

Project:

Implementation of Advanced Carbon Fiber Composites Technology for Repairing and Strengthening Kentucky Bridges

KY SPR 99-200

Objectives:

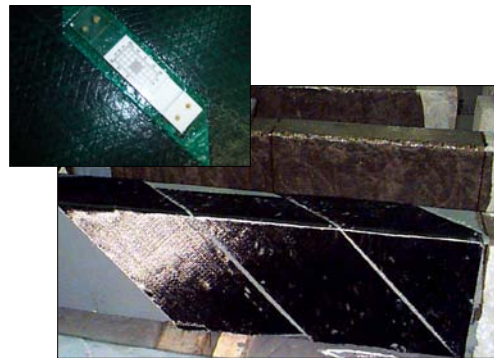
- Laboratory testing of reinforced concrete beams strengthened with carbon fiber-reinforced polymer (CFRP) fabric and laminates.
- Field application and monitoring of CFRP fabric and laminates on Kentucky bridges.



For more information contact:
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Results:

KTC laboratory tests showed that shear strength is increased up to 33% for concrete beams wrapped with CFRP fabric and flexural strength is increased up to 58% for beams strengthened with two CFRP laminates.



Implementation:

(1) CFRP Strengthening of the Carter County Bridge --

- The bridge on KY 3297 had severe cracks which would indicate replacement of the entire super-structure costing over \$600,000.
- The bridge was repaired using CFRP fabric costing \$100,000 with little disruption to traffic.
- There has been no movement in the bridge cracks after nearly four years.

(2) CFRP Laminate Strengthening of the Louisa-Fort Gay Bridge --

- The beams in three of the four reinforced concrete spans of the bridge had severe flexural cracks.
- The bridge was repaired using CFRP laminates without any disruption to traffic.
- After nearly two years, there has been no movement in the bridge cracks.



Benefits:

Both KTC field applications of CFRP retrofits have been a great success. A major benefit of retrofitting bridges with CFRP is the ability to repair with little or no disruption to traffic. This is in addition to significant (6 to 1) cost savings over replacement or major structural rehabilitation of a bridge.