bridge No. 6.
- ◀ The bridge uses 17 tons of structural steel framing.

made staged construction impractical. The affected businesses agreed upon complete closure for a few days for the demolition and erection to take place, and the long Thanksgiving weekend proved to be the best time frame.

At the request of the Allegheny County Department of Public Works, structural engineer HDR investigated using accelerated bridge construction (ABC) techniques to build the new bridge and used Pennsylvania Department of Transportation's BRADD (Bridge Automated Design and Drafting) program to design the superstructure.

Span width for the replacement structure was restricted by a pumping station located on the east side of the bridge, a sewer line interceptor manhole, a power line and a business on the west side of the bridge. The new bridge, nearly 48 ft long, consists of one 11-ft, 6-in. lane, a 6-ft-wide shoulder and a 2-ft-wide shoulder. With an overall width of 22 ft, 6 in., including barriers, the deck is supported by five W18x119 rolled beams spaced at approximately 5 ft. The new superstructure was assembled at a staging area adjacent to the existing bridge and uses 17 tons of steel in all. The deck is a concrete overfilled 5-in. steel grid (7³/₁₆ in. total thickness) with reinforced concrete barriers and was placed on the superstructure



- ▲ The new bridge, in place ahead of time.
- ▼ Framed superstructure with grid deck, adjacent to the existing bridge.





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◀ The bridge site on Thanksgiving morning of last year.



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◀ The bridge site the Friday morning after Thanksgiving Day.

and cured prior to placement in its final location.

HDR designed the superstructure and deck assembly to be placed in two sections using normal weight concrete, and the two sections were bolted together and the deck finished with a concrete closure pour. The contractor, the Joseph B. Fay Company, elected to prefabricate the deck in its entirety prior to setting the superstructure in place in order to further expedite the project's

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▲ The 5-in. steel grid deck.

completion. The use of steel beams and grid deck kept the crane pick weights to a minimum.

Weekend Work

The existing bridge was closed at 5:00 p.m., Wednesday, November 21, 2012. The new bridge had to be opened to traffic by 6:00 a.m. the following Monday or liquidated damages of \$10,000 per hour would be assessed against Joseph B. Fay.

Demolition of the existing pre-stressed concrete adjacent box beams and partial demolition of the existing masonry stone abutments was completed by Thanksgiving morning, and the concrete abutment caps were then set and grouted in place. The superstructure and deck were set at 4:00 a.m. on Friday, and the steel rails for the barriers and the approach guiderail were placed on Saturday evening. This put completion approximately a day-and-a-half ahead of schedule, giving all involved something to be thankful for.

MSC

Owner

County of Allegheny, Pa.

Structural Designer

HDR Engineering, Inc., Pittsburgh

General Contractor

Joseph B. Fay Company, Tarentum, Pa.

Steel Fabricator and Detailer

KARD Bridge Products, a division of KARD Welding, Inc., Minster, Ohio (AISC Member Fabricator/AISC Certified Fabricator)

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