

# Workshop: Fiber Reinforced Polymer (FRP) Composites in Navigation Structures

Tuesday 8<sup>th</sup> September

9:00 am – 1:00 pm

## **COURSE DESCRIPTION:**

1. INTRODUCTION (3/4 hour)
  - a. FRP and its constituent materials
  - b. Properties and advantages of fibers, resins and FRP composite Laminates
  - c. FRP Reinforcing Bars (rebars)
  
2. REPAIR AND STRENGTHENING OF CONCRETE STRUCTURES USING FRPs (3/4 hour)
  - a. Selection of repair materials, procedures and specifications
  - b. Installation techniques, quality control and quality assurance
  - c. Case Studies
  
3. DESIGN OF FRP STRUCTURAL SHAPES INCLUDING CONNECTIONS (1.5 hours)
  - a. Axial, Bending and Shear Behavior of FRP Open and Closed Sections
  - b. Load and Resistance Factors
  - c. Connector Details
  - d. Design Methodology
  
4. CASE STUDIES OF FRP APPLICATIONS FOR NAVIGATIONAL STRUCTURES (1 hour)
  - a. The World's Largest Composite Miter Gate
  - b. H-Pile Repair, Miter Blocks, Wicket Gates and Coatings

## **WHO SHOULD ATTEND THE COURSE?**

Any design/maintenance engineers interested in design and rehab of navigational structures with FRP structural components, rebars and wraps resulting in minimal traffic interruption while maximizing cost effectiveness.

Reasons to attend the course:

Learning FRP composite material characterization as well as design and rehab principles to enhance strength and durability of navigational structures with FRP components, rebars and wraps.

Knowledge gained/course objectives:

To familiarize practicing engineers with the use of advanced composite materials for design and maintenance of navigational structures.

**INSTRUCTOR(S):**

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