MERCURY

Reasons for Deterioration of Reinforced Concrete Structures & Methods of Strengthening

1 – 5 February 2027
Barcelona (Spain)



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Reasons for Deterioration of Reinforced Concrete Structures & Methods of Strengthening

Ref: 15379_305955 **Date:** 1 – 5 February 2027 **Location:** Barcelona (Spain) **Fees:** 6200 Euro

Introduction:

Building renovation and strengthening to fulfill new requirements could be achieved using advanced repair materials and techniques. The reinforced concrete structure deterioration and strengthening methods course might be needed for architectural changes, increasing building heights, changing the function that differs from the original design concepts, and repairing defective works.

The reinforced concrete structure deterioration and strengthening methods training will include an extensive explanation of the steps needed to achieve integrated technical reports with particular attention to visual inspections, discussions, and field and laboratory environments to evaluate the health of reinforced concrete structures.

Scientific and technical information and applications of modern and advanced strengthening materials and techniques will be discussed, including concrete admixtures, the polymer concrete family, fiber-reinforced polymers, ferrocement, self-compacting concrete, and ultra-high-strength concrete. Standard specifications and codes of practice concerned with the integrity and sustainability of reinforced concrete structural systems will also be discussed. Audiovisual aids such as CDs, transparencies, and video films will be extensively used.

Targeted Groups:

- Civil and architectural engineers are involved in the design of reinforced concrete structures.
- Executive maintenance managers oversee the integrity of reinforced concrete frame structures.
- Highly qualified technicians specializing in the assessment and strengthening of concrete structures.
- Estate agents are responsible for managing properties with reinforced concrete structures.
- Contractors specialized in innovation work related to analyzing and designing reinforced concrete structures.

Course Objectives:

At the end of this reinforced concrete structure deterioration and strengthening methods course, the participants will be able to:

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- Identify common causes of deterioration in reinforced concrete structures.
- Understand the impact of environmental factors on concrete integrity.
- Analyze the effects of chemical attacks on concrete structures.
- Recognize signs of structural weakness and failure.
- Evaluate the role of design and construction flaws in deterioration.
- Learn methods to assess and diagnose concrete damage.
- Explore techniques for strengthening and rehabilitating reinforced concrete.
- Apply best practices for repairing and maintaining concrete structures.
- Review case studies of successful concrete strengthening projects.
- Develop skills to implement preventive measures against future deterioration.

Targeted Competencies:

Participants' competencies in this reinforced concrete structure deterioration and strengthening methods training will:

- Identification of concrete deterioration causes.
- Analysis of environmental impacts on concrete.
- Understanding chemical attack effects.
- Recognition of structural weaknesses.
- Diagnostic skills for concrete damage.
- Knowledge of strengthening techniques.
- Application of repair and maintenance practices.
- Case study analysis of concrete rehabilitation.
- Preventive measure implementation.

Course Content:

Unit 1: Introduction:

- Reviewing new building requirements, including types of reinforced concrete structures case studies.
- Exploring natural and unexpected hazards that can lead to the deterioration of concrete structures.
- Engaging in discussions about reinforced concrete structural design and what constitutes a reinforced concrete structure.

Unit 2: Integrated Technical Reports:

- Exploring the contents of integrated technical reports vital for building reinforced concrete structures.
- Providing a complete illustrative guide for ideal technical reports that address the lifespan and performance of reinforced concrete structures.
- Presenting a case study for the application of building inspection focusing on corrosion in reinforced concrete structures and discussions.

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Unit 3: Durability of Buildings:

- Techniques for non-destructive field tests applied to reinforced concrete structures.
- Investigating factors affecting the durability of buildings, including corrosion and protection methods in reinforced concrete structural systems.
- Overview of maintenance systems designed specifically for the longevity of reinforced concrete frame structures and discussions.

Unit 4: Repair and Strengthening:

- Advancements in repair and strengthening materials applicable to various reinforced concrete structures:
    - Innovations in cementitious materials and admixtures.
    - The increasing use of the polymer concrete family in reinforced concrete structure reinforcement.
    - The role of fiber-reinforced polymers FRP in strengthening concrete structures.
    - Implementing ferrocement in the context of a reinforced concrete structural system.
    - Employment of self-compacting concrete in contemporary construction.
    - Utilization of ultra-high strength concrete for enhanced structural capabilities.
    - Adherence to specifications and codes of practice strengthens methods of concrete structures and discussions.

Unit 5: Techniques:

- Examination of various strengthening techniques and their application to specific components of reinforced concrete structures:
    - Foundations and how they form the bedrock of reinforced concrete structures.
    - Methods to strengthen columns within a reinforced concrete frame.
    - Innovations in reinforcing and cantilever slabs constitute integral parts of reinforced concrete structures.
    - Approaches to reinforce beams within the framework of reinforced concrete structure design.
    - Analysis of walls and their importance in the overall stability of building reinforced concrete structures.
    - Close remarks and discussions regarding the latest trends in strengthening concrete structures.