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ICRI PROJECT AWARDS

2006

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ICRI 2006 PROJECT AWARD WINNERS

AWARD OF MERIT: Strengthening Category

FLORIDA KEYS OVERSEAS HISTORIC TRAIL: BRIDGE REPAIRS AND UPGRADES AT BIG COPPITT KEY

Big Coppitt Key, Florida

Submitted by Univeristy of Missouri-Rolla



This project involves the flexural strengthening of 95 cantilevered bridge deck panels on six bridges of the historic Florida Keys Overseas Railroad built between 1904 and 1912 by industrialist Henry Flagler. These railroad bridges were converted for automobile use in the 1930s by adding cantilevered deck slabs. These slabs were the ones included in a structural rehabilitation and repair project in 2005.

The original mass concrete railroad bridges, converted for highway use, were rendered obsolete in the 1980s with the construction of a new Overseas Highway (US 1) from Key Largo to Key West. The Florida Department of Environmental Protection assumed ownership from the Florida Department of Transportation and converted the old road bed and bridges into a bike and walking trail. In the aggressive environment that is the Florida Keys, the concrete slabs were experiencing accelerated deterioration and safety concerns, especially because power company line trucks use the bridges to access the main power feed to Key West.

Increasing the flexural strength in the negative moment regions of the deck was the challenge, and that challenge was met using carbon fiber-reinforced polymer (CFRP) bars installed as near-surface-mounted (NSM) reinforcement. Shallowness of placement (preserving existing steel reinforcing bars), speed of installation, and corrosion prevention were the technical features most attractive to the owner.

Owner

Florida Department of
Environmental Protection
Tallahassee, Florida

Project Engineer/ Designer

Co-Force America, Inc.
Rolla, Missouri

Repair Contractor

Coastal Gunit Construction
Company
Bradenton, Florida

Material Suppliers/ Manufacturers

Hughes Brothers
Seward, Nebraska

DeNeef Construction
Chemicals, Inc.
Houston, Texas

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