

High Value Research Projects -- 2010

Submitter

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Research Program

Sponsoring agency or organization: *Kentucky Transportation Cabinet and Federal Highway Administration (Research conducted by the Kentucky Transportation Center in the College of Engineering at the University of Kentucky)*

Project Title, ID, Cost and Duration

Title: *Bridge Strengthening with Post Installed Shear Studs*
Report number: *Report not yet available, but paper published to the Web site cited below.*
Project cost: *Bridge retrofit \$26,000 and associated research \$260,000.*
Project duration: *2008-2010*

Weblink *www.ktc.uky.edu (select High Value Research button) or contact iharik@engr.uky.edu*

Brief Summary

The KY 32 Bridge over Lytles Creek, located in Scott County, KY, is a single span steel girder bridge with a non-composite reinforced concrete bridge deck. A field investigation was carried out to evaluate the viability of using post installed shear studs to increase the load capacity of a non-composite single span bridge. Adhesive anchor shear studs that can be installed with minimum traffic disruption were selected for this project. A finite element analysis was performed to investigate the number of studs required to achieve a minimum HS25 load rating. An AASHTO load rating analysis showed that the maximum inventory level load rating of the bridge before the installation of the shear studs was an HS12.2 truck load. Following the placement of the shear studs, the inventory level load rating increased to an HS33.0 truck load -- an increase of 170% in load rating capacity. The final field test provided information to positively verify that post installation of shear studs to achieve partial composite action can be successfully performed to increase the flexural capacity of non-composite bridge girders.