

## **CASE STUDY**



## **FRP DURABILITY UPDATE:** CROSSING OLD SPANS

The 73-year-old Greene County Bridge on Farm Road 148 near Springfield, Missouri was one of 76,000 bridges nationwide deemed "structurally deficient" after its steel reinforced deck's load rating had dropped from 10 tons to only 4.3 tons. To remedy this problem, Greene County decided to replace the bridge girders and deck. Similar redecking operations, with steel reinforcement, typically take 2-3 weeks. In 2005, the redecking portion of this project was completed in only five days and with an estimated 75% less labor cost using Strongwell's GRIDFORM<sup>™</sup> system. The Center for Infrastructure Engineering Studies and Civil Engineering Department of the University of Missouri at Rolla assisted the highway department with their inaugural FRP composite bridge application.

The project used Strongwell's GRIDFORM<sup>™</sup> system, which was designed to replace steel rebar with FRP in reinforced concrete bridge decks. GRIDFORM<sup>™</sup> is comprised of a double layer of pultruded fiberglass grating bars separated by FRP shear connectors with nylon bolts and FRP plate bonded to the bottom of the grating panels, completing the pre-assembled stay-in-place concrete form. Expansion joints utilized a silicone joint system to eliminate the need for any type of steel in the bridge deck.

GRIDFORM<sup>™</sup> eliminates many of the procedures associated with steel reinforced bridge decks. The light weight, high strength system removes time-consuming and labor intensive steps such as setting bottom forms and tying rebar.



Another major advantage of GRIDFORM<sup>™</sup> is its resistance to corrosion. Unlike steel rebar, FRP does not corrode when exposed to deicing salts and other corrosive road chemicals. Using FRP greatly reduces bridge maintenance and extends the life of bridge decks.



Today, the number of structurally deficient bridges has been reduced, indicating progress has been made by DOTs and Highway Departments throughout the nation. However, with the continued use of traditional materials, construction maintenance costs and traveler delays remain high. By implementing broader use of alternate systems such as GRIDFORM<sup>™</sup>, municipalities can save money and time and provide a longer-lasting end product. After more than ten years in service, Greene County reports there have been no issues with the bridge deck's performance from abnormal cracking or deficiencies resulting from FRP components. County administrators and Strongwell engineers have been very pleased with GRIDFORM<sup>™</sup>'s capabilities as a concrete bridge deck reinforcement system.

## **TECHNICAL DATA**

Product:	GRIDFORM™ Bridge Deck System
Process:	Pultrusion, Fiberglass Fabrication
Materials & Sizes:	GRIDFORM™ System (18 - 8' x 24' panels): 1-1/2" I-Bars 1/8" FRP Plate FRP Vertical Shear Connectors
For:	Hartman Construction
User:	Greene County, Missouri Highway Dept.



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