Durability Of Reinforced Concrete Structures Assessment and Repair Course

Venue Information

Venue: London UK

Place:

Start Date: 2026-07-07

End Date: 2026-07-11

Course Details

Net Fee: £4750.00

Duration: 1 Week

Category ID: CACETC

Course Code: CACETC-25

Syllabus

Course Syllabus

Course Description

As cities grow older they inherit a wealth of buildings that have economic, functional and heritage values and yet their uses may need to change, human knowledge is enhanced and thus their vulnerability to extreme events are better understood and sometimes changes may need to be made in their structure to adapt to new uses. In all of these cases structural engineers are called upon to make assessment of the current condition of the structure and to advice on what type of intervention is needed to ensure safety, functionality and economy of such alterations.

Course Objective

- Evaluations of existing structures start with understanding the new criteria which the structure is to be measured against and is then followed by testing of the existing properties which in turn is followed by analysis to determine whether the set criteria are met. Where a residential building is to be used as offices, new live loads will need to be investigated. Where new statistical data is available on the maximum wind speed or maximum snow accumulation, assessment of existing buildings may reveal some shortcomings. Most importantly, ramification of seismic events are now understood more than ever before and the need to assess resistance of old buildings is evident in many developed countries and other countries where catastrophic losses have been experienced. The course covers the processes required to evaluate and retrofit vulnerable buildings.
- Marin environment is another situation where deterioration of buildings may be expedited by the presence of chloride and wetting and drying cycles. Inspection of buildings that are exposed to such sever effects is discussed in the course with recommendations for repair and the production of durable concrete.
- Solutions using traditional material such as steel and concrete are discussed. This discussion is followed by the examination of new materials. These will include the use of carbon fibers, epoxies and various admixtures.

Course Outline

Day One:

Session 1 (Structural evaluation of buildings for):

- For the purposes of change in use
- For addition of floors or other structural changes
- Due to apparent signs of distress

Session 2

- Cracks in building.
- Types of cracks, early thermal shrinkage, drying shrinkage and thermalcracks
- Inspection and diagnosis
- Repair of cracks, material and system
- Monitoring of cracks

Session 3

- Testing of concrete in the structure
- Destructive tests: cores and pull outs
- Nondestructive tests: Rebound hammer, penetration resistance and UPV

Day Two:

Session 1

- Seismic rehabilitation of existing buildings
- Seismic vulnerability of buildings

Session 2

Session 3

- Decreasing demand of an existing system
- Rehabilitation of nonstructural elements

Day Three:

Session 1

- Retrofitting using steel and concrete
- Use of plates with bolts and/or epoxy fixing
- Jacketing of columns

Session 2

- Use of new technologies such as carbon fibers and resin
- Application to enhance flexure and shear
- Use as column confinement

Session 3

- ACI requirements for the evaluation of existing structures
- Analysis of buildings using available information
- Report writing

Day Four:

Session 1

- Foundation movement inspection and interpretation
- Options for intervention: direct and indirect
- Underpinning of building structures

Session 2

- Chemical attacks
- Chloride attack
- Sulfate attack
- Carbonation
- Mechanism, perpetuation, mitigation and repair

Session 3

- Marin environment
- Durability of concrete as influenced by the used material and systems

Day Five:

Session 1

Section 2

- Changed use of a building
- New and more stringent snow load requirement
- Archeological site