

# FRP Composites for Maintenance and Repair of Navigation Structures

Richard Lampo  
USA ERDC-CERL

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US Army Corps of Engineers  
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# Fiber Reinforced Polymer (FRP) Composites

- A fiber reinforced polymer (FRP) composite is defined as a polymer (plastic) matrix that is reinforced (combined) with a fiber or other reinforcing material with a sufficient aspect ratio (length to thickness) to provide a discernible reinforcing function in one or more directions.
- Both *Thermoset* and *Thermoplastic* Composites

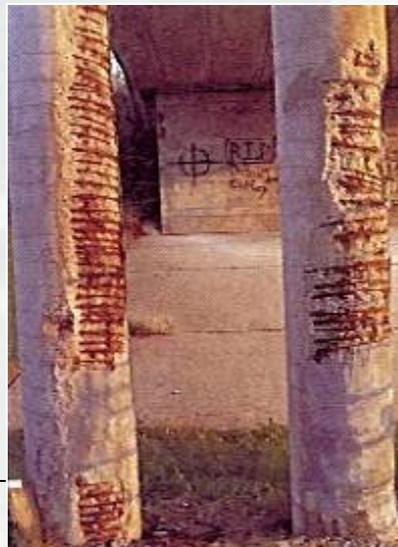


# FRP Composite Reinforcements for Concrete

- TYPE OF REINFORCEMENTS
  - ✓ Rebars
  - ✓ Tendons / Cables
  - ✓ Grids
  - ✓ Plates
  - ✓ Overlays / Wraps



External overlays



Corroded steel reinforcement



# FRP Composite Structural Shapes & Panels

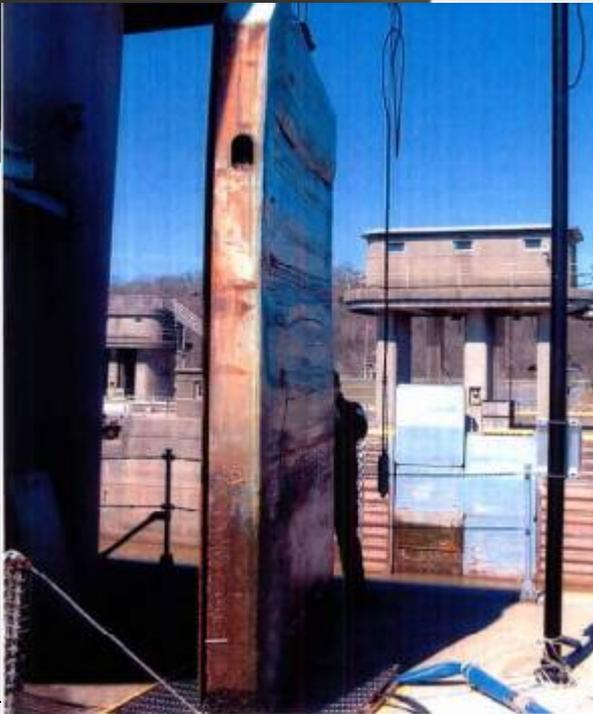


Profile of composite decking



Composite valve gate

Potential application as panel fillers



Hybrid composite sheet piling



# Polymeric Pilings

Rebar reinforced HDPE



Dolphin cluster



Fender system



Fender pilings



# Guide Walls and Fenders



Guide Wall / Boardwalk



Plastic Timbers  
on Sector Gate



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# Civil Works Challenges



**Unique Structures / Difficult Repair Environment**



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# Survey Questionnaire

- Have you ever used FRP composite materials for maintenance and repair?
- Lessons learned?
- Potential applications of FRP composites?
- Possible field tests and demos?
- Barriers to use?
- Need for guidance?

