DEVELOPMENT AND EXPERIMENTAL TESTING OF PRESS-BRAKE-FORMED STEEL TUB GIRDERS FOR SHORT SPAN BRIDGE APPLICATIONS

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ABSTRACT

FIELD EVALUATION OF A MODULAR PRESS-BRAKE-FORMED STEEL TUB GIRDER IN AN APPLICATION THAT INCLUDES SKEW AND SUPERELEVATION

The Short Span Steel Bridge Alliance (SSSBA) is a group of bridge and culvert industry leaders (including steel manufacturers, fabricators, service centers, coaters, researchers, and representatives of related associations and government organizations) who have joined together to provide educational information on the design and construction of short span steel bridges in installations up to 140'-0" in length. A technical working group from within the SSSBA developed the notion for the modular shallow press-brake-formed steel tub girder as a solution for the short span steel bridge market.

After extensive testing at West Virginia University and multiple successful field demonstrations, members of the SSSBA collaborated with the West Virginia Division of Highways to arrange implementation of this system. The Fourteen Mile Bridge located in Lincoln County, West Virginia, was chosen as a prime candidate to demonstrate the system due to the significant superelevation and skew present. Upon completion of the Fourteen Mile Bridge, researchers from Marshall University and West Virginia University traveled to the bridge site to perform a live load field test.

This study presents the results and evaluation from experimental and analytical testing of the Fourteen Mile Bridge. Additionally, the research methods for both the experimental and analytical testing are outlined. Live load distribution factors were computed from the experimental and analytical data and compared to those computed following the AASHTO LRFD specifications. The results of this comparison reflect that the AASHTO LRFD specifications are conservative in the analysis of press-brake-formed tub girders. This report also includes an initial qualitative examination of bracing configurations for non-composite press-brake-formed tub girders. The results provide the basis for extending the work towards a closer investigation to determine the best practices of bracing.

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