



# Innovative FRP Solutions for Waterfront Infrastructure

LARGE DIAMETER PILINGS • CAMELS • PIER PROTECTION • GUIDEWALLS • LOCK GATES



Composite Advantage's engineered FRP products & systems protect vessels, structures and budgets in the aggressive marine environment by offering:

- **Superior Energy Absorption**
- **Long Life, Maintenance Free**
- **High Strength, Light Weight**
- **Low Environmental Impact**
- **Project Cost Savings**
- **Fast Installation**

# Fiber Reinforced Polymer (FRP) Composite Benefits

- Corrosion Resistance to chemicals and water
  - Low to No Maintenance
- Light Weight
  - Only 20% of reinforced concrete panels
  - Simpler installation
  - Reduced cost of superstructure and substructure
- Prefabricated Structures
  - Accelerated construction
  - Incorporate features in shop fabrication
  - Lower cost; higher quality
- Design Flexibility: Energy absorption, High strength

# Universal Composite Sub Camels

- 36 feet long, 18 feet high, 17.5 feet stand-off depth



- Structure weighs 70,000 lb. Internal ballast weighs 35,000 lb

# Moored to Pier and Ready for a Sub



# Sub Berthed at Composite Camels



# FRP Pier Protection Systems



# Barge Impact Protection

- Large diameter pilings
- High energy absorption
- Recoverable deflection
- High strength; low stiffness
- Lowest cost solution – Initial & Long Term



# Fender Pilings up to 100 feet long









30FP100

85

30FP100

FP100 X85

FP100 X85

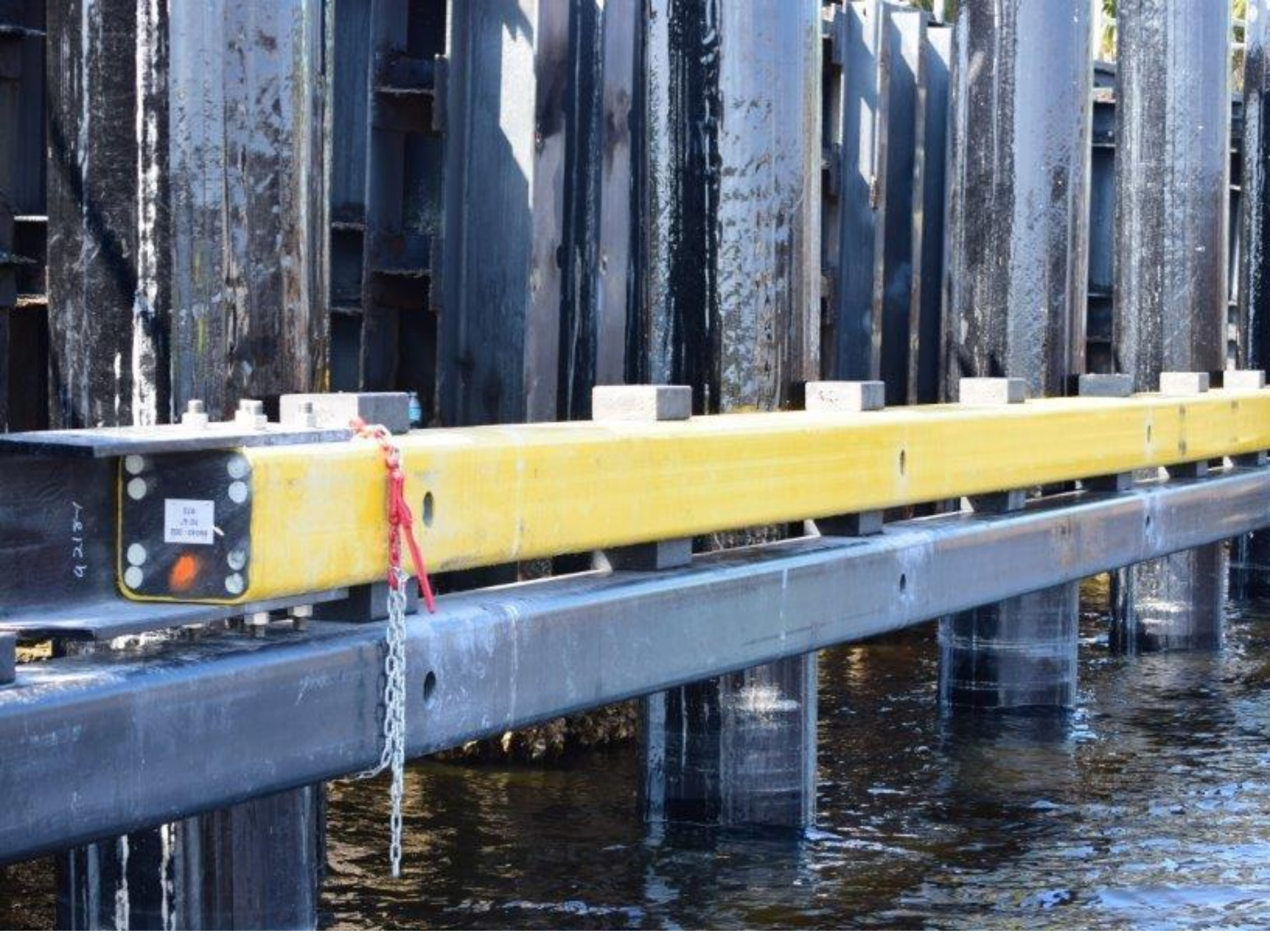
BFPO75

75 X80



*FRP Slipwalls  
St. Johns River Ferry  
Jacksonville, Florida*





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**Benefits:**

**Longer Life**

**Softer Impact for Ferry Passengers**





# Army Corps of Engineers Wicket Gates



Control Water Flow at Dams

# FRP Composite Wicket Gates

Current Wood Gates



FRP Composite Gates



- Acquisition Cost Savings and Longer Life

# Wicket Gate Installed in Illinois River by Army Corps of Engineers



# Lightweight Trench Covers

- Replace concrete covers on frequently accessed trenches
- Load capability is 40,000 lb with 15% impact factor
- Cover weight is less than 200 lb
- Embedded steel for attaching eyebolts
- Non-slip surface



# CA Products and Value

- Solutions for applications requiring:
  - Corrosion resistance and long life
  - Large parts
  - Structurally demanding requirements
  - Light weight
- Innovative Designs
- Contact:
  - Scott Reeve, 937-723-9031,  
sreeve@compositeadvantage.com
  - Steve Shannon, 717-459-3471,  
sshannon@coastlinecomposites.com
  - [www.compositeadvantage.com](http://www.compositeadvantage.com)