

Strengthening Riveted Steel Girders using UHPC and External Post-Tensioning

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Abstract

Dead and live load demands can substantially increase when the span lengths of existing bridges are lengthened to accommodate widening projects for underlying roads or highways. Thus, the existing bridge superstructures are required to be strengthened to accommodate the increased dead and live load stresses. Given its high compressive strength, UHPC can significantly increase in the flexural capacity of composite steel beams. This presentation will discuss an innovative strengthening method to increase the span length of existing riveted steel girder bridges using a field-cast UHPC topping and external post-tensioning. This innovative UHPC-based strengthening approach is intended to have minimal impact on operational needs of existing structures. The New York State Department of Transportation (NYSDOT) has partnered with the researchers at FHWA's Turner-Fairbank Highway Research Center (TFHRC) to conduct a large-scale proof of concept test on this innovative strengthening method. Testing at the TFHRC structures lab is slated for early 2019. This presentation will cover the critical findings from this proof of concept test.