Assessment Of Defects In Concrete Structures and Evaluation Of Safety Of Concrete Infrastructure Training

Description

Course Description

This course aims at providing participants with the knowledge, skills and expertise to identify durability problems of concrete structures, understand their causes, assess the associated short and long-term risks, and develop cost-effective and technically efficient rehabilitation and repair strategies to upgrade the performance of such structures, with special focus on hot and humid environments.

Course Objective

Specifically, participants will learn how to:

- Identify performance and durability problems of concrete materials and structures
- conduct field monitoring and non-destructive evaluation of concrete structures
- carry out forensic assessment of deteriorated concrete structures
- design repair strategies for deteriorated concrete structures including repairing with
- composites
- design stabilizing and strengthening techniques of reinforced concrete structural elements.

Who Should attend?

Any civil engineer with interest in learning about the modern methodology for control the construction quality and managing the construction execution on site with an advanced technique. It is foreseen that individuals from the following backgrounds may attend:

- Construction engineers
- Maintenance Engineers
- Design structural engineers
- Supervision engineer
- Planners

Course Outline

Properties of cement and concrete:

- Cement manufacturing
- b. Cement hydration
- c. Cement and concrete microstructure
- d. Blended cements
- e. Chemical admixtures
- f. Special concretes

Causes and mechanisms of degradation of concrete structures:

- Corrosion of reinforcing steel
- Sulphate attack
- Marine environments
- Alkali-silica reaction
- Cavitations and abrasion
- Moisture effects (drying shrinkage, creep, etc.)
- Thermal effects
- Load effects
- Faulty workmanship: designer, detailer, contractor

Monitoring and evaluation of concrete structures

- Condition assessment
- Visual inspection
- Non-destructive testing
- Locating defects
- In-situ tests
- Monitoring movement
- Evaluating safety

Surface repair of concrete structures

- Strategy and design
- Materials requirements and selection
- Surface preparation
- Bond of repair materials to existing concrete
- Implementation methods

Stabilization and strengthening of concrete structures

- Flexural strengthening of beams
- Shear strengthening of beams
- Strengthening of columns
- Seismic retrofit of columns

- Strengthening with composite materials

Litigation and forensic engineering of Concrete infrastructure

- Litigation
- Forensic Engineering
- Case studies