

STRONGWELL®

APPLICATION PROFILE



UPDATE: STATE-OF-THE-ART BRIDGE PROVIDES LINK FOR NATIONAL FOREST

Over 5 million visitors explore Daniel Boone National Forest annually, making it one of the most heavily used forests in the south. In Bath County, Kentucky, visitors have been unknowingly using a high-tech link to a major hiking trail for almost 20 years. A 60' clear span bridge connecting the Clear Creek Furnace Picnic Area to the Sheltower Trace Trail was the first hybrid fiber reinforced composite I-girder bridge. An FRP hybrid composite I-beam (24" x 7-1/2" x 3/4"), pultruded by Strongwell, provides the main load carrying members. The addition of carbon fiber to the flanges of the I-beam substantially increases the bending stiffness. The hybrid beam demonstrates a modulus of elasticity of 6.0×10^6 psi (compared to 2.8×10^6 psi for the typical FRP beam without the additional carbon fibers).

Pultruded grating from Strongwell-Chatfield was used for the walkway and fiberglass sucker rods (produced at Strongwell-Bristol) were anchored to the abutment for post tensioning. The bridge is designed in accordance with AASHTO "Standard Specifications of Pedestrian Bridges," with live loads of 85 psf and allowable deflection of L/180 (4 inches over 60 feet).

The work was completed as part of a Technology Reinvestment Project, sponsored by the Department of Defense, Advanced Research Projects Agency (ARPA) to demonstrate low cost/high volume manufacturing of high performance composite material structures for infrastructure applications.



The total design, fabrication and testing of the bridge and its components were accomplished by researchers at the University of Kentucky (under the direction of Dr. Issam Harik). The Great Lakes Composites Consortium, Wisconsin, and Basic Industry Research Laboratory (BIRL) at Northwestern University, Illinois were instrumental in the analysis, design and construction techniques of the composite components. ●



TECHNICAL DATA

Product:	Hybrid Fiber Reinforced Composite Pedestrian Bridge
Process:	Pultrusion, Fiberglass Fabrication
Materials:	Carbon and fiberglass reinforced vinyl ester (carbon fibers in top and bottom flanges of beam)
Sizes:	Total Bridge: 6 ft. wide by 60 ft. long Hybrid Support Beams: 24" x 7-1/2" x 3/4"
For:	Cave Run Lake Daniel Boone National Forest



STRONGWELL

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