Modern Materials and Technology in the Concrete Sector

Novel Materials for Concrete Restoration and Preservation

Introduction

This training course on Advanced Materials & Technology in the Concrete Industry will familiarise participants with recently developed concrete materials and repair materials that are used in the majority of concrete structure repair projects, whether they are required for new construction or the rehabilitation of existing structures. In addition, test procedures, technical details, and troubleshooting for the most typical issues with these materials will be covered.

Around the globe, concrete is used in a variety of ways. Recent developments in material science have made novel materials or admixtures available to supplement or replace traditional concrete components in order to improve the qualities of concrete. These materials might be used to the building of new concrete structures or to the maintenance of already-existing ones. If not handled correctly, these products might be ineffectual or perhaps more harmful than beneficial.

The participants will be equipped with the knowledge required to understand the many advanced concrete materials, including what tests to run and how to interpret the findings, what to look for in specifications, and the benefits and drawbacks of each new material.

This training session for Course N Carry will emphasise:

- Sophisticated methods for codes and standards
- Cutting-edge materials for concrete building
- Novel materials that improve the durability of concrete
- Using cutting-edge building techniques to create a sustainable structure
- Cutting-edge tools and methods for fixing concrete
- Carbon Fibre Reinforced Polymer (CFRP) for Reinforcement and Repair of Concrete Structures
- Modern methods for protecting against corrosion

Objectives

Following this training session, the participants will be qualified to:

- Learn about the new methodology for project management for brownfield projects.

- Explain using innovative design techniques and make a distinction between codes and standard
- Describe how the concrete industry is using new materials.
- Become familiar with cutting-edge building techniques.
- Learn about Self-Consolidating Concrete (SCC), High Strength Concrete (HSC), and High-Performance Concrete (HPC).
- Become familiar with all current materials and repair techniques.
- Competent to plan and carry out CFRP for reinforcing concrete

Training Methodology

To guarantee optimal comprehension, retention, and understanding of the material provided, this Advanced Materials & Technology in Concrete Industry training course will make use of a range of tried-and-true adult learning strategies. There will be a lot of interaction and participation in the daily sessions. Images and videos will be used as examples.

Organizational impacts

This Advanced Material & Technology in Concrete Industry training course has the following important effects on the company.

- Enhancing construction quality control
- Cutting down on building time by using cutting-edge concrete additives
- Increasing the organization's structures' longevity and lowering maintenance costs
- Cutting down on the amount of time that construction upkeep requires
- Boost organisational investment by being aware of cutting-edge materials and technologies and how they are used in actual projects.
- Enhance the return on investment for the organisation by maintaining an efficient structure throughout time.

Personal Imapct

The following are only a few of the many effects this training programme has on the participants:

- Enhancing workers' abilities to utilise concrete's advanced materials for a variety of uses
- Using the cutting-edge material to optimise the concrete's design
- Updating cutting-edge technologies and enhancing the concrete's history
- Boost knowledge of material characteristics
- Learn about the most recent materials used in building and maintenance.
- Become more proficient in the maintenance approach
- Develop the ability to improve the standard of each stage of the oil and gas projects.

Who should attend?

People working in the construction, oil and gas, and government sectors who are engaged in building construction, maintenance, and repair programmes are the target audience for this Advanced Materials & Technology in Concrete Industry training course. It is also intended for engineers who specify and choose repair techniques, as well as those who prepare maintenance document packages and diagnose failure causes.

A suitable variety of professionals are enrolled in this Course N Carry training session, and they will greatly benefit from:

- Civil Engineer
- Structural engineer
- Project Manager
- Engineer for Construction
- Supervisor of Projects
- Manager of Engineering
- Manager of Construction

Course Outline

Day 1

Overview of Advanced Materials

- Concrete Inspection and Quality Management
- Mixture for Concrete Design
- Concrete with great strength and performance
- Particular Component Materials and Additives
- Concrete Construction Techniques in the Gulf Area
- Precautions for Various Concrete Operations in the Gulf Region's Hot Weather
- Standard Test Procedures for Reinforcement and Non-Conventional Concretes

Day 2

Characteristics of Ultra-High-Performance Concrete (HPC) and High Strength Concrete (HSC)

- General High Strength Concrete
- Modern Reinforced Concrete Additives
- Concrete Additives Types and Limitations
- Fly Ash, Slag (GGBS), and Silica Fume
- Production of High Strength Concrete
- Mixing and Batching Concrete with High Strength

- Setting Up and Compacting Concrete with High Strength
- Steel Bar Corrosion Phenomena

Day 3

Advanced Techniques and Materials for Protection Against Corrosion

- Standard Test Procedures for FRP Rod Properties
- Technical Details for Reinforcement and Concrete
- Using Innovative Materials to Prevent Corrosion on Steel Reinforcement
- Unconventional Reinforcement Materials for Concrete Structures
- Epoxy- and galvanized-coated bars
- Anodic Inhibitor for Concrete Reinforcement using Fibre Reinforced Plastic (FRP)
- Standard Details for Bars with Epoxy Coatings

Day 4

Modern Materials and Methods for Concrete Restoration

- Rubberized Concrete
- lightweight concrete
- Fiber-infused Concrete
- Assessing the Current Framework
- Describe the Repair Process
- Traditional Techniques for Slab and Beam Repair
- Using New Materials to Repair Foundations
- Fixing Latex Modified Concrete with Steel Section
- Typical Guidelines and Specifications
- Concrete with Latex Modifications
- Manufacturing
- Qualities and Uses

Day 5

Applying CFRP to Repair

- Method of Repair Using CFRP
- The CFRP Philosophy's Design
- Choosing Reasonable Materials
- Carrying out the CFRP
- Advanced Inspection and Repair Programmes