Structural Analysis and Design For Concrete Buildings Course

Venue Information

Venue: London UK

Place:

Start Date: 2026-04-28

End Date: 2026-05-02

Course Details

Net Fee: £4750.00

Duration: 1 Week

Category ID: CACETC

Course Code: CACETC-51

Syllabus

Course Syllabus

Course Description

Concrete is everywhere! In pavements, building structures, foundations, motorways/roads, overpasses, parking structures, brick/block walls and bases for gates, fences poles and many more. Concrete is used more than any other man-made material on the planet. It has been said that instead of naming our era "The Nuclear Age" it Should be named "The Concrete Age" as almost all of our modern lifestyle and constructions Depend on this material.

This five-day course covers the manufacturing, designing and maintaining of concrete. It includes the details about ingredients and its quality, quantity and effect on the final product of concrete. Concrete designing, its Specifications, standards and codes and the concrete mix design is discussed in detail

The basics from ingredients of concrete to repair and maintenance is covered throughout the workshop and would be very useful to every technician who works with concrete. The methods of design are discussed here which can help the engineers, architects and designers to design the most effective final product of concrete.

Course Objective

At the end of this workshop participants will be able to:

- Understand what concrete is and why it is used everywhere for construction
- Study the ingredients of concrete and their importance in quality control of concrete
- Learn the chemistry of concrete
- Be able to do simple concrete mix designs
- Learn everything about concrete manufacturing
- Know about testing, inspection and quality control of concrete
- Understand the defects which can occur in concrete at different stages or shortcoming and their remedies
- Study the modern concepts like ready mix concrete, precast and prestressed concrete
- Learn the methods of protection and maintenance of concrete
- Know the safety precautions to be taken while working with concrete
- Understand the concrete prepared for special purposes and the admixtures which can affect the properties of concrete

Course Outline

Understanding concrete

- The history of concrete
- Main constituents of concrete and their characteristics
- Cements
- Aggregates and mineral additions
- Water
- Chemistry of concrete
- Cement chemical properties
- Hydration of cement
- Characteristics of concrete
- Strength
- Durability
- Workability
- Permeability
- What makes concrete develop strength?
- What makes concrete durable?
- Deterioration common reasons
- Related to ingredients chlorides, sulphates and aggregate-alkali reaction
- Related to climate – temperature (hot/cold) and humidity
- Related to manufacturing and workmanship mixing, transportation, compaction, cold joints and large mass

- Target strength
- Cement content
- Aggregate sizing
- Water cement ratio
- Mix design procedures
- Specification development
- Mandatory requirements
- Durability parameters
- Investigating defects

Concrete manufacturing

- Raw material storage and handling
- Concrete mixing and production
- Transportation of concrete
- Dealing with temperature
- Formwork and its influence on durability
- Placement of fresh concrete
- Treatment to joints
- Consolidation and compaction procedures
- Curing and care of green concrete

Testing, inspection and quality assurance

- Laboratory and full-scale trial mixes
- Quality assurance
- Processes
- Acceptance criteria
- Sampling and testing of ingredients
- Sampling of concrete
- Tests on hardened concrete
- Analysis of concrete
- Non-destructive testing methods for concrete

Ready mixed concrete

- Advantages
- Types of RMC
- Specifications and tolerances
- Quality assurance
- Production and transportation

Concrete admixtures

- Benefits of admixtures
- Types of admixtures
- Water reducing admixtures
- Plasticisers

- Water proofing agents

Concrete – shortcomings

- Cracking
- Crazing and shrinkage
- Creep

Protection of concrete abrasion, corrosion and chemical attack

- Designing a protection strategy
- Surface preparation
- Improving abrasion and wear resistance
- Design and construction techniques
- Hardeners
- Coatings and toppings
- Protection against corrosive environments
- Sealers and coatings
- Toppings and linings
- Cathodic protection and metallising
- Preventive maintenance and monitoring

Concrete repair

- Inspection and investigation
- Procedures of repair or replacement
- Pressure grouting
- Shot crete
- Encasing
- Demolition of old concrete
- Repair of delaminated structure

Special purpose concrete

- High strength concrete
- Fiber reinforced concrete
- Cellular concrete
- Polymer concrete