

BRIDGE BUILDER

Design • Construction • Maintenance

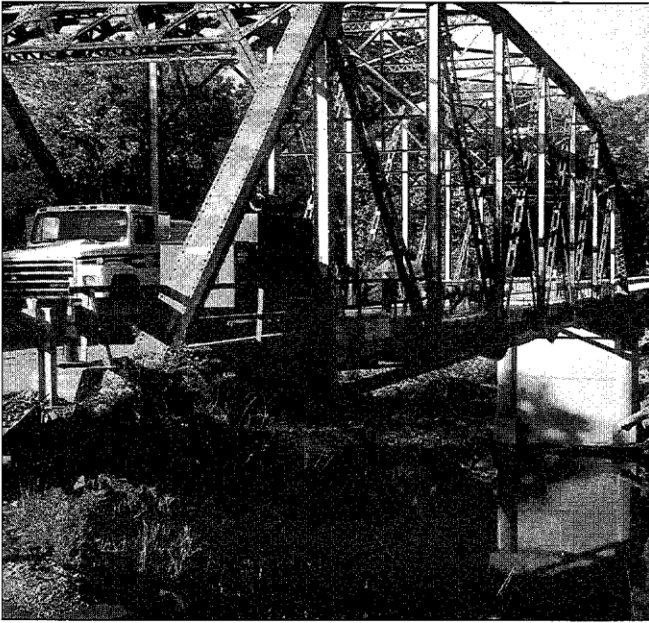
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The old bridge decking had been rated poor-to-critical. New weldless decking was installed, reducing weight while increasing load capacity of the floor by 55 percent, and truss capacity by 19 percent.

Fort Springs Bridge, West Virginia has a brighter, lighter future

Deck replacement adds years, removes weight, from heavily traveled bridge

by Joni Mangone

"Absolutely perfect" was the answer given by Steve Faulkner, bridge design engineer for the West Virginia Department of Transportation, when asked recently about the condition of the Fort Springs Bridge in Greenbrier County, W.Va., after its renovation last year. As many as 1,000 trucks, some 18 wheelers, tandem trailers, carrying crushed limestone from Acme Limestone Quarry located nearby cross the bridge daily. How has the decking held up after a year of heavy truck traffic passing over its steel members?

"Excellent," according to Faulkner, after a recent inspection of the bridge with George Grounds, maintenance supervisor for W.Va. DOT "the grid looks exactly like it did last fall".

Faulkner designed the deck using four inch on center open grid for the approach spans and six inch on center open grid for the through truss span - partially filled HPC was used to reduce the dead load and increase live load capacity. This was essential in view of the heavier truck loads using the bridge. An important factor in the planning of any bridge decking lies in the early design stages. It is critical not to stress the fatigue strength of the material and lack of proper design would do just that.

The old decking had been rated poor-to-critical with some complete failures of the concrete according to a report

by the W.Va. DOT. To reduce weight while maintaining strength, it was decided to use the weldless design. The end result was a 55% increase in load capacity for the floor and a 19% increase in load capacity for the truss.

Normally, in 20 to 30 years minor renovations must be made to a bridge. The Fort Springs Bridge is expected to be in service for 40 years or more without such repairs. For that matter, Faulkner said "from what we've seen we have no reason to doubt that it won't be there for another 40 years."

After the deck replacement, the truss was readied for painting. Preparations included hand cleaning the with power brushes instead of sandblasting. It was painted a silver gray using a Wasser® over coat paint system.

Final cost on the project, including painting and expansion joint seals, came to \$329,694 or \$ 66.50 per square foot for the completely finished roadway. Faulkner said that a new structure of precast concrete, pre-stressed concrete boxed beams, and integral deck, would have been approximately \$180 to \$190 per square foot.

The weldless design is a unique mechanically interlocking joint system eliminating the need for welding intersections - thus eliminating many of the problems associated with welding fatigue failure. The first full year of continuing truck traffic has yielded positive results and hopefully will continue to do so in the many years to come. ▲▲