

# Assessment , Evaluation and Repair of Reinforced Concrete Structure

## INTRODUCTION

- This Assessment, Evaluation, and Repair of Reinforced Concrete Structure training course will present the methods of inspection and evaluation of buildings. It will diagnose the reason for concrete deterioration or the corrosion of the steel bars to develop a preventive maintenance program. The causes of structural deterioration will be discussed deeply and concentrate on the reason for corrosion and new protection methods to the steel bars. The repair of the reinforced concrete structures recently developed by using new materials will be discussed theoretically and practically, its advantages and disadvantages, and how to use the suitable method.
- The assessment of the reinforced concrete structure is now a main challenge to the civil engineer. The repair of reinforced concrete structures has developed in recent years due to the new technology of the materials and the techniques of maintenance and repair. The preventive maintenance strategy, with its target and plan in the scope of the economic perspective, shall be clarified. Moreover, computer programs can be used to manage maintenance. Risk-based inspection techniques will be presented in the scope of the likelihood of building failure, consequences of failure, and the building risk matrix.

This training course will highlight:

- Technologies of evaluating both of structures composed of concrete or steel
- The value of diagnoses and tests used for inspecting constructions
- Understanding how the inspection as well tests are applicable for different areas of constructions
- Different methods based on theories as well as practice for inspection
- The way to use advanced techniques by some integrated method in the work

## OBJECTIVES

By the end of this training course, the participants will be familiar with:

- Testing and inspection techniques of engineering materials
- The workmanship in building construction
- Non – destructive evaluation (NDE) for the steel and welding
- The capability to inspect the finishing work activity
- Testing and inspection for road construction
- The ways and skills for the inspector

## **TRAINING METHODOLOGY**

- This Assessment, Evaluation, and Repair of Reinforced Concrete Structure training course will utilise a variety of proven adult learning techniques to ensure maximum understanding, comprehension, and retention of the information presented. The daily workshops will be highly interactive and participative. Videos and photos will be used for illustration.

## **ORGANISATIONAL IMPACT**

The impact on the organisation in attending this Assessment, Evaluation, and Repair of Reinforced Concrete Structure training course are the following:

- Improve the maintenance cost by enhancing the engineering review process
- Improve the maintenance cost by enhancing the construction and materials selection process
- Reduce the maintenance cost by using a new approach for structure assessment
- Increase the structure of capital investment by increasing its lifetime
- Improve the organization investment by providing a durable structure by better design, construction or maintenance
- Save the money which can be spent for corrective maintenance

## **PERSONAL IMPACT**

The impact of this training course to the participants are manifold and includes:

- Enhance the skills of inspection
- Gain knowledge of up to date of the execution phase
- Increase the skill for maintenance approach
- Increase the skill to design CFRP
- Improve the skills of statically structural systems

## **WHO SHOULD ATTEND?**

This Assessment, Evaluation, and Repair of Reinforced Concrete Structure training course is an important course to evaluate constructions and define practical solutions suitable to a wide range of professionals but will greatly benefit:

- Architects
- Engineers
- Project Engineers
- Contractors and Building Owners
- Practicing Building Construction Inspectors
- Technicians and Technologists involved with building maintenance

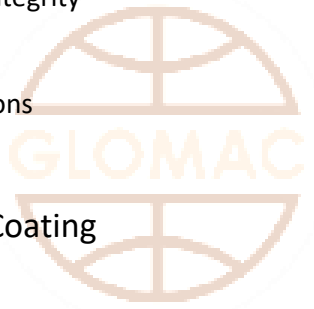
## Course Outline

### Building Assessment

- Introduction to Mature Structure and Understanding Statically System
- Codes and Standard Features
- Inspection and Evaluate the Buildings by Different Methods
- Visual Inspection Criteria
- Inspect the Building Using New Techniques
- Using Ultrasonic and Infrared for Inspection
- Evaluate the Building Risk
- Diagnoses the Reason of Deterioration

### Problems in Design, Materials and Construction

- Concrete Materials Problems
- Construction Ways Affect Concrete Durability
- Design Error Affect Structure Integrity
- Errors in Soil Investigation
- Error in Design Foundation
- Error in Foundation Constructions



### Properties of Protective Coating

- Selecting the Materials Repair
- Step by Step Repair Procedure
- Methods of Protection
- Corrosion and Protection of Steel Structure in Concrete
- Protection of Reinforcing Bars
- Comparison between Different Type of Protection
- Materials used to Repair Corroded Structure
- Methods of Repair
- Using Polymer Bonding Materials

### Methods of Repairing the Cracked Structure Corrosion

- Properties of these Materials
- Ways of Using Steel Sections in Repair
- Types of Cracks in R. C. Structures
- Comparison between Different Cracks
- Reasons for Each Type
- Methods of Repair and Prevent for Each Type
- Define the Method of Repair

## Maintenance Strategy

- CFRP Design and Applications
- Likelihood of Building Failure
- Define the Consequences of Failure
- Provide Risk Matrix
- Maintenance Plan and Strategy
- Maintenance Plan based Economic Cost
- Software for Maintenance Strategy

