Modern Structural Renovation of Buildings

Training program

Introduction:

The renovation of the reinforced concrete structures has become common in recent years due to the development in technologies, materials and the techniques for maintenance and repair. This course will present methods for inspection and evaluation of buildings and diagnose the reason of concrete deterioration or the corrosion of the steel bars, to develop preventive maintenance program.

The causes of structure deterioration will be discussed concentrating on the reason of corrosion and new protection methods to the steel bars. All the repair and renovation methods will be covered theoretically and practically and obviously discussed its advantages and disadvantages and how to use the suitable method. The case study explains practically who can we diagnosis the reason of deterioration and take the decision of repair and choose between different alternatives. CFRP will be illustrated for renovation and strengthening the structure.

This course will feature:

- The materials that will be used in concrete structure repair
- The new methods of structure diagnosis
- The new methods for structure renovation
- Protection of the structure during the renovation

Who Should Attend?

Construction Engineers, Senior Construction Engineers, Construction Supervisors, Construction General Supervisors, Construction Project Managers, Engineering Technologists, Supervision Engineer, Inspection Engineers, Civil Inspectors, Foremen, Design Structural Engineers, Planners, Structural Engineers, Material Specialists, Quality Control and Quality Assurance Experts, Architects, Supervision Engineers, Team Leaders, Site Officers and Managers, Mechanical Engineers, Technical Professionals, Field Production Supervisor, Operation Engineers, Clients Representatives, anyone in the construction industry who are involved in building maintenance and provide execution plan for maintenance and repair for buildings, those who are involved in preparing maintenance document package, diagnose the reasons of failure, and also the engineers who define and choose the methods of repair.

Course Objectives:

By the end of this course, delegates will be able to:

- Diagnose the problem and provide a repair solution
- Understand modern and effective procedures for renovation of the building
- Know the structure defects and cracks and diagnosis the reason for deterioration
- Familiarize with up-to-date renovation methods for concrete and steel structures

Course Outline:

Building Evaluation

- Inspection and evaluation of the buildings
- Methods of Inspection
- Visual inspection criteria
- New techniques to inspect the building
- Using ultrasonic and infrared for inspection
- Concrete material deficiencies
- Evaluate the building risk
- Diagnose the reason of deterioration

Successful Steps for Repairing RC Structure

- Construction errors
- Design errors
- Define the method of repair
- corrosion phenomena
- Precaution during repair
- Selecting the materials repair
- Step by step repair procedure
- Corrosion and protection of steel structure in concrete
- Methods of protection
- Cathodic protection
- Comparison between different types of protection

Properties of Protective Coating

- Evaluate the current protective coating
- Types of protective coating
- Properties of each type
- Precautions in using the coating
- Types of cracks in R. C. structures

- Comparison between different cracks
- Reasons for each type of cracks

Methods of Repairing the Cracked Structure Corrosion

- Methods of repair and prevention for each type
- Materials used to repair corroded structure
- Methods of repair
- Using polymer bonding materials
- Types of polymer
- Properties of these materials
- Using Hot rolled section for repair

Maintenance Strategy

- CFRP application
- Design and construction of CFRP
- Using CFRP for repair
- Using CFRP for structure strengthening
- Likelihood of building failure
- Define consequences of failure
- Provide risk matrix
- Risk based inspection (RBI)
- Maintenance plan and strategy based economic