

FRP Composites for Reinforced Concrete Construction

ONE DAY, 7.5 HOURS

Practical application of products and systems for new and retrofit reinforced concrete construction

Program Content:

This intensive seminar will introduce FRP materials and focus on the practical application of products and systems currently in use for new and retrofit reinforced concrete construction.

Part I Introduction to FRP Composite Materials and Systems

■ FRP Forms, Products, and Applications

- FRP rebar
- Other FRP forms
- FRP strengthening systems

■ Physical and Mechanical Properties and Behavior of FRP Systems

- Design tensile strength
- Time-dependent behavior
- Fatigue
- Durability

Part II Design of Concrete Members with Internal FRP Reinforcement

■ Flexural Design

- Failure modes
- Flexural capacity
- Minimum reinforcement
- Serviceability

■ Shear Design

- Failure modes
- Shear capacity
- Stirrup design

■ Temperature and Shrinkage Reinforcement

■ Development and Splices of Reinforcement

- Development length of a straight bar
- Development length of a bent bar
- Tension lap splice

■ Slabs-on-Ground

- Design of slabs with shrinkage and temperature reinforcement

■ Design examples and case studies

- Recently completed projects will provide the attendees with field application information and will demonstrate why the use of FRP for concrete reinforcement has dramatically risen in recent years

Part III Design of FRP Strengthening Systems for Concrete Structures

■ Strengthening Concrete Structures

- Reasons for strengthening
- Types of FRP strengthening systems
- Materials and properties of FRP strengthening systems

■ Substrate Preparation/FRP Application

- Substrate repair
- Installation methods
- Quality control

■ Design Principles

- Strengthening limits
- Flexural strengthening
- Shear strengthening
- Axial strengthening

■ Reinforcement Details

- Bond and delamination
- Detailing of laps and splices

■ Design examples and case studies

- Recently completed projects will provide the attendees with field application information and will demonstrate why FRP composites are used for strengthening concrete structures

Who should attend:

Engineers, designers, contractors, owners, and building officials will receive information on the specification, design, and construction of concrete reinforced with FRP bars

Instructors:

Gregg C. Blaszak, William J. Gold, Sami H. Rizkalla, David W. Scott, and Robert E. Steffen

Seminar handouts:

- Guide for Design and Construction of Concrete Reinforced with FRP Bars (ACI 440.1R)
- Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures (ACI 440.2R)
- Special handout with notes authored by the instructors

