

FDOT Transportation Innovation Initiative: – Design Innovation



Fast
Facts:
Carbon
Fiber-
Reinforced
Polymer



Project Location:	District 6 Monroe County Key West, Florida
Agency:	FDOT/City of Key West
URL:	https://www.cityofkeywest-fl.gov/egov/documents/1508946447_02929.pdf
Project Name:	Key West Bight Ferry Terminal Pier Extension FPID: 412194-1 (LAP)
Project Description:	Construction of a 20'x80' concrete pier extension to the existing Key West Bight Ferry Terminal.
Project Purpose & Need:	Extend to the existing Key West Bight Ferry Terminal pier 80' for passenger embarkation and disembarkation. Included the use of CFRP prestressed piles for supporting the concrete pier structure.



Overall Budget/Cost Estimate: \$1,126,400

What was unique about this project?

This project is an extension of an existing pier. Work activities included extending the existing pier using prestressed precast 14” concrete square piles reinforced with carbon fiber reinforced polymer (CFRP) strands and spirals supporting a concrete superstructure reinforced with conventional steel.

Describe Traditional Approach:

Traditional approach includes use of conventional steel strands and spirals in prestressed precast concrete beams and piles with highly reactive pozzolans (silica fume, metakaolin, or ultrafine flyash) and conventional steel reinforcement in the cast-in-place bridge deck.

Describe New Approach:

Key West Bight Ferry Terminal pier extension uses CFRP prestressing strands and CFRP spiral ties in the prestressed precast concrete piles, 270 ksi low-relaxation uncoated steel prestressing strands in the prestressed cap beams and conventional grade 60 steel reinforcement in the deck.

Top Innovations Employed:

Utilization of CFRP prestressing strands and square spiral ties within the splash zone/marine environment.

Primary Benefits Realized/Expected:

Longer service life of the pier extension without major maintenance.

Project Start Date/Substantial Completion Date:

June 2018 – April 2019

Affiliations:

- Architect: Peter Pike Associates
- PE Consultant: M. Cordero and Associates Structural Engineers.
- Construction Contractor: Ebsary Foundation Company

