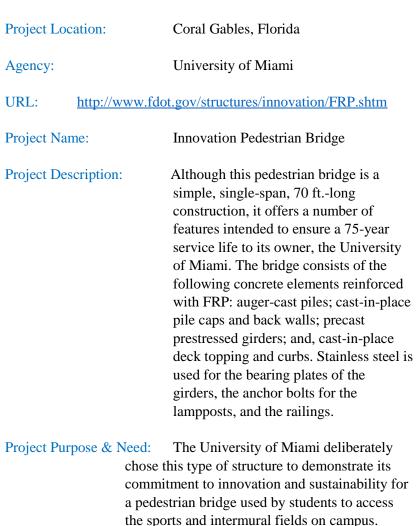
FDOT Transportation Innovation Initiative: FRP – Design Innovation



Fast Facts:

Glass Fiber Reinforced Polymer

UNIVERSITY OF MIAMI



| Overall Budget/Cost Estimate: | \$ 750,000. |
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| What was unique about this pro | oject? There is not a single pound of "black steel" (carbon steel) in any element of the bridge; in fact, all reinforcement and tendons are made of composite materials. |
| Describe Traditional Approach | This project initially specified the use of steel-strand prestressed girders supported on traditional steel reinforced concrete piles and pile caps. |
| Describe New Approach: | This project achieved special impact because it allowed the use of non- corrosive reinforcement, addressing sustainable practices towards low maintenance with zero anticipated repair costs due to corrosion. For the first time, this simple structure combines novel materials including Basalt FRP (BFRP), Glass FRP (GFRP), Carbon FRP (CFRP) and novel composite manufacturing technologies (continuous closed stirrups and automated-preassembled cages) to ensure that degradation due to steel corrosion no longer reduces the longevity of the transportation infrastructure. |
| Top Innovations Employed: | a) Prefabricated reinforcing cage for auger cast piles. Cages consisted of six #6 BFRP bars and #3 spirals made by taking advantage of precision manufacturing. b) Girders in the shape of double-tees prestressed with nine 0.6-inch diameter, seven-wire CFRP strands. CFRP tendons have been used for other precast or post-tensioned applications, but never before in the fabrication of double-tees. The reinforcement grids for both stems and flange were made of pre-assembled interwoven BFRP bars (#3 and #4, respectively). c) Cast-in-place elements such as curbs and pile caps reinforcement consisted of a combination of continuous closed BFRP stirrups and straight BFRP bars. |
| Primary Benefits Realized/Exp | ected: FRP reinforcement eliminates the need for additional concrete cover for corrosion protection as well as the use of waterproofing sealants. This project allows for significantly lower labor and equipment costs because of the lightweight reinforcement handling. Other benefits of this projects range from low maintenance costs for the owner. |
| Project Start/Completion Dates: 11/2015 – 4/2016 | |
| Affiliations: | General Contractor: OHL Arellano Construction Co. Engineer of Record: Brill Rodriguez Salas & Associates Inc. |
| Project Contact: | Antonio Nanni, Prof. and Chair, University of Miami, Dept. of Civil, Arch. & Environ. Engineering. nanni@miami.edu |
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